Mapping Critical Practice In A Transdisciplinary Urban Studio

Helen M. O'Connor

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School of Education

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I must also acknowledge with huge thanks those distinguished academics and practitioners who kindly gave their permission for the inclusion of images. I have argued here that knowledge is embedded in images, many have been critical to the development of this study, and therefore my text (in places) originates from and is structured around them – so thanks are due to Pol Gallagher of ZAP Architecture (the cost of architecture school), to Sarah Wigglesworth (the disorder of the dining table), and to Professor Leon van Schaik (the social theatre of practice).

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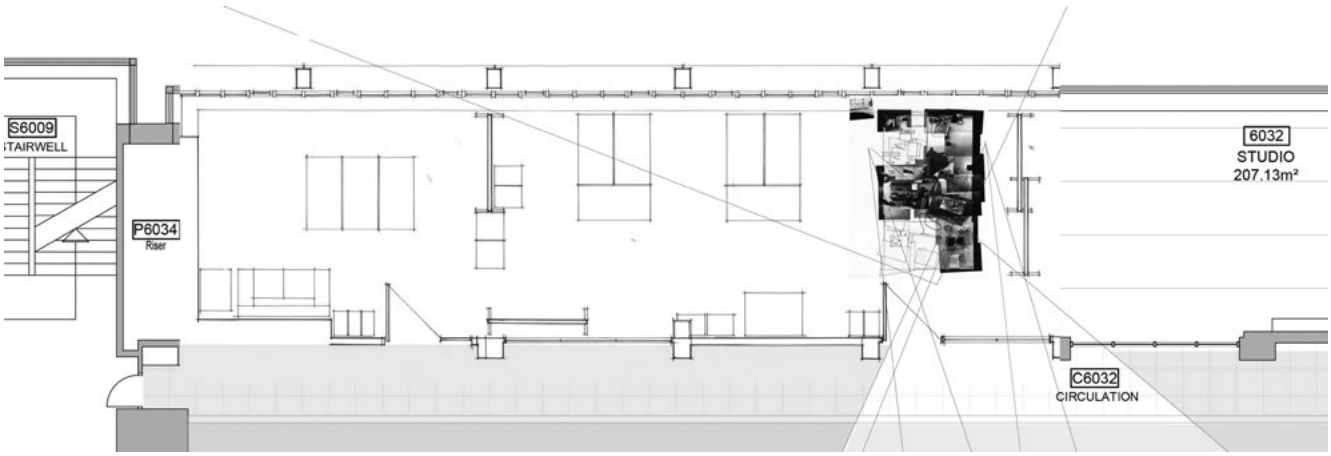
Lastly, but most importantly, this study would not have been possible without the enthusiastic support, and endless patience of the M.Arch with Urban Planning cohort of session 21-22. They freely shared their time and their ideas while themselves navigating the most important year of their academic careers to date. I must also acknowledge the same unwavering support and patience from my colleagues in the School of Architecture and Urban Planning, and my long-suffering family.

Abstract

Architecture and Planning exist to make positive changes to our environment. Future practitioners in these disciplines will be responsible for how our cities develop and are managed - they will be required to exercise their professional judgement in complex and unpredictable contexts. There is increasing interest in transdisciplinary urbanism, but implementation in academic contexts has to date been relatively limited. This thesis aims to build on these examples, through a detailed account of one academic design studio which operates across architecture and urban planning; in doing so it aims to make the case for transdisciplinary, problem and place-based studio teaching.

The study considers how a transdisciplinary studio environment supported students to develop a critical approach to practice through collaborative discourse. It looked at studio methods/practices; what it means to practice 'critically' in the context of design; and the role 'going public' by sharing ideas in public fora might play in developing critical positions.

The study was undertaken in collaboration with nine students, a single cohort undertaking the final year of a hybrid master's qualification in Architecture with Urban Planning. It adopts socio-material and spatial approaches to follow how the studio environment and the students' emerging interdisciplinary identities shaped both their individual and their shared work. It mapped how their approach to their practice evolved through observations, interviews, and informal conversations, and through their drawings, models and journals. In carrying out these observations, and their analysis, I have returned to drawing methods common in architecture. This allowed me to explore and record aspects of studio practice which might otherwise be missed and revealed the importance of visual and spatial thinking to my own practice. Observations revealed how material spaces, tools and artefacts acted to structure social relations in the studio, and how these relations shaped individual approaches to critical practice.



Locating the table in the studio

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Declaration

I, the author, confirm that the Thesis is my own work. I am aware of the University's Guidance on the Use of Unfair Means (www.sheffield.ac.uk/ssid/unfair-means). This work has not been previously presented for an award at this, or any other, university.

Setting up the degree show - the studio from the street 09/05/22

1: Introduction

How might professional education better prepare graduates to practice *critically* - to exercise judgement mindful of their obligation as citizens of a wider society? Professionals are increasingly seen as providing a technical service (Kreber, 2016a). In professional education, this direction of travel is propelled by the political rhetoric around higher education which emphasizes employability and future financial return as a measure of success, and by a quality assurance culture of quantifiable learning outcomes (Barnett, 2011, Giroux, 2002). But professionals are required to take decisions in complex and unpredictable circumstances where aims are open to debate and there will be no one 'correct' answer. They will be pulled in multiple directions and must be open-minded and empathetic, acknowledge uncertainty but prepared to act with courage and integrity (Kemmis 2012, Kreber 2016a).

Nowhere is this question more urgent than in how we educate those who will design and manage the development of our future built environment, as Cortese points out 'It is the people coming out of the world's best colleges and universities that are leading us down the current unhealthy, inequitable, unsustainable path' (2003, p.16). To address the challenges facing contemporary and future cities, we may need to explode the disciplinary and institutional silos currently containing professional education. This doctoral project is centred on one academic design studio delivering a combined masters-level programme in *Architecture* and *Urban Planning* - two discrete professional disciplines normally taught in quite different ways but which share a common concern in how society shapes urban environments.

Studio methods are central to architectural education: students engaging with iterative, problem-based learning structured around design briefs. Studio has been proposed as an exemplar for professional education as it can build a reflective approach to practice (Schön 1983), but the paternalistic scenario of 'coaching' which persists is problematic for many contemporary critics (Dutton and Willenbrock 1984, Webster 2004, 2008, Mewburn, 2012, Salama 2021) and the core of studio methods - the physical space of the studio - is in question. Studio space is an expensive resource increasingly difficult to justify in the context of diminishing budgets, utilization surveys, and an increasing emphasis on digital learning. Just how critical is the physical space of the studio, to *studio* as a teaching method? How might the space itself, and the material and/or object languages it enables (Cross 1982) facilitate discourse, collaboration, and the development of a *critical* approach to practice?

The *M.Arch with Urban Planning* studio described in this doctoral project is not revolutionary. Its methods and context will be familiar to any tutor who has been involved in architectural education but because of its hybrid agenda it frames problems from a subtly different perspective, a shift of position which has wider implications than might be immediately obvious. Spatially the emphasis moves from the *figure* of the built form to its *ground* - the spaces created around and between buildings. This territory is necessarily created by negotiation and in parallel the students inhabit the borderland shared between the programme's two constituent disciplines, engaging in a more collaborative and perhaps also more *critical* design practice.

There is an increasing interest in, and acceptance of the value of *inter* and *trans*disciplinary urban practice, but implementation in academic contexts has been to date relatively small scale and limited. In parallel there is an increasing recognition of the importance of building critical and ethical approaches to design practice in architectural education (RIBA 2020, ARB 2023). This doctoral study aims to build on those of transdisciplinary studios which have been documented (Després et al., 2011, Doucet and Janssens, 2011) and the more numerous and targeted[1] studies conducted in more disciplinary orientated studio settings (Dutton, 1987, McClean, 2009, McClean and Hourigan, 2013, Corazzo, 2019, Shreeve et al., 2010). It presents a rich and detailed description of the MArch & UP studio as it developed during the academic session 2021-22. In doing so it aims to make the case for transdisciplinary problem and place-based studio teaching.

1.1.1: Research questions

The study focuses on the development of a *critically reflective* approach to practice in students on the threshold between an academic and professional context, specifically it examines how a transdisciplinary studio context might support students to develop a critical approach to their future practice.

1 This would include (for example) literature documenting reviews/critiques and/or assessments in studio methods, but is not limited to this.

To investigate this, a series of sub-questions were considered:

- What does it mean to practice *critically*, and specifically in the context of urbanism?
- How important are studio methods/practices and 'designerly' or solution-focused ways of thinking (Cross, 2011) in the development of critical practice?
- What role might be played by the discourse, collaborative problem-forming and problem-solving inherent in the studio's pedagogy?
- How do students use artefacts, materials and spaces to structure that discourse and collaboration?
- How might *going public*, that is the obligation to share ideas in a public forum, help define a critical position and shape an approach to future practice?

Methodology + methods

The study was undertaken in partnership with students and external collaborators as co-researchers. It is an ethnographic study of a single cohort of nine students over one academic session, following how their final thesis projects developed and how their roles transitioned from undergraduate *Architecture* students to *M.Arch with Urban Planning* students, to new graduates embarking on professional careers. It maps how their approach to their practice evolved. The study was carried out through observations; interviews, and informal conversations with the students; and through gathering the drawings, models, and diaries that the students made in developing their final year projects.

1.2: Position: this is ~~not~~ architecture

Position is central to the aims, context, and methods used in this study. I have therefore included below an account of how my own position has evolved, and how this has led to questions set out above.

> The shape shifting of the architect's identity is not a weakness; it's a great strength. I've run out of patience with, and we have run out of time for, the voices saying 'this is not architecture'. (Lokko and Hughes, 2021 p. 2)

This is a statement I can identify with. Francesca Hughes describes a familiar scenario: she is a critic in an architectural review[2], a fellow critic responds to Hughes' comment by saying "yes, but speaking as an *architect*" a remark which is almost invariably followed by a discussion of formal concerns around composition. I've been there and heard that. Architecture is fundamentally about how we live in the world so where do the boundaries of this discipline lie? Who decides what is relevant, what is not and by what logic these lines are drawn? Can we afford the luxury of narrowing our focus in this way?

2 *The tradition, logic and process of architectural reviews will be explored in Chapter 8 (page 163)*

I must admit to a conflicted position. There are more important concerns facing the world and the designers who shape it than formal, compositional ones. Proposing a new building as the default answer to every problem is at best naïve, at worst an unethical waste of precious resources. In conducting this study, I am therefore questioning my own professional identity - what it means to be *an architect*, at the same time as questioning how education might best prepare new graduates to practice architecture in a super-complex world which is facing environmental crisis.

Professional identity

I am an architect. That is my academic background and I have the statutory right to that title. Architecture, the design of architectural space and form, is also my passion. But I submitted my resignation from practice on the same day I passed my professional exams, so what does my title mean? How much of *being an architect* is invested in a knowledge of the academic discipline, and how much is engagement with its professional practice? Architecture is art and science, theory and practice - it is amorphous, multi-dimensional and slippery.

I left practice having concluded that I wanted to teach the academic discipline of architecture more than I wanted to practice the profession so this has become the other half of my own professional identity. I have taught in architectural studios for the entirety of my career. I have examined for professional bodies and academic institutions throughout the UK, Europe and beyond. I take my role as a teacher of architecture seriously enough that I chose to return to being a student in order to undertake this study.

1.2.1: Interdisciplinarity

This study is, therefore, situated between disciplines: between the already 'interdiscipline' (Heckhausen 1972) of urbanism, and that of education. While my step across boundaries into the academic discipline of education is relatively recent, throughout my own education and the way that I've subsequently taught architecture I've been interested in what other disciplines can teach us: how 'patrolling the boundaries' (Dogan and Pahre, 2019) can inform the centre. Architects are highly skilled spatial thinkers, effective problem-framers and solvers who can exercise these skills across wider fields than construction, but to underestimate the contribution of other disciplines and professions (as architects are often accused of doing) is myopic and ultimately marginalizes the architect's voice.

To explain what has shaped my approach to interdisciplinarity in studio teaching practice it is necessary to briefly recount my experience leading two contrasting final-year studios:

Material: 2007-2014

Figure 1.1 this photo-collage of the material degree show exhibition was made by students in the 2009-10 studio. Students in this cohort were working with etching, casting and collage among other techniques, as methods for investigating architectural space

The final year *Material* M.Arch studio focused on the creative potential of making, both in the studio and in the construction of built space. This approach might be termed material practice - considering the 'emotional capacity of materials' to shape the experience of built space (Caruso and St John, 1996) - a position broadly aligned with phenomenological readings of architecture. *Material* drew on practice in other visual disciplines: film, sculpture, collage, textiles, and illustration. Because of the interest in physical making inherent in this approach, the studio enabled and encouraged experimentation centred on material *things* in the form of drawings, models, and artefacts.

Despite the ultimate success of material students in both final assessments and in their subsequent architectural careers, staff and students were often subject to challenges of the "this is not architecture" variety cited by Lokko and Hughes (2021). While the research questions the students posed were architectural, their methods and their outcomes were not always limited to the design of buildings.

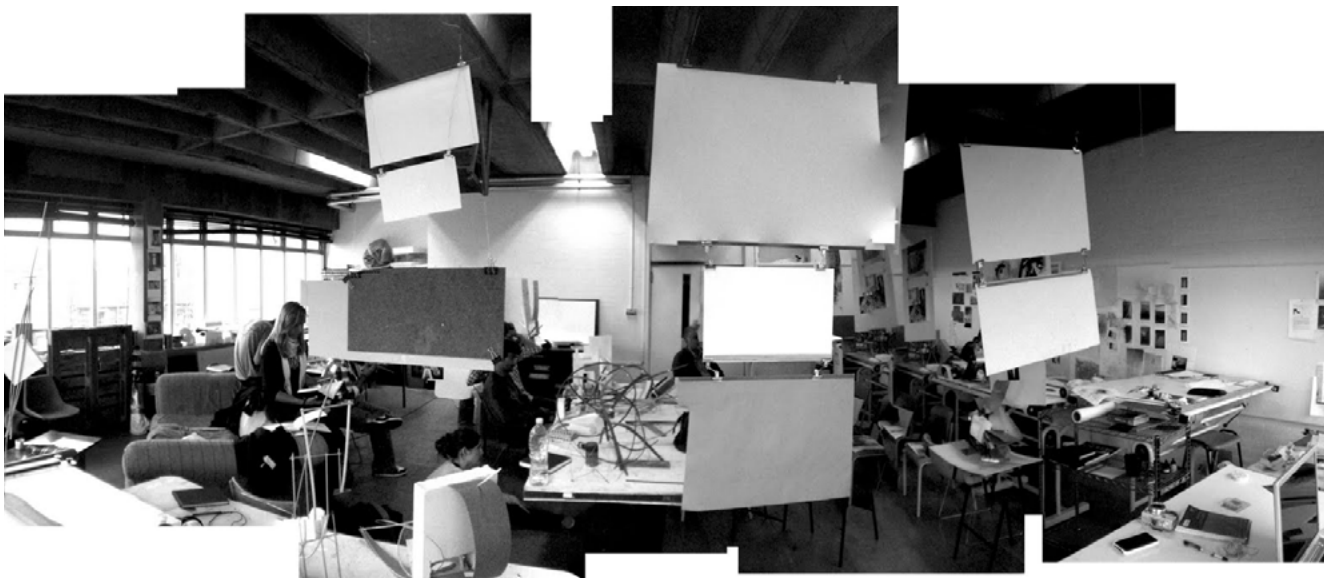


Figure 1.2: Photocollage by S. MacAllister of the Material Studio 2010.

M.Arch with Urban Planning: 2016-2023

In 2014, as discipline lead for learning and teaching, I developed a proposal for an interdisciplinary qualification utilising modules from an existing M.Sc Spatial Planning course with the core M.Arch *(Figure 1.3: page 20)* which would enable graduates to qualify as accredited professionals in both disciplines. I began this undertaking with extensive experience in professional accreditation procedures - particularly in architecture - and an interest in curriculum development, but with little knowledge of planning.

We often talked about *interdisciplinarity* in the Material studio and would regularly ask individuals from other disciplines to act as critics or contribute to studio teaching. We explored adjacent disciplinary territories to borrow ideas or techniques which might yield fresh, insightful results when applied to architecture, but we were not seriously questioning conventional architectural value systems. Engaging meaningfully with planning through leading *M.Arch with Urban Planning* and working collaboratively with colleagues inside and outside the institution forced me to address sometimes uncomfortable 'truths' that I'd largely ignored to this point.

1.2.2: Hanging on to the tip of an iceberg

In a filmed 2018 symposium Tatanja Schnieder uses the metaphor of an iceberg to discuss the city, equating the physical fabric of the city with the iceberg's visible peak (Schneider, 2018). She argues that Architecture's focus on the formal aesthetics of the built environment obscures the importance of less tangible factors, the social, political, economic, and environmental networks within which architecture is embedded, and of which it is a product. She suggests that engaging in formally-focused critique only reinforces the impression that architecture can be something closed and 'finished' - that this emphasises the exchange value of buildings and spaces over their social use value. Contemporary buildings in this analysis are the products of an economic system that understands them primarily as commodities to be traded.

Schneider's analogy of the iceberg applies not only to the city as a complex 'organism' (Jacobs, 1961) but also to how architecture relates to the systems and networks which generate it:

> If you imagine our environment, the production of space, as an iceberg - buildings or other interventions as at the tip of this iceberg - they are representations or expressions of the underlying systems and values in both an aesthetic and socio-economic sense. If one wants to fundamentally change how our environment is produced - so what the tip of this iceberg represents - it's not enough to change the look of the tip. Any intervention that is interested in true transformation needs to understand the entirety of this iceberg (Schneider, 2018).

Schneider suggests that instead of focusing on the aesthetics of architectural form we should be asking questions: who *produces* buildings, spaces, cities or territories? Who holds the power to make decisions? Who and what finances the spaces of our cities? Ultimately, she asks us to consider what roles we as architects, and/or teachers of architecture play in this system: are we reinforcing existing patterns, hierarchies, and dependencies through our own actions/inaction? It is as relevant to ask these questions of planners as of architects, but

planning does (at least) recognise the built environment as more than the tip of the iceberg. Where architecture is concerned with architectural space as the outcome - its *commodity, firmness and delight*[3] - planners must anticipate the interconnectedness of often invisible networks and systems which shape our environment and the possible consequences that intervention may have.

I remain *an architect*. I believe that commodity, firmness and delight are all fundamental to architecture while continually questioning what these terms mean in a contemporary context. But I have come to appreciate how blinkered the architectural profession, and perhaps even more so architectural education, can be.

1.3: Urbanisation/why cities are interdisciplinary problems

I have suggested that the problems facing our urban environments require a change in the way we educate graduates to meet them, I therefore include a necessarily brief explanation of this broader context.

> Each of the various specialists remains too closely concentrated upon his single specialism, too little awake to those of the others. Each sees clearly and seizes firmly upon one petal of the six-lobed flower of life and tears it apart from the whole (Geddes 1917, in Trywhitt, 1947, p. 26)

Patrick Geddes was a central figure in the early development of town planning bringing his disciplinary background in botany to his thinking about the nature of cities. He was writing here in the context of nineteenth century urban problems that he perceived as already too complex and multi-faceted to be solvable by any one discipline. In addition to devising innovative urban plans for new and existing cities he also proposed radical interdisciplinary educational models as a means of addressing these challenges (Rubin, 2009).

55% of the world's population now lives in cities, a proportion forecast to increase to 68% by 2050. The world's urban population increased from 751 million in 1950 to around 4.2 billion in 2018 (United Nations, 2018). That population inhabits an increasingly dense and polluted environment with consequent detrimental impacts on human well-being, and physical and mental health. The urban sprawl facilitated by increasing reliance on cars is worsening inequalities in access to housing, infrastructure, and services (Sennett, 2007, 2018, Harvey, 2008, Soja, 2013, Perez, 2019). Climate change will only exacerbate these issues. How cities evolve, how they are designed and managed, can assist in addressing the root causes of climate change and mitigate against its worst effects, but if specialists remain focused on their specialisms we are in danger of missing this holistic goal. We might therefore question the capacity of traditional disciplinary structures to address these contemporary demands and effectively prepare new graduates to enter this field of professional practice.

3 Roman architect Vitruvius identified the three elements necessary for a well-designed building as: firmitas, utilitas, and venustas, i.e. that the structure and envelope should be well constructed, that the arrangement of spaces should meet the users' requirements, and that it should be beautiful. This was translated to English in the seventeenth century as 'commodity, firmness and delight' by Henry Wotton

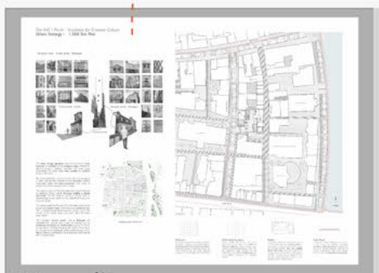
semester 1 **semester 2** **semester 3** **semester 4**

DISCRETE, THEORY/ANALYSIS MODULES

30 credit **Architectural Humanities**
History; Theory; Fine Arts

20 credit (Urban Planning)
Property Development Processes

20 credit (Urban Planning)
Sustainability in Contemporary Cities

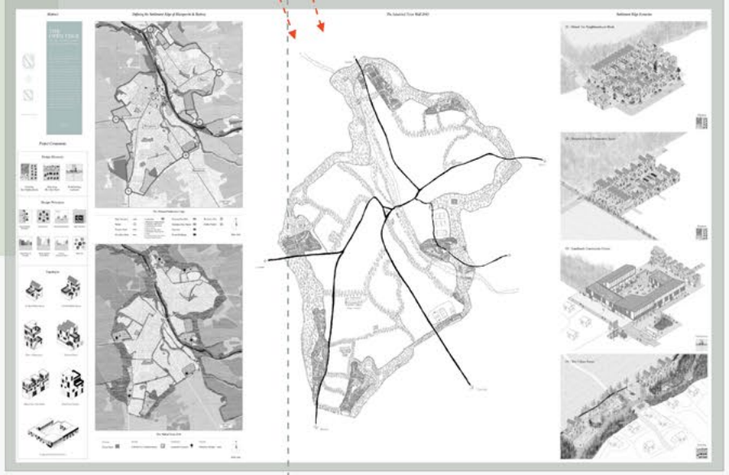


30 credit
Urban Theory, Analysis & Strategy
context; urbanism etc.

60 credit **Integrated Design Project**
brief; organisation of space; technical resolution etc.

20 credit (Urban Planning)
Statutory Planning

60 credit **Design-Led Research Project**
combines Architecture and Urban Planning concerns



CONNECTED, PLACE-BASED, DESIGN MODULES

Figure 1.3: The MArch with Urban Planning course is completed over two academic sessions. This diagram illustrates the work of one student completed during the sessions 20-21 and 21-22.

Complexity, organised complexity and wicked problems

The professional education which aims to prepare graduates to enter this field has traditionally been structured around disciplines – architecture, urban planning, engineering - but urban problems are never the province of a single academic discipline; they are always, as Jane Jacobs notes, multi-faceted - any intervention having potentially far-reaching and unpredictable consequences (1961). For this reason *urbanism* was described as an 'Interdiscipline in waiting' by Heckhausen (1972) held together by the need to address complex, compound problems which transcend disciplinary boundaries.

Jacobs' conception of the city is more an interconnected, multi-layered web of dynamic processes than a physical structure – closer to ecosystems in continual evolution than to machines (1961). The term she used to describe this - *organised complexity* - suggests an emergent order, but can the design of cities be treated as *complex* problems, or are they *wicked*? The term 'wicked problems' was originally coined by Rittel specifically to describe the nature of urban planning problems. It refers to problems which are unique, open-ended, and elusive and which have no 'correct' solutions, each 'unique' problem being a 'symptom of another problem' (Rittel and Webber, 1973). If urban problems are 'wicked' in nature – what skills and attributes might professionals need to effectively address them? Engaging with uncertainty of this kind is central to design practice - Schön argues that this is where a professional is required to practice *reflectively*, and exercise *judgement* (1983).

1.3.1: Context: the M.Arch with Urban Planning

This study focuses on students studying an M.Arch with Urban Planning (M.Arch & UP) programme at the University of Dundee. This is described in course literature as a 'hybrid qualification' - graduates emerge as architects and/or planners, positioned to progress to chartered status in either or both professions. The course was initially designed with a twofold ambition: to better equip graduates to practice in an increasingly diverse professional environment, and to help shape more holistic professions better able to address complex urban problems. More prosaically, it sought to exploit the recruitment potential of combining two disciplines which had recently been amalgamated within the university's administrative structure.

The programme enables architecture students within the final year of their five-year ARB[4]/RIBA[5] accredited course to follow a hybrid pathway which includes postgraduate urban planning modules which is also then validated by RTPI[6] . It runs in parallel to the core M.Arch programme - embedded as a *studio* in the final year of Architecture - but is distinct from it.

4 *Architects Registration Board: the statutory body which prescribes UK qualifications and maintains the professional register.*
5 *The Royal Institute of British Architects: the professional body which validates architectural qualifications in the UK and internationally.*
6 *The Royal Town Planning Institute: The professional body which validates qualifications and offers chartered membership*

The M.Arch with Urban Planning aims to work across disciplinary boundaries. However, despite our[7] initial claims for the course as an innovative *interdisciplinary hybrid*, in its first iteration it would have been more accurately described as 'multi-disciplinary'. The distinctions between these terms will be more fully explored in Chapter 3 *(page 44)* but here it is sufficient to say that students studied modules from the different disciplines in parallel, each one retaining a clearly-defined disciplinary remit and identity (Klein, 2017). The course structure has not changed since the first cohort graduated in 2017. What has evolved is the way that the programme is delivered, the way that students and staff interact with each other and the way that we recognise (or not) the disciplinary boundaries. Staff work closely together to both devise and deliver modules and students often work in inter-disciplinary teams towards delivering shared objectives. Individual M.Arch with Urban Planning *design-research* projects *(page 33)* are positioned in the shared space between the two disciplinary territories. While these projects may often be centred on the design of architectural form/space they are always viewed through the more holistic, multi-layered perspectives of urban planning.

Architects? Planners? and/or Urbanists?

Given that both disciplines are concerned with the design and management of the built environment there is a significant overlap between the curriculum set-out by RTPI for Planning and that prescribed for Architecture by the ARB. However, as will be explored in Chapter 2 *(page 29)* there are significant differences in their approach to practice as well as in the methods employed to teach them. Where architecture is a design discipline which uses largely visual methods to propose a creative 'best-fit' design outcome, planning relies on a rigorous analysis of data, producing reports to evidence policy and to take decisions. Where an architect's first responsibility is to their client - designing to meet their needs, a planner's responsibility is to wider society. Where architects will usually focus on the organisation, alteration and construction of buildings to address problems, planners can consider a broader range of approaches to leverage change. While the course was conceived primarily to equip architecture graduates with additional skills and knowledge, some graduates have chosen to broaden their professional practice to reflect these dichotomies, locating themselves on the boundary between architecture and planning by choosing multi-disciplinary practices which allow them the opportunity to work across multiple scales and fields. These individuals no longer see the title of architect, or planner as relevant.

The transdisciplinary objective

Since its inception the course has 'located' itself by focusing each year's study in a specific place - a town or city enclave within the region - addressing their real-world challenges through agendas defined in discussions with external partners. Working with the complexity of a real place locates what may be global concerns within the tangible context of local problems, pressures, and constraints.

7 *The course was designed by me and a colleague in Urban Planning (Barbara Ilsley)..*

While it is not unusual for an academic studio to select a shared context as the site for their projects, what may differentiate this studio from many is that all the students' individual projects are developed within the context of all the others, requiring them to continually work in collaboration to create a holistic studio vision for the wider place. The students engage and work with the reality of a place (and the changes to it that their peers' projects might generate) in all its complex facets – economic, social, cultural and political as well as physical. The shared agenda that the studio[8] negotiates becomes a 'meta project' in which all are engaged. It defines and is defined by all the individual design investigations developed within the studio. It sets the frame through which all individual work is then understood.

As the course has evolved, we[9] have extended how we engage with external partners in the community. Students are briefed on contextual issues not only by academic staff but by local and national government planners. They develop a more specialist and detailed understanding of the specific issues on which they chose to focus through conversations with developers, civic bodies, and community organisations. Where practicable they present their developing design ideas to these stakeholders through informal dialogue and critique[10]. The work generated by the students has been the subject of local publications, exhibitions, and community events[11] instigating conversations around future development; in parallel the students have gained a valuable perspective on their work - that of those who might be most impacted by it.

1.4: *Mapping* practice: employing visual and spatial methods

> Architectural drawings should never be thought of as illustrations. They are things with much more significance. Not simply tools which visualise ideas that happen elsewhere, but the site where architectural ideas emerge (Jacob, 2020).

In carrying out this study I have drawn heavily on methods common in my 'home' discipline - observational sketching; photographs and photographic 'joiners' (Hockney and Joyce, 2008); diagrams; and orthographic drawings. I have also constructed collaged 'maps' to position the students' emerging projects and to analyse data a process examined in more depth in Chapter 5 *(page 83)*. I make no claim for these images as artworks: they have been included here as 'thinking tools' used to explore and frame ideas.

I have long been aware of my own tendency to use visual clues over verbal ones - most of those who chose to study architecture are inherently *visual thinkers*. My step into the discipline of education has highlighted differences between the tactics that I habitually employ in constructing and communicating knowledge, and those

8 'Studio' refers here to the members of the studio - i.e. the students.

9 We here refers to the course team, teaching is planned in collaboration with staff leading Urban Planning modules.

10 This trajectory has been significantly slowed by the constraints of 'lockdowns' between 2020 and 2022. While it remains the ambition of the studio to as far as possible engage directly with communities beyond that of the university, recent circumstances mean engagement has often been limited to professional practitioners.

11 Student work was included in an international conference organised by the Perth City Leadership Forum in November 2020.

which may more usual in an EdD thesis. Images have been central to the development of this study. In most instances they have not been made as illustrations to the text but are the foundation of it - these drawings are not representations but *operations* as discussed in section 5.3.2 *(page 97)* - they have been used as a tool for observation and analysis as well as communication.

The use of these methods has allowed me to explore and record aspects of studio practice which may otherwise be either underplayed, or even wholly missed in text-based accounts of studio practice, but it has forced a departure from the usual guidelines for the presentation of a thesis. Where a linear narrative proved insufficient I have used drawings. To make these legible, and to give them the 'visual space' that they require, they have been sometimes been included as separate 'fold-out' pages.

1.4.1: Structure

This study is structured in two parts:

Part 1 *(page 26)* follows a linear structure, grounding the study in its context and literature, and setting out the theoretical and methodological frameworks which have shaped the study and the methods used.

The context is structured in two chapters. ***Chapter 2: educating urbanists*** *(page 29)* situates the study in the contemporary landscape of professional education in architecture and urban planning what shapes pedagogy in these disciplines and how the professional bodies are implicated in perpetuating these. This chapter therefore, establishes the key characteristics of *studio* pedagogy and the role this currently plays in the architectural education, it also considers how *criticality* might be understood the current HE context. ***Chapter 3: locating transdisciplinary urbanism*** *(page 43)*, attempts to navigate the jargon by first establishing what is meant by *transdisciplinarity,* and then exploring in turn the characteristics of *transdisciplinary urbanism* as set out by Doucet and Janssens (2011): the integration of theory and practice, an ethical approach to that practice, and a *designerly* approach (Cross, 2011). This outlines what may be understood by the term 'critical practice' and how this intersects with 'designerly practice', and the role played by material artefacts in a design process.

The methodology and the theoretical framework which has shaped this approach taken are then set out in two chapters. ***Chapter 4: material + spatial frames*** *(page 69)* explains how socio-material and spatial theories have informed the study and how they have been translated across the boundaries between traditionally spatial and non-spatial disciplines. ***Chapter 5: constructing a spatial bricolage*** *(page 83)* then sets out how the study was conducted and the methods that were employed as part of a bricolage approach to the gathering of data, focusing on the rationale for the visual methods used.

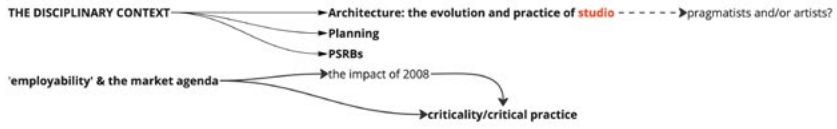
Part 2 is less linear and more spatial - structuring the presentation, analysis and discussion of data in the form of three inter-connected *stories* conceptualized around *sites* or 'places which gather' (Cresswell 2014) which are identified in a brief introductory section (Chapter 6 *page 108)*.

- ***Chapter 7: collaborative practice: the table*** *(page 117)* narrates how students used the space of the studio, and material artefacts in the form of books, drawings and models to construct their individual and shared understanding(s).
- ***Chapter 8: representations of place*** *(page 143)* maps the design and production of two parallel material artefacts - a 3-D printed model and a hand-stitched map - intended to overlay the students' shared designs onto a real place and to communicate this to an external audience. It looks at how the collaborative design and making of these artefacts structured and shaped the studio discourse.
- ***Chapter 9: going public: positioning ideas in a dialogic space*** *(page 163)* considers the temporal site(s) constructed to stage project reviews and how these punctuated and shaped the development of critical positions.

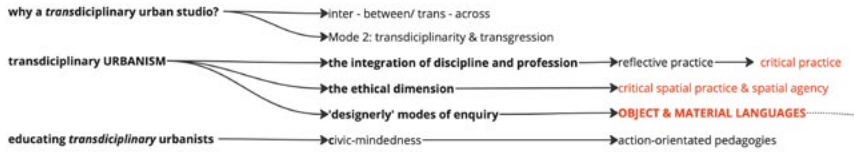
The threads connecting these three sites have then been drawn together in the concluding ***chapter 10*** *(page 181)* which sets out the broader implications of the study.

PART I:

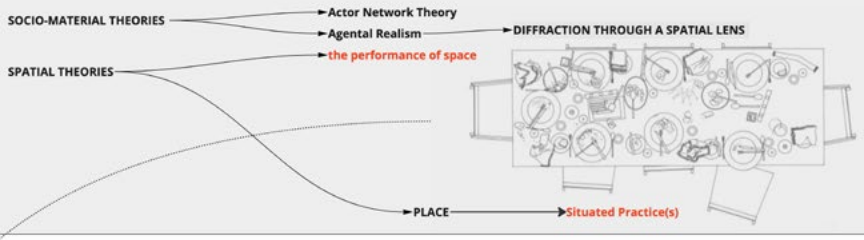
2: EDUCATING URBANISTS



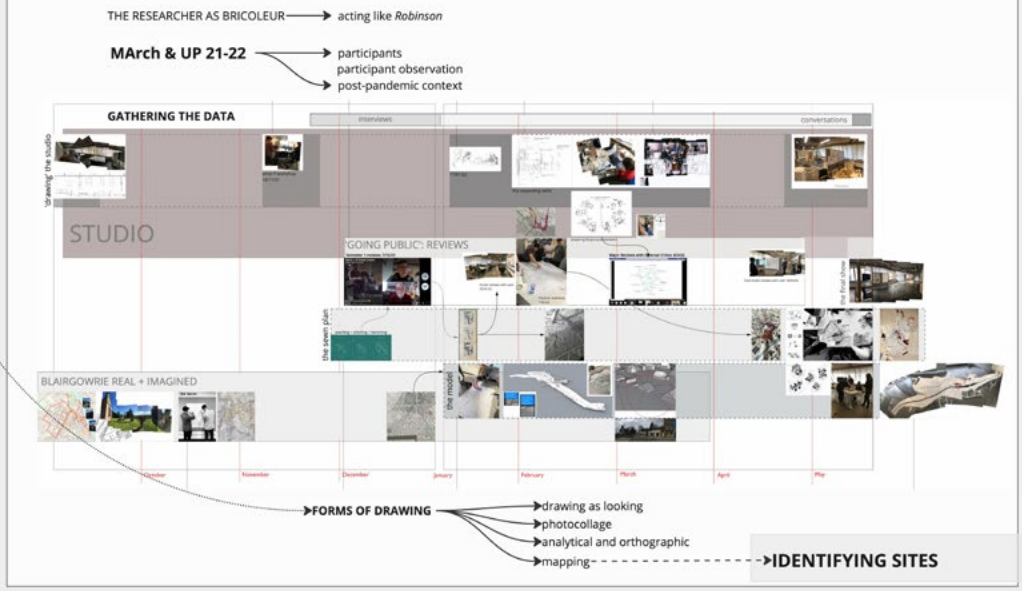
3: LOCATING TRANSDISCIPLINARY URBANISM



4: MATERIAL + SPATIAL FRAMES



5: CONSTRUCTING A SPATIAL BRICOLAGE



'an ever-changing set of relations between people and things, mediated by spaces and structures across multiple scales' (forensic architecture)

PART 2
STORIES / SITE

Defining the context, 07/02/22

2: Educating Urbanists - The Contemporary Landscape

Professional education must always navigate a territory between theory and practice, academia and the profession. This chapter situates the *MArch with Urban Planning* in the context of contemporary professional education in architecture and urban planning, briefly outlining how these academic disciplines have evolved and what has shaped their pedagogies. It considers the centrality of the studio in architectural education - as a context, a culture and a teaching method - and how this approach may be implicated in the forming of critical positions and attitudes to future practice. It then outlines the role played by the respective professional and statutory bodies which accredit professional courses, how these inform both curricula and teaching methods and how accreditation frameworks are shaped by wider political and economic concerns. The origin and potential impact of recent developments in architectural education which seek to reconnect the discipline and profession are considered.

These disciplines are then positioned in the wider context of Higher Education in the UK, including the contemporary emphasis on employability and measurable returns on investment and the role universities play in wider society. Finally, how we might think about education for *future practice*, and the questions that this raises for professions are briefly explored.

2.1: The disciplinary context of professional education

A broad range of academic disciplines and professional practices engage directly with urbanism as a concept but urban places are usually considered from discrete disciplinary perspectives - not as an interdisciplinary problem. This study will most closely address two closely related but distinct disciplines: *Architecture*, and *Urban Planning*, it is therefore important to consider how each has evolved as a distinct disciplinary culture in contemporary higher education.

2.1.1: Architecture: the evolution and practice of *studio*

Architecture in the UK is currently exclusively taught under the remit of university-accredited courses and, excepting some notable exceptions which will be touched upon in this section, within a university context. University-based qualifications in Architecture are, however, a relatively recent development given the long history of the profession[1]. The *studio* teaching model which is now a mandatory requirement of statutory prescription in the UK originates in the *atelier* system used in the first European school, the École des Beaux Arts, established in Paris in 1819 (Salama 2021). Atelier operated as semi-autonomous units where students elected to work under a specific studio 'master' replicating the master-apprentice relationships of practice.

Formal architectural education in the UK emerged from a pupillage system - the first academic course designed to augment learning in practice began as a night school in 1847. The academic discipline was only fully accepted into universities in the second half of the twentieth century (Powers, 2015); the 1958 *Oxford Conference* representing a 'tipping point' between practice apprenticeships and academic institutions. This conference resolved to raise the 'standards of competence at all levels' in the profession and set out how this might be achieved through a full-time[2], university-based educational programme (Martin, 1958). The conference concluded that as entrance to institutions was limited to those achieving higher academic standards this would raise standards in the profession; that the academic discipline would benefit from being located in a multi-disciplinary academic context; and that within a university architectural education would be required to be 'something more than the study of techniques and parcels of... knowledge' (Martin, 1958) - considering practice in the context of theory would definitively move it beyond purely technical training. It was envisaged that the development of specialist postgraduate education and research in architecture would advance both the academic discipline and the standing of the profession.

Architecture remains an uncomfortable fit within conventional academic structures, neither an art nor a science but straddling both. Studio teaching relies almost entirely on iterative, inquiry-based learning and a continually evolving, often contested knowledge base (Ash and Sakula, 2015, Murray, 2016). The Oxford

1 *Leon Battista Alberti is often credited with distinguishing the 'architect' from the 'master builder' during the Italian Renaissance, Vitruvius "ten books' date back to Roman times.*

2 *An element of mandatory practice experience was introduced in 1962*

Conference was held in the idealistic context of the post-war era and the consequent massive expansion of the profession based on public sector works. In the current context of student fees and unstable employment, the approach the conference adopted might now be viewed as effectively excluding candidates who cannot fund a lengthy full-time course and dismissive of 'practical wisdom' in favour of more conventionally academic forms of knowledge. As will be discussed further below *(page 37)* as a result of these concerns, and the pervading political and economic context of student fees, the pendulum has now begun to swing back towards practice as the preferred context for architectural education in the form of work-based learning and graduate apprenticeships.

While a studio is a physical space, it is also a project-based teaching method. Students *learn by doing* and in this way gradually learn what it means to 'act' as an architect. As Shreeve et al. point out in studio teaching 'the emphasis on doing is not simply about being able to produce a skilled performance but is about understanding what it means to be a skilled performer' (Shreeve et al., 2010 p. 128). Students are set design *projects* – problems are sometimes abstract but more often framed by a set use and/or a client or user, and a given context (a *site*). Projects may be limited to a day, or a few days (a *sketch design*) several weeks, or in some instances months, and may be completed by teams or as individuals. The challenges set will be designed by the tutor or studio leader as a vehicle for students to engage with specific ideas, problems, or areas of the curriculum. From the outset of their architectural education all UK students are taught through studio-based design projects for a mandatory minimum of 50% of their course[3]. They will engage in a repeated, iterative process of problem-forming, speculation and testing of options.

Studio & studio culture

Studio pedagogy is not of course exclusive to architecture - it is standard practice across art and design education. Donald Schön's focus on studio education in architecture schools also brought this approach to wider attention (1983, 1985, 1987)[4] particularly in professional education. As more interest has been paid to problem and project-based learning and art schools have become more integrated within mainstream universities the literature exploring aspects of studio practice and pedagogy has expanded. Studio creates valuable opportunities for informal and distributed learning (Corazzo 2019, 2020; Shreeve, Sims and Trowler, 2010; Vyas and Nijholt, 2012), but it is space and labour intensive in comparison to more conventional academic models and its continued existence is always under threat in a landscape of diminishing resources (Heywood, 2009).

Studio is not simply a physical space but as identified by Schon (1987) it is also a 'culture' in that it has devel-

3 this minimum percentage is set by both RIBA (professional body) and ARB (statutory regulator) at the time of writing.

4 The RIBA Building Industry Trust commissioned one of Schön's publications (1985) as an argument for the value of studio teaching methods in architecture.

oped customs and social behaviours[5]. Many of these are common to all design studios, but tutors or studio leaders will often encourage conventions and ways of working specific to an individual studio. In a manner still strikingly similar to that described in the École de Beaux Arts students work alongside their peers, regularly presenting work-in-progress for critique and informally sharing both ideas and skills (Vyas and Nijholt, 2012, Shreeve et al., 2010). In this way they learn how to work in studios, and how to be a student of architecture. Formal taught delivery, particularly in the later years of the course, is secondary.

Pragmatists or artists?

While an academic design project may mimic some of the conditions students might be confronted with in their future practice, it is neither possible nor wholly desirable for an academic studio to precisely mirror that of professional practice. In an academic context, the compromises and the often-conflicting demands which shape practice would place limitations on a student's capacity to explore creative possibilities without jeopardy, and to effectively meet academic 'learning outcomes' necessary to demonstrate compliance with PSRB[6]criteria. Some courses can include a small component of 'live'[7] project work within their courses and these opportunities are of huge benefit and are highly valued by students (Harriss and Widder 2014) but if we are aiming to e*ducate* as well as to train future critically reflective practitioners there also needs to space to experiment without the consequences of failure which exist in the real world. An absolute facsimile of practice may not be the appropriate model.

> Tensions also persist between a profession often sceptical of the value of abstract theory and the expectations of higher academic study which require students to engage with less tangible and immediate concerns; a significant fracture line which has been characterised as a split between pragmatists and artists: the former would want graduates, as the end products of an expensive architectural education to be practice-ready, poised to add maximum value from the outset in the practical craft of architecture, the latter seek to keep architecture as open a field as possible, encouraging students to discover the high ground of speculation and vision. (Ash and Sakula, 2015 p. 124)

Contrary to what might be assumed reading Ash and Sakula's analysis, not all practitioners would align themselves with a *pragmatist* position, nor all academics that of the *artists*[8]. What is meant by the term *Art* here is perhaps more nuanced than it first appears, and the most extreme pragmatist would not dismiss the need for graduates to think creatively. However, the pragmatist line in the UK is increasingly held through the requirements of professional accreditation (discussed below *page 34*), and in consequence, the *artists* may come to depend on higher education qualifications frameworks which mandate 'critical thinking' and 'innovation' at graduate level (SCQF) to defend their corner.

Just what skills and knowledge may equip a graduate to be 'practice-ready' are open to question. The pro-

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5 Not all 'studio culture' is healthy as has been identified by reports conducted in the US (Koch 2002. and UK (Vowles, Low, & Doran, 2012) often leading to long working hours and isolation.

6 Professional and/or Statutory Regulatory Bodies

7 'live' projects engage directly with external clients to meet a real, identified need. These may or may not include a built outcome.

8 Ash and Sakula is a successful practice that explicitly states they are 'with the artists'

fession, like the built environment landscape that it operates within, is continually changing. This is a position common across many professional disciplines, learning 'vocational' skills is often meaningless in an abstract context and it may be more valuable to equip students with the skills to think analytically, critically and creatively, enabling them to meet new problems as they arise. (Trede and McEwan 2015).

Critical agendas in a studio system

As students progress through the mandatory five years of architectural education they will be expected to address each successive design project with an increasing degree of autonomy, developing their knowledge, their skills, and their professional artistry. By the final year of their education, students are expected to locate their work within a theoretical framework, justifying their design decisions and articulating a critical position.

Design studio is usually formulated in one of two ways, either as a whole year cohort where all students will respond to a similar design brief, or as individual studios often termed *atelier* or *units*, usually of between ten and fifteen students. Units will all meet the same academic learning outcomes but will do so through a programme and critical agenda proposed by individual members of teaching staff, enabling students to 'opt-in' to a critical approach to the discipline as proposed by the unit leader, a series of preoccupations and a way of working which may be more, or less, prescribed. A unit structure allows students, usually those at the post-graduate level, to be exposed to critical discourse at an advanced level. But in aligning their critical 'position' with that of a studio the student may be compromising the agency to develop their own value system. This is a form of studio which can most closely resemble the 'master/apprentice' model and as Lang has recently pointed out the unit system potentially encourages convergence – a form of 'group-think' which perpetuates well-understood approaches and tactics, rather than diversity, creative speculation and the willingness to challenge personal beliefs and assumptions which is inherent in *critical* practice (Lang, 2021).

Design Research

Design projects in the final year are often framed as design research. Students are required to consider their projects as *theses*; articulate research questions; position their work in a wider research context; articulate methods and draw conclusions based on the outcomes. The outcomes of *design research* in architecture are always two-fold. A design outcome is used to explore and test a research outcome. These are developed and communicated through a portfolio including both visual and written methods (Archer, 1995, Biggs, 2000).

The M.Arch with UP studio is treated as one of several final-year *units*, and it operates similarly. It is centred on an independent *design research* project, which asks the student to identify a specific problem, to develop a design brief, and to use the design process to frame and structure an enquiry which positions this within the wider context of urban theory and practice.

2.1.2: Planning

While architecture has both a history and a recognised identity planning did not emerge as a separate and recognised practice until the twentieth century. Before this time, the design of cities was the province of architects and engineers - once the need for a distinct role was recognised this was seen as a specialist study adjunct to one of those two disciplines (Davoudi and Pendlebury, 2010).

Post-WW2 reconstruction elevated the status of the planning profession and expanded its numbers. In parallel *Town Planning* became a stand-alone undergraduate qualification. To reinforce its status as an academic discipline, planning schools were encouraged to develop research agenda and to adopt social science research methodologies. This, perhaps combined with the requirement for public policy to be wherever possible 'evidence based' rather than speculative, has resulted in a progressive but significant shift in the role played by professional planners and in how the discipline is taught in universities. Where the subject was previously often taught through engagement with studio design projects, it is now more commonly delivered through lectures and assessed via essays and examinations (Davoudi and Pendlebury, 2010). There is now an increasing recognition that the shift towards normative social-science teaching and assessment models potentially limits the development of professional skills that graduates will require in practice and may weaken valuable connections between practitioners and students (Bertolini et al., 2012).

The planning department at the University of Dundee was founded in 1964. It was originally closely aligned with architecture, both disciplines being part of the College of Art. Planning left the faculty to join Social Sciences in the 1990s, only returning in 2021 via a circuitous route and because of a reorganisation merging it with architecture. This location now makes it unique in the UK and potentially forces a more design-orientated, problem-based learning approach than would be common, or possible, in most planning schools.

Our experience of teaching the two disciplines together over the past six years has led us to appreciate some of the possibilities of combining their often-distinct approaches to learning and teaching. The more structured attitude to reflection, greater emphasis on social and ethical responsibilities, and requirement to evidence decision making - all of which are standard in planning - enables design-orientated architecture students to appreciate the wider context in which they must operate with far greater clarity. In parallel, design methods can be used to structure enquiry beyond the design of form - planning students benefit from the collaborative, problem-based learning approach common in architecture.

2.1.3: The role of PSRBs

Education in both Architecture and Planning is accredited by professional bodies. This is used by universities as an external measure of quality and as a marketing tool, but it imposes obligations on schools to conform with PSRB requirements including prescribing what must be taught, and sometimes how.

The regulatory position of Architecture is complex. Courses are prescribed under legislation via the Architects Registration Board (ARB), a process which largely defines the curriculum, but it is also subject to a system of professional validation by the Royal Institute of British Architects (RIBA). While the two bodies are often conflated, they have quite separate agendas. ARB's responsibilities are to ensure professional competence, thereby protecting the consumers of architectural services, their clients. Courses are tightly regulated and at the time of writing permit little flexibility, mandating five years of full-time study which must be explicitly 'in architecture'. The RIBA in contrast is a professional body set up by royal charter in 1837 with the remit to 'advance architecture', the current interpretation of this role is set out as: 'driving excellence in architecture' and serving 'our members and society in order to deliver better buildings and places, stronger communities and a sustainable environment' (RIBA).

These two bodies formally worked in parallel to negotiate shared criteria for professionally accredited courses, but in the turmoil created by the decision to leave the EU[9] their remits and approaches have begun to diverge. Where ARB as the regulator is concerned with maintaining a baseline of competency commensurate with the title 'architect', the RIBA (which has no statutory role) has more recently focused on promoting excellence, diversity and distinctiveness in educational offerings between individual schools (RIBA 2021).

Both bodies are currently engaged in reconsidering and re-articulating their positions in the light of changing political, legal, economic, and social contexts and the contemporary challenges facing the profession[10]. Both are also questioning the balance between an academic and a practice-based education, challenging universities to find better ways to embed practice-orientated learning in their curricula. The ARB is proposing more flexible routes towards registration (ARB 2023) which balance work-based and more traditional academic learning in parallel with mandatory outcomes more heavily weighted towards prescriptive, practical skills. The most recent draft outcomes published by the ARB (2023) are based on the current understanding of 'what an architect does' and does not attempt to anticipate those skills, qualities, and dispositions an architect may need to meet future challenges. The RIBA is simultaneously promoting a far greater emphasis on what it describes as 'professional skills' in academic programmes (RIBA, 2020) although leaving what those skills might be open to interpretation. A recent document published by RIBA states:

> The renewed emphasis on learning in the workplace is significant, although it should be remembered the leitmotif of the 1958 Oxford Conference was to realise the intellectual ambitions of architecture through research and to move away from *training* towards *education* (RIBA 2021).

It goes on to say that this critical distinction must be 'jealously guarded' (2021) a position which suggests that 'professional skills' are not seen as limited entirely to those conventionally understood as 'pragmatic'.

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9 The ARB is currently revising both its criteria and the mandatory length and content of academic courses towards an outcomes-based approach.This has been made possible by the decision to leave the EU where architectural education was standardised.

10 There is an increased emphasis on life safety and ethical decision-making in the wake of the Grenfell fire, and on climate literacy and social justice in the context of climate emergency

While recent documents produced by the RIBA (2018) explicitly link ethical practice with climate literacy and argue that the profession must restate its commitment to a progressive social, political and environmental programme (2020), there is perhaps a conflict between this approach and the RIBA's remit to represent its members. 'Promoting the profession' entails maximising the profits of private practice, a problematic position given the potentially harmful social and environmental impacts of many proposed developments. There is also a conflict between the RIBA's stated position on 'jealously guarding' the intellectual ambitions of 'education' as opposed to 'training', and the often-stated views of much of its wider membership, the *pragmatists* referred to by Ash and Sakula *(page 32)* (2015).

Interdisciplinarity and professional accreditation

Currently, the extent to which professional courses in architecture can include content drawn from outside its disciplinary core is limited by the statutory criteria for prescription - both through the extensive curriculum which must be taught and assessed and the requirement for a five-year, full-time course. However, architectural knowledge covers a broad spectrum from fine arts to engineering, so while the inclusion of more than a small number of elective modules can be problematic, where those modules can also be mapped to the architecture criteria then these may be accepted. This has allowed the development of a small number of courses which include Engineering or Urban Design within their course descriptions, including the *M.Arch with Urban Planning* which is accredited as a *Part 2*[11] qualification in architecture and a post-graduate qualification in Planning. It is the only qualification currently offered in the UK which meets these two requirements[12].

The Planning professional body, the Royal Town Planning Institute (RTPI) is a smaller organisation than RIBA, and while it sees education as central to its remit it is arguably less influential in shaping courses. There is no statutory requirement to hold chartered status as a Planner, and no legal protection of title. Planning courses tend to be small, and can struggle to recruit students particularly at undergraduate level, making them more vulnerable in a market-driven higher education environment (COSLA, 2022). It is also more viable to offer an unaccredited qualification in *urbanism* or *urban design* than would be the case in architecture, where the title is limited by legislation to those who have completed a professionally accredited course. These two factors mean that any sanction which might be imposed by RTPI carries less weight at institutional level; perhaps as a result the RTPI accreditation process is less prescriptive and more collaborative in nature, actively supporting innovative and interdisciplinary approaches.

Ultimately, professional accreditation has the effect of 'fixing' disciplinary boundaries and institutions must think creatively to incorporate any degree of real interdisciplinary learning.

11 Architecture qualifications in the UK consist of 'Part 1' undergraduate, 'Part 2' post-graduate, and a 'Part 3' professional examination. All three are required to join the professional register (ARB).

12 A similar qualification was taught at the University of Sheffield until 2019

2.2: *Value* & the market agenda in higher education

The Oxford Conference was held at a point of massive change in the wider higher education system in the UK. The expansion and proliferation of universities from the 1960s onwards, together with the neo-liberal political agenda of the 1980s has fundamentally shifted the role of universities from the elite, research orientated institutions envisaged by the Oxford Conference to a more diverse system serving a far wider constituency. The market-orientated turn taken by higher education in the UK has also led to a far greater emphasis on employability and measurable outcomes often in the form of financial returns (DfE, 2018). In parallel the expansion in provision has resulted in an increasingly competitive marketplace between institutions which centres around league-tables (Nixon, 2011).

In this context, and that of fees - which, for a professional qualification that mandates both undergraduate and postgraduate study are considerable - the emphasis has shifted from one of education for its own sake, to vocational skills which might prepare graduates to compete within an unstable professional environment. This shifting context has changed the approach funding bodies, professional bodies, and institutions take to professional curricula, and how students perceive education. The RIBA is increasingly concerned by the length of time taken to qualify as an architect (a minimum of seven years and on average ten (RIBA)) and how this may impact access to the profession. They, and student bodies, have become more vocal in calling institutions to account *(Figure 2.1 page 38)*. At the time of writing ARB is formally consulting on proposals to remove the mandatory period of study and replace this with a single assessment of competency, a move which is also being argued on the grounds of accessibility and inclusion.

The impact of 2008

The converging pressures of significant planned changes to professional accreditation, a shifting understanding of the role and value of higher education more generally, and an architectural profession in a degree of flux is creating a context for change. Despite some hesitancy in adopting the degree apprenticeship model a small number of accredited architecture courses at both undergraduate and postgraduate levels have now been established. In parallel a strand has emerged of innovative academic courses embedded either partially or wholly in professional studio contexts[13] . These courses have been explicitly designed to address the funding challenges faced by students and to bridge the gap between architectural education and practice (Hunter 2012). They initially capitalised on the emergence of a wave of new, small practices which often questioned the orthodoxies of professional practice in architecture. Born out of necessities created by the 2008 financial crash these practices were often set up by young architects and recent graduates with little or no experience

13 UCL and University of Sheffield, have both launched partially practice-based 'part 2' courses over the past five years, these built on the earlier example pioneered by the Welsh School of Architecture at Cardiff University, and the London School of Architecture which launched as a school wholly based in practice in 2014.

Figure 2.1:
The Pavilion of Protest, ZAP Architecture 2011

of how practices were 'supposed' to operate. Often working across traditional professional boundaries, they found or initiated projects across far broader fields of design, construction, property management and community engagement. In mapping less traditional pathways into professional practice graduates were more entrepreneurial and more flexible. They invented alternative professional structures and rejected traditional practice hierarchies.

Disappointingly, despite the radical ambitions underpinning the foundation of these courses - specifically the *London School of Architecture* (Hunter, 2012, 2021) a cursory reading of the outputs of recent final year students[14] suggests their outcomes do not differ substantially from more mainstream courses. The scope, focus and nature of the projects presented appears fundamentally unchanged. In parallel, the practices which act as partners for the *LSA* have become better-established, larger and arguably more conventional in their approach. While these courses may be challenging the context of contemporary architectural education, they do not (to date) seem to be seriously questioning either its traditional disciplinary identity or the value system that this implies *(page 48)*.

A developmental and/or engaged university?

Architecture remains an attractive choice for undergraduate applications and the debates around education in Architecture take place in the context of a continuing expansion of university provision (Waite, 2021). Each new course must carve its own space out within an increasingly crowded marketplace positioning its 'distinct' offering in the context of the profession, and its host institution's 'vision'.

Since the upheaval of the post-war years, universities have undergone huge shifts in their conceptions of themselves and their role within society (Nixon, 2011; Collini, 2012). In this context, scholars have proposed alternative ways of thinking about the contemporary university, its approach to knowledge, and its relationship to civic society. Barnett argues that 'as universities have come much more into society, so their episte-

14 as demonstrated through online degree show exhibitions and student awards

mologies have become more practical, processual and performative in character' (Barnett, 2011a p.30). He visualises the impact of this shift in how universities see themselves through two axes: the line between how far knowledge is perceived as valuable in its own right and how far it may be useful for society, and that between where that knowledge might be produced – the academy or the real world. While professional education will always be characterised by the application of knowledge it is likely that all architecture schools would be positioned slightly differently within in this matrix, and all would likely have both an actual position and an ideal of where they would want to be.

Professional courses, particularly those that rely on specialist resources such as studios, are expensive to teach and professional accreditation brings layers of often unwelcome institutional scrutiny. Justifying their continued existence within those institutions may depend on recognising other measures of value. Currently Architecture courses are taught within traditional academic disciplines and conventional faculty structures. They are governed by the requirements of professional bodies, the constraints of institutional economics and their institution's strategic direction. But as discussed above urban problems are not confined to single disciplines and professional disciplines are not solely concerned with knowledge 'for its own sake'. Urbanists do not only study urban problems, they also aim to *act*, and in doing so to transform urban environments. Barnett describes the *developmental university*, a term originally proposed by Coleman (1986) as one which is 'both active in the world and is generating knowledge through those activities' (2011a p.30) and this may be one model for future education in architecture and urban planning. Universities can be seen as reservoirs of talent, energy and ambition to shape change, a transdisciplinary approach to education in urbanism might challenge both disciplinary and institutional silos, allowing students to actively engage with their civic contexts.

2.2.1: Critical thinking, criticality and critical practice

While *critical thinking* might be assumed to be central to Higher Education, Davies and Barnett argue that its place is increasingly challenged by the focus on 'employability' as a measurable outcome. They suggest that in this context *criticality* should be re-framed, recognising and highlighting its value to wider society in social and civic terms (Davies and Barnett, 2015).

Critical thinking might be understood in its simplest definition as a capacity to question. This can be extended to 'thinking aimed at forming a judgement', that is, deciding 'what to think and how to act' (Bailin et al., 1999). Barnett and Davies argue that a commitment to action by the thinker is key, they therefore use the term *criticality* in place of *critical thinking*:

> The term "criticality" attempts to inject a perspective that widens critical thinking to incorporate not only argument and judgment and reflection but also the individual's wider identity and participation in the world [...] involving students reflecting on their knowledge and simultaneously developing powers of critical thinking, critical self-reflection and critical action (2015 p.15).

This instrumental turn is particularly relevant when considering education for professional practice. An awareness of what shapes a practitioner's position, a capacity to question and to self-reflect are fundamental to exercising good judgement in situations where there will be conflicting interests and no one 'correct' answer. While these characteristics are key, they are difficult to position within a taught curriculum, and however valuable are increasingly squeezed by the more tangible technical, practical, and easily measurable skills prioritised by professional competency frameworks.

There are also dangers associated with the communities which are built by professional disciplines and perhaps exacerbated in the case of design disciplines by studio culture:

> Undergraduate students commonly want to belong to a profession rather than critique it. It is easier to work with a definition of critical thinking that is unquestioning, and supports the existing culture, one that encourages reproduction and consumption, rather than disruption and uncomfortable learning (Trede and McEwen, 2015 p.470).

Students instead need to be encouraged to question the value systems of the disciplinary and professional cultures within which they learn and which they seek to enter.

Such questioning is perhaps increasingly important if traditional professions are to remain relevant and sustainable. Rory Hyde has suggested that the practice of architecture might be reinvented by 'asking new kinds of questions, developing new kinds of practice models, and rebuilding the social contract between the profession and the public' (2019 p.84). Hyde's argument centres on the current inability of architecture (setting aside architectural education) to justify its value in economic, cultural or in social terms. Serving the 'public good', and not confusing this with commercial value to clients[15] would in Hyde's view set out a viable alternative future for the profession:

> If we were to consider architecture a public right – to safe streets, decent housing, classrooms that encourage attention, public buildings that inspire trust in institutions, and so on –then how might we reorganise the research, management and application of architectural knowledge to serve these aims?.. If we were to reconceive of the architectural project as an obligation to the entire city, rather than our own portfolios, then we could begin to reimagine architectural practice as an open, collaborative, cooperative endeavour (Hyde, 2019 pg. 89).

This position asks architects to reconsider how they frame design problems and to take up a position more closely aligned to that of planners *(page 55)*. It resonates with Schnieder's analogy of the iceberg as set out in the previous section *(page 18).* If architects continue to focus only on the aesthetics of the built environment, without recognizing (and questioning) the impact of their buildings on the wider economic, political, social, and environmental contexts, then they will continue to contribute to urban problems rather than their solution. The creative 'speculation and vision' that Ash and Sakula suggest is the remit of the 'artist' might be redirected at re-imagining the profession itself. *Critical practice* might be where knowledge, reflection and action coincide (Higgs, *et al.*, 2010).

15 The RIBA webpage 'Why work with an architect' highlights 'adding value' and getting the 'best return on your investment'.

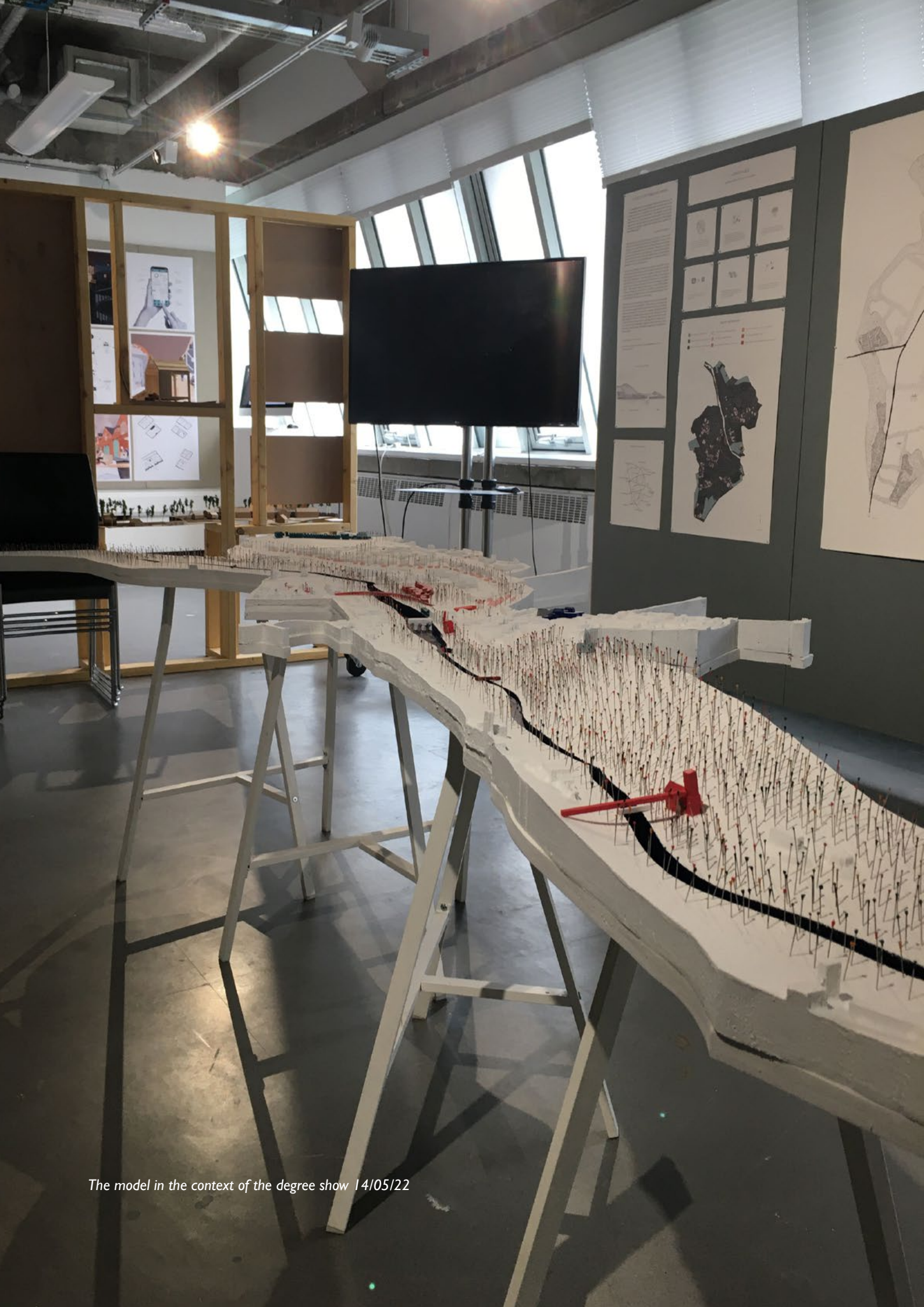
2.3: Conclusion

This section has set out the context within which architecture and planning are currently taught in the U.K. and the tensions between the often-conflicting concerns of academia and professional practice.

Despite the economic pressures on institutions, studio remains central to architectural education. It has evolved beyond its origins in a master/apprentice model and its problem-based learning approach may have applicability beyond the traditional design disciplines. It is a rich learning environment which has the capacity to build independent critical thinkers (Scagnetti, 2017). However, we should continue to question and challenge studio and how it operates in the academy - it reinforces normative disciplinary practice more often than challenges it.

The professional and institutional context also often acts to maintain the status quo through an increasing emphasis on employability and measurable outcomes. Professional accreditation positions graduates as members of a wider professional community. Accreditation systems translate well-understood professional and societal expectations directly into academic curricula, but in doing so they can limit the opportunities for constructive critique of existing practice, for innovation, and for working across disciplinary and professional boundaries. This applies both to academic courses and to an individual student's ability to shape their own direction, keeping disciplines within silos and a student's portfolio within predictable boundaries.

But it is also evident that both the profession of Architecture and its education are at a point of change driven by the external political and economic climate. Ongoing changes to professional accreditation combined with challenges to conventional models of practice and of academic institutions suggest there may be opportunities to reconsider both conventional course structures and their priorities. This may enable more direct engagement between disciplicines, between practice and academia, and between institutions and their civic contexts. Challenging these boundaries may allow schools to explore what it means to practice architecture *critically* but only if an equitable balance can be found between what it means to *train* a practitioner and to *educate* a professional, a position which may ultimately be dictated by that of PSRBs. Space must be preserved within the prescribed curriculum for students to critique existing practices and speculate on their future shape.



The model in the context of the degree show 14/05/22

3: Locating Transdisciplinary Urbanism

Chapter 2 set out the current context of architectural education in the UK. As a professionally accredited, interdisciplinary course the *MArch with Urban Planning* is an outlier in this landscape. This section will further explore what it means to work in an interdisciplinary way and how this may inform the development of a *critical* approach to practice. The literature which surrounds interdisciplinarity is full of fashionable jargon, 'buzzwords' too often used without interrogating their meaning or appreciating their nuance and wider resonances - in addition to positioning the study in the context of existing theory and practice this chapter seeks to unravel the terminology.

I have referred to the MArch with Urban Planning as a '*trans*disciplinary urban studio', therefore the first part of this section will set out what is meant by a transdisciplinary approach, and how this might differ from an interdisciplinary one. It then goes on to consider *transdisciplinary urbanism* arguing that this framework has the potential to build a more 'civic-minded' and critical approach to practice. Each of these terms and their combined meaning can be associated with one or more strands within the existing literature, all of which are worthy of further exploration.

This chapter has been structured as three sections. It will initially set out the discussion around *inter* and *transdisciplinary* knowledge production, expanding on definitions of these terms. It will then consider the characteristics of *transdisciplinary urbanism* as described by Doucet and Jannsen, (2011): that is the intersection between discipline and profession; what is understood by *ethical*, and by *designerly*, practice (Cross, 2011); and the understanding of these terms in architecture as a discipline and a practice. Finally, it will consider the potential implications for professional education through ideas around *civic-mindedness* and Arendt's conception of the relationship between *action* and public space, and how these might relate to the development of professional artistry, judgement, and criticality.

3.1: Why a *transdisciplinary* urban studio?

In the introduction to this doctoral study I briefly set out the argument for cities as interdisciplinary problems *(page 19)*. I have chosen however to use the term *transdisciplinary* to describe my ambition for the MArch with Urban Planning studio, what this means, and how a *trans*disciplinary studio might differ from an *inter* or *multi*disciplinary one is explored below.

3.1.1: Inter – between/trans – across

The terminology used to define work between and across traditional disciplinary boundaries is often indistinct and fluid. As a result, any discussion of *inter* or *trans*disciplinarity will inevitably include clarification of how the author interprets those prefixes; Klein's typology of interdisciplinary practices (2017), while not an attempt to fix these definitions, nor claiming to be neutral, does seek to clarify their scope.

Disentangling *multi*disciplinary approaches, from *inter* and *trans*, is perhaps relatively easy. Wherever disciplines are juxtaposed, involving a wider scope of knowledge and methods, but remaining distinct, their identities not 'questioned' - then this might be characterised as *multi*disciplinary (Klein, 2017). In a research context this might mean several contributors making distinct disciplinary-focused contributions to one study; in an educational context, many of those courses which describe themselves as *interdisciplinary* (including the MArch with Urban Planning as it was originally conceived *(page 21)* are, in reality, opportunities for students to study parallel disciplines in distinct modules. These courses would therefore more accurately be described as multidisciplinary. A move beyond this position implies not juxtaposition, but active integration between disciplines.

Distinctions between *inter* and *trans*disciplinary approaches are less easily made and are arguably as much defined by geography as by radical differences – *inter* being more commonly used in the North American and UK context, *trans* more associated with continental Europe (Barry and Born, 2013). However, while interdisciplinarity operates in the space *between* established disciplines; transdisciplinarity implies working *across* disciplinary boundaries. The step from *between* to *across* might be understood as simply a more radical approach, Nicolescu, in his 'Manifesto of Transdisciplinarity' uses the term to 'celebrate the transgression of disciplinary boundaries, an act that far surpassed the multidisciplinary approaches' (Nicolescu, 2002, p. 1). However, Bruce, et al. characterise transdisciplinarity more distinctly - as organising knowledge around 'complex heterogeneous domains' rather than disciplines. Transdisciplinary work begins from, and 'attempts to devise approaches which are tailored specifically to the problem context' (Bruce, Lyall, Tait, & Williams, 2004, p. 549). In doing so transdisciplinary knowledge production potentially addresses 'real world' problems and draws on knowledge and expertise beyond the academic context.

Architecture is defined in its most QAA benchmark statement as 'by definition interdisciplinary' (2020 p.6)

but would not qualify as such under Klein's typological structure (2017). As Heckhausen notes, those disciplines which are related to professional fields and practices tend to be 'eclectic rather than purist in their 'epistemological concepts of themselves' (Heckhausen, 1972, p. 81). Architecture has a broad scope and relies on knowledge and practices drawn from a wide variety of other fields. Architects draw on theories from outside the discipline to support their arguments, but often do so in a superficial way (Salama 2021). An architect will still act as an architect, viewing knowledge through an architectural lens and using it to assist them in solving fundamental architectural problems of 'commodity, firmness and delight'[1].

Boundary work

While they actively reject the term interdisciplinary as being too broad, Dogan and Pahre argue that the marginal space between disciplines is the locus of innovation and that 'one can survey most important new work in a field simply by walking along its boundaries' (2019, p. 1). They describe the process of concentration, fragmentation, and subsequent dispersal as follows:

> As disciplines... become more densely populated, they fragment into subfields, which themselves fragment into specialities... When specialities become densely populated by scholars and lushly supplied with knowledge, the scholars debate minor points that would be ignored in an underpopulated field; those interested in debating major points look elsewhere. Thus density in the core opens up room for innovation at the margins of the field, on the frontiers of knowledge, in the intersections where specialties from different disciplines overlap (Dogan & Pahre, 2019, p. 32).

The fragmentation of disciplines and the overlaps which occur in their boundary spaces have the potential to create new hybrids, or *interdisciplines* with distinct identities. This was the future anticipated for urbanism by Heckhausen in 1972, who described city planning as 'an interdiscipline in waiting... involving so many, and so diverse a range of subjects, that it manifested as a 'jigsaw puzzle-like composition of adjacent material fields' (1972, p. 85).

It should also be noted that disciplinary boundaries are not fixed, but in continual transformation (Barry and Born, 2013). Both the edges and the centre points of architecture and urban planning have shifted significantly over the period since WW2. Being aligned with professional practices their central concerns have and will continue to alter to reflect those of the society they serve, and their methods will change in response to real-world conditions. The 'technocratic' top-down approach to planning which defined post-war reconstruction resulted in unpopular and often dysfunctional redevelopment. This has been supplanted by a more community participation-led ethos. In parallel, as discussed in the previous chapter *(page 34),* academic planning schools have moved away from design-led courses aligned with schools of Architecture and of Engineering, and towards the Social Sciences (Davoudi & Pendlebury, 2010). Architecture has always occupied a fluid position in university structures, 'suspended between art and science, academic and professional, pure and applied, theoretical and practical' (Wigley, 1991 p.22). It can be associated with Engineering, Art and Design,

1 *This Vitruvian definition of Architecture has been referred to in a previous section (page 19).*

or Social Sciences - the focus of the academic discipline often shifting according to the managerial structure within which a specific university places it.

According to Barnett, education for future practice needs to inculcate 'capacities to live with and even love languages' (2010, p. 21). For future professionals whose role will always place them within multi-disciplinary design teams and in direct engagement with clients and building users, a transdisciplinary approach creates the framework for potentially innovative collaborative practice which builds on disciplinary expertise but avoids the increasing isolation (and irrelevance) of disciplines which speak only to themselves. The maintenance of hard disciplinary boundaries is identified by Lattuca as a key function of disciplines (2001). But disciplinary concerns unchallenged can become increasingly remote from those of the real world (those 'minor points' cited by Dogan and Pahre (2019) *page 45*) and disciplines increasingly unintelligible to outsiders not privy to the languages they speak. 'Learning languages' in this context can be understood literally as well as metaphorically. Communication skills, while being required by professional bodies, are usually interpreted in an academic context (and by those professional bodies) within disciplinary boundaries - how well a student can 'speak the language' of the discipline, rather than how well they might communicate with other professionals and with the wider world. While practising professionals become adept at wearing different 'hats' according to the context and audience to whom they are speaking, this is rarely a skill practised before graduation, its importance may not even be mentioned (Salama 2021).

Boundaries, borders and borderlands

The language around disciplines is full of territories and tribes (Becher & Trowler, 2001), and consequently boundaries, borders and 'borderlands' (Strathern, 2004). There is perhaps a useful spatial analogy here in the ideas of sociologist and urban planner Richard Sennett. Sennett identifies two related but radically different spatial conditions in *boundaries* and *borders*: the former he characterises as hard lines, the latter as active spaces of exchange (2009, 2017). Sennett uses the example of a market positioned at the centre of an existing deprived community and therefore likely to attract only those who live within that community - positioned on the edge between a deprived and a more affluent area it will draw in both, allowing a flow of resources from one to the other. Sennett advocates *borders*, not boundaries in developing urban spaces, but the same ideas might be translated to disciplinary and institutional boundaries - how might we open active spaces of exchange where currently hard boundaries exist?

3.1.2: Mode 2, transdisciplinarity and transgression

> Thinking between' demands that we call into question what we normally take for granted, that we question our methodologies, the ways we do things, and our terminologies… at best this is a difficult and transformative way of working - rigorous and reflective, creative and critical (Rendell, 2003, p. 224)

A position 'between' disciplines is where *MArch with Urban Planning* most often finds itself - operating on and between the boundaries of disciplines in an attempt to question/critique our own positions and that of the

disciplinary centre(s). It is the 'in-the-world' nature of transdisciplinary enquiry which suggests it as the logical goal of the studio:

> Transdisciplinarity is a new form of learning and problem-solving involving cooperation among different parts of society and academia in order to meet the complex challenges of society ... . A practice-oriented approach, transdisciplinarity is not confined to a closed circle of scientific experts, professional journals and academic departments where knowledge is produced... . Through mutual learning, the knowledge of all participants is enhanced, including local knowledge, scientific knowledge and the knowledges of concerned industries, businesses, and non-governmental organizations (Klein et al., 2001, p. 7).

Klein associates this approach with a strand she identifies as 'problem-solving', the roots of which can be traced back to contributions made by Erich Jantsch to the 1970 OECD symposium on interdisciplinarity. He suggested a social purpose as a defining feature of transdisciplinarity - that it focused on questions framed by societal rather than academic contexts (Apostel, 1972). This interpretation of transdisciplinarity (which has to an extent supplanted other narratives generated by the same conference) can be associated with *Mode 2* knowledge production (Gibbons, 1994), that is research which is generated by and carried out in the context of application. This form of enquiry draws together a wide spectrum of perspectives, skills, and expertise - 'a wider, more temporary and heterogeneous set of practitioners' (Gibbons, 2000, p.160). In her discussion of *Mode 2*, Nowotny justifies the use of the term transdisciplinary through its association with 'transgression' - 'knowledge is transgressive and transdisciplinarity does not respect institutional boundaries' (2006, p.2).

The role played by urgent problems, crises and/or issues of public concern in creating a context for transdisciplinary *Mode 2* enquiry is recognised by Strathern. This is a condition that she terms 'heat'. 'Hot' issues, she argues, are those that arise from the 'unpredictable interaction of diverse factors' (2004 p.3) and addressing them therefore involves knowledge drawn from diverse sources. In contexts such as these Strathern argues that the retreat of disciplinary specialists into their academic and disciplinary silos might be viewed as 'at best a distraction, and at worst… self-indulgence at the expense of public need' (2004, p. 4). Strathern cites the controversy around genetic engineering as an example of a 'hot' issue – those around mitigating the consequences of climate emergency in urban environments might be similarly described.

The agora: the context 'speaking back'

> The agora is the problem-generating and problem-solving environment in which the contextualization of knowledge production takes place. It is populated not only by arrays of competing 'experts', and the organizations and institutions through which knowledge is generated and traded, but also by variously jostling 'publics' (Nowotny, Scott, & Gibbons, 2003, p. 192)

Mode 2 suggests a greater diversity in the sites where knowledge is produced (Nowotny 2003). No longer limited to a single, or even a network of universities, the agora referred to by Nowotny *et al.* is less to a physical place and more the participants involved and the dynamics of their interactions, but the term's use will always be of interest to a spatial designer. The agora was a place of open-air assembly in ancient Greek cities, enabling commerce, but also political discourse. It was a fundamentally *public* space loosely defined by surrounding civic and commercial structures. A place where people gathered to discuss civic questions (Moroni,

2018). The Mode 2 *agora* is both the problem-solving and problem-generating environment (Nowotny et al., 2003). This is not a fixed context but one which, like the transactional space of discourse, is fluid and responsive - 'Neither state, nor market, neither public nor private but all of this in different configurations' (Nowotny, 2006, p. 6).

The agora frames more than a one-way exchange between the academic and wider contexts, denoting a more participatory and less hierarchical approach. Gibbons proposes that each context of application can be thought of as a transactional space where society can 'speak back' (2000). Mode 2 is instigated *by* the context rather than by external academic concerns. Researchers are asked to consider the societal implications of what they are doing and the value of 'non-scientific' knowledge and to view people not as research subjects but as participants - recognising 'the place of people in our knowledge' (Nowotny, 2006 p.3). In enabling an alternative to privileged disciplinary 'truths', part of the transgressive role of transdisciplinarity is, Klein argues, to create opportunities for more 'democratic' discourse across institutional boundaries (2013, 2015).

According to Gibbons the emergence of Mode 2 research has been parallel to what he terms 'Mode 2 society'. In his analysis contemporary society is characterised by complexity and uncertainty, but also 'the emergence of a greater degree of self-organisation amongst social actors' (Gibbons, 2000, p.160). Jane Jacobs' work on cities was initiated in response to the massive urban redevelopment proposed for Manhattan neighbourhoods in the 1960s - this might be understood as a concrete example of the 'context speaking back'. Jacobs was eloquent and informed, but not speaking from within an academic or professional context. Instead, she was acting as a citizen of an affected community and critiquing the then-accepted orthodoxy of technocratic urban planning - basing her theories on what she directly observed around her. Cities are fundamentally concerned with, and the concern of their citizens, in Jacobs' view they can only function as effective places when they empower and engage their inhabitants in decision making (1961). The subsequent influence of her ideas in shaping academic and professional discourse, even national policy, reflects the potential of such activism to fundamentally change the direction of public discourse as well as to address immediate problems. To return to Nowotny's question 'Where is the place of people'? (2006, p.3), If urban problems are to be meaningfully addressed, this cannot happen in an environment which excludes a city's inhabitants.

Accountability & quality control

Academic disciplines create a well-understood means of measuring 'value' through 'an infrastructure of books, articles and research reports…a means of instruction and initiation' (McCulloch, 2012, p. 102). Disciplines formally and informally set the criteria by which work is evaluated and establish who has the status and authority to do so - 'the disciplinary community... maintains disciplinary boundaries' (Lattuca, 2001, p. 24).

In contrast, transdisciplinary knowledge production exists outside these boundaries:

> Socially distributed' knowledge is perhaps the antithesis of scholarly publication, and 'scientific peers can no longer be reliably identified because there is no longer a stable taxonomy of codified disciplines from which 'peers' can be drawn (Nowotny et al., 2003, p. 187).

Within the context of professional education, how *value* might be measured is of particular concern. Graduates will be assessed against the expectations of their academic course, but also those professional bodies accrediting their studies through the application of threshold standards - an accountability regime based on the expectations of current, rather than future professional practice (as discussed in chapter 2: *page 41*). The work of architecture graduates is viewed - literally - alongside that of their immediate peers in public degree show exhibitions, but also through awards systems that of students studying in different institutions, nationally and internationally, a situation which prioritises graphic skills (Salama 2021), perpetuates disciplinary 'norms' and potentially excludes work which might challenge these. As Schneider points out:

> Architecture remains firmly rooted in the visual... projects that require comprehension beyond quickly digestible illustrations will lead to disapproval similar in intensity to that caused by utterly fantastical projects. (Schneider, 2016 p.63)

There is no question that specialist disciplinary knowledge is indispensable. Ultimately it enables *inter* and *transdisciplinary* work. There is value in the significant spatial design and graphic skills exhibited in the award-winning drawings published across the architectural press, but these are not the only, or even the most valuable skills of an architect. The *MArch with Urban Planning* works across more than one discipline and seeks to expand both the context in which projects are generated and the form that 'design' outcomes might take. One challenge is ensuring that the value of transdisciplinary work, and the value of MArch with Urban Planning graduates to their future profession(s), is recognized within the institution and beyond by associated professional bodies.

3.2: Transdisciplinary Urbanism

Having unpicked what is broadly understood by transdisciplinarity, I will now consider what is signified by '*transdisciplinary urbanism*' and the implications of this approach on studio as a culture, a method and a context for teaching. Doucet and Jannsen's discussion of transdisciplinary urban research identifies three characteristics: 'the integration of discipline and profession (theory and practice) in knowledge production, the ethical dimension, and the importance of experimental, designerly modes of inquiry' (Doucet & Janssens, 2011, p. 2). This analysis creates a useful framework in which to examine in more depth the concepts which underpin transdisciplinary urban practice, and the pathways along which it may develop in future. While the three facets identified by Doucet and Janssens have been considered sequentially in the analysis below, it should be emphasised that these criteria are not distinct but overlapping and intertwined.

3.2.1: The integration of discipline and profession

As discussed in the previous section *(page 30)* architecture and urban planning are simultaneously academic disciplines and professions. While Doucet and Janssens identify this through the qualifier 'theory and practice' the split this implies is perhaps not so simple, particularly in the context of professional education.

Professions are concerned with the application of specialist expertise – *knowing how* as well as *knowing what* - but know-how is often tacit in nature and disciplinary knowledge in this context is rarely fixed. In the discipline of architecture, knowledge is often fluid and contested. For example, while the science of building - architecture's *firmness* - is governed by constant laws of physics, the technical tools and materials available (and our understanding of how best to use them) are in continual development. The urban context in which we build is likewise in evolution as are societal needs and expectations. Architectural education therefore deals less with the transmission of factual knowledge and more with building the skills and tactics, and constructing the mindset that graduates will need to tackle each new and complex problem, that is *instrumental knowledge* and *dispositions*.

Reflective practice

Rather than any clear distinction between theory and its application in practice Schön argues that professional practitioners demonstrate 'artistry' - *knowing-in-action* - and that this is the case even when consciously applying theory, as they will use this *artistry* in order to judge when, and how, to do so. Knowing-in-action, while tacit, is also accompanied by *reflection-in-action* or *thinking while doing*, Schön describes this as 'turn(ing) thought back on action, and the knowing that is implicit in action' (1983, p.61). Fundamental to this process is its starting point. The problems faced by practitioners are, in Schön's analysis, constructed rather than given. Standardised theory cannot be applied until a coherent problem has been constructed from a 'problematic situation' - a desirable endpoint may be neither fixed nor clear (as discussed in chapter 1 *(page 21)* design problems can be considered *wicked*). Instead of applying established theory or technique to concrete problems, practitioners construct new theories around unique situations; they do not separate means from ends, thinking from doing. Schön characterised design as 'a reflective conversation with the situation' basing his analysis on observations of an academic architectural design studio (Schön 1983, p.76). While the studio practice Schön observed, particularly the questionable power dynamics it revealed, has been subsequently critiqued and extended (Dutton & Willenbrock, 1984; Mewburn, 2012; Webster, 2004, 2008) its identification of the processes at work remains extraordinarily influential in architectural pedgagogic research (Mewburn 2012).

Schön also describes the scenario whereby a practitioner might reflect on knowing in practice 'post-mortem' perhaps in preparation for future projects, a phenomenon of particular interest in an educational context. Basing their observations on an architectural PhD by practice programme, Blythe and Van Schaik have devel-

oped a further iteration of Schön's often-cited *reflection-in* and *reflection-on-action*, terming this *reflection-for*. This suggests that an emerging body of work can form the site/focus of reflection, a repository for 'potential design moves in waiting' (Blythe and Van Schaik, 2013, p. 62) which enables its author to construct a position or theoretical approach to their practice.

Blythe and Van Schaik's diagram *(fig. 3.1)* also positions all forms of reflection in a social context, illustrating them as frames within what they term the 'theatre of practice'. Reflection takes place within a wider discourse which includes *mentors* and *challengers* - 'those with whom (to an extent) we share a position and those who resist by presenting alternative views' (Blythe and Van Schaik, 2013 p. 65). This approach may be more evident in visual disciplines where studio discourse and semi-public critique are regarded as an integral part of teaching. Similar methods are often used within professional design studios: a designer or design team will present their emerging work to a group of their peers within a formal or semi-formal context, this group act as 'critical friends' (Costa and Kallick, 1993) questioning and probing to discover and clarify motivations and identify issues which may have been overlooked.

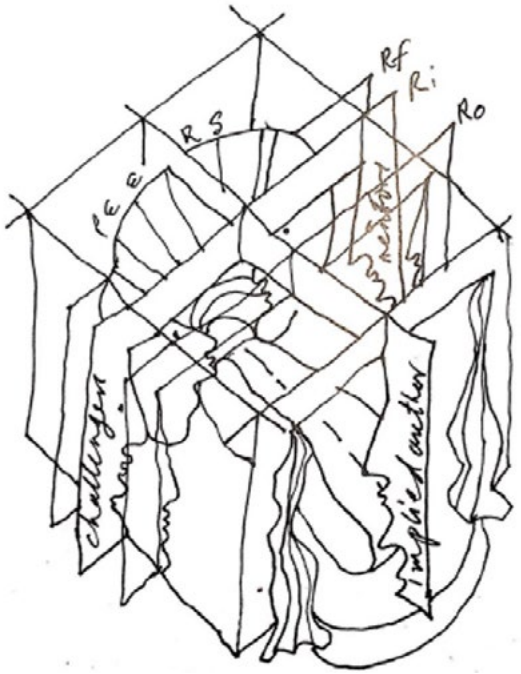


Figure 3.1: 'The theatre of practice' (Blythe and Van Schaik 2013) – the different forms of reflection (Ri, Ro and Rf) are shown as 'flats' across the stage, mentors and challengers face onto the stage from the wings – peers create the backdrop and the 'implied author faces onto the stage – projects are positioned as the focus, on the stage itself.

The studio as a community of practice

The academic studio as it has evolved can be understood as a community of practice (Lave and Wenger, 1991). This is a form of learning as embodied practice which does not separate knowledge from the processes of knowledge production or from the processes of producing knowledgeable, skilled practitioners. The processes at work identified by Lave and Wenger can be mapped onto those which operate within the design

studio as students become progressively embedded within a studio culture *(page 89)*. Learning is a trajectory towards the centre of the community of practice and teaching is rarely 'formal' - students learn by doing, and by observing and interacting with their peers.

While Lave and Wenger developed their theories through a study of apprenticeship - where learning takes place 'in and with the world' - a design studio is still usually protected from commercial realities by the boundaries of the institution. The academic architecture studio was modelled on, and remains, a precursor to practice *(page 30)* but it can isolate students from 'real world' concerns and contexts. Architects begin the process of fixing professional identities in an environment often divorced from the clients, users, and wider society that graduates will be required to engage with throughout their professional careers (Salama 2021); and from those fellow professional disciplines – planning, landscape, engineering, construction management etc. that together facilitate the design and development of cities (Till, 2009). Students develop a way of working and a system of values which is particular to this protected environment and which may or may not be applicable to practice in the wider profession. They may become skilled in some aspects of the discipline but must usually rely on more formal 'taught' delivery when considering how to meet the more gritty challenges of a 'live' practice context. The community of practice observed in academic studios overlaps with, rather than sits wholly within that of the mature profession (Morton, 2011). The idealism and formal concerns of the academic discipline will inevitably be continually challenged by the commercial constraints of the profession.

Recent initiatives in architectural education have sought to challenge the separation between academic and professional studios by locating students within professional communities of practice *(page 37)* and by directly addressing their expectations of their future professional roles - challenging students to envisage positive change. The London School of Architecture (founded in 2014) asks its students to consider a series of questions:

> What change do you want to see in the world?
> How does your architecture contribute to that change?
> Who do you want to be as a designer?
> Who does the world need you to be as a designer? (Hunter, 2021 p.22)

While how far this approach has so-far succeeded in changing the fundamental debate may be open to question *(page 37),* it challenges students to imagine *future practice* rather than perpetuating what exists. By locating students within professional studios and asking them to explore these questions in discussion with both academic and professional mentors the LSA brings academic and professional communities into closer alignment. It challenges both parties to question what qualities, skills and attributes should characterise the discipline and practice of architecture.

Critical practice

> I am aware of the contingencies of practice, bound as it is to capital and enmeshed in the vagaries of the world. Buildings are called into being by needs and desires in society, assembled from materials provided with the cultural disinterest of the market and to rules and regulations set by legislators and bureaucrats…. an abrasion between ideal and real, as fruitful as it is frustrating. Where in this gathering is there space for practice to be critical? (Clancy, 2020b p.27)

Architecture's *criticality* has often been inwardly focused, failing to survive the messiness of practice (Doucet & Cupers, 2009). Practice deals with complex, pragmatic problems in the real world, and as such is often considered separate from – and potentially in opposition to – theory, which is in parallel dismissed as a luxury of the academic discipline. A student graduating in Architecture will usually be required to position their work in a theoretical context, an exercise which aims to embed *critical thinking* but which can soon be forgotten amid the demands of day-to-day practice, and one which can result in a kind of self-referential theoretical complexity which fails to address concerns of significance beyond the discipline: 'a retying of architecture's internal knots' (Awan, Schneider, & Till, 2011 p29).

In contrast, Clancy's reading of *critical* is based on three linked but different (and therefore potentially revealing) definitions of the term. First, if something is *critical*, it is of importance; second, to *be* critical is to be 'questioning' to view architectural practice as more than a 'service industry'; and finally he refers to a *point of criticality,* as in 'sustaining a reaction' - here he proposes the kind of practice work which might produce ideas that others might follow (Clancy, 2020a). Clancy argues that it is possible within the complexities of practice to define a critical position but that this is rarely in the form of a unified grand gesture, that instead it is characterised by a gathering of multiple small decisions or 'acts of resistance' - that a critical practice is 'less a matter of an all-powerful, singular will driving an idea, than an openness to finding an equilibrium' (Clancy, 2020b p.29). Here the pragmatists and artists identified by Ash and Sakula (2015) and discussed in the previous section *(page 32)*, are no longer opposite poles but the same individual.

The swampy lowlands

Schön's exploration of the nature of professional practice includes the following widely quoted passage:

> In the varied topography of professional practice, there is a high, hard ground overlooking a swamp. On the high ground, manageable problems lend themselves to solutions through the use of research-based theory and technique. In the swampy lowlands, problems are messy and confusing and incapable of technical solution. The irony of this situation is that the problems of the high ground tend to be relatively unimportant to individuals or society at large, however great their technical interest may be, while in the swamp lie the problems of greatest human concern. The practitioner is confronted with a choice. Shall he remain on the high ground where he can solve relatively unimportant problems according to his standards of rigour, or shall he descend to the swamp of important problems where he cannot be rigorous in any way he knows how to describe (Schön, 1983, p. 52)

An architect has a responsibility to their client, not least, as Clancy points out, to deliver a financial return on their investment. The 'manageable' problems that Schön identifies might be understood in this context as satisfying the requirements of the client's brief, obtaining legal permissions, and delivering a building within the

original budget - all of which are hugely difficult tasks requiring extensive professional expertise. But in reality, the navigation of this process will present a series of choices, points at which the architect must balance conflicting demands and interests, making decisions where there will be no one 'correct' answer but which may have lasting impacts beyond the confines of the project. They must be prepared to wade into the swamp and meet the challenges it presents with creativity, innovation and rigour. As Clancy points out, *criticality* might also be understood as 'sustaining a reaction'. A work of architecture becomes part of the built culture, therefore these challenges can be treated as opportunities (however small) to make a meaningful contribution to architectural knowledge in its built form.

3.2.2: The ethical dimension

Doucet and Jannsen's second characteristic of transdisciplinary urbanism is its explicitly 'ethical dimension'. Ethics in professional practice is often equated with the codes of practice authored by professional bodies and consequently in education it is usually a sub-component of 'professional studies'[2] (Salama 2021). For an architect this code emphasises the duty of care owed to a client and the contractual obligations they have to other professionals before the more general obligation to act ethically with respect to wider society. As Till states this 'turns its back on something rather important, which is architecture's outside' (in Roberts, 2020, p. 3). Professional codes prescribe professional conduct, but do not always articulate values or principles, nor do they empower individual practitioners to 'act ethically'. It could be argued that a code's existence outsources ethical decisions, making them extrinsic rather than intrinsic to an individual's practice (Kreber, 2016a). What is perhaps required is ethical 'know-how' (Varela, 1999). As Roberts points out, 'the process of conceiving, making, using and transforming the built environment is aligned to ecological, social and material conditions. Built environment practice therefore demands an ethical standpoint' (2020, p.4).

Taking design decisions involves balancing conflicting interests therefore a designer will need to continually consider their ethical position. In a context of increasing social inequality and climate emergency it may be useful to return to the question Hunter asked his students at the LSA 'Who does the *world* need you to be? (Hunter 2021, p.22 emphasis added).

Practice/praxis + phronesis

The form of thinking employed in the theoretical sphere is contemplative, in the practical realm it is *making* - an activity which is dependent on skill (techné) but also on exercising judgement. *Praxis* is not simply action grounded in reflection, but action embodying qualities - how best to act in a specific situation: 'praxis is what people do when they take into account all the circumstances and exigencies that confront them at a particular moment and then, taking the broadest view they can of what it is best to do, they act' (Kemmis and Smith,

2 *The terminology used to describe this course (usually lecture based) will vary by institution.*

2008, p. 4). According to Fraser an architecture *praxis* constitutes a more 'dynamic and engaged model of design practice' which is 'critically engaged and socially proactive' (2013, p. 4).

While acting with an awareness that actions have human and social consequences, is a disposition central to ethical practice Kemmis also emphasises that praxis in these terms is *acting in uncertainty*, and that practical wisdom - *phronesis* - is acknowledging that uncertainty and having the courage and commitment to act, taking moral responsibility for those actions. According to Kemmis the wise 'avoid both haste and indecision…and they act as best they can for the good' (2012, p. 155). He sets out three characteristics of phronesis - being prepared and open to understanding a given situation in different ways; being open to seeing a situation from others' perspectives and developing one's own interpretations in this light; and finally being open to experiencing the world in new ways. Kemmis argues that these dispositions are not things which can be taught directly in any formal educational environment but must be acquired through the experience of practice (2012) but it is possible that a studio, particularly one which collaborates across disciplines and engages directly with real-world problems might at a minimum frame a context for discourse.

Kreber argues that what is necessary here is *emancipatory knowledge*, that is 'knowledge that challenges compliance with the status quo' (2016a, p. 88) an approach she terms 'critically inspired phronesis'. Building emancipatory knowledge requires critical reflection which questions how our assumptions, values and views have been shaped by our own experiences, and a recognition of the social structures which shape these. In architecture it suggests challenging both the boundaries of accepted disciplinary knowledge, and questioning the priorities suggested by those shiny exemplars often held up as representing the 'best' of current professional practice. To meet the most pressing challenges of contemporary society it will be necessary to work across disciplines, to share the 'power' often jealously guarded by professional practitioners, and to recognise that knowledge does not always reside exclusively within that disciplinary or professional group. In short, to be inclusive and to be *wise* (Kemmis and Trede 2010).

Practice 'on behalf of': wider society as 'client'

Architecture, according to Vitruvius, is defined in part by 'commodity'. It is generated to serve a function and commissioned by a client - it must be 'useful'. The responsibility an architect owes to their client - who they *act in the service of* - may compromise their responsibility 'to wider society' (ARB, 2010). For example, the client will be required to pay for design decisions that may select a more sustainable and more expensive material over its less sustainable and cheaper alternative, ultimately the client must be presented with a choice and the information necessary to take a decision, and the architect must act in accordance.

Design is most usually constructed around the client's ends, as opposed to human needs (Woodhouse and Patton, 2004) and the *client* is not necessarily the *user,* their needs and motivations may differ. This creates a key difference between the role of a planner and that of an architect, one that can be both revealing and

useful in an interdisciplinary collaboration such as *MArch with Urban Planning*. A planner's client is effectively 'wider society'. When a student is asked to refocus their design practice *in the service of wider society*, they begin to consider in more depth the implications of design decisions on economic and social contexts as well as physical forms, and they consider how projects might evolve and impact over longer timescales – the society of the future as opposed to that which might exist at the point of a handover to a conventional client.

As has been defined above, transdisciplinary knowledge production engages with real-world contexts and is generated by real-world problems *(page 46)*. It therefore has the potential to build an awareness of, and direct responsibility to, that world. Within the *MArch with Urban Planning* studio, the design problems students construct are less abstract and more responsive to contextual issues than those of the parallel *MArch*. One of our former students explained that engaging directly with a community beyond the institution acted as a necessary 'reality check' which subsequently shaped her professional career. The work she was doing in the academic studio had (in her case) the potential to make real change[3], the people she engaged with were real and she felt a responsibility to them (Foy, Macari, & O'Connor, 2020) this direct engagement lent her approach a more significant ethical dimension.

'Critical Spatial Practice' & 'Spatial Agency'

The ethical dimension of spatial design practice has been further explored in two significant recent publications, both of which move away from using the term 'architecture' in favour of the more inclusive 'spatial':

> Critical spatial praxis – at least the sort that lives up to its aspirations – is more than the sum of its words. It is more than merely critique, and more than a praxis whose spatial extension is its only dimension….a praxis that would be *transformative* in actuality cannot be composed of purely reflective observation; it requires a *projective* approach (Avanessian, A. in Miessen, 2017, p. 13 emphasis added).

The term critical spatial practice originates in Jane Rendell's search for an alternative to the term 'public art'. Rendell, an architect who taught an interdisciplinary course in public art for several years, argued that the understanding of what was meant by 'public art' had been reduced to that of art as an object, positioned within the public realm, rather than as a practice which exists to comment on or challenge its situation. Rendell observed a tension between what fine art is essentially 'for' and the role it often takes on when made outside the gallery. *Art* cannot be used to 'solve problems' - it cannot take on functions or address social issues and remain at the same time exist independently 'for its own sake'. *Public* art, a form of artistic practice which aims to be *transformative* in some way, therefore oscillates between art and design (Rendell, 2003).

Rendell emphasised in her initial discourse the *critical, spatia*l, and *interdisciplinary* nature of this practice but her approach has evolved in more recent publications, and she has proposed adjustments to her earlier defi-

3 This is not the case for all MArch with UP projects. This student developed a programme of events which would re-frame public perception of a post-industrial area allowing an existing network of creative businesses to engage directly with potential customers..

nition, notably, she suggests that for interdisciplinarity she would now substitute *trans*disciplinarity, to explicitly reflect practice which is not confined to academia or defined by academic disciplines (2020).

The title *Critical Spatial Practice* has been taken-up and subsequently extended by others (Hirsch & Miessen, 2012) but it remains grounded in the critical theory of the Frankfurt school and underpinned by an agenda of social justice and a desire for social change, seeking to *transform* rather than simply describe. In Meissen's view *Critical Spatial Practice* exploits the potential of art to 'act critically', outside the market orientated compromises which are necessary in architectural practice. He contrasts his position with that of Rendell by emphasising this may often manifest in practice which is 'anti-object' – not necessarily producing physical space but considering alternative mechanisms for making change (Miessen, 2017), a position which is increasingly relevant in the context of diminishing resources. While Miessen is interested in art as *critical practice*, he is also clear that being a *spatial* practitioner carries societal obligations from which fine art is liberated: 'Critical Spatial Practice should be understood as a means of rethinking one's professional practice, operation, and codes of conduct' (Miessen 2017, p.53).

Spatial Agency is a term carefully chosen by Awan, Schneider and Till to categorise forms of architectural practice which they see as 'action propelled by a critical understanding of external conditions' (Awan et al., 2011, p. 29).

> Architects start out intrinsically optimistic, and even if this hope is tempered and frustrated over time by the barriers that have to be overcome, the initial motivation of betterment still remains… The question then arises as to exactly what constitutes 'better', and what means are used to achieve it? (Awan et al., 2011, p. 37)

They use the term *spatial* to consciously expand upon the conventional associations of architecture (the building as an object) and the consequent tendency to prioritise the qualities associated with static objects - the aesthetic; the a-temporal; and the commodification of architecture as real estate. *Spatial Agency* recognises that the production of space is not the exclusive province of architects and planners and that space is not fixed but dynamic and never 'neutral': 'people live out their lives in this space and so one has to be continuously alert to the effects of that space on those lives' (Awan et al., 2011, p. 30).

In the most basic sense all architects act as 'agents' for their clients, but *agency* in this reading draws on the ideas of Giddens (1986) to define it as *acting with transformative intent* in response to a context. For *spatial agents* knowledge is unstable, non-hierarchical, and most importantly shared. Rather than practicing only 'on behalf of' the client, this form of practice is founded in exchange – working 'with and on behalf of others' (Awan et al., 2011, p. 32).

This is a position which aligns with participatory design: a form of design *by* society that similarly seeks to challenge the myth of 'the designer as auteur' by redefining design practice as a collaborative engagement. Woodhouse and Patton recognise that designers will inevitably tend towards design for themselves, or

someone like themselves - 'What makes sense will tend to be in accord with the designer's tacit assumptions' (2004, p. 2). This can act to perpetuate social norms and exclude a more diverse population, excluding 'people' from the production of knowledge which seeks to transform their environment. As Doucet and Janssen note in their discussion of transdisciplinary urbanism:

> 'Design by society' brings an important ethical dimension into design: namely, it asks 'how design [might] move into public debate, systematic inquiry, and institutional practices?'. It does not merely acknowledge that a myriad of persons participate in design processes… it also examines how societal norms are built into design and how design can be or should be held accountable for its impact on society at large. (Doucet & Janssens, 2011, p. 11)

While all design must be 'accountable' - it needs to serve the purpose for which it was designed - where and how far that accountability should extend will ultimately be the responsibility of the designer(s) to define. They will be required to use professional judgement or *ethical know-how* in identifying who should be included and how their voices might be translated into transformative action. It is explicit engagement with a 'real-world' context and the inclusion of voices from outside the discipline, profession and academy which distinguishes the approach of a *transdisciplinary* urban studio.

3.2.3: Designerly modes of enquiry

> The starting point of design is the proposition that things could be otherwise. (Brenner, 2013)

To understand what might constitute the 'designerly modes of enquiry' referred to by Doucet and Jannsens, it is first necessary to attempt a brief definition of design, while recognising that this activity covers a wide spectrum of disciplines, methods, and practices (Buchanan 1992). The term design is derived from the Italian 'designo' meaning drawing but indicating the making of drawings which might then be translated into a constructed, physical artefact (Hill, 2003). Given this origin it might be assumed that 'design' applies only to traditionally visual and/or creative disciplines, but this is not necessarily the case - a 'plan' might be an architectural drawing showing a layout of spaces but it can equally be a written set of instructions. Herbert Simon's 1969 definition opens these wider possibilities, explicitly questioning assumptions which link design to material artefacts by stating 'everyone designs, who devises courses of action aimed at changing existing situations into preferred ones' (Simon, 1996, p. 111).

Findeli's analysis of what it means to work in a '*designerly*' way aims to distinguish it from scientific modes and models. He equates *designerly* with being *project-orientated*. He theorises that if design is essentially about improving 'habitability' by making new tools which mediate between humans and the world that they inhabit, then its closest scientific discipline would be human ecology - 'the study of how human social systems interface with wider ecosystems' (2010, p. 293). What separates the these disciplines is not the subject or the field of enquiry, but instead the angle from which they approach the problem:

> The aim of human ecologists is to construct a theory of human-environment interactions; their stance is descriptive and mainly analytical. Conversely, the aim of designers is to modify human-environment interactions and to transform them into preferred ones. Their stance is prescriptive and diagnostic… human ecologists consider the world as an *object* (of inquiry), whereas design researchers consider it as a *project* (of design). (Findeli, 2010, p. 293 emphasis added)

Designerly ways of knowing: being solution-focused

Cross argues that design needs to be understood as its own discipline rather than as a science; that it should be 'studied on its own terms and within its own rigorous culture'; and that underpinning this are 'forms of knowledge special to the awareness and ability of a designer, independent of the different professional domains of design practice' (Cross, 2001, p. 54). He sets out a number of interrelated characteristics which distinguish *designerly* enquiry including common approaches to problem-solving, modes of thinking, and thinking tools.

A designer will propose and test multiple solutions as a way of approaching problem-solving, using this iterative process to better understand the nature and boundaries of that problem. Cross illustrates this by referring to an experiment conducted by Lawson (2006) which examined problem-solving behaviour in postgraduate science and architecture students. The two groups were set the same three-dimensional spatial puzzle:

> The scientists generally adopted a strategy of systematically exploring the possible combinations of blocks, in order to discover the fundamental rule which would allow a permissible combination. The architects were more inclined to propose a series of solutions, and to have these solutions eliminated, until they found an acceptable one (Cross, 1982, p. 223)

Lawson's analysis of his results suggested that while the architecture students had effectively understood the nature of the problem through testing potential solutions, the scientists worked in a more linear fashion beginning from a study of the problem. Cross argues that this 'solution-focused' approach is a logical response as designers are commonly faced with ill-defined or 'wicked' problems. Where problems have 'no stopping point' (Rittel and Webber 1973) any attempt at a rigorous analysis will inevitably lead to a conclusion that 'more research is needed'. A *designerly* approach accepts this uncertainty - designers 'learn to have the self-confidence to define, redefine and change the problem-as-given in the light of the solution that emerges from their minds and hands' (Cross, 1982, p. 224).

This does not imply that designers do not pay careful attention to the problems they are presented with, but it does reflect their messy nature - these are less problems and more what Schön terms 'problematic situations'. Designers engage in a process sometimes described as *problem framing*: 'interactively, we name the things to which we will attend and frame the context in which we will attend to them' (Schön, 1983, p. 40). The use of the term *frame* originates in sociology where it indicates a specific perspective on a situation 'a set of principles or rules, or an organizational pattern that we use to delimit, identify, and make sense of a situation' (Bijl-Brouwer, 2019 p.31). Design is not a technically rational, linear process but one of iterative testing and a continual re-framing of problems.

Buchanan refers to a designer's *placements* as opposed to *frames*, a choice of words which suggests a point of view rather than a window with defined boundaries, and something which may be more particular to the designer than the specific problem (1992). A 'placement' might be understood here as an evolving theoretical position built upon a designer's beliefs, values, influences and experiences which can then be used as a toolkit or 'personal proto-philosophy' of design. While this does suggest that a designer might approach each problem based on the same or similar *placement(s)* it should not be dismissed as a personal style, more 'a characteristic way of seeing possibilities through conceptual placements' (Buchanan, 1992, p. 13). Just as problems are subject to re-framing, it should also be noted that placements are not fixed but may evolve or be consciously constructed and re-constructed through reflective practice.

'Constructive' thinking.

> Makers are driven to synthesize what they know in new constructions, arrangements, patterns, compositions and concepts that bring tangible, fresh expressions of what can be (Owen, 2006, p. 17)

To design is to invent – to envisage things which do not currently exist. A designer must use their knowledge, skill, and artistry to translate problematic situations into potential solutions. Cross describes this as:

> a process of pattern synthesis, rather than pattern recognition. The solution is not simply lying there among the data, like the dog among the spots in the well known perceptual puzzle; it has to be actively constructed by the designer's own efforts. (Cross, 1982, p. 224)

A design is not (usually) the result of a blinding flash of inspiration, but of an iterative process of seeing, moving, seeing, a 'reflective conversation with the materials of a design situation' (Schön & Wiggins, 1992). 'Seeing' could be understood literally, that is drawing out an idea and reflecting upon this drawing, but Schön and Wiggins explicitly use this term rather than 'looking' to imply active investigation and discovery. This involves seeing possibilities, or recognising a 'bad fit' and rejecting or amending it (Alexander, 1964); being alert to both intended and unintended consequences - the unfortunate and the serendipitous; and making the necessarily qualitative judgements based on the designer's own system of values (Vickers, in Schön & Wiggins, 1992). A designer *constructs* a design.

A slightly different view of *constructive thinking* positions it in relation to *critical thinking*. In the interpretation of Thayer-Bacon, constructive thinking does not attempt to separate the self but instead integrates the inner voice: the subjective, intuitive, believing; with the voice of reason: the objective, critical, doubtful (1995). Thayer Bacon argues that *criticality* cannot be neutral, but that contemporary discourse has downplayed this and instead emphasized rational and linear thought downplaying more intuitive responses (1998). Intuition is perhaps a term loaded with preconceptions and distrusted as defying rational explanation (Claxton and Atkinson, 2000) but designers will normally acknowledge that much of the way they work is 'intuitive', perhaps unconsciously using this as a shorthand for the more complex processes of *framing* which occur in design.

Both Buchanan's *placements,* and these conceptions of *constructive thinking* emphasise the role of a design-

er's *position* and value-systems on how they make judgements and design decisions. As Cross points out the solution is not 'simply lying there', each design decision is made by the designer and will therefore reflect their personal beliefs, agendas, and value systems. In an educational context students need to understand and be aware of this relationship, be conscious of their value-systems and how these may differ from others (Salama 2021).

Object/material languages

> To start with you see the thing in your mind and it doesn't exist on paper and then you start making simple sketches and organising things and then you start doing layer after layer… it is very much a dialogue (Santiago Calatrava quoted in Cross, 2011 p. 14)

Cross argues that all designers use 'codes' to translate abstract requirements into designs and that they use these codes to both 'read' and 'write' in *object languages* (1982). He explicitly uses the term 'codes' to enable a broad interpretation as the methods used will vary across design practices but he is referring here to the knowledge that is embodied in material things, and how designers use these things – drawings, models etc. as a way of thinking through making, or literally *seeing - moving - seeing* (Schön & Wiggins, 1992). Architectural knowledge is embedded in and communicated through a combination of texts (in the form of written history and theory), drawings made by designers, and the buildings which result. As Cross acknowledges, architects study other buildings (normally termed *precedents*) as part of their design process not out of a desire to 'copy' but because this is where architectural knowledge ultimately resides (1982).

The place of the drawing in architecture is critical, and somewhat loaded. The term *architect*, as opposed to master builder, dates from the Renaissance and the role as defined by Leon Battista Alberti in his 1452 text 'De re Aeduficatoria'. This explicitly separated the work of the intellect, from that of the hand: the architect *drew-out* the design[4], which would then be constructed by builders. This changed the status of architects, they were no longer anonymous craftsmen, and of their drawings as these effectively became the locus of architectural knowledge (Hill, 2005).

4 *As previously discussed, etymological the root of 'design' is 'disegno' - to draw (page 58)*

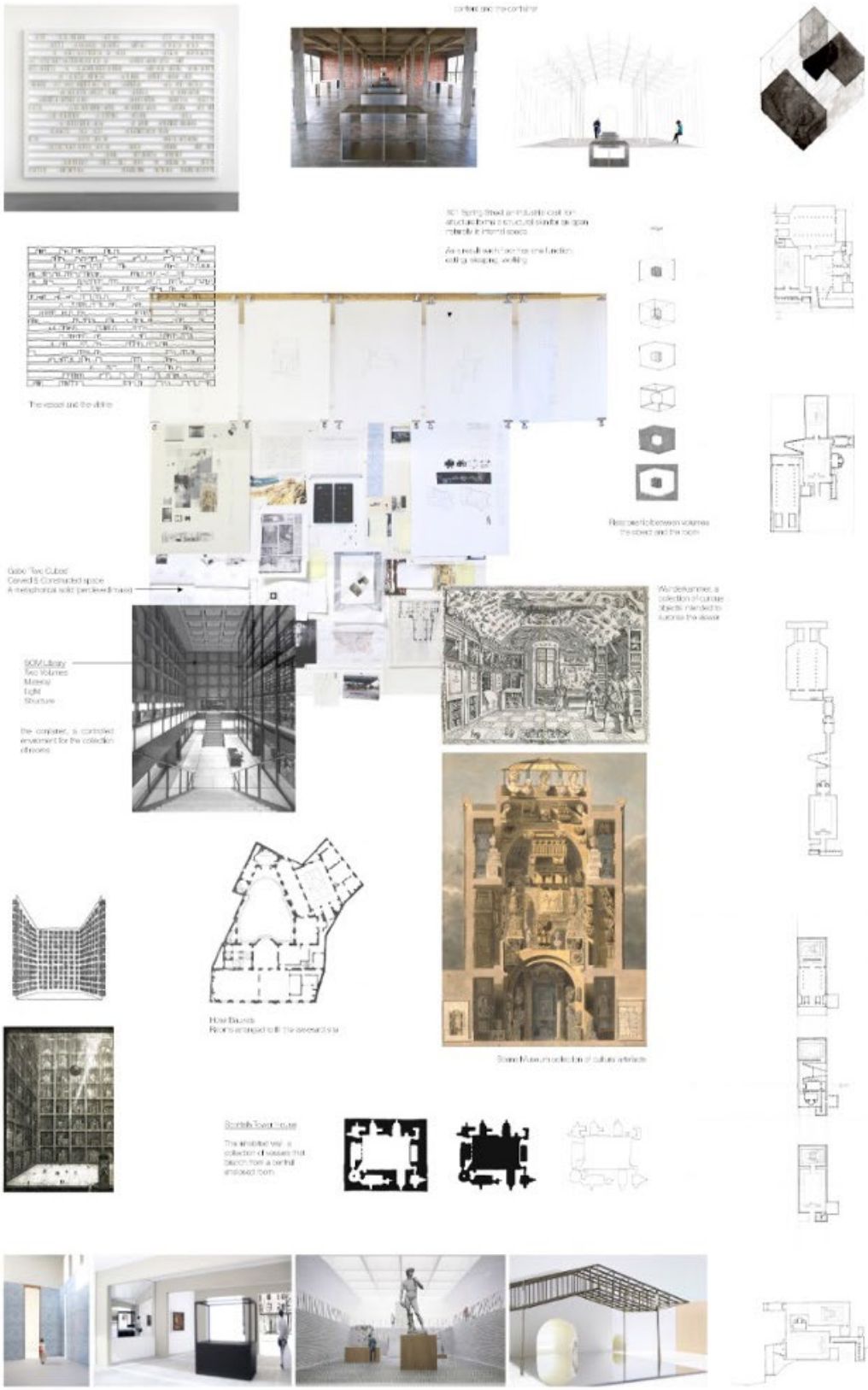


Figure 3.3 .'Visual Abstract' by Ed Fisher 2015.This study made by an M.Arch student draws together precedents which informed his thinking around the design of a new museum. It includes original drawings and images of built and made work, together with the student's own drawings of those projects, and his own drawings and models of his emerging design proposals. Knowledge here is represented by and synthesised through images.

An architectural drawing acts as a proxy for the physical construction at one remove. Raimund Abraham, an architect as influential for his drawings as his built architecture explained his process as follows:

> A drawing for me is a model that oscillates between the idea and the physical, or built reality of architecture. It is not a step toward this reality but an autonomous act to anticipate the concreteness of the ideal… the first markings on a white sheet of paper, the first carvings in stone, the first engraving in metallic plates represent the beginning of architecture, the primal act of construction toward the realisation of an idea. (Abraham in Groihofer, 2016, p. 102)

Even in an academic context where there is little to no prospect of speculative drawings becoming physical built reality, a drawing represents a 'virtual' building with physical and material properties envisaged by both its author and its readers (Medway and Clark, 2003). Buchanan argues that in a design context artefacts made as part of the process should be understood as a form of argument equivalent to text 'reflecting the deliberations of designers and their efforts to integrate knowledge in new ways, suited to specific circumstances and need' (1992). Drawing is a 'code' that architects learn from the outset of their education and one that they rely on absolutely, but the absence of a material 'building' as the endpoint of an academic project can result in a fetishization of the drawing as an art object - images which are designed to appeal to other architects. Drawings can exclude those who are not fluent readers of this privileged language and the emphasis placed on them in education can be problematic. The 'answer' to a design problem may not be a building. To communicate effectively with their disciplinary peers MArch with Urban Planning students have often been forced to find innovative ways to 'draw' processes in the absence of objects.

Design as a collaborative space

As Findeli points out, unlike most other disciplines the subject matter of design is effectively universal. If the problem is centred around how human beings might live in and experience the world, then this can (and should) be considered from a multiple disciplinary perspectives (Findeli, 2010). This is why architects describe their subject as inherently 'interdisciplinary', it is also what makes design problems 'wicked', and what makes them fertile territory for *inter* and *trans*disciplinary projects. Here disciplines, the academic, non-academic, professional and non-professional, can meet around the shared context of a problem:

> Few engineers and composers… can carry on a mutually rewarding conversation about the content of each other's professional work. What I am suggesting is that they can carry on such a conversation about design, can begin to perceive the common creative activity in which they are both engaged, can begin to share their experiences of the creative, professional design process (Simon, 1969 in Cross, 1999, p. 7)

The challenge that Cross perceives in delivering this paradigm is one of communication. The language of drawing is not easy to learn, and its practice as 'thinking through making' demands an almost unconscious application of skills which anyone not fluent may find daunting. Working in a transdisciplinary way means the designer needs to be less 'precious' and more generous, acting as an inclusive facilitator and bringing their skills to a collaborative process. To marry the necessary disciplinary expertise with the inherent interdisciplinarity of design requires all parties to find a language in which they can communicate across disciplinary boundaries.

3.3: Educating transdisciplinary urbanists

> Neither education nor the structure of the profession nor the design and production of buildings can be seen in abstract; they are all affected by the social, political and economic framework of our society, and a part of education is to consider and question this framework (Hinsley, H. in Schneider, 2011, p.7)

The *MArch with Urban Planning* course was originally conceived to equip graduates with 'the skills and confidence to meet the challenges of future society and the contemporary workplace, as innovative, effective, and responsible individuals within increasingly complex and diverse professional contexts'[5]. Its structure built on an existing opportunity for specialist study in the final year. Core disciplinary knowledge is embedded primarily in earlier years and the final year of the M.Arch is focused around building graduate attributes – the qualities and dispositions graduates need to 'flourish' (Barnett, 2007). What I did not fully appreciate at the outset was the external perspective that direct engagement with urban planning might lend to these students' conception of themselves, their (original) discipline, and their future professional roles. Shifting the 'client' and therefore primary responsibility, from an individual or organization to wider society *(page 55)* reinforced the students' understanding of the professional as a *citizen*.

3.3.1: Education for civic-mindedness

> Civic mindedness: 'a person's inclination or disposition to be knowledgeable of and involved in the community, and to have a commitment to act upon a sense of responsibility as a member of that community' (Bringle & Steinberg, 2010, p. 429)

Reacting to the increased professionalisation of the contemporary university, the focus on employability and the drift of professions towards service industries, Carolin Kreber's argument centres on the contribution that graduate professionals can make to society. She argues that professional education is enriched by stronger and more critical engagement with communities - by the acquisition of instrumental knowledge and technical skills *(page 54)* but also what she terms 'communicative and emancipatory knowledge' and 'a disposition to seek greater social justice' (Kreber, 2016a, p. 12). *Civic-mindedness* is grounded in Kreber's view in what she terms an 'authentic professional identity' and she argues that professional education has a responsibility to nurture this. *Authenticity* in Kreber's view requires students to 'develop the capacity to make choices that are bound up with their own inner motives. They become personally invested in their choices' (2016a, p.38).

Kreber's analysis draws on two separate but overlapping interpretations of the fundamental purpose of professional education. The first is Ronald Barnett's focus on critical *being* as an extension of critical thinking and the role of higher education in enabling graduates to flourish in the contemporary context of epistemological uncertainty and super-complexity (Davies and Barnett, 2015). A graduate in these terms would be self-reflective; conscious that problems are 'wicked'; prepared to question their assumptions; and open to challenge and critique - an 'actor in the world' (Davies and Barnett, 2015, p. 65). Balancing this more philosophical, exis-

5 *This is directly quoted from the programme rationale submitted for Q.A. approval.*

tential-oriented perspective Kreber refers to Sullivan and Rosin's 'critical and communitarian' interpretation of 'authenticity' (Kreber, 2016a, p. 42). Sullivan and Rosin put forward an argument for practical as well as theoretical reasoning in higher education, linking critical thinking with concrete practices and situations. They propose an education oriented towards decision and action, a graduate being 'a person disposed to questioning and criticising for the sake of a more informed and responsible engagement' (Sullivan and Rosin, 2008 p. 16).

Kreber concludes her exploration of *graduateness* by proposing 'civic pedagogies' which might define professional education. These would 'provoke students to critically reflect on their assumptions, beliefs and values'; encourage students to take risks and to subject their ideas critical debate within public fora; encourage active learning and personal investment in the issues studied; and be as far as possible 'experiential' requiring students 'to relate abstract academic content to concrete real-life issues of social relevance' (Kreber, 2014 p.98). Kreber argues that professional education has a responsibility to educate its graduates to be active citizens - to prepare them to operate in complex situations where their actions will have consequences. For an architect, a line drawn in a virtual environment becomes a structure in the world. Architects must be mindful of who wins and who loses by where, how, or if, that line is drawn.

Action-orientated pedagogies: the 'public' studio

This approach to *civic-mindedness* draws on the ideas of the political theorist/philosopher Hannah Arendt, specifically those around *Labour, Work* and *Action*. In Arendt's analysis, *Labour* is the work that we do that is cyclical and without a clear end-point, it is what we do because it is necessary for survival 'We must eat in order to labour and we must labour in order to eat' (Arendt, 1998, p. 143) and *Work* is what we do to make the artificial world, those 'technically rational' projects and artefacts which transform our environment. Both these might be performed by an individual within the private domain, but to *act* means to position oneself in the public sphere and to engage in discourse and debate. Kreber argues that professional activity in the contemporary context is increasingly relegated to labour, and while all aspects are necessary to the fulfilment of a professional role, graduates should be encouraged to understand *action* and the creation of spaces which enable action as central to their future roles (2016b).

Arendt goes on to identify two factors upon which action depends – *natality*, that is the freedom to 'call something into being which did not exist before' (1998, p. 151), and *plurality* – the presence of others who can receive, interpret and respond to our action. Action is therefore necessarily *public* and it is always relational and participatory (Biesta, 2012). Kreber suggests that in recognising the importance of plurality professionals would understand their 'social interconnectedness', the necessity of 'integrating their individual goals and those of their professional group with those of the larger community' and 'the existence of multiple perspectives' (2016a, p. 129). Natality in her view would imply agency and accountability, but also an imperative to enable such agency for others (Kreber, 2016a).

For Arendt exercising astute judgement depends on going 'public' – being confronted by other opinions and life experiences, a multiplicity and diversity of perspectives. Kreber argues that 'civic-minded' professionals have a responsibility to both facilitate and engage in public discourse, to be 'civic agents' (2016a, p. 134). She suggests that professional education might involve students in the same open, democratic discourse. Also drawing on Arendt's ideas, Biesta identifies three forms of what he terms *public pedagogy*: pedagogy for the public, of the public, and pedagogy that generates a 'space through which freedom can appear' (2012 p.686). Kreber references these distinctions, elaborating on how they might be interpreted within professional education. She argues that Biesta's pedagogy *for* the public can be equated with a service ethic - addressing problems in the service of the wider community; that a pedagogy *of,* or *with,* the public would entail collaboration and public deliberation of issues 'the community would not only define its needs but would have an equal say in how these might be addressed and what might qualify as the best solution' (Kreber, 2016, p. 145); but that Biesta's third pedagogy - 'creating space for action' - relies on spontaneity and while this can occur, it is not something that can easily be designed into any academic programme. A transdisciplinary urban studio, such as the MArch with Urban Planning, might allow for all three modes to exist but it would be naive to suggest that either the second or third could be easily prescribed. The dynamics of a project as it progresses and the approaches of the individuals involved will condition how far the studio can operate as a truly 'public' space.

While Arendt did not focus on education, her ideas around public space and action did influence those of Maxine Greene, who equated classrooms with 'local' public spaces where the unique contribution of each individual could be discerned by others in that space (Schutz, 1999). An academic design studio creates the space for multiple individuals to work together on common projects while maintaining unique positions: each has a unique experience of the world - a distinct voice. While the opinions and perspectives which contribute to an academic studio discourse might lack the diversity of a truly *public* space, it is still of value. However, the wider the spectrum of voices we can include, while ensuring that students continue to have the confidence to speak, the better-prepared graduates will be to act as effective *civic agents* in the wider public realm.

The material dimension of public space – Arendt's table.

> The market square as a public space is also a political space, which accommodates difference, and obliges engagement, and induces vulnerability of the self and necessitates attention to the other (Pimlott, M. quoted in Bolhuis and Kennedy, 2020, p. 75)

Architects work with physical space, both real and projected. Arendt's use of spatial terminology means that she is increasingly referenced by architects. Arendt refers to a table: 'to live together in the world means essentially that a world of things is between those who have it in common, as a table is located between those who sit around it' (1998). This table structures the space for *action* to which Kreber and Biesta refer. It positions people in relationship to each other, and locates them in the world – its material, economic, social and cultural dimensions. It allows for conversations, and it sets the dynamics of the gatherings which happen around it, rendering 'the plurality of perspectives visible' (Teerds, Grafe, and Koekoek, 2020, p. 15). But a

table is also a designed and made artefact - the product of *work*; the architect/urban planner must engage in both forms of *vita activa*. Central to their concerns are the city and the design of its public realm, the infrastructure of public life.

3.4: Conclusion

In an attempt to address Geddes' critique that we remain too focused on single specialisms, and 'too little awake to those of the others' (Trywhitt, 1947), the MArch with Urban Planning studio operates in the shared border space between two disciplines. In this context the students learn to value other disciplinary perspectives - the shared context of 'design' creating a space for collaborative discourse between and across disciplines.

As a studio tutor I also work in this boundary space, but I must do so in close collaboration with my colleagues. I am aware that I am an architect, not a planner, and inevitably approach urban problems from that perspective - through the lens of my own value-system. My students however, will be both planners and architects, claiming the disciplinary expertise of both professions. In their first four years of higher education, they have been trained as *designers* - to express themselves and their ideas visually; to go through an iterative, cyclical process of experimentation and reflection, often working intuitively and post-rationalizing an underpinning logic for their decisions; and accepting that there is no one 'correct' answer. They approach what are essentially *planning* problems with a designer's process. As has been described this is a distinct approach to *problem-framing*, *forming* and *solving*, and one which involves a designer in constructing 'placements' or 'frames'. Whether individual or collaborative this process is shaped by a designer's evolving critical position - what influences their ideas, what they consider important, what, and who they choose to prioritise in balancing conflicting concerns.

In dissecting the terminology around *interdisciplinarity* I have been prompted to explore in more depth much more commonly used (and misused) terms including what is entailed in *design*, in *reflectivity*, *criticality* and *agency*, as they might apply to design practice. The M.Arch with Urban Planning studio is *trans*disciplinary. It operates across disciplines and asks students to work collaboratively to address real world problems, and to do so with a view to transformative action - to engage in a *critical* form of practice. The studio sets-out a framework which might deliver Kreber's 'civic pedagogies' (2014). In developing their design-research projects students are required to continually question their assumptions, beliefs, and values. They do this as part of their own reflective process, and within the wider 'social theatre' of the studio (Blythe and Van Schaik 2013) which includes both peers and challengers. While this remains an academic (and professionally prescribed) programme, it attempts to deliver a curriculum through direct engagement with real-life issues of social relevance.

Agreeing on the model's extents 18/01/22

4: Material + spatial frames

> A place between is *spatial*, it is a mapping of the topographies between here, there and elsewhere. (Rendell 2003, pg 1, emphasis added)

This study explores how students develop a critical approach to their practice - a *position*: how they understand and articulate where they stand in relation to *mentors* and *challengers* (Blythe and Van Schiak, 2013); to their discipline(s); to the wider communitity; and with respect to global concerns. As an architect I tend to work in a *designerly* way *(page 58)* and use *material and object languages* to do so *(page 57)*. The disciplines of architecture and urbanism are essentially concerned with the study of existing spaces and places and 'drawing out' their potential future through design. This is an area of study and practice which is therefore explicitly material and spatial in nature.

What remains under-explored in the previous discussion of *transdisciplinary* practices in urbanism, is this spatial and material context. This section will introduce the key socio-material approaches which have been used to construct the theoretical framework of this project, including how Actor Network Theory (ANT) has been applied in the field of spatial design (Yaneva, 2005, 2009; Mewburn 2009, 2012) and in education (Fenwick and Edwards 2010), and how socio-material approaches are understood in the work of Barad. It will then go on to consider the 'spatial turn' and how spatial theories initially drawn from spatial disciplines have informed my understanding of educational processes, concluding with an explanation of how definitions of 'place' became relevant in the context of this project.

4.1: Socio-material theories

Architecture and Urbanism are fundamentally concerned with the production of physical and material space, and architectural knowledge, as discussed in the previous section *(page 59),* is embodied in the material outcomes of design - buildings. These are not the only arguments for adopting a spatial/material approach to this study. The tools and tactics designers use to envisage future places - that is their *object languages (page 61)*- are themselves dependent on material things. The drawing instruments, whether analogue or digital, and the drawings and models which form part of design's seeing-moving-seeing process act as 'aids of imagination and instruments of thinking tied to the body' (Latour and Yaneva, 2008, p.108). Socio-material approaches recognise the importance that these 'non-human' actors play in social processes.

As discussed in chapter 1 *(page 13) Material Practice* is an approach to architecture which has consistently informed my own practice and my approach to studio teaching. The term, when used in architecture, implies a concern for the tools and tactics employed in a design process (drawing and modelling etc.), and an approach to the generation of architectural space and form which treats materials and making as integral and which prioritises the human experience of the resultant space[1]. *Material* in architecture is 'the means by which space is grasped' (Sanaksenaho, in Lavalou, 1998, p.50); the physical properties of those materials invest in the resultant spaces an 'emotional capacity' which defines the user's experience (Caruso & St John, 1996). I therefore begin from a position which places material in the foreground.

4.1.1: Actor Network Theory

Actor Network Theory (ANT), first developed by Latour, Law and Callon (Latour, 2007), might be better understood as not a theory, but an approach, or 'sensibility' (Fenwick, Edwards, and Sawchuk, 2011) which informs the use of ethnographic methods. It allows for the role that physical spaces and material objects play in the formation of dynamic networks or assemblages:

> ANT's analyses trace how all things – natural, social, technical or, more accurately, the messy mix of these – become assembled and enacted in networked webs, how they associate and exercise force, and how they persist, decline and mutate (Fenwick et al., 2011, p. 94).

Importantly ANT does not attempt to deny 'messiness' or suggest coherence where none exists – it recognises that assemblages are made of multiple overlapping networks or 'simultaneous ontologies' (Fenwick et al., 2011, p. 108), and that these networks are potentially infinite. This is a position which presents the researcher with two related concerns – where to centre their focus, and where to draw boundaries: where to 'cut' a network.

1 *Material practice is often associated with phenomenology, and the writings of Heidegger, and Merleau-Ponty – these ideas have been applied directly to architectural theory notably through the work of Juhani Pallasmaa, Alberto Perez-Gomez et al.*

In the context of a design studio the equivalence between human and non-human actors implied by *Actor Network Theory*, something which might be normally considered problematic or at least strange, here appears entirely logical. As Fenwick et al point out, in other disciplines there may be an inherent difficulty in 'interviewing inanimate things' (2011, p. 98) but students of architecture learn that architectural knowledge can be deciphered through a detailed study of architectural artefacts, representations, spaces and forms. A design process can be 'read' as it unfolds through the drawings, memos, and emails which act as traces of a complex and dynamic assemblage (Gottschling, 2018). *ANT* does not treat meaning and material as inherently separate. It is not only concerned with what an object might mean but also what it might do, what force it might exert within a network: a drawing will reveal possibilities and change the direction of a seeing-moving-seeing design process; the properties of a material will influence the form a building takes; an architectural space will influence (it may even dictate) the actions of its occupants.

ANT in educational research

> A socio-material approach to ethnography means direct observation of material things (i.e. objects, technologies and settings) in ways at least equivalent to those that notice people. (Michael, 2020, p. 275)

An ANT approach to education research foregrounds the often-overlooked significance of material in educational processes. It considers the material connections which can instigate and hold together events, people and ideas; how educational contexts are created shaped and continually reshaped by social and material processes (Fenwick et al., 2011); and how material objects might actively contribute to education and facilitate different forms of knowledge (Sørensen, 2009). Education research places an understandable focus on the interaction between students and teachers, often treating the material aspect as background or peripheral. In contrast, ANT informed studies such as those carried out by Sorensen and by Roehl pay close attention to assemblages of human actors, practices, but also *things* (Roehl, 2012; Sørensen, 2009). They create detailed readings, de-constructing how networks operate and potentially enabling the identification of the most opportune points within networks to intervene (Fenwick and Edwards, 2010).

Perhaps because of the evident synergy with *material practice* approaches to architecture, ANT has increasingly been used in the exploration of both professional studio design practice (Yaneva 2009), and educational design studios (Mewburn, 2012). Researchers in these contexts have engaged in participant observation, embedding themselves within studios to observe, record, and interpret how design (and educational) processes emerge within the complex intersections of physical spaces, artefacts, tools and designers, following the actors – both human and non-human - where they might lead.

ANT in design, architecture, and planning

Latour has noted that to design is essentially always to re-design (Latour, 2008) echoing Simon's definition: 'changing existing situations into preferred ones' (Simon 1996, p.111). A design process does not begin from

nothing: there is always an issue or a problem to be defined which will exist within a potentially infinite network of assemblages. In parallel, all design decisions will have wider implications which create deformations in those networks, that is architecture's 'outside' (Till, 2009). Latour and Yaneva's essay 'Give me a gun and I will make buildings move' considers architecture from an ANT standpoint and in doing so challenges the idea of an architectural space or form as something static, seeing it instead as emerging within an evolving network of social relations. In doing so they recognise the centrality of representation to architectural practice, and speculate that it is the focus on architectural drawing *(page 57)* that is responsible for our view of buildings as 'fixed' static entities: 'Euclidian space is the space in which buildings are drawn on paper, but not the environment in which buildings are built – and even less the world in which they are lived' (Latour & Yaneva, 2008, p. 105).

Latour and Yaneva are not however aligning themselves with the more usual *material practice* *(page 17)* arguments despite their recognition that space is not purely optical, but inhabiting space and time (Pallasmaa in Havik, 2014). They argue that these so-called 'phenomenological' approaches to architecture ultimately reproduce a binary distinction between the between objective Euclidian space and the body's subjective experience of that space, and that this fails to address the fundamental problem: architecture is not 'fixed' and cannot therefore be adequately represented through the flat surface of a drawing. Drawing is ultimately a notation system which conforms to conventions - a 'code' - and one which excludes as much as it includes. Latour and Yaneva propose that we might find radically new ways to represent process, but this is not simply a call to find a new way to *draw* architecture, it entails finding a different way to conceptualise its process, practice, and outcomes.

While recognising the role that *material* plays in defining architectural form, Latour and Yaneva challenge the primacy given to the *artefacts* of architecture - its representations and its physical outcomes as objects. Instead they are interested in an understanding of the practice(s) of architecture, and how *artefacts* shape and are shaped by these - that is buildings as *projects*. This understanding necessarily recognises that architectural processes are always influenced by actors beyond the architect - that design is always collaborative whether its collaborators are visible, welcomed and willing or not (Latour, 2008). This challenges both how architects commonly understand buildings (as outcomes), and the fallacy that they are the sole authors of any design.

Clancy (2020b) in his explorations of critical practice *(page 53)* and Awan et.al. (2011) in defining spatial agency *(page 56)* have both referenced ANT as a way of conceiving of architectural space and practice which recognises its entangled complexity. Clancy proposes that a *critical practitioner* recognises that they work within and against the constraints of often contradictory external demands and forces and that these are necessary to (and catalysts for) architecture. In Spatial Agency 'buildings are not seen as determinants of society (the primacy of the individual) nor as determined by society (the primacy of structure) but rather as in society' (Awan et al., 2011, p. 31). This is an approach which builds on Giddens' ideas of the dialectic between

individual agency and the constraining structure(s) of society - its social, political and economic forces (1986). *Spatial agents* negotiate within and between existing structures - 'action to engage transformatively with structure is possible, but will only be effective if one is alert to the constraints and opportunities that the structure presents' (Awan et al., 2011, p. 31); they identify those points in a network where intervention might have the maximum positive effect.

It has been argued that ANT is a purely analytical tool and as such cannot be applied within design practice (Harman, 2017); that it may be useful in understanding how phenomena occur and have occurred in the present or past (how a form has arisen) but does not allow for speculation on futures (it cannot generate it). Design however is an analytical as well as an imaginative process. In the 'social theatre of practice' ideas and projects become part of an ongoing reflective process for designers - an evolving body of work which creates a framework for critical practice (Blythe and Van Schaik, 2013). An understanding of how processes operate and what acts upon them may allow designers to make better informed decisions with better understanding of the motivations which underpin them.

4.1.2: Agential realism

ANT is of course not the only approach associated with socio-material theories. Karen Barad's ideas originate in her background in science, specifically quantum physics. Her approach to material is derived from a recognition of the importance of 'matter', not least the role that scientific apparatus plays in the measurement of scientific phenomena. An apparatus should not in Barad's view be seen as 'neutral' – they do not measure, but instead produce 'material realities' (Hollin, Forsyth, Giraud, and Potts, 2017).

There are many similarities between *ANT* and Barad's concept of *agential realism.* Both recognise that material 'matters', and both focus on the relationships and interaction between things. Differences arise in their approach to agency: where ANT implies that all 'actants', whether human or non-human possess agency, in Barad's interpretation this agency is dependent on their interactions. The relationships between 'things' enable action - the world is not formed of individual 'things' nor is it constructed socially, it is 'enacted as practices' - it is *performative.* The challenge then is to capture and describe the performative nature of the world, rather than its static representation.

Diffraction

Barad's use of a wave metaphor to illustrate her interpretation of 'diffraction' (Haraway, 1997) has become a useful way of thinking about my own position with respect to this study. In carrying out this doctoral study I am similarly aiming to straddle disciplinary boundaries. Is this study focused on architecture (my discipline)? Or the interdisciplinary practice of Urbanism (the students)? Or is it focused on the education of architects and urbanists, but seen from *my* perspective - that of an architect/urbanist who is primarily an educator?

Barad brings the material dimension to her reading of social practices but also suggests that *diffraction* is more than a material metaphor and that it should be understood as a method (Barad, 2014). She shows how observations drawn from one discipline - in her own case physics - when read through another can lead to creative insights (Bozalek and Zembylas, 2017). Criticality and critical reflection have been discussed in the previous chapter *("Reflective practice" on page 50)*, but what is not yet articulated is how critical reflection might be practised in the context of this study, and what additional insight might be evident from looking at the studio through this diffractive lens. Essentially, this might suggest being attentive to both how differences in perspective and approach manifest, and what their effects might be, that is a 'critical interrogation of the effects of one's own location' (Hollin et al., 2017).

4.2: Spatial theories

Socio-Materialist approaches arose from and have been applied to transdisciplinary contexts. According to Gulson and Symes, spatial theories have similarly escaped their disciplinary origins (Gulson and Symes, 2007) in an emerging recognition of the importance of the spatial context to the construction of knowledge across social sciences and humanities. This has been described as 'the spatial turn' (Warf and Arias, 2009).

Materialist approaches view the physical context of networks as part of that network, but not only do networks include physical spaces, they are themselves fundamentally spatial. A place is not separate from networks but arises from them and vice versa. Educational research has also begun to explore the 'spatial turn' (Fenwick et al., 2011; Gulson and Symes, 2007) factoring spatiality into analyses of learning. How might spaces create inequalities or exclusions, open or limit possibilities? The physical space of the studio is important but we increasingly work (and draw) in a digital space, often a shared space which crosses time zones. As well as asking *how* we might ask *where* knowledge emerges.

As an architect, I am inevitably interested in the ways that spaces act – how they might instigate or change the way that human actors respond - space is not a fixed container into which students and teachers are poured, but is dynamic and constantly (re)produced. As a teacher of architecture, I am also concerned with the spaces and places which are the *subject* of study *(page 87)*: as they are experienced, perceived and understood; and how their futures might be imagined in the form of design proposals. And lastly, because the study and practice of architecture are carried out through *representations of space*, those paper (or digital) spaces become contexts worthy of consideration both as material, non-human *actants*, and as spatial organisations in their own right.

4.2.1: The performance of space

Latour and Yaneva argue that the spaces and places that are the focus of architecture and urban design are not 'static' but can be understood as enacted, produced and/or performed (Latour and Yaneva, 2008). For example, a 'marketplace' only exists as such in the human interactions it supports and their temporary physical manifestations. Similarly, a 'studio' is a physical space, but it is also a teaching method, a programme of activity, and a culture of students working together (Schön, 1987). Before it is occupied with the activity and detritus of studio work-in-progress a *studio* is a room. Architectural discourse usually focuses on a 'perfected moment of completion over the imperfections of occupation' (Wigglesworth and Till, 1998, p. 7), the conventions of drawing erasing all but an occasional use of furniture blocks[2] to indicate scale. Glossy images of completed buildings often exclude both humans and the traces of human occupation.

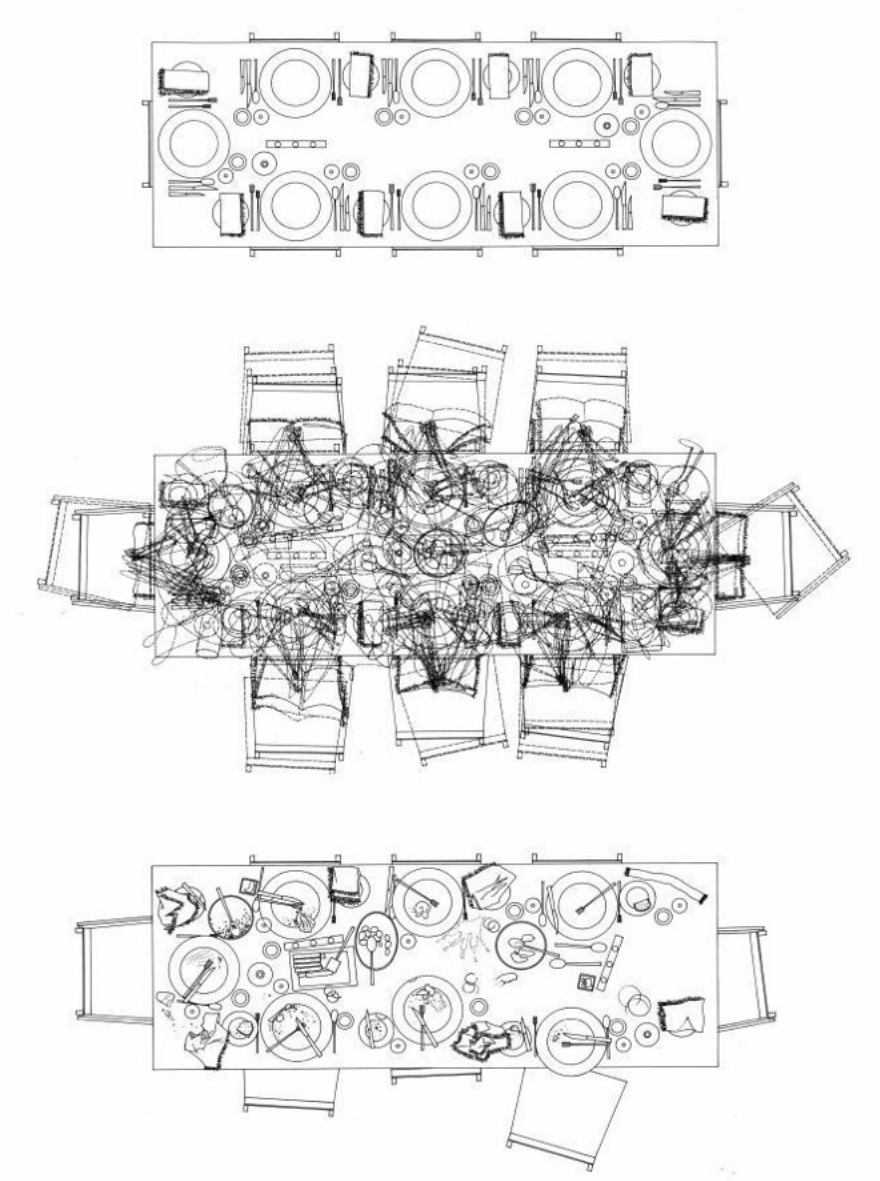


Figure 4.1: The Disorder of the Dining Table: These drawings were made to explore the role that the table played in structuring activity within Wigglesworth's home/office space and to record activity over time. The first image 'the lay of the table' is 'an architectural ordering of place, status and function'; The second records a meal and 'begins to undermine the apparent stability of order'; the third records the traces of use - 'a palimpsest'. (Wigglesworth & Till, 1998, p. 32)

2 *A 'block' is a standardised drawn object – a chair for example – which can be imported into a CAD drawing.*

Sarah Wigglesworth's drawings of her own dining table *(Figure 4.1)* are an attempt to subvert architectural drawing conventions by using them to record the performative nature of space. These drawings conform to the normal rules of a *plan* drawing in that the table is seen from above, rather than within, the action, and they exclude the human body representing only how bodies interact with 'things', and the traces they leave.

Everyday life: the social production of space and the city

Wigglesworth and Till titled their study 'The Everyday and Architecture' obliquely referencing a central theme within spatial theory represented by Lefebvre's 'Critique of Everyday Life' and De Certeau's urban treatise 'The Practice of Everyday Life' (2011). De Certeau identifies two conceptions of the city[3], illustrating his argument with a description of New York as seen from the 110th floor of the World Trade Centre, as opposed to how it would be understood from street level. The view from above allows us to see the whole, to understand the relationship between things from the perspective of an outsider. This viewpoint - the top-down 'plan' - is 'a way of keeping aloof... The panorama-city is a theoretical (that is visual) simulacrum' (de Certeau and Rendall, 2011, p. 93). The contrast to this abstracted version of city is the 'lived' city which is experienced at ground level - it is *embodied*, in De Certeau's terms, in the 'ordinary practitioners' of the city:

> Walkers… whose bodies follow the thicks and thins of an urban text they write without being able to read it… the networks of these moving intersecting writings compose a manifold story that has neither author nor spectator (de Certeau & Rendall, 2011, p. 94).

As De Certeau points out, the architect and urban planner most commonly view the city from above, in *plan*, a position which can be 'both dominating and reductive' (Liggett and Perry, 1995, p. 8). Orthographic projections *(page 96)* tend to illustrate space as static forms - they focus on 'imaging, designing and delivering stable conditions of certainty' (Miessen, 2017, p. 40). Acknowledging the limits of the top-down perspective and welcoming the messiness of 'the everyday' subverts this neat view of the city - it recognises that the architect is not the only - or even the pre-eminent - author of space. Lefebvre similarly critiques habitual architectural representations of space which exclude the social, and thereby suggest stasis and 'closure'[4]. But it is not possible for architects to reject architectural drawing any more than it is possible to wholly ignore aesthetic and formal considerations. Drawings are the language of Architecture, the key may be to recognise their limitations.

Coleman suggests through his reading of Lefebvre that architects might pay closer attention to how the spaces they visualise are appropriated and used by their inhabitants, shifting their attention from space as built form to the social processes of its production (Coleman 2015). This interpretation echoes Latour and Yaneva's ANT-informed argument (2008) for the building as a *project* not product. While as noted in the previous

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3 This is also analogous to Richard Sennett's separation of the conception of the Cité – the city as a physical collection of buildings; and Ville – the city as a community of citizens (Sennett, 2018).

4 This echoes Sennett's argument for an 'open' city (Sennett 2017) (page 46)

chapter designers will tend to design for themselves *(page 58)* the process of designing does entail imagining (as far as possible) the potential future inhabitation of spaces as well as their form. This is necessary in order to understand how those spaces will operate, how they will serve their intended function and how they might be occupied or experienced - as Georges Perec notes it is almost impossible to imagine a space without imagining its 'use' (1999).

Perec, who at one time acted as a research assistant to Lefebvre (Smith, 2019), extended the 'everyday' into what he termed the *infra-ordinary*. This he conceived as diametrically opposite the 'extra-ordinary' but also different from the ordinary or 'everyday' - where the everyday might refer to the commonplace and familiar the 'infra-ordinary' refers to a 'microscopic texture' which we do not see unless we focus explicitly upon it:

> How should we take account of, question, describe what happens every day and recurs every day: the banal, the quotidian, the obvious, the common, the ordinary, the infra-ordinary, the background noise, the habitual? (Perec, 1999. p. 210)

Perec asks his readers to re-focus on the *infra-ordinary* - to 'see' the world in different ways and 'exhaust the subject' rather than turning away before they have taken notice of everything by seeing more 'flatly'. This emphasis on the relationship between the spatial and the visual is important; 'our gaze travels through space and gives us the illusion of relief and distance. That is how we construct space, with an up and a down, a left and a right, an in front and a behind, a near and far' (Perec, 1997, p. 81). As will be discussed in chapter 5, visual methods have been key to the way that I observed, recorded, and analysed the studio *(page 97)*. The use of the term *mapping* to describe the overall study recognises both its spatial nature, and the role that tracing 'everyday' practices by visually recording through drawings and photographs has played. Wigglesworth and Till's 'Dining Disorder', in its attempts to recognise and draw the occupation of space over time and its focus on the table surface as a structuring *space,* has directly informed the development of the drawings I have used *(page 122, 113)*. The similar sequential ordering, albeit over six weeks rather than an evening, is also a nod to Yaneva and Latour's metaphor of 'the gun' (2008), an apparatus designed to take multiple freeze-frame images of movement in succession[5].

4.2.2: Place(s)

While spatial theory may have 'escaped' its traditional disciplinary boundaries (Gulson and Symes, 2007) the use of the term 'place' is less common outside explicitly spatial disciplines. In the simplest terms, space can be understood as abstract, whereas a place is particular; place is considered static and associated with the local, whilst space is dynamic and global (Gulson and Symes, 2007).

Place implies more than simply a geographical location - it is also a *locale* and a *sense of place*:

5 *Latour and Yaneva reference a photographic 'gun' devised by Etienne Jules Marey as a way of recording movement (published in 1895.)*

- location describes a specific, measurable point on the surface of the Earth;
- the 'locale' refers the unique physical assemblage of buildings, green spaces, roads etc. and the context this creates for the particular practices which unfold, that is how we 'know' a place (Cresswell, 2014);
- a sense of place is subjective - the meaning people ascribe to an area based on their memories and experiences etc. that is how people identify with *place* (Agnew, 2014).

Cresswell builds on this widely accepted definition to propose a *place* as a 'gathering of materialities, meanings and practices' (Cresswell, 2014, p. 6). This approach begins from a foundational concept of geography - that it is a study of how things come together uniquely in particular places. He goes on to argue that this suggests constant dynamic of things (objects, material, emotions and memories) on the move as they are gathered (Cresswell, 2014) challenging Gulson and Symes' definition of place as 'static'. In this reading, *places* are continually in a process of forming and re-forming, echoing Latour's observation of a building as an ongoing 'project' *(page 71)* rather than a fixed object.

Cresswell suggests that this 'gathering' of things works along a horizontal axis or plane, but that it is anchored by the particularity of place (its location) and how people are rooted to it (the *sense* of place). This is the vertical axis which anchors place as 'here' as opposed to 'there'. In this respect a *place* might be understood as a node within a dynamic assemblage - an 'articulated moment' (Massey, 2000) created by the intersection between the vertical and horizontal axes:

> Maybe the first [lesson] was that the very term place is problematic, implying a discrete entity, something you could put a fence around… What we mean by place is a crossroads, a particular point of intersection of forces coming from many directions and distances. (Solnit, 2007, p. 1)

Similarly, Ingold argues that *space* is a reductive and abstract way to describe inhabiting the world. He objects to the idea that *places* exist 'in space' and instead proposes that they should be understood as entanglements of pathways – the trajectories along which the world's inhabitants move (Ingold, 2009).

Scale

While a *place* is understood as local rather than global - it has a specific location however transitory - *placeness* is an attribute of things across scales: a fireside hearth can be described as a place, as can a region or a nation-state. For example, in focusing on the *micro*, Perec does not exclude the *macro* scale. He positions his *infra-ordinary* observations within a holistic picture - 'the macroscopic accompanies the microscopic' (Smith, 2019 p. 67). Perec's text 'Species of Spaces' appears at first to be an attempt to order a taxonomy of spaces organised according to scale. He begins from the space of the bed, through the room, the apartment etc. to that of the world. However on closer examination each of these spaces is not treated in isolation - he slides and moves between scales. Places can be understood as existing at 'nested' scales, they 'open up to disclose other places within them... while from within any particular place one can always look outwards

to find oneself within some much larger expanse' (Malpas, 2018, p. 170-171)[6]. This is not to suggest that the concerns that shape our conception of 'place' at the scale of the city are the same as those of a table - in this respect, scale is not a given, but is socially produced (Barad, 2007). Similarly if 'space' is socially produced and *not* a passive container - but instead (as Lefebvre argues) a participant in multiple processes of exchange then these processes will similarly operate at different scales (1991). At a *micro* scale the *M.Arch with Urban Planning* students may exercise control over their space, but how they occupy the wider studio will be negotiated between the studio group and subject to wider norms of studio culture, and how this space is allocated is a result of negotiations at an institutional level. How subjects are taught, and the resources allocated to them may be subject to decisions taken at a national and international scale.

4.2.3: Situated practice(s)

> First, practices are the doing of social life: they are physical accomplishments otherwise known as enactments. Second, practices are materially mediated: they are accomplished with the participation of objects, technologies, and settings, etc. Third, practices are situated: essential characteristics of a given practice are context, setting and place… Learning is not transferred from one mind to another, rather it is a consequence of the material entanglements of practice. (Michael, 2020, p. 274)

Both material and spatial theories share an emphasis on *practices* as a way of understanding the social. A practice describes a form of routinised social behaviour which consists of many interconnected elements: actions of both body and mind; rational and intentional actions; and also embodied routines that are grounded in tacit knowledge that is 'the sayings, doings, and relations in everyday life' (Roehl, 2012). A practice cannot be separated out into separate elements as each rely on their interconnection and material 'things' will form part of this web. Studio practices should be understood as a 'situated' this is 'a place where knowledge material and practice come together (Corrazzo and Gharib 2021, p. 148), and as Cresswell points out, *places* gather 'practices' (Cresswell, 2014).

Looking at studio from this perspective challenges the usual emphasis on how tutors and students might interact, and instead foregrounds the material and spatial. Wigglesworth's drawing *(Figure 4.1 page 75)* excludes human actors, recording not just space and material (at an *infra-ordinary* scale), but also action - the unfolding occupation of space over time. To suggest this in her central drawing she uses a series of layered successive 'freeze frames' that she has called 'mini-moments of stillness' (Wigglesworth 2022, p. 123) the viewer must imagine the actions which connect these and the human actors who perform them. This drawing, together with its introduction - the table set for the meal (static, predictable, set according to convention) and its conclusion - the table abandoned after the meal, revealing traces of the action as stains on the tablecloth, tell the story of an event and locate this story in a place.

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6 This aligns with Patrick Geddes' conception of the 'city observatory' in the form of the outlook tower, an exhibition that nested the city within its region, its nation-state and the wider world – ultimately leading to the formation of the discipline 'town and regional planning'.

4.3: Conclusions

This study places material and spatial in the spotlight - considering how these aspects of the studio are implicated in unfolding practices. While a focus on 'the everyday' is not exclusive to material and spatial approaches, the emphasis on noticing the 'things' which exist in space but which we normally overlook (for example the 'detritus' left over in studio) has been central in this study. Drawing on the ideas of De Certeau and Lefebvre, and connecting these to geographical conceptions of *place* has led to a conceptualisation of the design studio as multiple *places* while recognising that places are not static but emerge and dissolve over time. In existing as recognisable places they 'gather' materials, practices, experiences, and meanings.

I have used the term 'mapping' in the title of this doctoral study as this is a process associated with the analysis and representation of multi-dimensional places on a flat surface. As will be further discussed in chapter 5, cartography can be used to tell spatial stories *(page 104)* . *Mapping* recognises the importance of position and the impact of context - on disciplinary and institutional territories; in the occupation of physical spaces and surfaces; and in the students' emerging professional identities. It reveals the role that studio space and its situated practices play, but also the influence of other *places* along the students' personal trajectories in defining their positions.

Material and spatial frames have been utilized in the observation, analysis, and representation of the work of the studio in this study. This may be self-evident given the inclusion of various forms and types of drawing, but it has also informed the way that this document has been structured and formatted. Barad's insights around diffraction *(page 73)* have informed this approach. As an architect I am aware that I am a 'spatial thinker' - this is how I interpret situations and how I construct knowledge.

Work-in-progress on the table 03/03/22

5: Constructing a Spatial Bricolage

> Ethnography… involves the ethnographer participating overtly or covertly in people's daily lives for an extended period of time, watching what happens, listening to what is said, asking questions – in fact, collecting whatever data are available to throw light on the issues that the focus of research (Atkinson and Hammersley, 1995 p.1)

This doctoral project has been framed as an ethnographic study of a transdisciplinary design studio which aims to *map* emerging critical practices and professional identities. This chapter outlines the rationale for the *bricolage* approach which has been taken (using what is *at hand* to build a rich description of the M.Arch with Urban Planning studio culture) and expanding on the definition of *bricolage* in the context of visual and spatial disciplines.

The study took place over the academic session 2021-22. The rationale underpinning the course and its structure have been outlined in a previous section *(page 20)* however the way that the programme was framed for this specific session, the themes and questions posed by the location of study chosen, and the particular post-pandemic circumstances that students were navigating are outlined here. This locates the study in place and time and recognises the impact of this context on the way that it evolved. As has been previously discussed a studio is a place, but it is also a culture, and a group of individuals (Schön, 1987) who create a 'community of practice' (Lave and Wenger 1991). These various individuals are therefore identified in terms of their roles and positions in relation to the studio. I have reflected here on my own position - effectively

on the boundary between insider and outsider - and sought to address the potential ethical implications of participant observation in this context.

I then set out a detailed timeline which maps the methods used against the 2021-22 academic programme and the studio's activities. The critical role played in creative studio practice of material and spatial sensibilities (as outlined in chapter 4) means that visual, sensory and spatial methods have been key to both the observation and analysis illustrated in this timeline; the various forms of drawing used are therefore considered in turn.

5.1: Constructing a bricolage/the researcher as bricoleur

> Bricoleurs move beyond the blinders of particular disciplines and peer through a conceptual window to a new world of research and knowledge production (Kincheloe et al., 2011, p. 168)

Bricolage is usually understood as something constructed or created from a diverse range of things 'to hand' suggesting a practice akin to 'DIY'. As it has been utilized in anthropology, in the wider social sciences, and in the visual disciplines this definition is differently nuanced. First adopted by Levi Strauss as a way of describing the process by which myths are constructed (1966), the term has become established within qualitative research practice as articulated by Denzin and Lincoln:

> The material practices of qualitative enquiry turn the researcher into a methodological (and epistemological) bricoleur. This person is an artist, a quilt maker, a skilled craftsperson, a maker of montages and collages. The interpretive bricoleur can interview; observe; study material culture; think within and beyond visual methods; write poetry, fiction, and autoethnography; construct narratives that tell explanatory stories; use qualitative computer software; do text-based inquiries; construct testimonials using focus group interviews; and even engage in applied ethnography and policy formulation (2011, pp. 681-682).

The association of bricolage with 'DIY' might suggest a lack of rigour or clarity in research aims - as Hammersley points out, Levi-Strauss was suggesting that ethnographers might study the practice of bricolage, not that they would themselves act as *bricoleurs* (1999). His metaphor contrasts the *Bricoleur* with the *Engineer* (Levi-Strauss, 1966): each is presented as an archetypal representative of their different ways of thinking – the engineer is a rational, evidence-based, analytical problem solver, while the bricoleur improvises - thinking through making and taking their next steps based on the outcomes of the last, a process perhaps analogous to the 'seeing - moving – seeing' of design (Schon and Wiggins, 1992) discussed in Chapter 3 *(page 60)*. Hammersley instead prefers the analogy of boatbuilding as a way of suggesting a coherent *wholeness* (1999). This reading of *bricolage* however downplays the central role of the *bricoleur* who constructs with intent, and the holistic nature of *a bricolage*. This may be a stitching, editing, and montaging of slices together, but it is done with the aim of constructing a coherent whole. The term *bricolage* as it is used in art practice does not signify DIY. It implies neither a lack of skill nor intent. It refers to the making of a work of art from available materials, the artist putting to work what is found *to hand*.

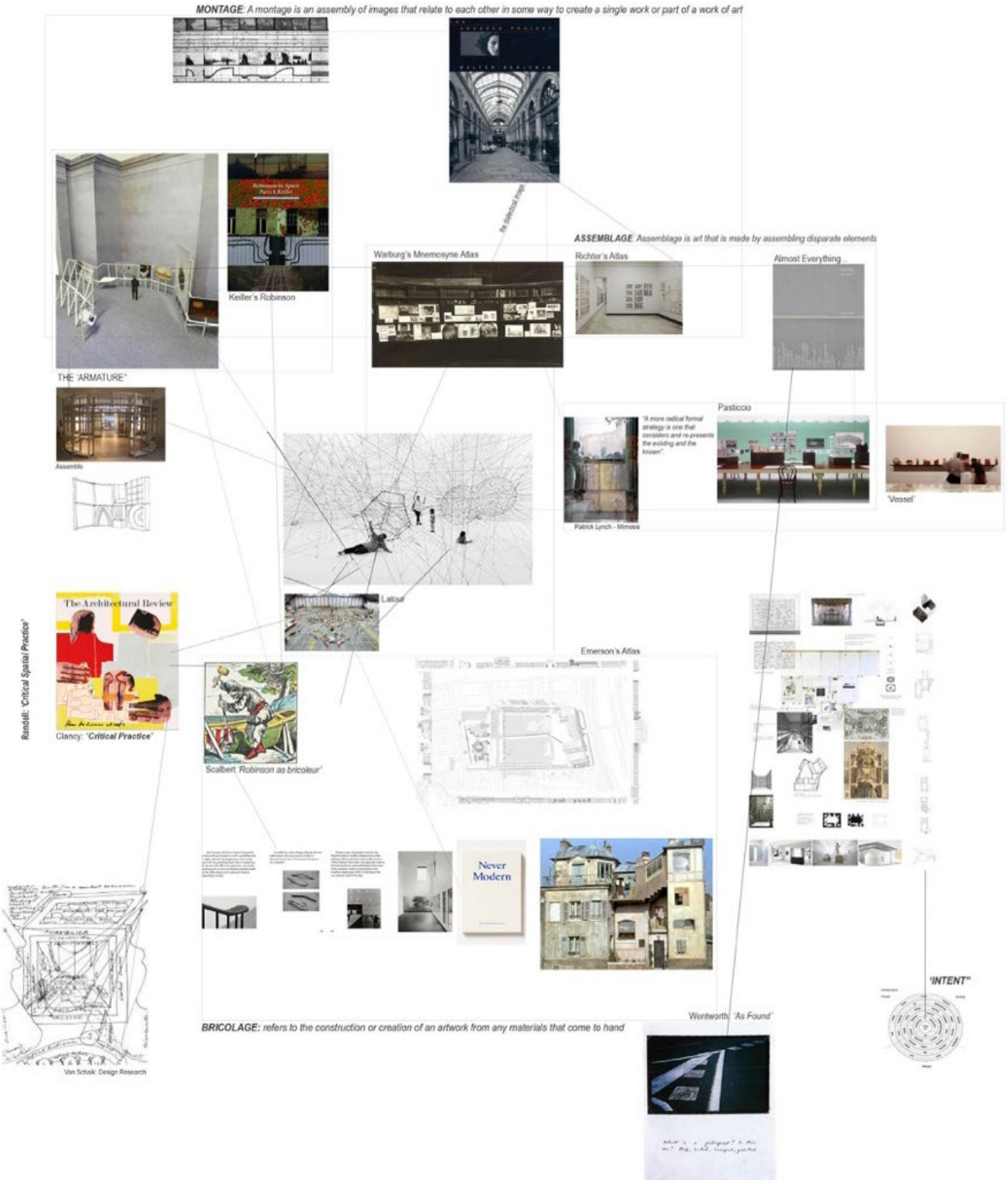

Figure 5.1: A collage made in 2019 as teaching material. I used this as a way of ordering, communicating and contextualising the processes of collage/montage, assemblage, and bricolage, relating these to critical, spatial design practice and locating my own position within this contextual network. It identified key themes and texts which might have been useful to the students in relating these ideas to their own practice and located them in relation to examples of art, design and architectural practice. I positioned Latour's example of a sculpture by Tomas Saraceno – a spatial network but one which is capable of distortion – as the central armature which holds the whole together (Latour, 2011). In collating these references, and positioning myself in relation to them, I was exploring and reflecting on my own interpretation of bricolage as a practice, as well as attempting to communicate this to the students.

The term *bricolage*, while not mainstream, has also been used to theorise the role of the architect. Scalbert uses Tournier's 1967 identification of Robinson Crusoe as a bricoleur to explore the role of the maker - someone who is simultaneously a designer, builder and user, who is part of their assemblage of materials and whose identity becomes indistinguishable from their context. According to Scalbert, bricolage is a process which 'values flair, wisdom and forethought, resourcefulness, deception and vigilance, opportunism, skills, and experience' (2011, p. 77). In these terms bricolage would not be understood as a methodological strategy, but more as a methodological approach or toolkit which might be employed as and wherever the need arises. This implies a degree of flexibility, a willingness to adapt and improvise, and that this toolkit might be fundamentally interdisciplinary in character. Roberts describes bricolage as:

> How the wayfaring academic or artist/practitioner negotiates his or her passage through landscapes… To make sense of these landscapes… requires access to a correspondingly 'undisciplined' set of methods and toolkit. (2018, p. 2)

Reflexivity and the 'spatial bricoleur': acting like Robinson

Ingold argues that while much has been written about the ethical difficulties of separating the self from the act of observation, that this might instead be embraced - that as researchers we should 'demand the right to speak with voices of our own' (2017, p. 24). This, and Scalbert's 'recognition of the entanglement of the maker/author/researcher and context/subject of study, is also echoed by Roberts in his discussion of *spatial bricolage*:

> Space and self are dialectically woven from the world as it is experienced, conceived and practiced. The researcher or practitioner of spatial anthropology steps reflexively into this world in order to know it (2018, p. 2).

He goes on to suggest that the process of bricolage is unapologetically subjective and that 'making do requires the researcher to step into any given space in ways that her presence—her creativity and performance; her intersubjectivity; her body; her spacing—becomes constitutive of that space.' (2018, p. 7). Roberts uses the term *spatial bricolage* to reflect the spatial 'turn' in social sciences *(page 74)* and theorises how this might be embedded within ethnographic methods. I would contend that constructing a bricolage is a fundamentally spatial process in its own right. It matters how 'slices' are positioned in relation to each other, whether they sit behind, in front or adjacent, in proximity or at a remove.

In the context of this doctoral study the term bricolage suggests that beyond 'following' where emerging studio practices led and utilizing a variety of tools and methods to record and analyse what was observed, I used creatively what was 'to hand' and did so with an awareness that I could not separate myself as author/maker from what I made. As a spatial designer that also meant drawing on the methods of investigation and communication common within design disciplines as well as more 'usual' text-based methods - speaking not only with, but through 'things' in the form of my own drawings (Levi-Strauss, 1966). I was unavoidably part of this assemblage of tools, materials, people and places.

5.2: M.Arch with Urban Planning 21-22: The Valley Section

As has previously been discussed *(page 21)* students following this programme are required to bring together architectural and urban planning knowledge to address the specific complexity presented by a real place. They use this tangible framework of local problems, pressures, and constraints as a lens through which to examine what are often global concerns.

Each year the M.Arch & UP studio projects are sited in one identified place. This acts as the focus of study and a shared context for investigations which begin in mid-September and conclude with a degree exhibition in May. With the exception of 20-21[1], each year the studio has been presented with a new locus for their studies: a place of appropriate scale and complexity which is easily accessible and for which background information can be sourced. Each presents new, relevant, and often timely challenges. For 2021-22 this was Blairgowrie, a small market town where the local economy still relies heavily on agriculture and tourism, but which is also a rapidly expanding sub-urban dormitory settlement of nearby cities. The previous year's work had centred on one of these cities - Perth, 2021-22 asked students to look at its hinterland of satellite towns and villages and consider how they operated both as independent settlements and as part of a wider network, an idea embodied in Geddes' 'valley section' (Geddes, 1968).

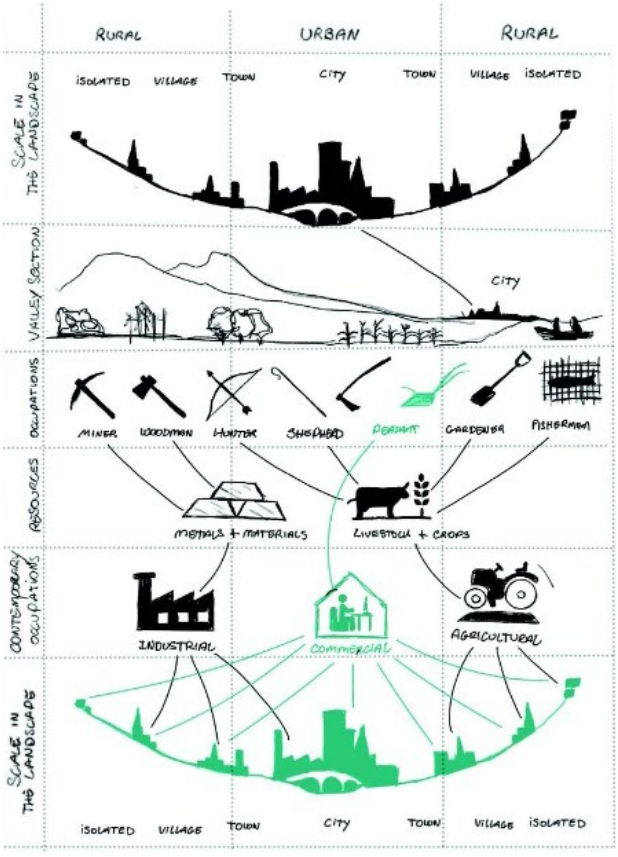

Figure 5.2 - One student's analytical sketch redrawing Geddes' 'Valley Section' as it might be applied in 2021, the connection between work and place is challenged by the ability to work remotely facilitated by contemporary technology. The 'peasant' may no longer be engaged in industry or agriculture, but commercial activity based in the home. Kerr Cuinier 2022.

1 20-21 was severely impacted by the limitations of movement introduced to combat the spread of Covid-19. As we were unable to visit sites we utilised contextual data collected by the previous cohort.

A small town may not be perceived as a traditionally 'urban' context, but this semi-rural place presented students with questions around appropriate density and encroaching urban sprawl. A sustainable future for the town might depend on the development of physical and social infrastructure to support 'living locally' - considering resources, energy and skills. The students identified and sought solutions to problems around the integration of a transient population of agricultural workers, access to affordable housing and workspace, and increasing levels of rural fuel poverty; while seeing opportunities in the connections to the landscape, biodiversity and the rich built heritage of the town. The problems and opportunities associated with the sustainable development of rural towns have been brought into sharp focus by the accelerated changes to living and working patterns which can be attributed to the Covid-19 pandemic (Vyas, 2022) and this context therefore presented a timely challenge to the 21-22 studio.

5.2.1: The participants

Students can apply to transfer to M.Arch & UP at the end of their 4th year of M.Arch studies. They are selected based on their performance in year 4 together with a brief written rationale which must evidence a clear interest and serious approach to urbanism as a field. The group therefore is self-selecting and academically well-prepared. In addition, students are advised when considering their options that the M.Arch & UP entails extensive collaboration with others, sometimes across disciplinary boundaries; that they must be confident in their abilities to manage their time; and that given the nature of inter and transdisciplinary work, they may be called upon to challenge assumptions based on disciplinary norms.

Of the nine students who made up the 21-22 M.Arch & UP studio, only two[2] had not been part of the same M.Arch cohort since beginning their studies at the university in 2016. Given the nature of studio teaching *(page 25)* and the relatively small size of their overall cohort - around 50 students where the average cohort would be 65 - these students began the year with already close working relationships.

Table 1: Studio Participants:

'Philip'	*Joined the M.Arch in year1 via an HNC in interior design. He was born in France but he was brought up in Glasgow, he's a talented designer with exceptional skills in digital graphics - a 'big personality' in studio*
'James'	*Joined the M.Arch in year 1, popular and quietly studious, making steady progress through every year of his studies finishing year 4 top of his year (surprising himself and his peers).*
'David'	*Joined the M.Arch in year 1 having gained some work experience in an architecture practice. Quiet and sometimes lacking confidence, close friends with Philip – sharing a flat.*
'Catriona'	*Joined the M.Arch partway through year 1, transferring from Law. A strong academic background combined with an interest in fine arts – her parents are both artists - confident, articulate, and happy to take risks.*

2 *Two students joined the cohort in September 2020, one who joined as a direct entry applicant, one who did not take the usual year in professional practice and so advanced from the succeeding year group.*

'Euan'	*Joined the M.Arch in year 1 via an HNC in construction, having originally intended to apply to study engineering – a strong interest in technology and construction, an enthusiasm for learning which sees him experimenting with new ideas and techniques and taking up any opportunities which present themselves – close friends with both Emma and Catriona.*
'Christy'	*Joined the M.Arch in year 1, but one year behind the rest of the studio as she did not complete an interim year in practice. She is from China, she is very quiet in studio perhaps as she is not always confident in her language skills, and does not know the other students so well.*
'Emma'	*Joined the M.Arch in year 1 – she is local to the university and familiar with the context studied. She is strong academically, but not necessarily in design modules. She is methodical and rigorous in her approach to all her work. Close friends with Euan.*
'Lai'	*Joined the M.Arch in year 4, with the expressed intention of studying MArch with Urban Planning. Completed his UG studies at an excellent school in Malaysia. Imaginative, enthusiastic, chatty and outgoing.*
'Dori'	*Joined the M.Arch in year 1. She is Bulgarian, attending a school which enabled students to study engineering and construction alongside academic subjects. She is talented and serious in her approach to design. Alongside her studies she plays team sports to a high level and maintains a part-time job in architectural practice.*

Studio culture

The way that the course is conceived as 'place specific' requires the students to collaborate - to understand how a development in one physical location might impact on (or work in concert with) another on an adjacent site, and to understand how their ideas connect and overlap intellectually. The studio ideally operates as a supportive network within which ideas are continually exchanged and developed (Lave and Wenger, 1991). The way that each successive M.Arch & UP studio has developed, structured, and represented its studio-wide agenda has emerged across each academic session. This is directed by the students themselves. It is dependent on the students' individual preoccupations and research interests, the size of the group, the personalities within it and the skills these individuals possess.

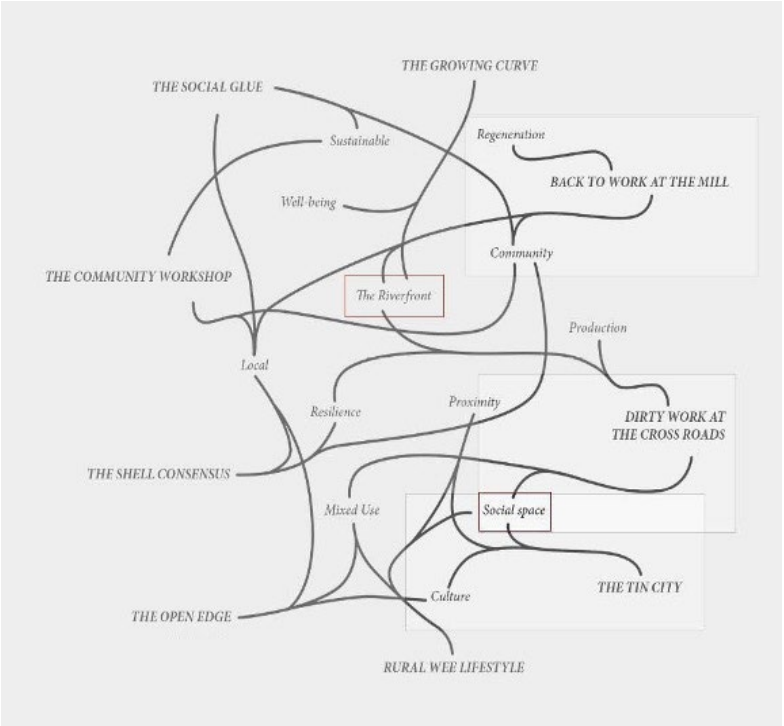

Figure 5.3: The 21-22 map of connecting themes/ research interests which was developed by the students over the session and presented as part of their final examination.

'External' participants

While the students form the core of the M.Arch & UP studio several peripheral and external actors must also be considered 'participants' in this project. These include members of academic staff who teach on the programme or who participate in reviewing the work as it develops[3], and external professionals who assist in setting up the framework for the students' study and participate in reviews, often revisiting every year. In 21-22, this latter category included two M.Arch & UP graduates, both of whom have subsequently positioned themselves professionally as 'hybrid' practitioners *(page 22)*. Both were invited into the studio primarily to share their expertise, but their presence was also an opportunity for students to discuss their post-graduation experience and current professional roles. This enabled current students to understand how their academic knowledge might be applied in practice and to see their own potential pathways beyond graduation.

Table 2: External Participants:

	Interaction with studio in 21-22	Professional Role
Staff member 1	*Worked closely with the students for a semester one module and was a regular contributor to reviews, acting as lead 'urban planning' tutor helping them develop their projects.*	*Experienced in professional practice (urban planning)*
Staff member 2	*Led a semester two module in Urban Planning and participated in reviews in March.*	*Senior academic with a background in teaching architecture but who has developed a research specialism in urbanism*
External Critic 1	*Contributed to reviews (December and March)*	*Senior government advisor in architecture and planning*
External Critic 2	*Contributed to reviews (December and March)*	*Architecture practitioner with experience in urban design and collaborative placemaking practice*
External Critic 3	*Contributed to reviews in March*	*Architecture practitioner and visiting professor of UoD. Extensive experience in masterplanning and urban design.*
External Critic 4	*Contributed to reviews in March*	*Architect working as a senior local government official in Denmark. International reputation in placemaking and urbanism.*
External Critic 5 'Sam'	*Contributed to reviews in January and April*	*Architecture with Urban Planning graduate working in interdisciplinary design practice*
External Critic 5 'Hazel'	*Contributed to 'workshop' in February*	*Architecture with Urban Planning graduate working in interdisciplinary design practice*
External Critic 6 'Julia'	*Contributed to 'workshop' in February*	*Senior architect working in interdisciplinary urban design practice*

5.2.2: Participant observation

While this study has been formulated as *ethnographic participant observation*, there is inevitably an element of critical auto-ethnography (Anderson, 2006; Cohen, Manion, & Morrison, 2018). I have been required to

3 *A 'review', also known as a 'crit' is a core teaching method used across studio-based disciplines. Students are asked to present their work (drawings/models and a prepared verbal explanation) to their peers, academic staff and visiting 'critics'. Reviews are explored in depth in Chapter 8 (page 163).*

consider the familiar environment of the design studio from an unfamiliar viewpoint and to reflect on my own position as both participant and observer and how this impacts on my role as 'the instrument of data generation' (Ruby, 1980 p. 153). This study is not an auto-ethnography. It is not focused on my experience, but I recognise that absolute objectivity here is not possible. I am entangled with this place, these participants, and practices (Reed-Danahay, 2009) and their stories are inevitably told from my perspective.

I have studied and taught in architectural studios for more than thirty years. Over that time the tools that design students use have progressively shifted from analogue to digital and the physical studio space that we occupy has consequently changed its character, and the amount of contact teaching time - and therefore my role as a design tutor - has altered, but the fundamental way studio operates, as space, culture and teaching method, has remained consistent. It is not usually within my role to actively observe how students learn, but instead to support their work as it progresses. I anticipate how activities and tasks may contribute to building knowledge and evaluate how they have been received as part of the iterative process of an ongoing studio project. I may reflect in hindsight, but I rarely step outside these processes to observe them in depth, to understand more objectively what is happening in everyday studio exchanges or 'pay close attention' to things which might normally be overlooked (Ingold, 2017). What I have attempted to do in carrying out this study is to make the seemingly contradictory movement of stepping back in order to more carefully and closely observe.

It should be noted that the nature of studio teaching, the relative maturity of this student cohort, and my familiarity with them built over several years, means that this is perhaps not a conventional teacher/student relationship. The students enthusiastically embraced the idea of their tutor taking up an additional role as a 'student' and consequently welcomed my looking from two different perspectives – as a design educator/critical friend whose role was to help them identify problems and opportunities in their own emerging design research, and as student/researcher exploring how this was shaped by the context(s) within which they worked. Participant observation necessarily navigates a line between insider and outsider, participant, and observer. A researcher in this position will necessarily be entangled (Barad, 2014; Burawoy, 1998) - an actor within the ANT assemblage they observe, or in Barad's terminology an 'active agent'. Ingold argues that observation from this perspective cannot be considered objective 'data collection' (2017).

Ethical concerns

> To observe is not, in itself, to objectify. It is to notice what people are saying and doing, to watch and listen, and to respond in your own practice (Ingold, 2017, p. 23).

While I can in no way be positioned as an objective outsider, I am not fully an *insider.* A *studio* is not a classroom. It is the students' workplace, not mine. I am an insider in the development of the studio projects in that I set the initial framework and I engage with the students on an almost daily basis. I organise and am present at every significant formal studio event across the academic session. But the studio is not my terri-

tory - it 'belongs' to each group of students for the academic session that they inhabit it. I therefore asked for permission to observe any activities in the studio at which I would not normally be present. I remained conscious that my presence was likely to impact the dynamics of interactions and that productive conversations often happened 'off stage'. There was clearly a danger of power dynamics distorting how and what the students communicated.

There were also legitimate concerns around the potentially conflicting demands of this research project, and those of the participating students - between my motivations and theirs (O'Neill, 2012). My observations and conversations with them had to be as unobtrusive as possible and take place when they would have minimal impact on the student's emerging projects. The students were working on their own design research projects aimed at exploring questions around urbanism and the future of urban places. To do so they were engaging with a place and the concerns of its inhabitants. They were required to collaborate and to share their developing ideas with each other and with outsiders in the form of critics and examiners but the work that they produced to do this was part of *their* ongoing design investigations. The physical artefacts in the form of models, drawings and texts, and the collaborative discourse which took place to facilitate these were potentially rich sources of 'data', but I aimed to conduct this study *with* rather than *of* the MArch & UP studio. The students, therefore, were treated as active collaborators - co-researchers who helped to shape decisions about how and where specific methods would be used (Vaughn & Jacquez, 2020), what was shared and how it was used.

It is important to note that while students' comments made in conversations, and my observations of them in the studio have been pseudonymised, the students who participated in this project were keen to be publicly acknowledged as the authors of their own work through the annual degree show exhibition[4] and that this makes robust anonymisation almost impossible (Walford, 2002). This concern was acknowledged as part of the ethical approval and consent process *(page 212)* and partly to address this, all the students who took part have been consulted to ensure that they are comfortable with how they, and their work, have been represented.

5.2.3: The post-pandemic context

The academic session 2021-22 might be described as a transition year. My observations of studio practices were deliberately delayed from 2020-21 (which was conducted almost entirely online) as the study had been conceived as one of the physical, not digital, studios. However, despite the gradual roll-back of legislative and institutional restrictions imposed to limit the spread of Covid 19 there was an inevitable impact on how the studio operated - how accessible even relatively local places were, how students were able to use the studio space, and the physical/digital tools which were available to them. Patterns which were commonplace before

4 *This is perhaps a peculiarity of study in a visual discipline – student work is often exhibited physically and digitally in the public realm.*

the pandemic took time to re-establish. I might speculate on the impact that this extended period of enforced remote digital learning has had on studio practice, but this is not the subject of this study it is an acknowledged part of the context.

Architecture students at the University of Dundee are all provided with an individual workspace comprising a large, individual table[5] within a defined area of the shared studios. They have access to shared mobile pin-up boards, lockers, plan chests, and digital screens. Whereas in previous years the students were largely free to construct and inhabit their studio as they chose, in 2021-22 they were not permitted to sit at a closer spacing than two metres so tables and chairs had to remain in relatively fixed positions. In addition, individual workspaces needed to be regularly cleaned meaning students were unable to leave ongoing work in the studio. While some limitations were eased in January 2022 a degree of nervousness about 'inhabiting' the space remained[6].

A more subtle and localised context which should also be acknowledged is a university restructuring which administratively relocated the discipline of *Architecture and Urban Planning* from the *School of Social Sciences* into *Art and Design*, effective one month before the start of teaching. While this did not change the physical context of the studios, or the content and delivery of the curriculum, it opened-up specialist workshops and technical support which would not previously have been accessible to the students. This context proved unexpectedly significant to the approach the students ultimately adopted to their degree show presentation, an aspect which is explored further in chapter 7 *(page 143)*.

The context for this study was both typical and extraordinary. The number of students studying M.Arch & UP and their spread of abilities and backgrounds were not materially different from other sessions. Each student brought their unique combination of concerns and interests to bear on their studies, no more or less rich than any other year. But beyond the additional complications of the return to studio noted above, this cohort had been through the extraordinary experience of a year in professional practice disrupted by the lockdown of March 2020 - a circumstance that forced many into 'furlough' or remote working at the point when they should have been fully embedded within professional design studios. This was followed by a year of their education spent entirely online. In 20-21 'studio' was a weekly meeting - this might employ innovative technology but it was ultimately conducted from the isolation of their own homes. At the outset of any academic session I cannot predict how each MArch & UP studio will evolve and where the discourse which emerges in the studio will take us. In this instance there were perhaps more than the usual variables - challenges but also opportunities as the students took advantage of the unfamiliar spatial and material resources which were now available to them.

5 *While this was once the norm if not universal it is now increasingly rare in UK architecture schools.*

6 *When studios were closed at short notice in 2019-20 students were forced to abandon anything left in the studios.*

5.3: Gathering the data

The study took a longitudinal approach (Burawoy, 1998). While focused observations in the studio were concentrated on the period between mid-January and May 2022, these were informed by the whole academic session stretching from the point where students selected their final year studio in late August 2021 through to their graduation, and perhaps also by my prior knowledge of these students[7] and the way their knowledge, skills, and interests had developed over several years.

The timing of observations was shaped by module submissions and the opening of the final graduate show in May - this concentrates the development of both individual design research projects and collaborative group strategies into the second semester. The methods used followed practices as they emerged over the academic session. I focused on the evolution of the physical studio space and the artefacts that the students themselves made to explore and communicate their understanding and ideas, including individual and shared drawings, models, digital presentations, journals, and reports. I made drawings and photo collages of the studio and the work as it evolved, using annotated drawing as a form of reflective 'fieldnote'. Studio-based observations were bookended by a series of four individual conversations with students during November and December (to better understand their personal motivations and trajectory) and a small focus group conversation in May which enabled me to expand my understanding of what I had observed.

To organise and reflect on the data collected over the academic session I found it necessary to construct a timeline which positioned the various methods used in relation to significant studio milestones. The resulting drawing *(Figure 5.4)* enabled me to identify overlapping and parallel themes and lines of connection and to zoom in on specific locations and points in time which appeared to be key.

In constructing the analysis, I was able to draw from a varied pool of data: the *bookending* conversations alluded to above, interchanges which happened more spontaneously in studio, observation notes including annotated sketches and photographs, the students' own diaries and drawings, and screen-shots they took of group conversations enabling me to see these activities from their perspective. I was also able to revisit significant studio meetings and reviews through recordings made via 'teams'[8]. On some occasions, I was able to locate myself in the studio for several hours; more commonly I would visit the studio at the beginning or end of the studio day to take photographs or discuss what was happening with the students. It proved impossible to simultaneously both participate in and observe studio activity as I needed to be fully 'present' as a tutor and opportunities to switch focus were rare. Notes therefore were normally made in retrospect and often took the form of annotated sketches or photographic *joiners* (Hockney and Joyce, 2008).

7 *This cohort was one I had taught in studio for their 2nd year (2017-18) and 4th year (2020-21)*

8 *Recording any 'hybrid' meetings, tutorials and reviews has now become normal practice - it enables students to access verbal feedback.*

Timeline & methods

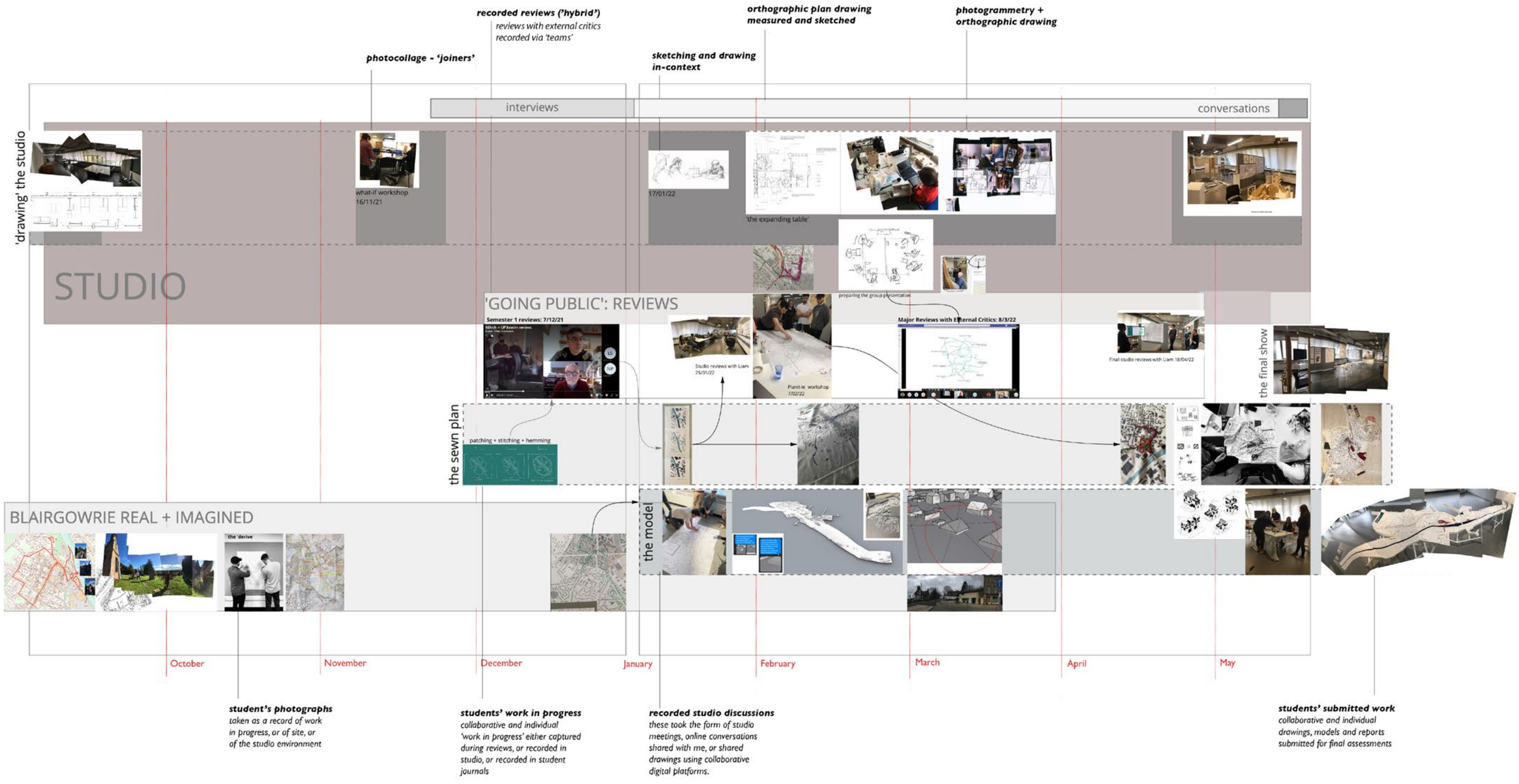

Figure 5.4: Timeline and Methods: Organising the Data

Table 3: Data

Fieldnotes	*Made around significant studio meetings and events, often taking the form of annotated drawings and sketches*	
Photographs	*483 images including both individual framed snapshots, and those taken in order to subsequently construct a photo-collage*	
Photo collaged 'joiners'	*21 constructed images ranging from 2 images spliced together to 20*	
Sketches	*8 observational sketches completed in studio*	
Orthographic projections	*10 orthographic plan drawings including both traced 'sketches' and more complex constructed drawings including photogrammetry*	
Individual, semi-structured conversations	*4 conducted in November and December 2021*	
'focus group' conversation	*1 conducted in May with 3 of the participants*	
Recorded studio meeting	*1 conducted in January*	*6 screenshots taken from these recordings*
Recorded review	*1 conducted in December*	
Students Screenshots	*11 screenshots taken by the students to explain their process of negotiating the construction of shared site model*	
Students' design development diaries	*All students completed these as part of their submission – they took different forms including notebooks, blogs, 'Miro' boards but many included photographs and narratives explaining how their work had developed within the studio context.*	
Collaged 'Diagrams'	*3 large 'Miro' Boards drawing together different aspects and forms of data, from which framed screenshots have been taken*	

While the data 'gathering' conducted for this study and its analysis are not presented in a strictly sequential format the constraints of the academic year must be acknowledged. *Reflection-in-action* is an inevitable, continual process, but *reflection-on-action* and *for-action* (Blythe and Van Schaik, 2013) potentially reveals more profound insight and this requires time and focus not usually available during the academic session. To the timeline shown in figure 5.4 *(page 95)* must then be added a summer period of collating, reflecting, structuring, and re-structuring analysis in the form of drawings and written accounts.

5.3.1: Methods: an ethnographic 'toolkit'

> Ethnography, with its capacity to open situated knowledge to view, is well suited to the pursuit of material practices: direct observation of objects (including people) and settings remains a central method for socio-material studies. (Michael, 2020, p. 274)
>
> 'ANT' is just good ethnography. Perhaps. (Baiocchi et al., 2013 p. 334)

Ethnography aims to create deep understandings and rich, vivid descriptions of phenomena, cultures and/or situations (LeCompte and Preissle, 1984). It relies on the use of mixed observational techniques often over an extended period (Denscombe, 2017, Walford, 2009), but ethnography is often focused on an interpretive model which downplays the role played by the material and spatial:

> At first sight, nothing seems more banal and uninstructive than to assert that social activity occurs in time and space. But neither time nor space have been incorporated into the centre of social theory, they are ordinarily treated more as 'environments' in which social conduct is enacted... rather than integral to its occurrance. (Giddens,1979, in Nespor 1997)

As discussed in the previous section *(page 70)* I would contend that the material and spatial dimensions of practice will always be important, but must be acknowledged as central to architectural education, both as subject and teaching method. The symmetry between the *human* and *non-human* in an actor network theory approach *(page 70)* opens the possibility of moving beyond human-centred methods of interviews and focus groups while not excluding them. ANT might be understood as a mindset, disposition, sensibility, or attitude towards an ethnographic study (Baiocchi et al., 2013) as opposed to a rigid framework. Adopting this sensibility makes certain practices more visible by foregrounding what might normally be overlooked, but it also suggests a broader range of methods. These tools and tactics might extend beyond text, taking 'a collage, heteroglossia, or even carnivalesque approach' (Nicolini, 2009, p. 1395). This study therefore used mixed and multi-layered methods to build a more complete picture that recognised social practices as complex intersections of people, material, and place(s), and also that this complexity - or 'messiness' (Law, 2004) - was not easily captured. The broad intent to construct a rich ethnography of the studio, and the socio-material sensibility adopted, meant that observing and recording studio practices required a responsive rather than a prescriptive/predictable approach, adopting (bricolage style) the tools and techniques appropriate as the study unfolded *(figure 5.4 page 95)*.

The 'positioned observer'

> 'I am the space where I am' (Noel Arnaud, in Bachelard, 1994, p. 137)

This study has been informed by spatial theories, and my own instinctively phenomenological approach to understandings of place, one which places value on sensory experiences. Sensory approaches to ethnography recognise the body as part of a social, sensory, and material context, and therefore also a source of knowing - 'Ethnographic experiences are "embodied" – in that the researcher learns and knows through her or his whole experiencing body' (Pink, 2015, p. 27). Pink argues that ethnography has traditionally been concerned with place and that this necessitates a recognition of the importance of *emplacement* - how we physically (and socially) position ourselves in relationship to others and to the environment we occupy, and 'how… we understand the role of the emplaced ethnographer as a participant in, and eventually author of, the places she or he studies' (2015, p. 33). In carrying out this study therefore I have been continually aware of location/place, my own position within and in relation to this context, and the perspective that position affords in observing and recording studio practices.

5.3.2: Visual/sensory methods: forms of drawing

> Drawing is proposed as an appropriate method of socio-material analysis because not only is it entirely mediated by the materials of its construction but it is inseparable from them (Michael, 2020, p. 273).

Visual methods, most commonly digital photography and film are increasingly used in ethnographic research and the artefacts created through these processes can contribute to the construction of ethnographic knowledge as well as how it is represented (Pink, 2015). The use of visual methods is not new – more 'traditional'

methods (sketches and drawings) have long been part of fieldwork (Kuschnir, 2016), but the drawings now used in social research are more usually those made by participants in the form of memory work or visualisation (Heath, Chapman, and Morgan Centre Sketchers, 2018). It might be argued that the easy access to technology offered by digital photography has democratised a process which was formally seen as requiring specialist skills or innate 'creativity' (Hurdley, Biddulph, Backhaus, Hipwood, and Hossain, 2017), however, while digital photography may have opened visual methods to a wider constituency it has perhaps lost the value inherent in the process of 'active looking' necessitated by less immediate methods.

The transition from taking photographs to making sketches in this study was not anticipated. Taking photographs was often intrusive, evidently making some of the students feel self-conscious. In contrast my drawing inspired curiosity but did not interrupt activity in the studio. However, as drawings take both time and focus, opportunities were limited to quiet times in the studio when the students were progressing individual work, or group sessions where my contribution was not required – when activities were being led by another member of staff, or by the students themselves.

Figure 5.5: Philip, Christy and Lai in a studio workshop 17.01.22

In stating that drawing is critical to the methods utilized in this study, it is first necessary to expand on what is understood by the term *drawing* both as a practice, and as an artefact, and to further explain how it might be used within an ethnographic study. A drawing made as a rapid line sketch is as much a drawing as a detailed and rendered study, or a measured orthographic projection carefully constructed over many hours. A drawing may not even be composed of lines but may instead consist solely of digital data points. As Petherbridge points out, a drawing is 'slippery and irresolute in its fluid status as performative act and idea; as sign, and symbol, and signifier; as conceptual diagram, as well as medium and process and technique' (2008, p. 27). A range of different drawing techniques and methods have been used within this study.

Drawing as looking

> I have learnt that what I have not drawn, I have never really seen, and that when I start to draw an ordinary thing, I realise how extraordinary it is. (Frank, F. in Maslen & Southern, 2011, p. 44).

The process of drawing is firstly one of close and careful observation – an 'investigative act of looking' (Michael, 2020, p. 272). To draw necessitates paying close attention. The observer sees what might normally be overlooked, visually measuring relations between things. Unlike a photograph, which necessarily captures a moment, a drawing is the result of many glances seen together, and it therefore also has the capacity to record both what is happening over time, and the viewer's experience of that activity (Berger, 2005). Beyond simply recording what is seen it encapsulates an *understanding* of what we see in a synchronous process of thinking and making - it is an ongoing process of visual exploration or a 'non-verbal thinking process' (Kentridge, W. in Maslen & Southern, 2011, p. 200). The drawing that results is a document of that process.

> It is a mistake to think that the camera does the same as a pencil, only faster; or that the photographic image achieves the same as the drawing, only with greater accuracy. For the pencil is not an image-based technology, nor is the drawing an image. It is the trace of an observational gesture that follows what is going on (Ingold, 2011b, p. 225).

A drawing therefore can be far more than a visual record – it is a way of actively, and attentively observing, and simultaneously thinking about what is observed.

The problem with photography

A photograph excludes time - the 'past is arrested' (Berger, 1995, p. 86). The process of 'active looking' described above takes time, but the evidence of duration within a drawing will not be 'uniform'; it will be distributed according to the importance placed on things observed. As Berger points out 'an instant photographed can only acquire meaning insofar as the viewer can read into it a duration extending beyond itself' (1995 p. 57). It can be positioned within an unfolding narrative but in separating the image from its spatial and temporal context 'all photographs are ambiguous'. (Berger, 1995, p. 91).

A photograph is also necessarily a selective composition. A shot is *framed* and will therefore represent a fragmented view of the world captured from one fixed position, at one moment. The photographer chooses both the focus and frame of a photograph - what will be positioned in the foreground and what will be 'out of shot'. Through this process an image is often unconsciously constructed to reflect its author's chosen narrative. While a drawing is also selective, it is clearly *authored,* a photograph is too often assumed to objectively reflect reality. At the same time photography risks a form of 'data overload' – it is not selective in that it captures everything within its frame, reinforcing the illusion of reality but preventing both the photographer and the viewer from really seeing the activity observed. A photograph is complete – it suggests finality, closure, and a degree of separation between observer and observed. In contrast a drawing is potentially open-ended, it reveals the process of its making and allows for extension - it can 'unfold' (Ingold, 2011a). Both the immediacy and totality of a photograph must be acknowledged:

> One of the things I'm doing… is finding out how difficult it is to learn not to see like the camera… the camera sees everything at once – we don't. There is a hierarchy, why do I pick that thing, as opposed to that thing, or that thing? (Hockney, D. in Maslen & Southern, 2011, p. 16)

Drawing, put simply, forces us to slow down, to be more selective, and to be aware of our own position.

In the context of this study, I have used the term 'snapshots' deliberately. My photographs were used as a way of quickly recording a moment (using an iPhone), rather than as considered compositions. These photographs have also been supplemented with the students' photographs *(figure 5.6)* taken in and around studio and subsequently shared or included in their journals or presentations. In retrospect these instances of the studio seen from the student's perspective were immensely valuable and I regret not asking the students to record and share more of these images. The student photographs include both 'candid' images and those they carefully constructed to portray a specific aspect of their work.

Figure 5.6: two images taken by the same student (Philip) the first to explain the 'derive' exercise (page 129) for his portfolio submission, the second his own 'snapshot' of the March project reviews (page 170) included in his development diary.*

Drawing as thinking in-situ

> Could it be that images do not stand for things, but rather help you find them? (T. Ingold, 2010, p. 16)

As Berger points out, a drawing is a 'translation' not a record (1995), the process of making a drawing is one of developing a visual understanding of what is observed. As such Hurdley et al. argue, drawing is 'like writing, it is a methodology: a way of thinking and doing research that shapes what knowledge and meanings are produced' (2017, p. 5). Ingold has similarly proposed a more expansive approach to the production of ethno-

graphic accounts, based on what he terms *inscriptive practice* which builds on the potential of drawing 'to re-connect observation and description with the movements of improvisatory practice' (2011b, p. 2). Ingold sees potential in the 'direct link between perception, gesture and trace' (2011a, p. 225) afforded by drawings generated *in situ* where a 'traditional' ethnographic account might be 'written-up' far removed from its context:

> Ethnographers observe in the field but withdraw to the study to describe. The real problem then lies not in the alleged contradiction between participation and observation…but in the disconnection between the art of description from observational practice. One way to reconnect them… might be to think of description, in the first place as a process not as verbal composition but of line-making (Ingold, 2011a, p. 224).

Drawing here is potentially less an illustration to support an otherwise written text, and more a 'text' to be valued in its own right.

Photo collage: when might a photograph be a drawing?

Figure 5.7 Catriona's workspace

A composite photo collage, sometimes described as a 'built frame' image, positions the author within a space and enables the layering of content, creating a more complex view. This method, which draws on techniques developed by David Hockney to create what he termed *joiners,* uses multiple images 'to trace space, to edit and include, depict multiple views, to build complex relationships between the subject and its editorial edges' (Ray, 1997, p. 73). Where a single image allows the viewer to understand little of the position of the author, a composite, constructed photo collage makes this evident - you are positioned in the author's location, you trace how their eye moved around it. Hockney envisages using a camera in a similar manner to a paintbrush in his joiners - he draws with photographic images creating rather than disguising gaps and overlaps, capturing the subject over time, and from multiple points of view (Hockney and Joyce, 1999). His aim is not to create a smooth 'wrap-around' reproduction of the space but to ensure the viewer remains conscious that seeing is not a continuous experience. The viewer is required to make the connections, to position themselves in the space as they 'read' the resulting image.

Enric Miralles' collages expand on the potential of a photo collage to juxtapose the experiential characteristics of architectural space (as seen through multiple, single-point perspective images) with its spatial dimensions in the form of orthographic drawings. This method creates dynamic, layered compositions which reflect 'a simultaneity of spatial and material experience' (Shields, 2014, p. 129). Miralles' collages also often mix scales in a manner not available to conventional architectural drawing[9] but which is also evident in Hockney's *joiners*. This way of using scale is perhaps more akin to the experience of being in a space, where attention flits between the detail – for example stepping over a threshold; to the surveying the space as a whole; to locating onself by referencing the view beyond the window.

The technique of photo collage became integral to my observation of the MArch & UP studio. I used Hockney style *joiners* which looked at the studio from my viewpoint, sometimes combined with orthographic drawings. These joiners were often annotated and used as a form of visual reflective fieldnote. Composite images allowed for an understanding of my own position in the space and relationship to the activities taking place, and better articulated the spatial relationship between humans, materials, tools and the studio.

Analytical and orthographic drawing

> Those using drawing as analysis in relational research should be ready to explain how art does its work – and in this way open their analysis to critique (Michael, 2020, p. 283)

Drawing practice can be both unconsciously and consciously analytical creating a framework for a practitioner to reflect *'on'* as well *'in'* action (Schön, 1983). Michael, in her ANT-informed study of artists' practices, uses an iterative series of tracings to explore material 'entanglements' - the conscious act of tracing allowing her to progressively 'de-clutter' the image and enabling her to use the drawings she makes not to deconstruct, but to preserve and explore these entanglements (2020). Comparable, consciously analytical drawing processes have been used by some architectural research studios that have proposed analytical drawing as a 'research method' in its own right. For example, in Steenbergen's work drawing types and techniques are selected and adapted to suit the questions and sub-questions raised by the subject of study, 'each drawing is an answer to a question, which in turn poses the following question' (2010, p. 25).

Steenbergen's analytical drawings are derived from *orthographic projections* - architectural drawings which employ mathematic tools and techniques to translate three-dimensional objects, spaces, and landscapes onto two-dimensional surfaces. An architect's drawing is not measured by eye – it relies on visual observation, but also a process of mathematical measurement and the skilful application of pre-defined rules. These drawings aim to be unambiguous as they are used as a means of verification, and ultimately control of the space they depict (Steenbergen *et al.*, 2010). However, orthographic projections - plans, sections, elevations - represent

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9 Architects' drawings are traditionally made to specific, familiar scales, designed to communicate specific aspects of the design, a 1:20 drawing will illustrate a level of detail in relationship to the human body, a 1:500 drawing might illustrate a relationship to the wider context, and an architect will learn to recognise these scales and automatically envisage what they would mean in physical space.

a single *slice* (vertical or horizontal) through a space (Perez-Gómez & Pelletier, 1997,) - they must be read together to construct a holistic understanding of a space.

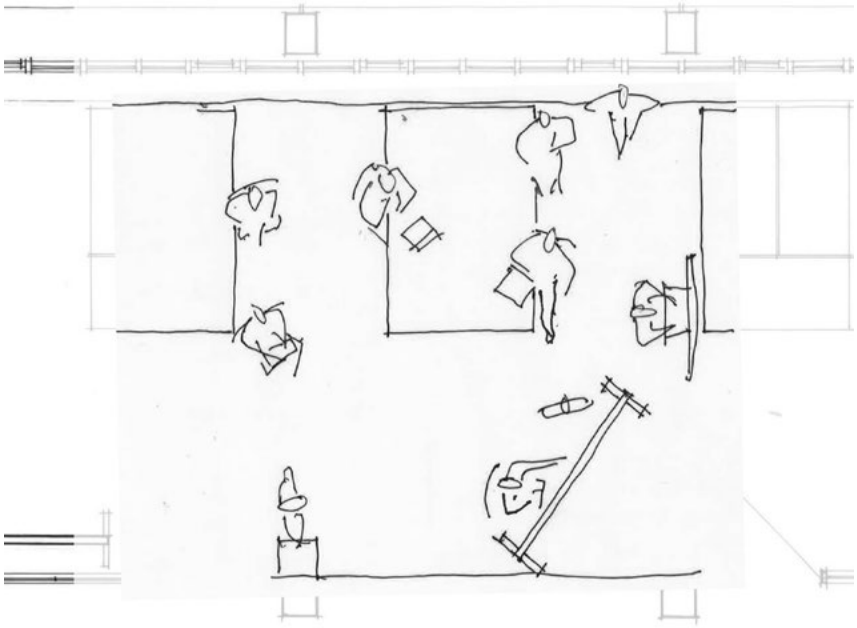

Figure 5.8 reconstructed plan drawing of the studio review 25.01.22.This was drawn 'freehand' but layered over a measured 1:50 plan I had previously constructed.

I have used orthographic projections in this study as a form of survey, recording the studio in plan, section and/or elevation to capture the spatial relationships which evolved around studio activities and the traces these left. These drawings were constructed based on measurements, supplemented by photographic records, and often annotated with notes. In some instances, drawings were constructed which combined photographic images 'flattened' to remove the distortion of perspective[10], and plans made on a drawing board – this was a process which included both hand collage (cutting and pasting printed images) and digital tools such as Adobe Photoshop.

All observational drawing, including measured orthographic projection, is an 'authored' creative process. It is not a neutral but instead involves its maker in a series of conscious and unconscious decisions – where to focus, what to include and exclude, what to emphasise. It may be explicitly designed to explore a specific question or to communicate a specific message. A drawing will also often carry the inevitable traces of exploration and decision-making, revealing the process of its construction (Berger, 2005). The drawings constructed as part of the reflective, analytical phase of this study have been deliberately treated as exploratory. I knew in advance what the drawing aimed to explore, but not how this would ultimately appear. Any traces of my process which were evident have therefore been retained.

10 This is a process known as 'photogrammetry' often used to capture the detail of photography in orthographic projections.

Mapping - ethnographic and otherwise

> Mapping can be used as a research tool to make social and spatial practices, and the interactions in space visual and tangible (Genz & Lucas-Drogan, 2017 p. 3)

Maps are central to geography, and by extension in urban planning. They are frequently used in MArch with UP studio as students are tasked with recording and representing their analysis of *place* as will be discussed in chapter 7 *(page 145)*. A map is usually understood as an accurate, measured, two-dimensional representation of a 'place'. It illustrates geographic location, and can also be used to embed and reveal multiple layers of data, with the advent of GIS systems often freely available at a key stroke[11]. But while some maps can convey more experiential qualities of place[12], as Massey points out they often 'give the impression that space is a surface' (2000, p. 227) and obscure the possibility of space/place as socially and culturally produced. Maps are not only tools which allow us to understand the physical world, they reflect power structures and (similar to an architect's plan) are commonly used as instruments of ownership and control (Wood, 2010).

Like the use of drawings in ethnography described by Heath et al. (2018) *ethnographic mapping* is increasingly used to draw out participants' narratives structured around specific places (Corazzo and Gharib 2021, Grasseni 2012). In the same way that a drawing is a record of the process of making, a map records data gathered in the exploration of a territory. What the mapmaker chooses to focus on, and the methods and process of information gathering will vary, as will the means of representation. *Mapping* has the potential to record qualitative as well as quantitative data – the locale and the sense of place *(page 77)* as well as the location. It does not always have to reflect only the conceived space of Lefebvre's planner - for example contemporary critical or counter mappings such as those made by Forensic Architecture (Forensic Architecture, Franke, Weizman, and Welt, 2014) are made with an awareness of, and active resistance to, the existing power dynamics of place.

Mapping can be used as a method in ethnography and urbanism to visualise, analyse and make tangible the spatial and social structures which define the 'everyday' (Genz & Lucas-Drogan, 2017), incorporating field notes, observations, sketches, found artefacts etc. The maps which result are an accumulation of 'multi-layered stories' (Genz & Lucas-Drogan, 2017, p. 3) which in turn tell the stories of places. These maps represent a reading and re-telling of place which prioritises its lived experience. We might assume that a map is simply a measured orthographic projection - a 'plan', but one that addresses the scale of a landscape or territory, as opposed to a building or object. But mapping as interpreted by Genz et al. is more reminiscent of the 'story maps' which preceded measured cartography as a means of narrating a travellers experience, or the psychogeography of Peter Ackroyd and Iain Sinclair who write their maps, and Patrick Keiller who films his (Coverley, 2018). Maps can situate narratives, grounding them in tangible places (Caquard, 2013).

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11 GIS – geographic information systems – attach data to specific locations.

12 The 'Map Works' made by land artists Richard Long and Hamish Fulton often include only a line drawn across a map to record their movement across a landscape, sometimes supplemented by text to indicate the duration.

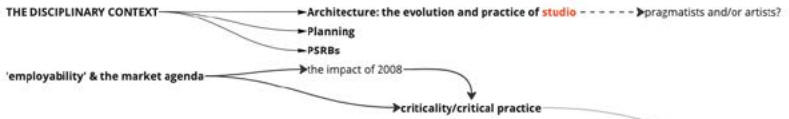
I have described this study as 'mapping' critical practice within a transdisciplinary design studio. Mapping may not always employ visual methods but it inevitably situates and spatialises practices. The *maps* that I have constructed in this study were made to trace practices through the studio over the course of the academic session. They do not exist as singular artefacts but rely on the reading of multiple 'slices' which have been stitched, spliced, and montaged together.

5.5: Conclusion

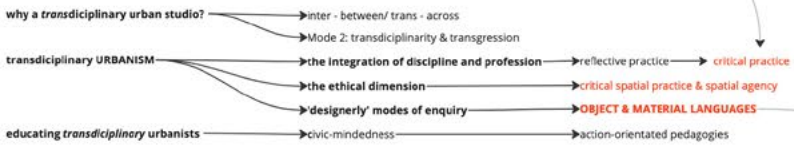
This chapter has highlighted the particular circumstances within which this study took place, recognising that the accounts which were generated reflect the experience of this specific group of students at this moment in time. It has argued that while *bricolage* is a process of putting to work what is 'to hand' tied inextricably to its maker, this does not mean that as a process it is wilful, lacking rigour, or the capacity to generate a holistic picture. The construction of a *bricolage* which includes visual methods appears particularly appropriate in the context of an ethnographic study which seeks to foreground the material and spatial dimensions of practice(s) and in a context where following these practices may take unpredictable turns.

Drawing as an approach to observation, recording, reflecting on and analysing what is observed, has been central to this study and therefore the variety of forms that a 'drawing' might take have been dissected, concluding with the practice of *mapping* as a tactic for anchoring narrative to place. The data, in the form of drawings and photographs (my own and the students') together with the students' accounts and explanations has allowed me to trace the emergence of their critical positions. The *timeline and methods* drawing (fig 5.4) can be understood as a map of the data-gathering process conducted for this study. Making it enabled me to identify connecting threads and critical nodes, clarifying those points on which to focus, and therefore which stories might be told.

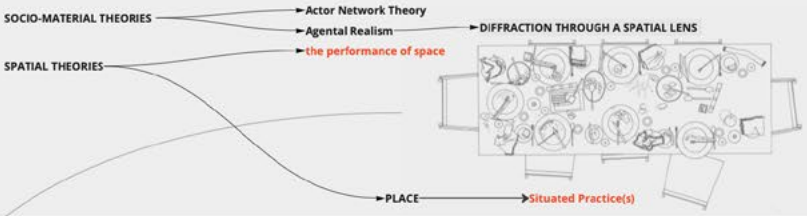
2: EDUCATING URBANISTS



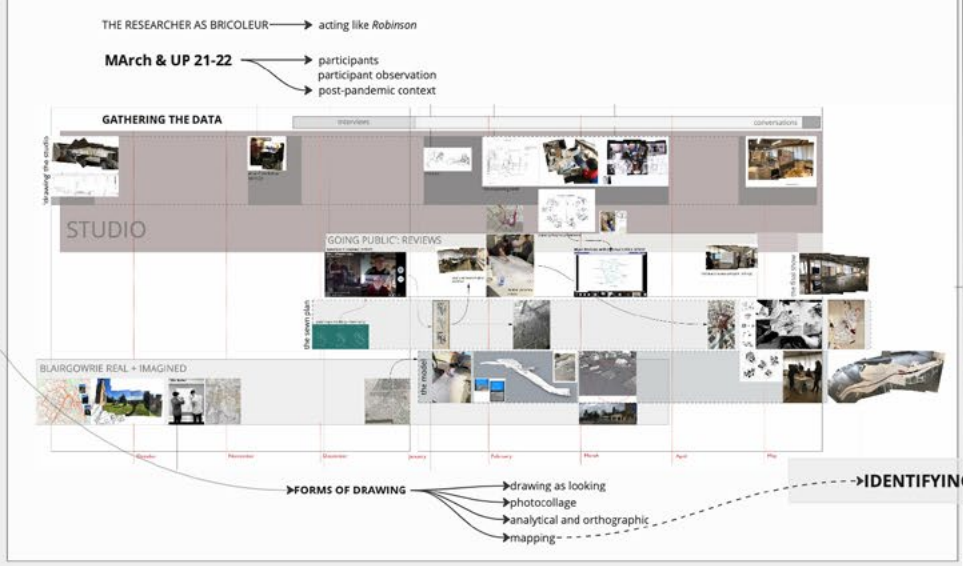
3: LOCATING TRANSDISCIPLINARY URBANISM



4: MATERIAL + SPATIAL FRAMES



5: CONSTRUCTING A SPATIAL BRICOLAGE



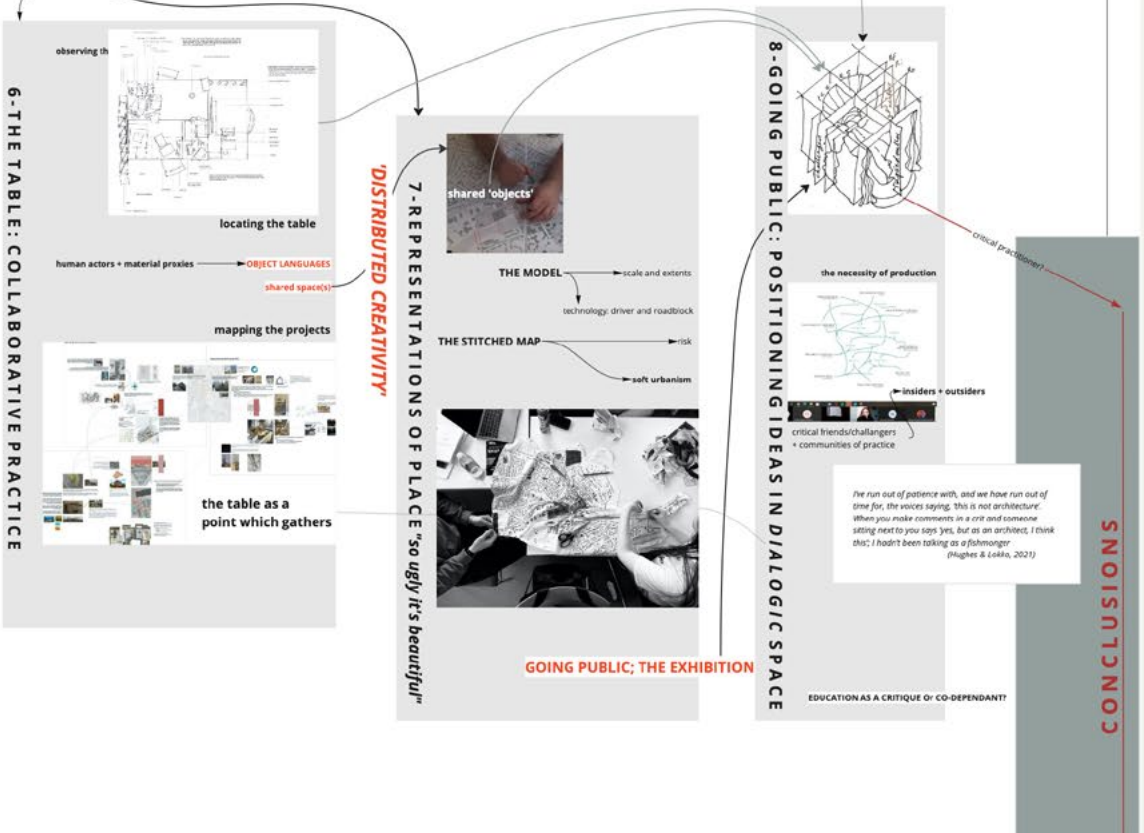
'an ever-changing set of relations between people and things, mediated by spaces and structures across multiple scales' (forensic architecture)

PART 2:

G SITES

STORIES / SITES

studio as situated practice - where knowledge material and practice come together



6:

Drawing threads together... ..and teasing them out.

This section draws together the key issues explored in part 1 of this study and how these define the context for part 2, setting the starting point for each chapter. It then briefly outlines how the methodological approach, visual and spatial thinking and *designerly* methods, has informed the generation, analysis and presentation of these chapters – that is the three *stories*. Finally, it sets out how the three *sites* around which these stories centre were selected.

6.1: Studio Pedagogy

Studio is both the locus and method of all design education. As discussed *(page 30)* in architecture it forms a mandatory minimum 50% of every accredited course in architecture, but what 'it' is, and how it differs from more conventional pedagogic approaches is often overlooked. Architects – those in practice and in academia – are familiar with studio teaching and may understand how it works at an instinctive level but often struggle to articulate this. Studio teachers often accept its culture and mores often without question, academic colleagues who do not teach studio struggle to understand how it differs from a classroom. Both positions are potentially problematic. There are aspects of studio pedagogy which may be hugely valuable but are largely unseen and therefore poorly understood. This study therefore aimed to understand more fully how the M.Arch with Urban Planning studio 'worked', leading me to focus on those studio practices I would normally overlook in order to highlight and explain this to others.

The evolution of 'studio'

The origins of the academic discipline of architecture lie in 'atelier' and their professional counterparts – architectural design studios *(page 30)*. This is a form of professional education which evolved from a professional practice and has only relatively recently been subsumed into an academic context[13]. It retains many of the characteristics of a practice-based apprenticeship mirroring aspects of professional studios but is

13 *In the UK this can be dated to the 'Oxford Conference' of 1958*

insulated from the risks and constraints of practice and in parallel requires students to meet the outcomes of an academic master's level academic qualification including to think *critically*.

Architecture is now accepted as an academic discipline, but studio remains a 'bad fit' within traditional academic processes and protocols more familiar with lectures, essays, and examinations. This is not to suggest that what is meant by 'studio' has not evolved: the term may now stretch to include digital and temporal places, academic studios may be located in professional contexts *(page 37*) and vice versa .Since the financial crash of 2007 the reinvention of traditional professional hierarchies evident in some professional design offices has been mirrored by pedagogical experiments which challenge the status quo, but these are the exception. As became more evident to me through carrying out this study, as architectural education has become established in academia it has developed 'signature pedagogies' (Shulman, 2005)– adopting methods and approaches which potentially atrophy rather than enable the practice of architecture to adapt and evolve to meet new challenges*(page 164)*.

Studio's emphasis on project-based learning - positioning students as active learners and focusing on the development of skills they will need in the workplace - could be seen as an exemplar, as was advocated by Schon (1985, 1987). But measurable outcomes *(page 39)*, a focus on tangible *employability*-focused skills over criticality, and well-understood (if often unarticulated) disciplinary expectations *(page 48)* limit how academic studios, and the students who work within them, develop; how projects evolve in response to external issues and concerns, and the emerging interests, preoccupations, and critical positions of the students. At a post-graduate level studio is unpredictable and often surprising. Following wherever studio practices led took me in sometimes unexpected directions (for example into the textile studio *(page 152)*)while allowing me to focus on the everyday activities, and see richness in studio exchanges that I might normally have overlooked.

6.1.1: The interdisciplinarity of architecture?

My motivation to undertake this study was personal – it was inspired by the challenge to my own understanding of my discipline – my professional identity - which resulted from a move into an interdisciplinary space *(page 16)*.

Architecture is often referred to as fundamentally interdisciplinary (QAA, 2020). The problem orientated nature of both architectural education and its practice ensures that it must cover a broad spectrum of knowledge: the subject of design is effectively universal (Findeli 2010) *(page 63)*. Perhaps as a result universities struggle to comfortably position architecture within conventional academic structures – is it *Engineering*? Or *Art*? Or *Social Science*? This might suggest something more fluid than a 'pure' academic discipline, but Klein's taxonomy would indicate that architecture is not interdisciplinary (2017) *(page 44)* and my own experience in moving from 'material' to 'march + up' *(page 16)* reflects this reading - I rarely questioned fundamental architectural 'truths' until required to see urban problems from an alternative disciplinary perspective.

In an academic context architecture can become self-referential and preoccupied with formal concerns debating 'minor points' in the phenomenon identified by Dogon and Pahre (2019) *(page 45),* or tying and 'retying architecture's internal knots' (Awan, Schnieder and Till, 2011 p.29). The M.Arch with Urban Planning is an architecture studio and an accredited course in architecture, but its concerns are by definition broader than only this discipline. The questions it asks must look outwards – beyond the discipline and the institution - and given its dual identity as an accredited course in Planning, its members must approach design problems with a different understanding of their 'client' *(page 55)*. This differential may appear subtle, but it can be seismic, and it is threaded through all the work undertaken in the studio during 21/22. The constraints of timetable and circumstances meant I focused primarily on a module which while 'hybrid' did not require the students to work in direct collaboration with students of other disciplines *(page 94)*. Studying the studio here was about understanding how studios worked but also noticing the differences that a transdisciplinary framework might instigate within an otherwise familiar pattern.

6.1.2: The transdisciplinary studio

Transdisciplinary urbanism recognizes the limitations of approaching complex problems from a singular perspective. It challenges disciplinary orthodoxies and value systems, requiring practitioners to question, to recognise their own position and how their decisions may have broader (often unanticipated) impacts – to be *critical.*

Critical, and/or ethical practice

Addressing architecture's outside (Till, 2009) can be linked to the 'ethical approach' which Doucet and Jannsen suggest is characteristic of Transdisciplinary Urbanism (2011). Criticality, and developing a critical approach to practice, has been the central concern of this study. The terminology here may be slippery and writing measurable academic outcomes which mandate 'criticality' may be problematic, but professionals are required to tackle wicked problems where there will be no 'correct' solution. In this context a capacity to understand one's own positionality, and acting with an awareness that actions have human, social and environmental consequences *(page 54)* is fundamental. We are educating our graduates for future practice – the studio acts as a community of practice where students can develop design skills, but it is also a context for critical dialogue where they can test, question and challenge their own and others design decisions and the basis on which these are taken.

The social theatre of practice

As represented by Blythe and Van Schaik in their drawing (2013) – studio is a 'social theatre'. Students work in dialogue with their peers, mentors and challengers *(page 50)*. In studying how an individual's critical position might emerge, it was necessary therefore to focus on how this worked through formal and informal studio discourse – how ideas and approaches might be shared and/or exchanged. As a studio tutor I am party

to studio tutorials and reviews, but the context of this study gave me permission to look more closely at how discourse developed – verbally, through emails and messages, and around the artefacts that the students constructed. The role of informal collaboration and discourse is the aspect of studio practice which is perhaps most easily overlooked. It is not easily quantified and is often undervalued by the students themselves (McClean and Hourigan, 2013). It is the easiest aspect of studio to lose in the push towards 'hot-desking' and potentially its most valuable (Cai and Kahn, 2010).

6.1.3: The importance of material

In unpacking the terminology around inter and transdisciplinarity, specifically *transdisciplinary urbanism* I have also been forced to examine more closely what it means to work in a 'designerly' way (Cross, 2001); what it means to be 'solution focused' *(page 59)*, how rich and complex this can be as a practice; and how it may be nurtured within a studio environment. Central to design practice are the 'codes' that designers use to engage in a dialogic design process – the tools, tactics and material artefacts they use to visualise and text ideas in a process of seeing-moving-seeing as described by Schon and Wiggins (1992). The importance of the material to design practice influenced the starting points for studio observations - focusing on the artefacts and tools that the students were using and the evidence of process that they represented; and also the methods I chose to do this – drawing and photographic joiners.

6.2: Following the 'model(s)' /identifying 'sites'

The practice of drawing is inherently 'socio-material' in nature. The tools and the media used are entangled in complex networks; the students' drawings (and models) themselves might be considered as sometimes actors, sometimes nodes or points of intersection within these networks. They have the potential to reveal stories of how, where and for what purpose they were made. Drawings and models act as both 'a surface on which to communicate' (Gottschling, 2018 p. 121) and one which might communicate with wider audiences beyond the studio itself. Even in a studio environment dominated by digital methods these representations of sites are also *sites* in their own right – surfaces worked upon by one or more individual and the subject of, or catalyst for, discourse.

Niccolini argues that 'all practices are 'inherently contingent, materially mediated, and… cannot be understood without reference to a specific place, time and concrete historical context' (2009 p. 1394). The spatial context of the studio frames learning and practice in architecture, as do the tools and artefacts used in the processes of design and its communication (Latour & Yaneva, 2008). I therefore took an initial decision to begin observing the studio by identifying and focusing on two 'sites', exploring how they operated as 'places' using Cresswell's definition - that is points of *gathering and distribution* (2014)*(page 77)* and/or *nodes* in

dynamic, evolving networks (Fenwick & Edwards, 2010) *(page 70)*. The first of these chosen sites was the physical space of the studio, and the second was the representative and physical space of the 'model'. These two were subsequently expanded to three through the inclusion of the temporal 'sites' generated by review events.

I have chosen to use the term *site* as opposed to either space or place. While *site* is often used interchangeably with *context*, *location* and *place*, its use implies future actions and consequences – it is a site *for* or *of* action:

> Architectural sites traditionally refer to that interval of time in which a project is conceived (project site) and built (construction site). Before this... the location exists merely as a place of unfocused attention. (Houge, 2013, p. 59)

Place and site are tightly intertwined– one being transformed into the other purely by the intention to *act*, and sites are temporal, existing as *places* both before and after action.

A site, as opposed to a *place*, has demarcated boundaries *(page 78)* – it is not a focal point, but a territory within which actions are confined. In an architectural site this territory is the designer's 'area of control' but external forces act upon it and any actions within the boundary will also have an area of effect. These three terrains, that of control, influence and effect overlap but are not identical - 'the areas of influence and effect situate design actions in relation to wider processes' (Burns & Kahn, 2005, p 12). This terminology therefore suggests a more explicitly spatial interpretation of networks. In identifying these *sites* I defined the spatial and temporal boundaries of the actions I would observe, which recognising that these were shaped by external forces and that what happened here had wider implications.

Site 1: the table

Figure 6.1: zooming in on the table

Observations of the everyday studio practice centred on one studio table, and how this worked as a site for *designerly* practice, collaboration and discourse. This choice was influenced by Arendt's identification of the table as 'located between those who sit around it' (1998 p. 52); by Wigglesworth and Till's 'Dining disorder' drawings of time and activity (1998, p.32); and by Miralles' observation of the how his studio table 'explains a

way of working in which the things themselves become actors… an island where depositing things initiates a dialogue between them' (Tagliabue & Lahuerta, 1996, p. 204). I recorded how this surface was used by the students who worked around it to develop their projects between January and March, how it shaped their interaction with each other and with the wider studio. The table was recorded as it changed its configuration and accumulated tools, materials, models, and drawings. Over a period of six weeks it was possible to trace not only the gathering and movement of material artefacts, but also how ideas and design tactics moved around the table.

Site 2: the 'model'

Where observations of the table were confined to a specific period and physical location, the 'model' emerged over the entirety of the academic session, beginning from conversations which took place early in the first semester and concluding with the degree exhibition in May. As part of this exhibition, students must show how their proposals work within the wider context and how their individual proposals 'fit together' to make a coherent, shared vision for the town. While it is not an absolute requirement a physical, scaled model can quickly communicate both topography and built form so large collaborative context models often act as the centrepiece of studio exhibitions.

Models are subject to the constraints of time, money, available skills, tools, and materials. Their production becomes a design process in itself - one negotiated between the studio as a whole rather than attributed to any one individual. This shares rather than duplicates the necessary effort and expense but can significantly increase the complexity of the design process. Students must negotiate and agree what the model should communicate and how this should be achieved. The model is not only therefore an object, but also a project (Latour & Yaneva, 2017) emerging from a complex intersection of practices.

A shared model can act as a material record of a collaborative design process. Like any representation it is authored. It is shaped by the students' shared reading of a real 'place', reflecting the place as it currently exists while being necessarily selective in what and how it represents: in ANT terms, where it 'cuts the network'.

Figure 6.2 Zooming in on the representations of place as a 'sites' in their own right.

In 2021-22 the MArch & UP 'model' became two separate artefacts which represented different ways of envisaging the studio's shared vision - a 'conventional' architectural scaled model which illustrated the location and physical form of the group's individual projects, and a sewn map. This similarly began from a scaled representation of place, but it challenged both traditional architectural modes of representation and technocratic approaches to urbanism, by aiming to communicate imprecision, fluidity and compromise. The sewn map, beyond simply illustrating the form of the proposals, advocated strategies of darning, hemming, and stitching to repair and reinforce the existing urban fabric. Both these representations of place acted as temporary physical and social focal points in the collaborative studio (which itself operated in both in physical and digital space).

Site 3: the review as a temporal site

Constructing and reading the *timeline* drawing *(fig. 5.4 page 95)*, using my own process of 'seeing -moving - seeing' (Schon and Wiggins, 1992), highlighted the pivotal role played by 'reviews' or 'crits' in both the development of projects and in structuring discourse. This, therefore, led to the identification of the third 'site' - the temporary 'spaces for action' advocated by Kreber *(page 65)* which were structured by reviews. This had not initially been anticipated as a focus of study and therefore necessitated both a more active positioning within the extensive literature around reviews, and the retrospective construction of drawings based on photographic records to explore their spatial context.

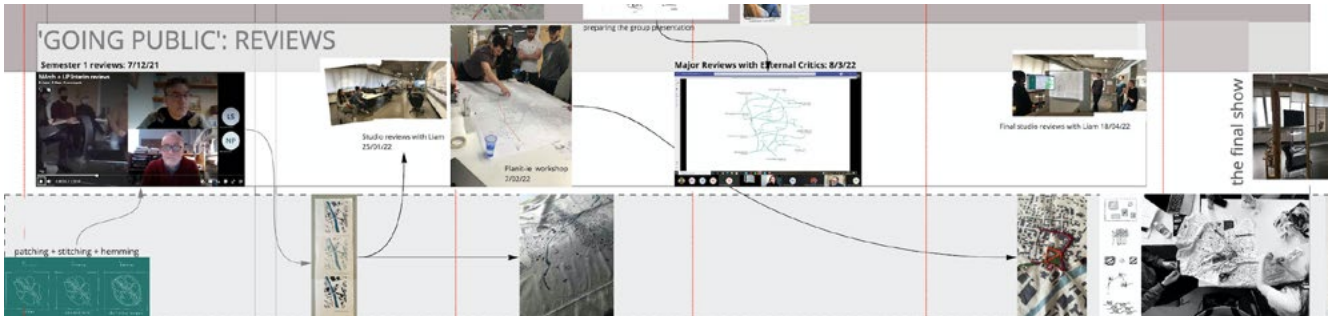


Figure 6.3: Zooming in on reviews

All these sites created an opportunity to structure a multi-layered, 'nested' reading of place (Malpas, 2018) *(page 77)* positioning them within wider networks and revealing their roles as *actants*. They were used to explore how the studio practices they instigated and facilitated might support the development of critical positions and emerging professional identities. They were considered as sites for collaboration, discourse and critical reflection; and for engagement with wider audiences (within and outside the studio), and with wider societal concerns.

6.2.1: Stories – the 'armature'

A *bricolage* constructed from fragments of what is 'to hand' requires an *armature* to hold these in place. The discussion of visual methods in this chapter does not pretend that drawing is in any way superior to writing. Instead, it aims to explain the approach taken to (and the value of) visual methods to observe, describe and ultimately analyse, while accepting that text will be part of the re-telling of any ethnographic account.

The *sites* acted as starting points, suggesting a route into what was otherwise a large quantity of 'data'. 'Revisiting' this data and positioning it within the *timeline* *(figure 5.4: page 95)* made it possible to identify themes which could be explored through narratives built around and anchored to these sites. The accounts presented in the subsequent chapters are interpretations of the studio processes and practices I witnessed. To use Yaneva's term, these are constructed as 'stories', they do not aim to be exhaustive, and are not necessarily linear or sequential (Yaneva, 2009). As De Certeau states, stories 'traverse and organise places; they select and link them together; they make sentences and itineraries out of them. They are spatial trajectories (2011, p. 115).

These stories have been generated by the three identified sites. They have been structured by following the practices which are centred upon these sites, and by 'zooming in and out' to reveal how 'local' practices might participate in larger assemblages and have wider relevance (Nicolini, 2009). They have been deliberately separated into three which, when read together, present a more rounded account of the way that the studio operated. This structure is in itself a 'spatial' armature - the reader is asked to consider studio practice from differing perspectives.

The stories are illustrated with both the students' work and my own drawings made as part of the analytical process. The juxtaposition of, and space between, written narrative and image(s) is designed to allow the reader to also make connections in a process akin to collage. As Walford points out, 'ethnography is story-telling with the researcher centrally involved on the generation and telling of the story' (Walford 2009 p 275) - the methods I have chosen to use emerge from my own disciplinary practice, and I am, like Robinson *(page 86)*, designer, builder and occupant of the accounts I have constructed.

The table 01/03/22

7: Collaborative Practice: The Table

> To live together in the world means essentially that a world of things is between those who have it in common, as a table is located between those who sit around it (Arendt, 1998, p. 52)

This study was carried out in 2021-22 - the first year that we had been permitted to use studios to teach following the extended absence caused by Covid 19. The 'lockdown' had forced students to work without a shared physical space, a highly unusual circumstance in design disciplines and one that increased awareness of its importance, and its vulnerability. Studio teaching is already 'precarious' (Heywood, 2009) amid increasing financial constraints. Throughout lockdowns studio teachers attempted to replicate a studio experience for students operating in a virtual space, but were aware that this could undermine the argument for its continued existence as a physical space. If we could effectively teach (and learn) design without access to studios, then why should universities continue to maintain continual access to this expensive resource?

This section considers the studio as a *site*: the ways that individuals use studio space for their own work but also how it facilitates critical dialogue and peer learning, and the role that the physical space and material artefacts might play in this process. It focuses on a single table within the M.Arch with Urban Planning studio, mapping how its surface was used over a period of six weeks through a series of annotated orthographic drawings and photographic joiners (Hockney and Joyce, 1999). It then goes on to consider how the students' differing uses of design tools (in the form of models, drawings and diagrams) was evidenced in the way the objects and practices accumulated on and around the table – how these externalised emerging design ideas, how their traces told a story of how design had been carried out, and how they could be used to structure a critical position.

When reconstructing the story of the students' intersecting design processes, it has proved difficult to separate the material artefacts from the ideas which were being explored by the authors. To untangle the way individual students used drawings and models, how these practices evolved, and how these objects influenced and informed the work developing around the table, it was also necessary to consider the role played by material artefacts in the trajectory of each design research project. I have therefore attempted to visually 'map' both these artefacts and the ideas which coalesced around them, through observation and conversations with the students concerned, showing how their work was developed in parallel but can be understood as inter-connected.

I have theorised the table as a 'place' in the terms suggested by Cresswell (2014) *(page 78)*. It was anchored by its locale in the M.Arch with Urban Planning studio between January and March 2022, acting as a focus - a fixed vertical axis gathering and distributing material things, meanings, and practices.

7.1: Observing the table

The photographs and field observations which form the basis of this section were made between the last week in January, and the first in March 2022, as shown in *Figure 6.1.* This was a critical interval between an informal review held to help the students clarify their research questions and the approach they would take to their projects as *design research (page 33)*, and a major critical review where they would be presenting more fully formed design proposals to external critics. This period allowed students the best opportunity to develop their proposals as they had no conflicting commitments in the form of submissions for other modules. The students knew that beyond the reviews in early March they would have minimal time to make any significant changes, this was therefore a potentially productive window from which they needed to take full advantage.

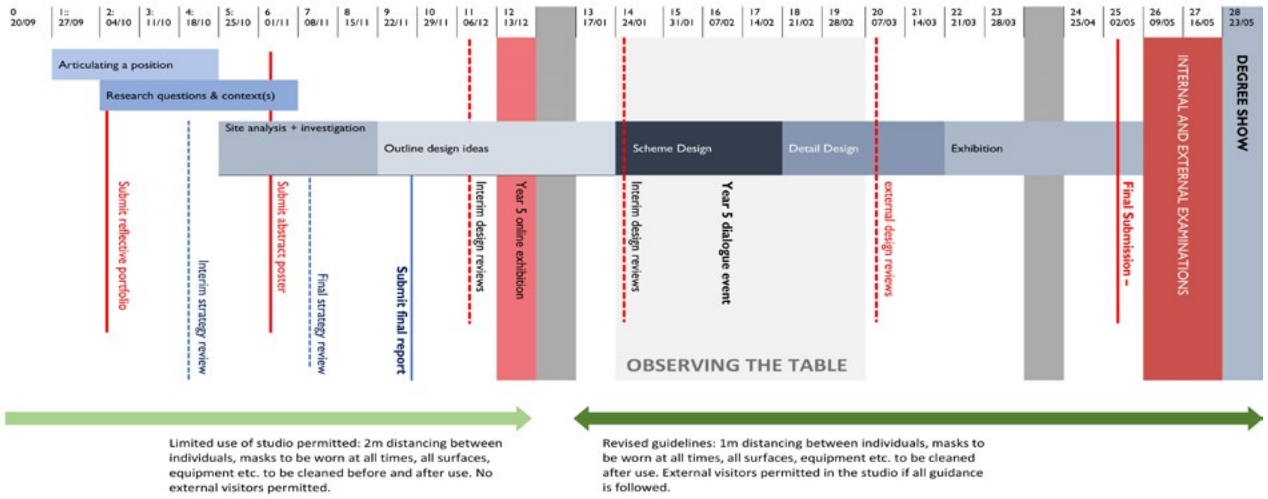


Figure 7.1: Design Research Timetable 21-22

Beyond the predictable constraints of programme, January to March 2022 also proved significant as it marked a return to the more normal operation of the studio following the relaxation of many restrictions imposed to combat Covid-19. Students were still constrained in how they might use the studio but they were encouraged to work in the space on a full-time basis and could 'inhabit' it with work-in-progress and reference materials. While still using digital screens to present much of their work for the January review, the students were asked to include at least one physical artefact in their presentations - a drawing printed on paper, or a physical model - these were in many cases left up on the walls after the review for future reference. This proved a significant turning point. It visibly marked the return to the physical studio.

At the outset of the year, the studio was organised to include a shared group-working space and three large tables, each made up of three individual workspaces of 1600mm by 800mm. Restrictions on studio operation *(page 92)* meant that these tables had to remain in these positions. In a more normal year the students would have taken more ownership of the space by adjusting the layout to suit their individual preferences.

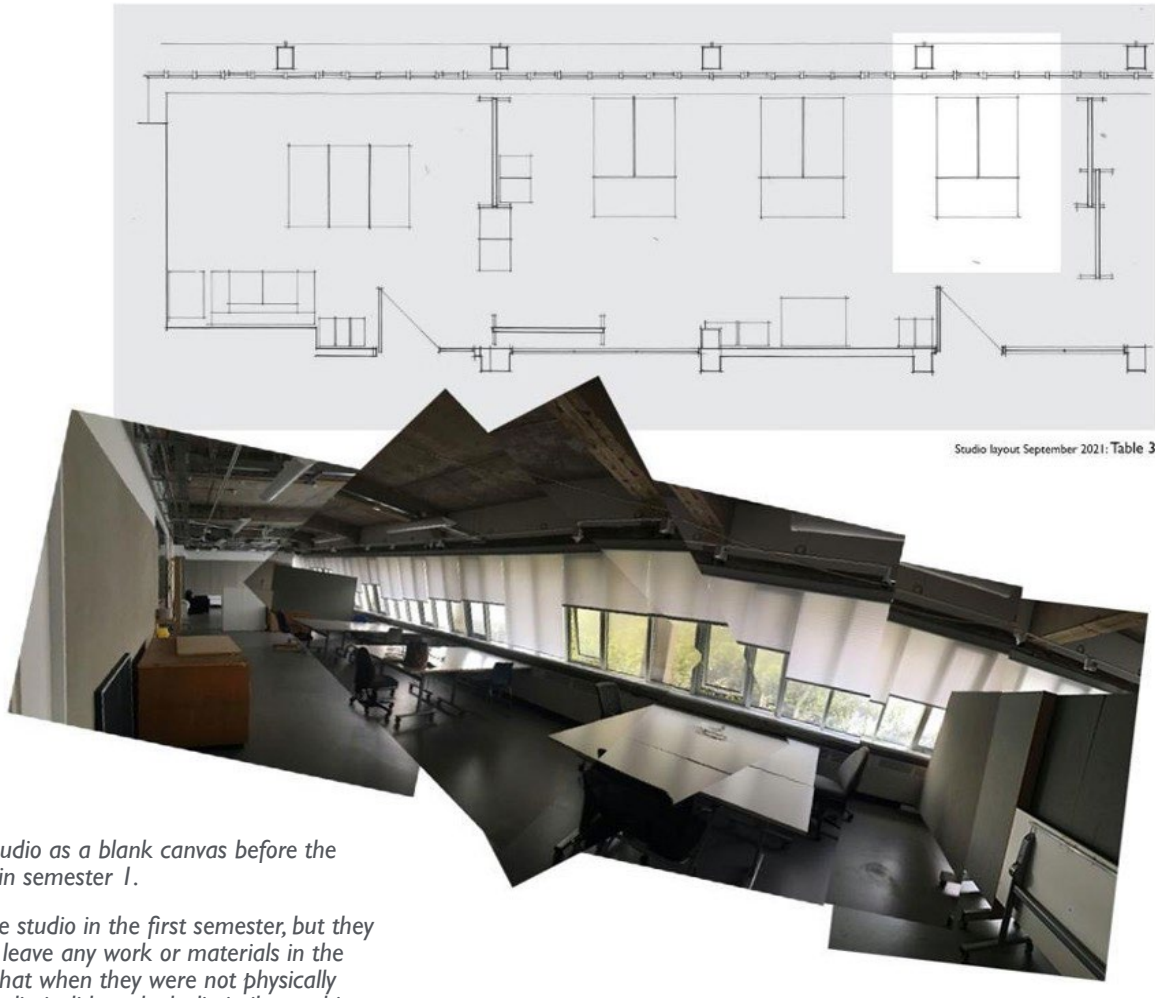


Figure 7.2:The studio as a blank canvas before the students arrived in semester 1.

Students used the studio in the first semester, but they did not generally leave any work or materials in the space, meaning that when they were not physically present in the studio it did not look dissimilar to this.

As work progressed towards the critical review scheduled for March 7th, I selected one table of the three tables on which to focus - primarily as this began to show evidence of a more 'normal' (that is pre-pandemic) inhabitation of the studio. While Euan, Catriona and Emma[1] may often have worked in other locations their workspaces were recognisably 'theirs'. This was evidenced by traces of multiple, parallel works-in-progress: models at different scales exploring spatial relationships between buildings and context, spaces and enclosure; scribbled notes and sketches; the books they were using to develop the thinking which underpinned their spatial ideas; and personal 'stuff' - water bottles, crockery and cutlery, face masks.

This specific table also proved interesting as the students working around it adopted distinct visual codes or 'object languages' to translate design problems into three-dimensional design proposals (Cross, 1982) *(page 61)*. Their projects were intimately entangled both spatially and in the concerns that they explored, as will be shown in figure 6.21 *(page 139)*, but how the students used space, tools and tactics differed.

The following pages document the evolution of the table over the period between January 31st and March 3rd.

1 *Pseudonyms have been used.*

7.1.1: 31/01/22: Models in dialogue

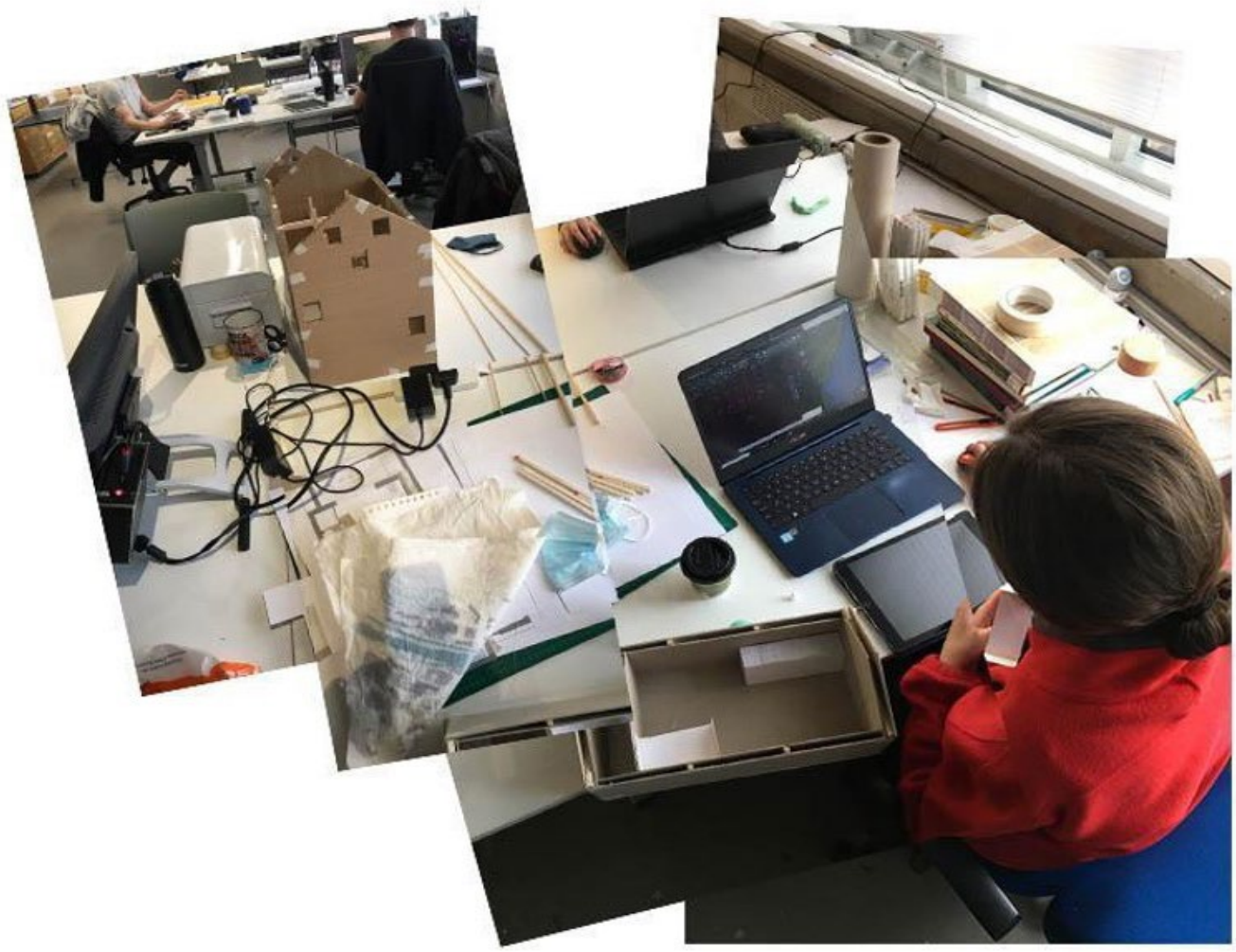


Figure 7.3: 31.01.22. Ten days following the January review:

Emma is progressing her 1:50 model of the main space in the Mill, by constructing a rudimentary model of the existing internal structure.

Catriona is attempting to understand the layout possibilities of a simple bothy 'hut' by working with furniture layouts in a 1:20 model. Both are working between technical drawings on their laptop screens, printed copies of these, and their physical models.

Euan has moved his own PC into the studio but is currently also working on physical models – detailed models of potential junctions between solid and lightweight elements. He's casting these in concrete, so he's temporarily moved away from the table as it's a messy process.

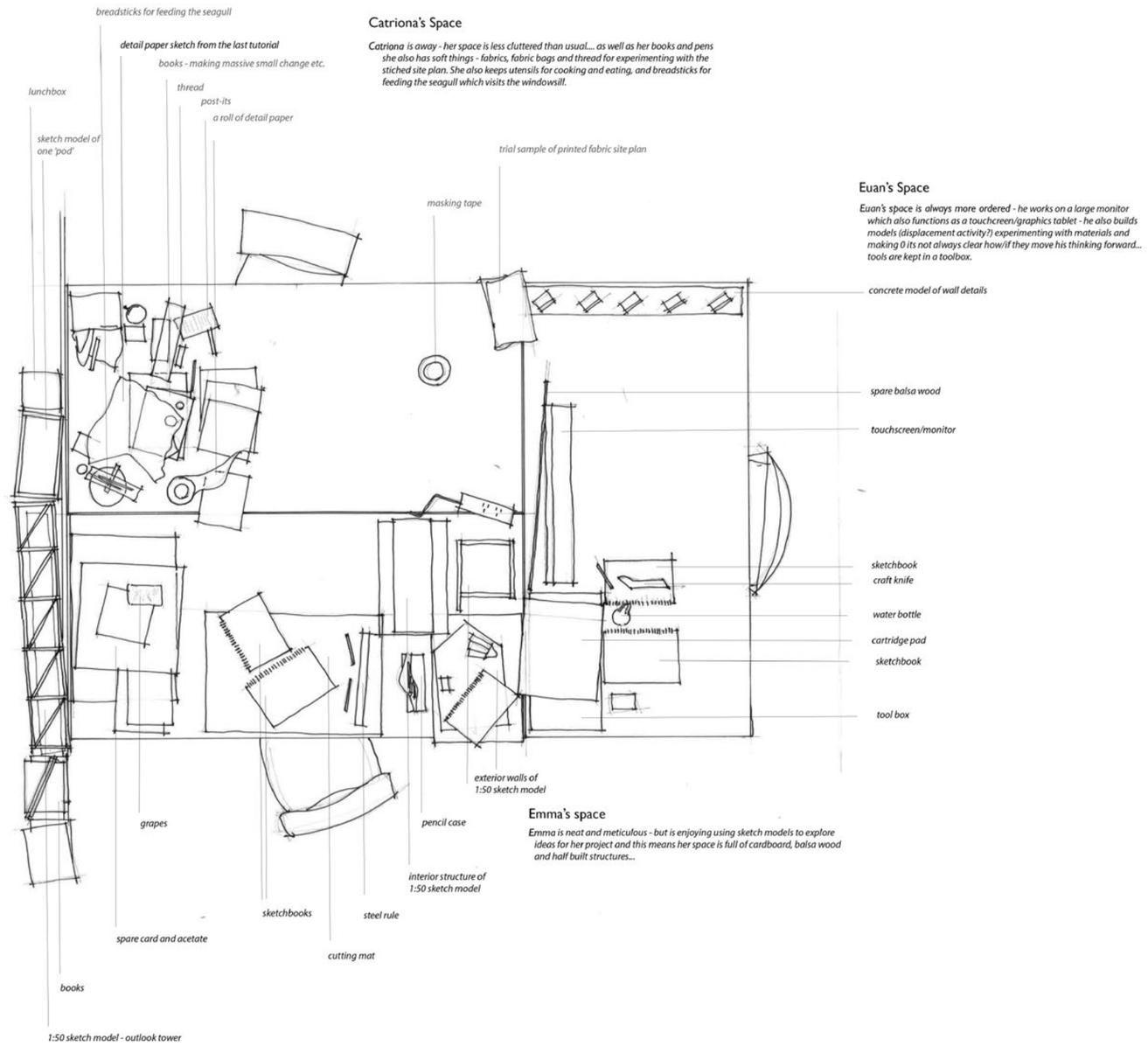


Figure 7.4: 15.02.2022:

Emma has temporarily put her models to one side to make notes in her sketchbooks, but the main model components remain on her desk, as does the cutting mat she uses to protect the surface.The tower model, built to test 'how high is too high' has been moved out of her way, onto the windowsill;

Catriona is away for a few days- her model has also been placed on the sill and her desk is covered by books, sketch materials et.; Even though she is absent, her desk is clearly occupied, and she has formalised the drawings on the board behind her – initially a 'left-over' from the January review, this has become a semi-permanent, evolving display.

Euan has finished his detail model and it is carefully positioned along the edge of his desk; he's now making a cast model of the building which formally occupied his site. All the students have reference books on their tables as well as materials and sketchbooks.

7.1.3: 28/02/22: Extending the surface

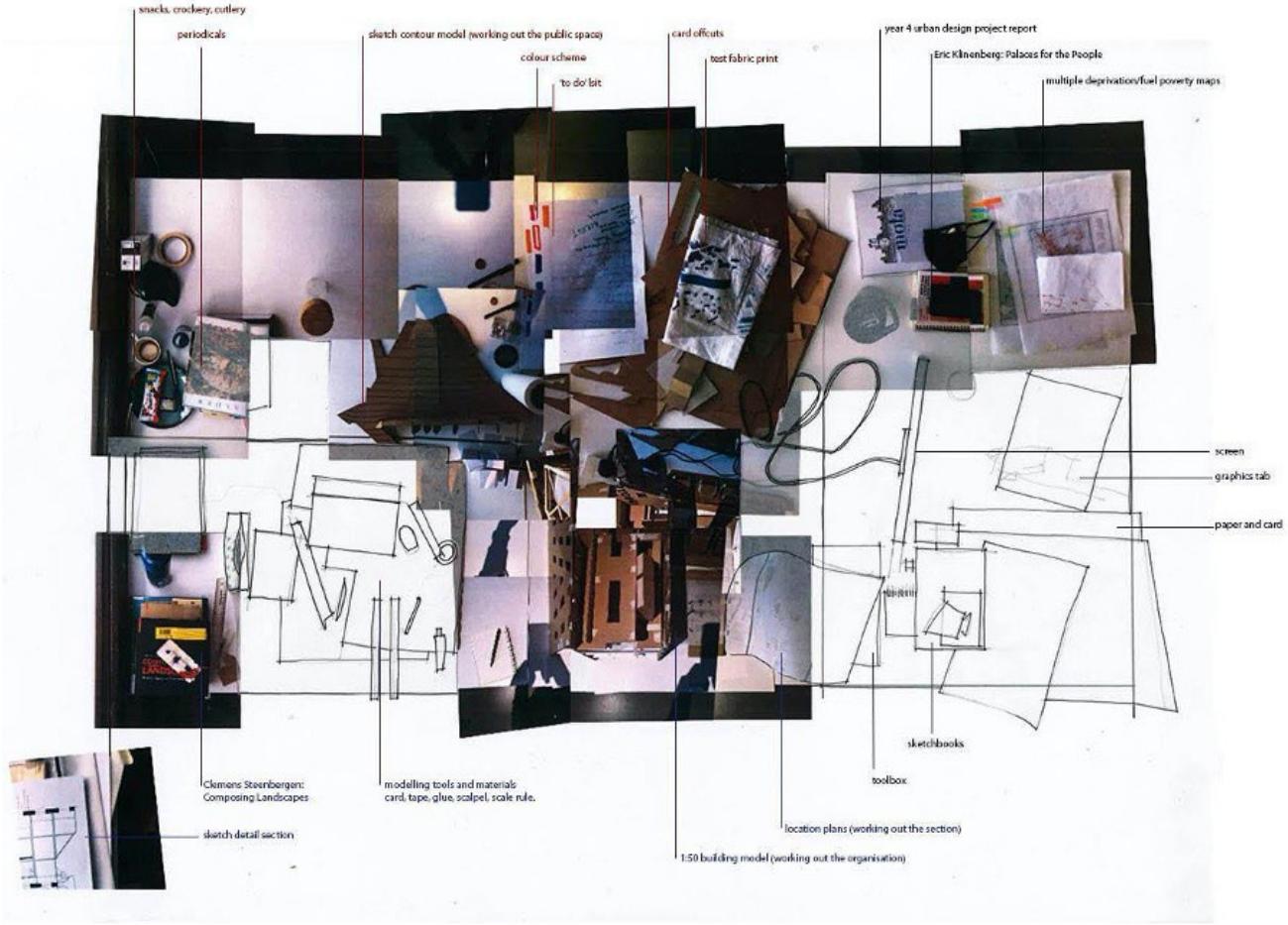


Figure 7.5: 28.02.2022:

Another table has been added to extend the available surface area for constructing models.

Euan's cast models have been moved into an adjacent storage space, in their place on his desk there is now a series of mapping studies and books he's reading to clarify his research questions, together with a copy of a piece of work he completed last year.

Catriona is constructing a site model of an existing public space - the contours are challenging and she needs to understand how these work in order to manipulate them.

Emma is continuing to make and remake her 1:50 model, but she's also now working at a much smaller scale (1:200) to understand the relationship of building to landscape.

7.1.4: 03/03/22 Preparing for reviews

Figure 7.6: 3.03.2022: Four days before the external review:

Euan has shifted focus to look at how his proposals will connect to the town; he's working on a sketch overlay of the site plan (by hand);

Catriona is away and will need to present her work over 'teams', so her models have been abandoned at least for this presentation.

Emma has taken the opportunity to double her workspace by temporarily occupying Catriona's space.

James, at the next table, has mirrored Catriona's approach by moving a screen to create a pin-up space behind his desk, using this to plan what he intends to present at the review.

Tables 1 and 2

As evident in *Figure 6.6* while this table was a distinct 'island' in the studio, it was one of three. The adjacent table was shared between three students who also worked primarily in studio but chose not to have identified individual workspaces, occupying whichever seat at their table was available when they arrived in the studio in the morning. These students would also leave some work-in-progress if it was difficult to transport, but they rarely left personal items. The remaining studio table was used only intermittently. The students who were allocated this space usually occupied it only when they needed to be present for tutorials or meetings. As the weeks progressed, one of the students on the adjacent table moved a screen to make a wall behind his favoured workspace *(Figure 6.6)* and used this to pin up his developing drawings. This *fixed* the more fluid occupation of the table which had operated up to that point and had the effect of further isolating the remaining table. This continued to be largely unoccupied and consequently was often used as spill-over layout space.

There is little space here to expand on why some students chose to work in the studio space and some prefer to work elsewhere, and any comments I could make would be largely speculative. More targeted and evidenced studies have concluded that some students find the 'forced sociality' of studio working uncomfortable as their work is effectively always on display to their peers (Corrazo and Gharib 2021). It is probably significant that two of the students who used the least occupied table as their base had only recently joined the cohort (in September 2020), and had not previously shared studio space with the other students in the group, and that all three, while fluent speakers, used English as a second language.

Figure 7.7: 11.02.2022 The least occupied table being used as a temporary layout space for the group's textile site map

7.2: Locating the table

The studios at the University of Dundee are large, purpose-built spaces constructed in the 1970s. The building is often described as brutalist due to its exposed concrete construction, but its defining spatial character is more closely aligned with the Dutch structuralism of Aldo Van Eyck and Herman Hertzberger (Stevenson-Brown et al., 2018). The building's spaces are organised by a primary structural grid of concrete columns in-filled by glazed or block-work walls to separate rooms which are arranged along an internal, multi-level 'street'. This street was designed to create incidental and unprogrammed spaces to sit or lean and to gather, as well as to connect the rooms which open off it, thereby encouraging informal interaction between students and between disciplines. It is an inclusive social space - a 'social condenser' in the architectural terminology of its time (Murawski & Rendell, 2017). The building itself is often used as a reference in teaching. Its evident structure is pointed out to explain the structural principles of columns, beams and slabs and the traces of sawn-timber formwork visible on the concrete are used to discuss construction processes. Its robustness invites its occupants to engage - the concrete reveals a memory of its original formwork, but also pencil marks where dimensions have been marked out by previous students and staff, and its surface has been polished by the touch of generations of students at popular 'leaning' places - those that afford the best view of activities taking place on the level below.

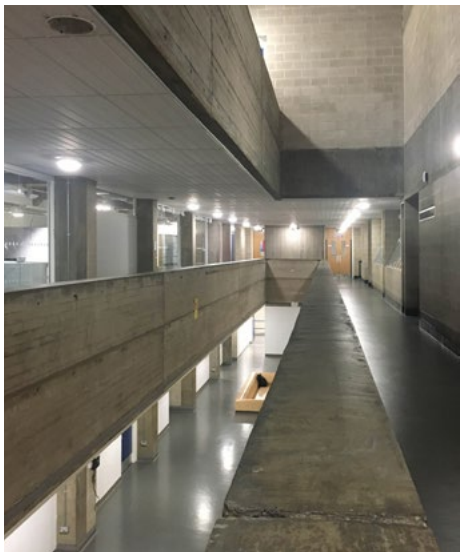


Figure 7.8:The Internal Street

The building is long and narrow, occupying what was once a medieval 'strip'. The architecture studios form an entire upper floor of the building, connected to other disciplines via the *voids*[2] along the length of the internal street. Years one to four are located along the East side in a single, top-lit space subdivided by fixed screens. Known as the 'main studio' this is a vast space reminiscent of an industrial factory floor and capable of accommodating individual desks for up to three hundred students. Year 5 students, both the core M.Arch and M.Arch with Urban Planning, occupy the area along the West side. These spaces are separated from the main studio by the internal street but visually connected by the internal glazed walls which open from both spaces.

The year 5 studio is less 'public' than the main studio. While its occupants remain visually connected access is controlled by swipe cards. It is also much narrower than the main studio discouraging its use as a 'through' space. However, it is still deliberately organised to encourage collaboration between the different year 5 studio groups which are separated by easily moveable screens.

2 *A 'void' is an opening in the floor slab. In this building they are staggered so that in some places along the 'street' this void works between two floors, in others they might stretch over three, four, or five floors.*

Locating the table

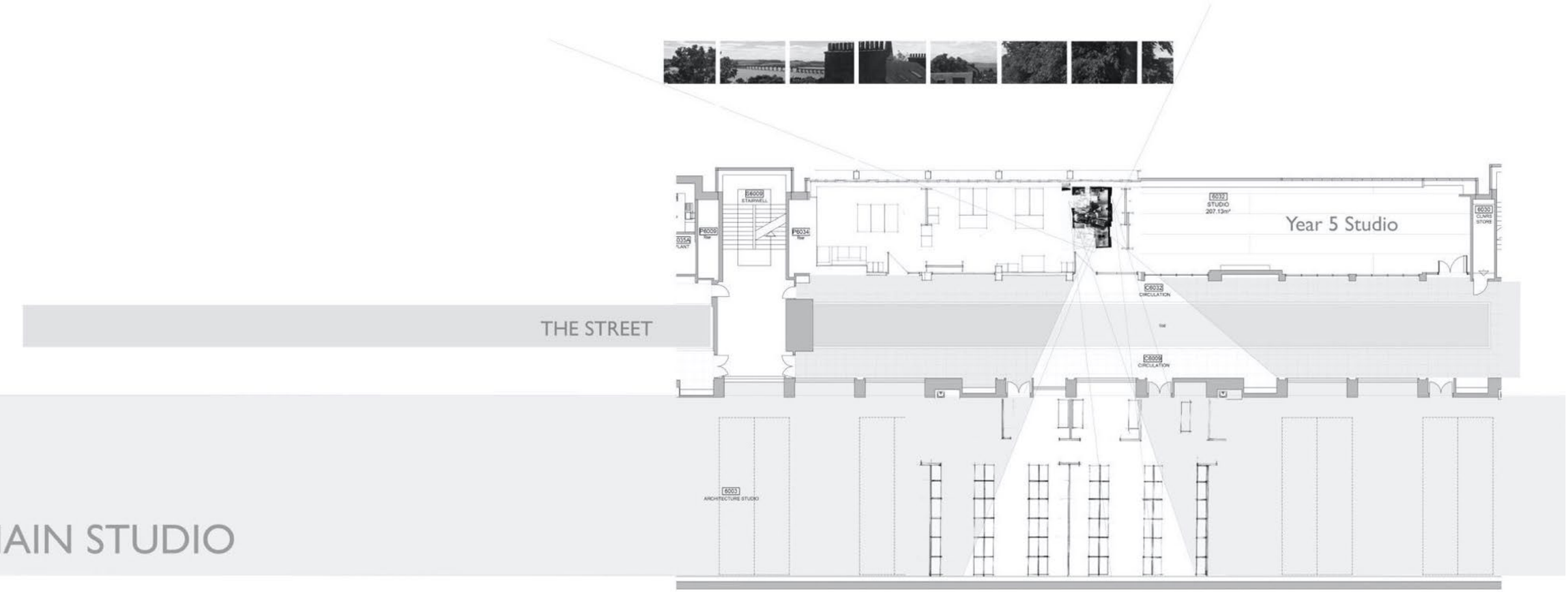


Figure 7.9: Locating the table: Euan, Emma and Catrionas' table is located between the internal street which runs down the centre of the building and which divides the undergraduate 'main studio' from the final year's more intimate studio spaces, and the city/landscape to the West.

Emma and Catrionas' positions afford them direct lines of sight across the void - they can observe and interact with students passing along the street and see the activity taking place in the main studio. At the same time they can see out to the landscape -

Euan sits with his back to the street -facing the world outside.

The year 5 studios are lit by, and orientated towards, windows opening to the west. In contrast, the main studio is internally focused - it is top-lit through roof-lights. The year 5 studio re-orientates its occupants towards the horizon - the external context of the city and its landscape - while remaining aware of the spaces they have occupied in previous years.

7.2.1: Locating the body

While the way space is occupied is not inevitable but more the result of a socio-spatial dialectic (Soja, 2013, Lefebvre, 1991) architectural form influences how inhabitants position themselves and plays a role in choreographing their movements. The width of the studio, the direction of natural light and the location of the power supply dictate where the tables are positioned, and therefore where the students sit. The dialectic between space and occupant may also be less obvious than simply where the doors and windows are located, and have more subtle effects on how the space is understood:

> A human being has a back, a front and two sides… the ground is below and above is the sky… each person stands at the centre of its own set of these six directions...Architecture sets up a resonance between an enclosure and an occupant (Unwin, 2009, p. 140)

The human body is continually aware of its proximity to surfaces even if they are beyond the realm of touch. This is a sensory awareness known as *kinaesthesia* which relies on subtle clues which may be visual, acoustic or haptic. While an awareness of our own position in space is what enables us to move through rooms without bumping into walls, it is also what conditions how comfortable, or uncomfortable we may feel within that space. How we orientate ourselves by understanding our body's position in relation to material things, architectural enclosure, and the world beyond is a process of continual readjustment. This is a dialogue between body and space: 'here/there: where my body is as opposed to where it is not, or might be; and near/far… the land on which I stand and the line of the horizon that lies beyond me' (Tilley, 2020, pp. 4 - 5).

Messina's painting St Jerome in his study is an image so often referenced by architecture students it is in danger of becoming a cliché (Heathcote, 2018) but it remains an archetypal depiction of a body/architectural space relationship. The scholar is at work at his desk - the space that it (and he) occupies is a 'study' but one constructed more like an elaborate piece of furniture; it lacks a ceiling and two of its enclosing walls and therefore resembles a stage; it's positioned within a space that resembles a church, which in turn is situated within a landscape. The space appears to be 'organised around the piece of furniture (and the whole piece of furniture around the book)' (Perec, 1997. p. 88). The scholar and his space(s) are in dialogue:

Figure 7.10: Antonella de Messina, St Jerome in his Study 1475 (National Gallery London)

> 'Here is a room so responsive to its inhabitant's particular physical and intellectual needs that it seems more like a protective garment. Each surface registers the physical presence of the saint, and even without him indicates the special character of its intended task... it is just as apparent that this room is only a fragment of something larger... carefully calibrated incompleteness situates the study within an implied urban context just in front of the picture plane while connecting this to a landscape framed and ordered by multiple fields of columns, windows... Within this rich contradictory setting, the actions of St. Jerome put figure and ground, and city and landscape into their multiple relationships.' (Dripps, 2020, p. 82)

The table I selected for this analysis is within the year 5 studio. This space sits on a threshold between the protected, internalised world of the institution and the greater complexity/messiness of the city beyond. This is an accidental but significant position which mirrors the more structured learning of the undergraduate studio and self-directed, independent agendas pursued in the final year. The studio table is also an evidently 'nested' location (*page 77*); it is within the MArch with Urban Planning area of the Year 5 studio, which are within the architecture floor of the art college buildings. This is a building which sits on the extreme western edge of the campus, looking out towards the wider city and the landscape beyond. Each layer of this nested identity is significant to how its occupants understand and relate to their 'place'.

7.3: The human actors (and their material proxies)

The three students who sat at this table, Emma, Euan, and Catriona, had known each other for more than five years and had often chosen to collaborate on studio projects before.

At the outset of the academic session 2021/22 the students were asked to complete two collaborative exercises, one informal and brief - an exercise in exploring the context from an unfamiliar perspective, and one a formally assessed component which extended over several weeks. The students who chose to occupy this table also chose to form teams for both these exercises, the first accidentally, the second as an active choice. The influence of both exercises can be traced in the subsequent development of their individual projects (as illustrated in Figures *6.13page 132,6.14* and *6.15*) and I have therefore briefly documented each here:

The dérive

> 'one of the basic situationist practices is the dérive [literally: "drifting"], a technique of rapid passage through varied ambiences'. (Debord, 2014

A *dérive* is a tool for understanding an urban environment developed by the Situationist International - a group of avant-garde artists working in Paris in the 1950s. It is unplanned and designed to explore the impact of place on behaviours and experiences (Debord 2014). This dérive was set as an exercise for the students' first visit to Blairgowrie. Students were asked to form teams of three, to map a random journey - to 'drift' - and to record what they experienced. This group's wandering took them from the town centre north and south along both banks of the river. They noted how distinct urban enclaves were characterised by not only

Figure 7.11 The Derive

the age of the majority of buildings but also how they were organised in space (and therefore the spaces made between the buildings) - the haphazard planning of the original village which had grown up around the church on the hill; the tight grid plan of the town laid out in the early nineteenth century; the mid and late twentieth century suburban and light industrial extensions. Back in the studio they were able to align their observations with historic maps sourced digitally. They illustrated their derive by collaging together maps from these periods and overlaying their notes. The map layered the existing reality with historical traces which continued to exert influence over the form of the town Buildings were represented which no longer existed in physical form, but which were echoed in the street names and property lines which defined more recent development.

The urban strategy

For this formally assessed task the students also formed teams, in this instance to complete an *urban strategy* project[3] a study which extended over several weeks. They were asked to identify a specific problem or opportunity evident in the town, and to develop a detailed strategy which might address this. Euan, Catriona and Emma (working with an MSc planning student) chose to look at rural fuel poverty. They had noted that the areas of highest deprivation overlapped with older areas of the town - nineteenth century buildings which were single skin stone construction and therefore poorly insulated, and where any possible alterations to improve efficiency would be limited by conservation legislation. They developed a strategy which considered energy transition to renewable sources (top-down) at a policy level, but also prioritised community engagement (bottom-up).

3 *This was part of the 'Statutory Planning' Module (page 20)*

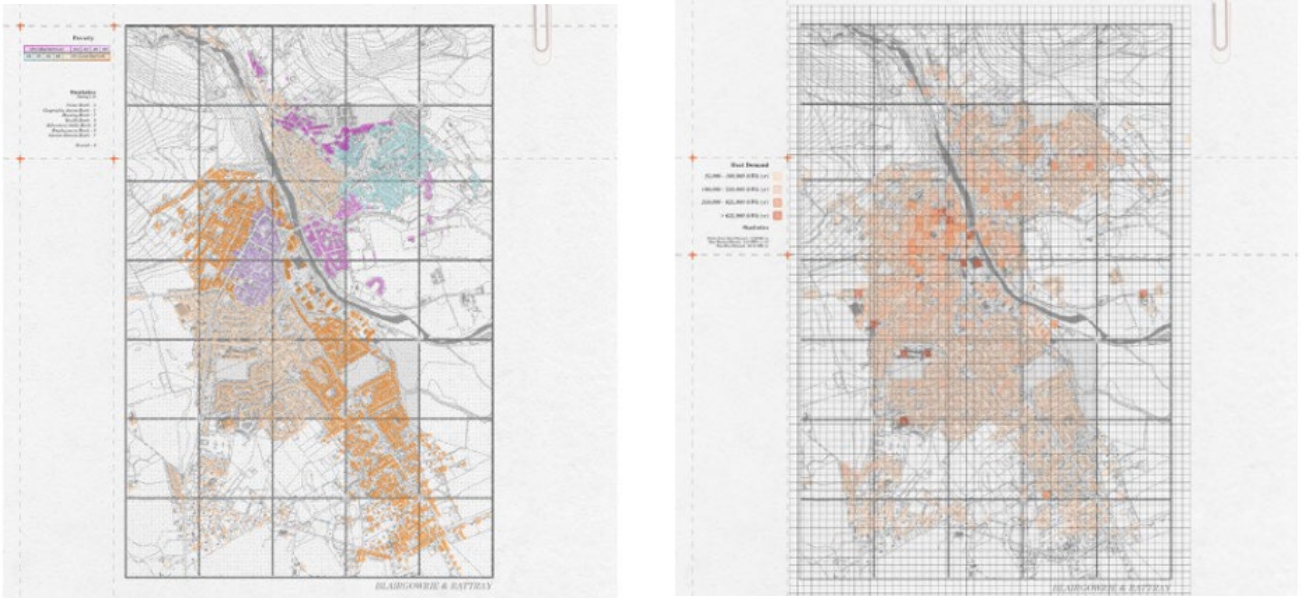
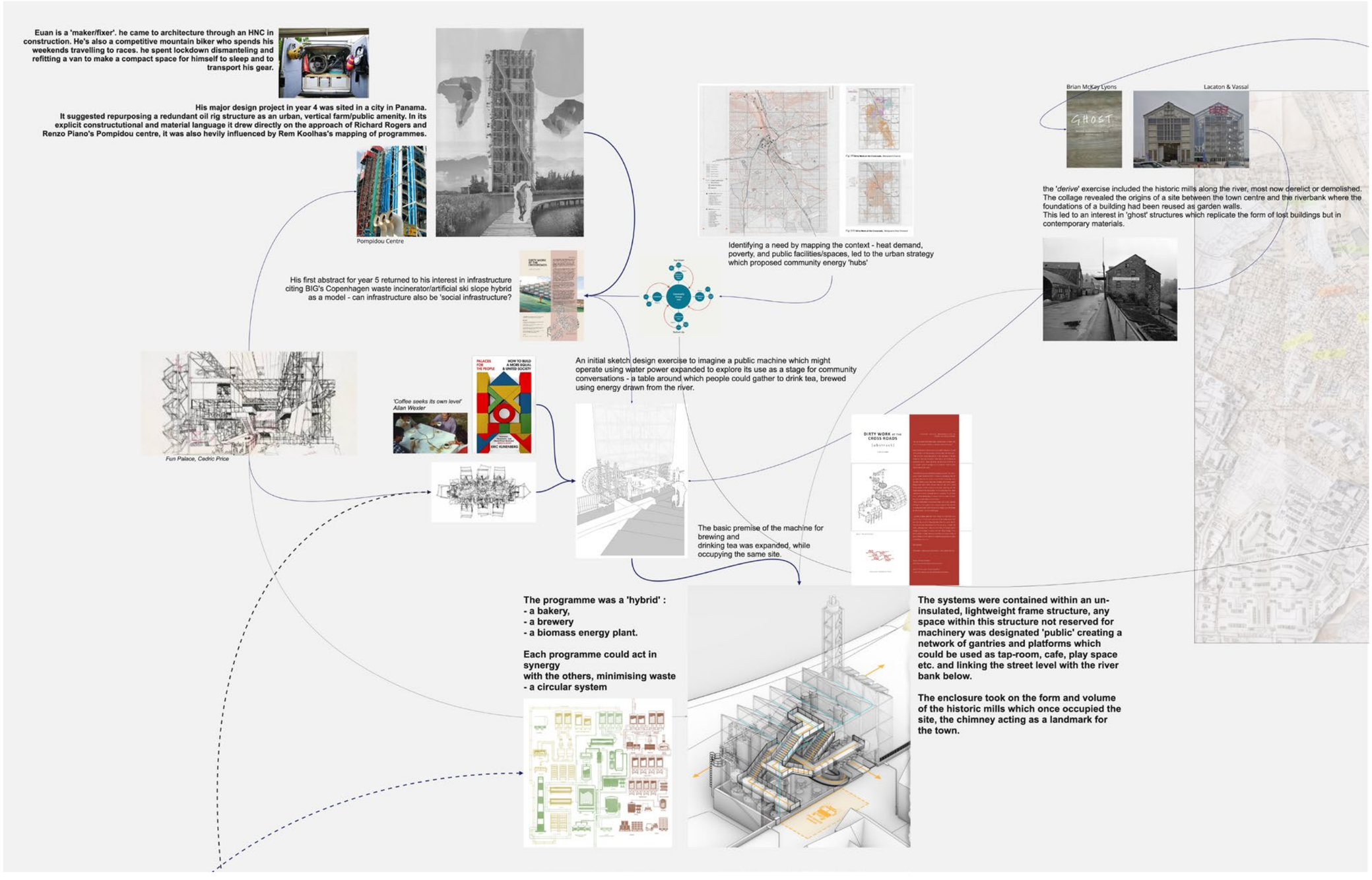


Figure 7.12: Mapping poverty and heat demand.

The strategy project contributed directly to the formation of research questions, and therefore the choice of building programme for Euan, *(Figure 6.12)* and more tangentially to the approach taken to efficient use of energy and collaborative space in the way that Emma's and Catriona's proposals developed. The first rough *dérive* exercise was the catalyst for Emma's study *(Figure 6.13)* her site being one of those visited on the students' *drift* through the town – while the observations around cultural memory and the traces of built form articulated by the collaged map were important in the theoretical framework of Catriona's study and reappeared in Euan's rationale for his choice of site, and the approach he took the developing an appropriate architectural form.

Each project reflected the individual concerns and interests of their authors. These were in some instances a reflection of the students' backgrounds and experiences before they had begun their studies in architecture, in others they built on work completed in previous years now seen through a *transdisciplinary* frame. A brief explanation of each has been 'mapped' on the following pages.



7.3.1: Mapping the project: *Dirty Work at the Crossroads*

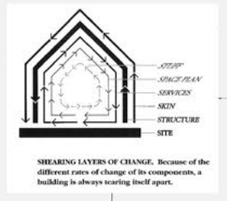
Figure 7.13: Euan – mapping the project (author's own using images created/collected by Euan)*

7.3.2: Mapping the project: *Back to Work at the Mill*

'never demolish, always transform'
Lacaton & Vassal.
This is part a wider agenda to make more sustainable descisions in 'recycling' buildings.

Emma's project began from a site. A semi-derelict mill which was first visited as part of the 'derive' exercise. This building is part of the town, but separated from it, reached by a well-used path from the town centre, but in a landscape context.

Haworth Tompkins



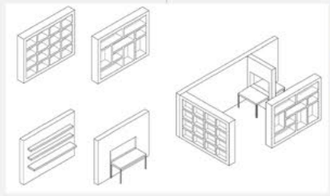
Stewart Brand's ideas around
'How buildings Learn' - i.e. that buildings can be understood as a series of layers under continual states of change, but that change being at different rates and therefore often in conflict.

This project perhaps began less from identifying a problem, than from identifying an opportunity in the form of a building and site which could be an asset.
Appropriately developing this building presented several problems which the project had to address:

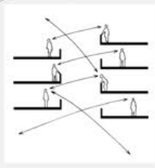
- **finding a new use which would 'fit'**
- **'connecting' the building to the town**
- **making the fabric environmentally suitable, while not destroying the character which makes it valuable as part of the cultural memory of the place.**

Emma's Project in year 4 proposed a co-working space as a way of re-energising the high street. The building she proposed was as much about creating spaces which encouraged people and ideas to interact as well as making appropriate workspaces which would meet practical needs.

Her project in year 5 took on a similar brief - could the mill become a different kind of active workspace and an economic driver rather than simply preserved 'heritage'?



Herman Hertzberger's agenda around how spaces structure and facilitate human occupation



The project in its final form was explored and presented at 3 scales

- **the 'distant' scale of the landscape**
- **the 'intermediate' scale of the building organisation**
- **the i'intimate' scale of the building fabric**

The mill's location, remote from the town centre on the northern periphery meant that it needed to act as a landmark if it was going to function as a public space.

This required investigation of the path and bridge as connectors, and the inclusion a tower as a visible marker. The height of this tower was tested to ensure it neither dominated the landscape, nor disappeared into the tree canopy.

Niall McLaughlin, Bishop Auckland

Figure 7.14 Emma – mapping the project (author's own, using images created/collected by Emma).*

Catriona was less often physically present working in the studio. Her background is important to the way she introduces herself. She was brought up on a croft, on an island in the outer Hebrides, the nearest settlement of any size being an hour's drive away.

Home figures large in her conversations, defining her academic interests and the way she approaches problems. Her parents are artists who manage the croft and supplement their income building and renting huts to tourists. She came into the studio wanting to look at rural development and building in the countryside.

During lockdown the community took on a project to rebuild a 'sheiling' as a bothy for walkers - a sheiling was a stone hut used by crofters during the summer months so they could shelter there when their cattle were on summer pastures.

Catriona recorded the build process through photographs which she subsequently combined with archive images to make etchings to illustrate a an essay of 'genius loci' and migration.

Chris Drury, Shadow Chamber

The oyster table is part of the 'climavore' project initiated by the arts collaborative 'cooking sections'. Sited on the coastline of Skye, it explores the relationship between place + food - natural ecosystems and how human inhabitation/exploitation disrupts these.

It is seasonal and temporal - acting as a structure inhabited by mussels and molluscs at high tide, and emerging as a table at low tide which is used for discussion/education purposes - reconnecting people to place through understanding how and where food is produced.

This is a fruit growing area. There is a large seasonal workforce who come to pick this fruit - originally travellers, now more often Eastern European migrant workers.

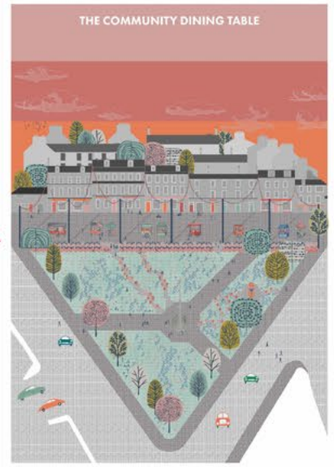
This history of seasonal migration, and the challenges/opportunities the temporal overlay of a different population and culture drove the project from the outset, as did the architectural language of the 'tin' sheds often used as housing for this workforce.This was a condition observed in the context - but one which clearly overlapped with Lorna's pre-existing interest in the relationship between culture and place, with the land and how it is worked.

Aldo Van Eyck's playgrounds designed for post-warAmsterdam were used as catalysts to rebuild communities.

They occupied bomb-damaged sites creating open-ended play 'structures' which enabled both children and parents to reconnect with their city and each-other

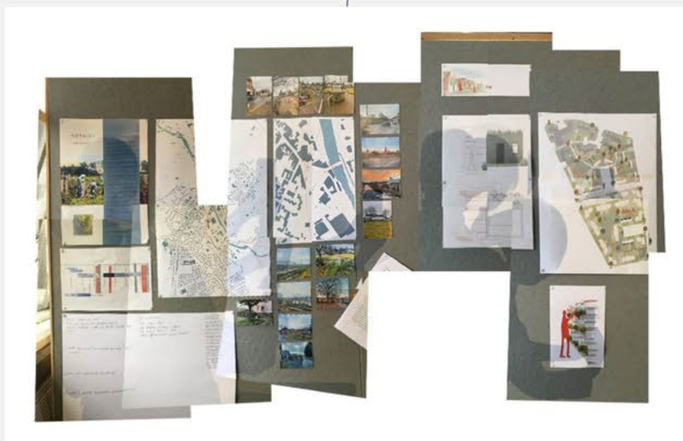
the artist Yinka Ilore constructed an installation in V&A Dundee in February 2022 - Lorna attended the opening.

There are perhaps two clear influences on Lorna's subsequent work - graphically her drawings became more colourful and narrative, and she expanded on the theme of 'event' to focus more explicitly on the potential of play to animate public space.



Ultimately the *Tin City* project centred on two key proposals:

- **firstly an event - the public space being re-worked to enable the staging of this - a dinner around 'the community dining table' which would be held at the start and conclusion of every picking season.**
- **secondly a system which leased living space 'bothies' sited in private gardens and community common spaces to seasonal workers - bringing the two communities into closer contact**



Catriona works through drawing.
The images she makes have an illustrative quality.

By mid-February, ahe had 'claimed' her space in studio by occupying the wall behind her workspace with:

- printed copies of site photographs,
- site plans,
- completed and 'in progress' prints of design drawings
- notes made at group meetings

This display was occasionally added to, but superceded work was not removed until the studio was cleared for the final exhibition.

7.3.3: Mapping the project: *The Tin City*

Figure 7.15: Catriona – mapping the project (Author's own using images created/collected by Catriona)*

7.3.4: Object languages

These three students have evolved distinct and different ways of using making within their design thinking processes.

Figure 7.16: 1:50 model - Emma

Emma's process was the most direct and the most consistent. She proposed the reuse of an existing historic mill. She used models to understand and to explore possible options for the space within the existing walls - making, and remaking different interior organisations which she could then slot into the same cardboard shell she had made to replicate the sandstone. This process enabled a tangible and relatively direct understanding of the spaces which might result. Putting an eye (or camera) up to a model allows a designer to literally see the resultant spaces (Yaneva, 2005). Emma was able to use her models to test potential design moves. To do so she employed specific scales which she had learnt the 'think within'.

After several years of building models Emma could envisage what abstract scaled measurements meant in real space - the relationship between a human body and the space she had constructed. A physical model temporarily *fixes* an idea at an appropriate scale (Rosbottom 2007). Emma began from a 1:50 model *(Figure 6.16)*, a scale which allows the exploration of space, enclosure and structure, but she went forward from this to use a 1:20 partial model to develop the relationship of specific material layers at a detailed level, and a 1:200 which showed her the landscape context. At all scales models draw together material, structural and spatial concerns into a coherent whole, 'revealing unconsidered problems and, sometimes, unexpected opportunities' (Rosbottom, 2007, p 15) in an iterative process of seeing moving and seeing (Schon and Wiggins, 1992).

Emma's models were always physical. These may be less time and resource efficient to construct and ammend than a digital model, but they enabled her to maintain a direct connection between hand, eye and space, and to use specific scales to focus on specific concerns:

> scaled sight is not an abstraction; it is achieved through judging the size of things in relation to ourselves. With cad, we do not operate at any particular scale because the image is severed from our frame of reference (Emmons 2013. p.71).

In contrast, Euan used multiple methods and tools *(figure 6.14)*. He is skilled in using a variety of software packages and used these to create both two-dimensional drawings and three-dimensional digital models[4]. He also made physical models, perhaps less as a 'testing' process and more as productive time away from his central design concerns: space to reflect-on-action[5] while constructing final presentation artefacts.

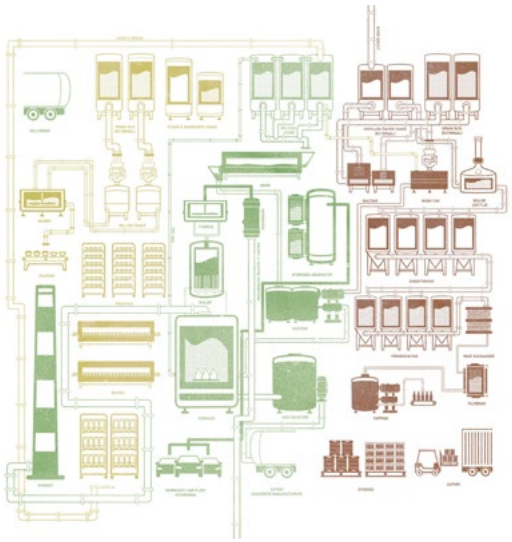


Figure 7.17: Diagramming the Programme(s): Euan

Most evident in the work that Euan produced were diagrams and mapping exercises made to reveal potential connections between systems *(Figure 6.17)*. Unlike the sketched notes which normally form part of an architectural design process, these diagrams were carefully considered to resolve and communicate spatial processes – the movement of materials and people, and they utilized a clear, personal graphic language. This approach was perhaps partially a consequence of developing a project in *architecture with planning*, as opposed to in architecture. Euan was less focused on the design of a building as a spatial object (as would be the focus in architecture) and, more on enabling a number of interlinked processes to operate in concert.

The project he developed sought to combine light-industrial processes with biomass energy production within a single closed loop to minimise waste; he combined this with more public uses to create *social* as well as industrial infrastructure (Klinenberg, 2018). To do this he was bringing his expertise in visual and spatial thinking to assist in untangling how these processes might intersect and create opportunities for synergy.

Figure 7.18 Illustrating the Tin City: Catriona

Catriona began at least two models between January and March but neither figured in presentations of her work for critique, either at the interim review which concluded this period, or in the final degree show exhibition. While she may have found these models temporarily useful they were both ultimately abandoned as unimportant to the final project. Instead she developed her project as a series of colourful, stylised drawings *(Figure 6.18)*.

4 A 3D model can be used to create drawings, and physical models via 3D printers etc.

5 It is not clear that either of the concrete cast models directly imfluenced the form of Euan's final design proposal, although they were included in his exhibition.

The drawing style Catriona developed enabled her to communicate a narrative - storytelling how people and transitory objects might temporarily occupy the spaces in the town over the course of the seasons. For the final exhibition these drawings were also used to construct a simple animation further reinforcing the narrative approach which underpinned her proposals.

As Schon and Wiggins expressed it, a design process is 'a reflective 'conversation' with the materials of a design situation. A designer 'sees, moves then sees again' (Schon & Wiggins, 1992, p. 135). A designer *externalises* their ideas through drawing and modelling and in doing so may recognise more possibilities in the artefacts they produce than had originally been intended. The works-in-progress which occupied the table were part of each student's individual, learnt process of 'grasping' (Sennett, 2009) or 'searching' (Pallasmaa, 2009). They were also the product of the problems that the students had identified, and how they had *framed* these problems *(page 59)*. If Emma had not elected to work with an existing stucture, she may not have used physical models to investigate and test its spatial perameters; Euan needed to diagram the relationship between processes in order to untangle their complexities; Catriona's project was more about the temporal occupation of space than the design of the space itself - animation allowed her to tell this story.

By positioning these evolving material artefacts in the semi-public forum of the studio the students consciously and unconsciously widened their individual 'reflective conversation' by inviting formal and informal critique from peers and studio visitors. The work-in-progress on the table was in a 'public' space and therefore encouraged 'peripheral participation' (Robertson, 2002; Vyas, Van der Veer, & Nijholt, 2013). The vertical and horizontal surfaces of a studio, which accumulate images, notes and sketches etc. have been termed 'artful surfaces' by Vyas and Nijholt, who argue that such surfaces act both functionally and inspirationally, that they are 'not just the carriers of design-related information but importantly they are sites of methodic design practices' (Vyas and Nijholt, 2012, p. 178). These practices might originate with the individual but in a shared studio one artefact might act within multiple design processes. Whether the students were physically present in the studio or not, the table and its environs 'spoke' for them when they were not there (Tagliabue, 1994). The models and books they left on the table and the drawings they pinned to the wall initiated a dialogue both between the those things, and design practices they were part of (Tagliabue & Lahuerta, 1996). One student might elect to 'shift' scales and consider their design problem through the perspective of landscape, this would initiate a response in the others who saw the potential this tactic might have for them, and one drawing out the choreography of an activity would provoke the others to consider and discuss how their own proposals might similarly be tested.

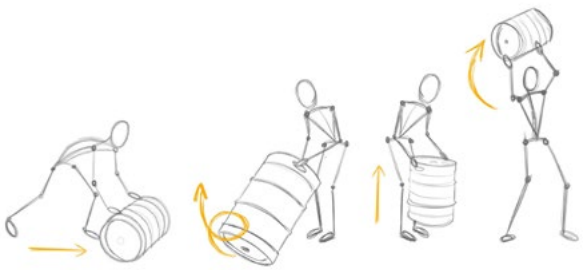


Figure 7.19 Choreography of Use: Euan

7.4: Shared space(s)

> In design studios, communication and collaboration between co-designers rely as much on different visual and physical aspects as they do on verbal aspects. (Vyas et al., 2013)

The M.Arch with Urban Planning studio (the space and the programme) was designed to encourage active collaboration towards shared goals and critical discourse between peers - sharing work-in-progress to elicit feedback 'early and often' (Cross, 2001). While formal critique is central to studio teaching (and is the focus of chapter 8 *page 163*) the less structured and more spontaneous informal critique that characterises a design studio is equally valuable (Corazzo, 2019, Gray, 2013, McClean and Hourigan, 2013). Students see what their peers are working on and they ask questions. Being required to verbalise design shifts the designer from *reflection-in-action* to *reflection-on-action*.

The table in this instance acted as a collaborative surface. The projects that the students developed were individual, as were the visual methods they employed. In this context it is not so easy to 'compare progress', an aspect of studio culture normally valued by students (McClean and Hourigan, 2013), but it is possible to identify shared concerns emerging in what may be radically different projects. In recording the table as it evolved, I was able to trace how practices emerged and re-emerged at different locations and in different forms around the table, for example the shifting of scales from detail to landscape/strategic level.

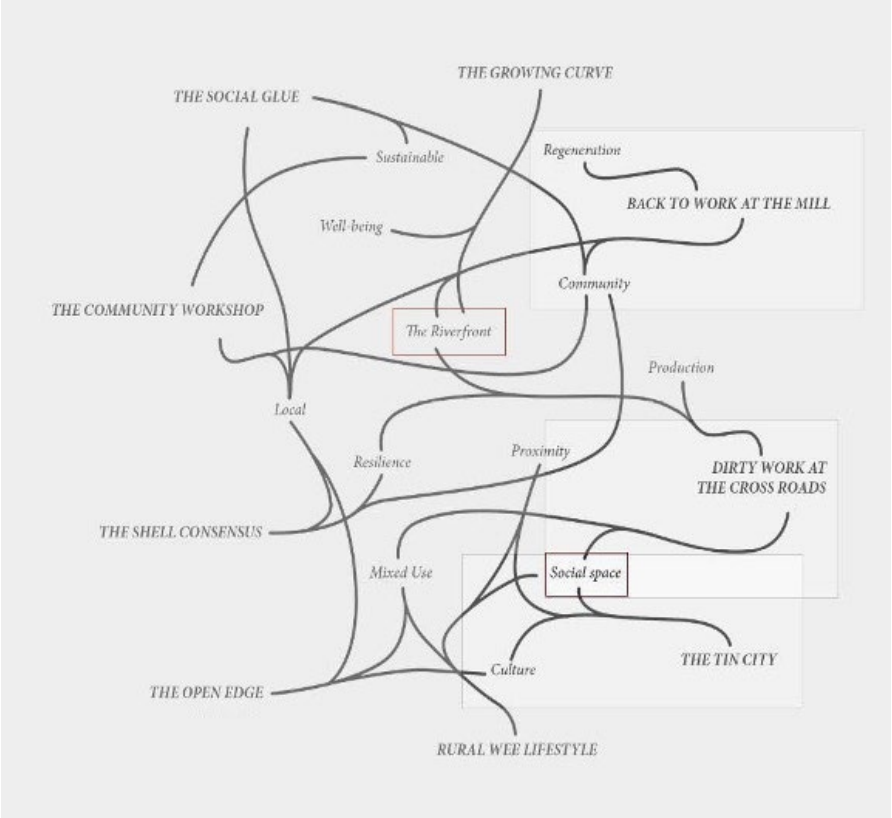


Figure 7.20: Annotated version of the studio's network diagram, illustrating the overlaps and connections between projects developed around the table.

While the projects discussed above were not *co-designed* but reflect the individual ideas and preoccupations of their authors, they do form part of a wider studio 'project' - an aspect of the studio which is explored in more depth in chapter 7 *(page 145)*. The projects were developed as interdependent both in terms of their underlying vision and in how they would operate if realised. Producing a shared, studio-wide 'vision' created the framework for a shared creative conversation as envisaged by Cross (1999). The necessity to produce a *design research project* in their final year (rather than a *design*) shifts the emphasis from solving design problems to using design problems as a framework for research (Rendell, 2004; Till, 2005). The studio's *vision* was therefore that catalyst for a shared discourse exploring the complex territory of urbanism. The table could be considered simultaneously a dialogic workspace (Wegerif & Mercer, 1997). Practices travelled, but also ideas.

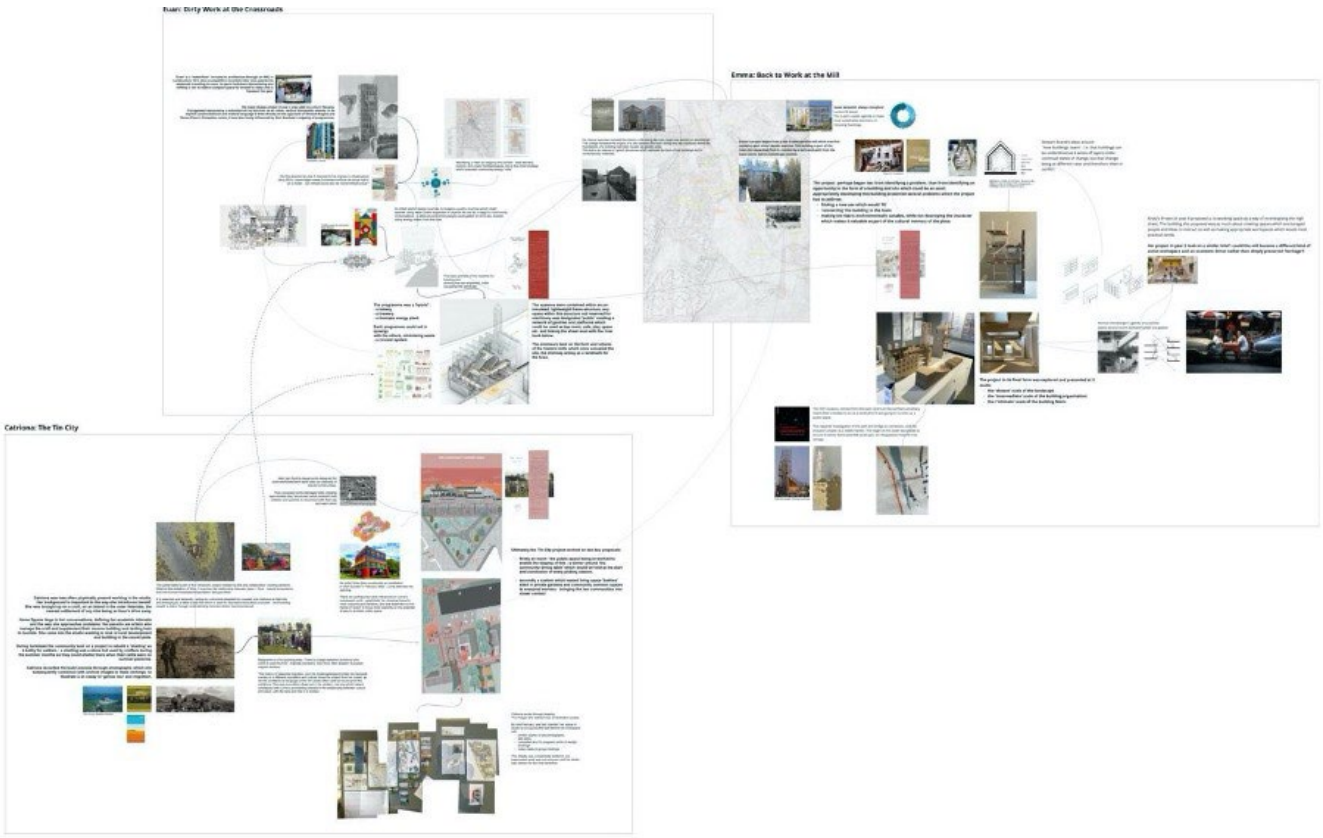


Figure 7.21: mapping the dialogic space (author's own 'Miro' board, constructed using images created/collected by the students). This illustrates is how Figures 6.13, 6.14, and 6.15 are connected.

The table as a point which 'gathers'

> The conceptualization of studio surfaces is not limited to different physical locations or physical objects and their placement, but more a phenomenological notion of 'place' that interweave material, social and situated view of studio surfaces. (Vyas, Van der Veer, & Nijholt, 2013, p. 430)

A 'place' can be understood as space that has 'accumulated particular meanings at the level of the individual and the social' (Cresswell, 2014, p. 4) but Cresswell also proposes a subtly different interpretation, that is a

unique 'gathering of materialities, meanings and practices' – an assemblage. Design practice takes place at tables. They are used for individual 'seeing-moving-seeing' work; as a frame for discussion and informal critique; and they are also the surface upon which the accumulated artefacts which arise from this thinking are stored (Clancy, 2017).

Cresswell's 'materialities' include those physical things identified above: the location of the studio, which fixes the location of the table; the physical properties of this enclosure and the tables and screens which define it; the more transient 'stuff' (Brand 1994) which occupied the table, sometimes over weeks and sometimes only for hours or moments. The 'artefacts' I have referred to - the models, drawings, tools and books - Cresswell would term 'things'. As he points out 'things travel' and in doing so both acquire and lose meaning (Cresswell, 2014, p. 10). Positioning a model on the table made it an active part of the individual and shared design enquiry, placing it on the adjacent window cill moved it literally, as well as metaphorically, to one side. Meanings might become attached to materialities - both locations and things - through their representation, their naming, and through the telling of *stories* – 'places are sites where stories gather. Individual stories… collective stories, official stories, subversive stories' (Cresswell, 2014, p. 11). Catriona brought her personal understanding of the intimate connections between seasonality and rural life to the table, through discussions which centred on the 'oyster table' *(page 134)*, and Euan his experience of *making* through the story of his 'made to measure' van *(page 132)*. Emma constructed and reconstructed her models of the mill - cardboard became stone and imagined future narratives of occupation unfolded. Places also have the effect of 'gathering' practices and constructing choreographies of use.

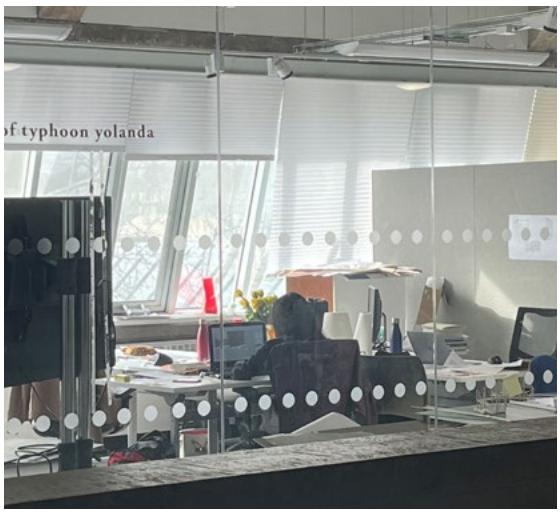


Figure 7.22 The same location in 22-23 occupied by a different group of students. It is differently configured, the students work in a different way and bring different things to the table.

Gathering in this interpretation works along a notional horizontal axis, while the vertical axis locates, or 'fixes' a place as, for example the table, within the studio, but even the material *place* is subject to change. A place viewed as an assemblage exists in a particular location and at a particular moment. It enables or prohibits potential future place(s). Materialities, meanings and practices are gathered, and are also dispersed. Catriona, Euan and Emma used this surface, in this way, over a period of weeks. The space that they occupied remains but the students who work here now are concerned with different questions. They bring different experiences, preoccupations and ways of working to their configuration of the same tables. But while much of the ephemera of printed drawings and cardboard models has since been recycled the ideas that the students explored and the insights they gained have become part of a collective

narrative (and digital library) of the M.Arch with Urban Planning studio. They will also continue to form part of their author's narratives, now dispersed and situated in their respective professional practices.

7.5: Conclusions

This story revolves around one table, considering how this one surface constituted a site for constructing the three projects which emerged from it, how it was situated in the studio, and the building, suggesting that this site also has physical zones of both influence and effect (Burns and Kahn, 2005). By visibly occupying this space, and by using it to consciously and unconsciously display their work the students were signifying both their ownership of this space and membership of this studio. Their identities as final year MArch with Urban Planning students were on display to the other occupants of the building. Beyond the immediate, the 'things' that the students brought to the dialogic space of the table evidenced a much broader zone of 'influence' *(Figures 6.13, 6.14, 6.15)*, and its zone of effect is likely to similarly extend.

The observations and analysis presented here have made evident the role played by physical studio space in the development of design practices. A studio is more than a convenient workspace. It is not a neutral back-drop but plays an active role in learning - structuring collaboration and enabling informal critique. Studio as a method of teaching remains central to architectural education. But as universities move towards 'hot desking' models in an effort to cut expenditure and increase student numbers (Cai and Khan, 2010) studio space which 'belongs' to specific students is less common. This has the potentially chilling effect of removing the material artefacts which leave traces of process, and with them opportunities for chance conversations which may evolve into productive critical dialogue. Conversations may still happen around laptop screens glimpsed over shoulders, but the models, drawings, diagrams and sketches, reference texts and notebooks left on the table in the M.Arch with Urban Planning studio enabled the students to engage with each other's ideas - whether their original authors and owners were physically present in the studio or not. By being 'on display' (Corazzo and Gharib, 2021) they also enabled those conversations to extend beyond this specific table, and this studio to students who were simply passing by along the building's internal street.

Painting the model: 10/05/22

8: Representations of Place: "*so ugly it's beautiful*"[1]

> If place is one of those moments when thought is woven with reality… In this sense, the drawing, even the paper itself, is place for an instant (Miralles, in Weinstein, 2007)

The site of the table discussed in the previous section might be commonly understood as a *place* in that it has a fixed location, but the sites discussed below, while they might also gather *materialities, meanings* and *practices* (Cresswell, 2014), are perhaps less clearly defined as places in their own right, having been constructed primarily to represent somewhere else. The models, drawings and artefacts that the students produced did not have a fixed location but moved between digital and physical spaces as they travelled between the workshops and the studio, before coming to (temporary) rest in the final degree show exhibition.

As previously discussed *(page 87)* all *M.Arch with Urban Planning* projects are sited in real places in the form of towns or city enclaves - they emerge from a reading of the place and its areas of 'control, influence and effect' (Burns and Kahn, 2005). The students must therefore explain, through the way that their projects are communicated (in drawn and modelled as well as written form) their understanding of the place as it exists and how their designs might shape its future. As all the projects also exist within the same shared studio *vision* for the place, a studio will normally share the task of making drawings and models which illustrate this context. They will use these to introduce, discuss, and present their final proposals in their final degree show exhibition and for assessment[2].

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1 This comment was made by one of the students in conversation with external examiners.

2 The work is assessed through the visual work included in the exhibition, and through accompanying texts, it is not assessed on verbal presentations, but these are used in presenting the work to external examiners evaluating the course standards.

The *site* is a key determinant for all architectural design; the site plan or model acts as a scaled proxy for the physical place, temporarily located within the studio. It becomes the ground against which design work is tested as it evolves – but the representation itself will act as a filter, it cannot reproduce reality exactly. Models, drawings, and maps must necessarily be selective in what they show. They illustrate what their authors observe and record, and in doing so what they decide is significant. In its production, a site representation acquires meanings and values - there is an 'exchange between the real and the representational, the extrinsic and the intrinsic, the world and the world as-known'(Burns and Kahn, 2005, p. 11).

In session 21-22, the usual site model followed an unexpectedly forked path which led to two outcomes: the expected 'controlled' and more conventional scale model, and the unexpected 'risky' stitched textile map. This story follows the processes and decision-making which surrounded the production of both. Having in the previous chapter *(page 117)* considered the role of the studio space in actively shaping discourse – how might the material artefacts made by the studio 'act' in the co-production of design knowledge?

A shared site model is always a significant undertaking which requires all students to collaborate effectively both in taking design decisions and in sharing the workload. My initial decision to *follow* the model's production *(page 113)* was prompted by two questions: did the students use the process of model-making as a way to develop their understanding of the context? And might its production constitute a collaborative 'design project' in its own right? Following the design process revealed how these artefacts became catalysts for shared thinking which structured conversations in the studio.

This story therefore explores how discourse and knowledge emerged around what ultimately became two parallel sites, and how engaging with two differing material practices shaped these outcomes. The two forms of representation that the students used articulated the same *vision* but took fundamentally different approaches to method and scope. This created an invaluable opportunity to examine how they acted differently in the development of critical positions, particularly the attitudes the students took towards *risk* when working outside disciplinary norms. The unfamiliar methods that the students adopted led them to venture across disciplinary boundaries. Their approach raises important questions - who is the intended audience for these representations - who are students communicating *with*? And following from this, what is considered a 'good' architectural representation, who makes these judgements, and against what criteria? The answers may have implications for the students' emerging critical approaches to practice, and thereby on their identities as 'hybrid' professionals.

This section maps the design and making process, concluding in the exhibition which took place at the end of the academic session.

8.1: Context: Shared Representations

> In architecture school, we typically work with abstractions. Students make drawings and models that by definition refer to something else (Guthrie 2005, p. 1)

Students studying architecture are asked to make and communicate design proposals. It is worth reiterating that even though it is often treated as such in an educational context a *design* is not an endpoint, but a 'constructed in advance representation that will determine essential features of the eventually to be completed artefact' (Medway and Clark, 2003, p. 256). Nor is a *design* a set of drawings or models. It might be best understood as a complex of ideas which rely on material re-presentations both to emerge - through an iterative reflective process - and ultimately to be understood by an audience in the form of a client and/or builder.

As described in the previous story *(page 132)* the students' projects are individual, but in the M.Arch with Urban Planning studio these individual projects exist within a shared *vision* they develop for the context on which they are asked to work. The studio's summary of relevant information about their given place, their interpretation of this, and how it has shaped their common approach to its future development is visited and revisited as the year progresses. It is presented by the students at the outset of each review[3] as a framework or lens through which to consider all the individual projects.

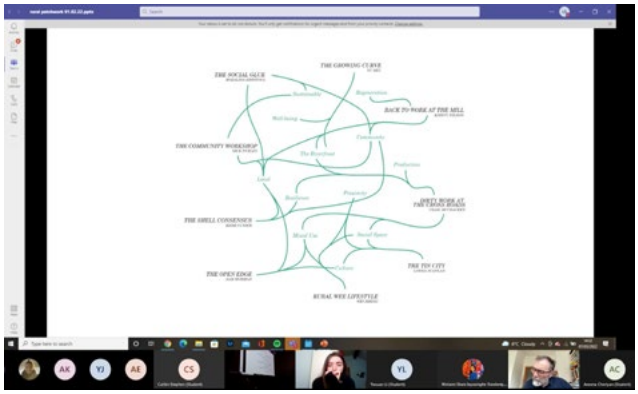

Figure 8.1 Screenshot of the students presenting their shared vision at interim reviews (digital) 7/12/22.

The studio's shared *vision* informs the approach all the students take - it creates the broad framework for the development of individual design projects[4]. This is a form of shared *positioning*: 'We name the things to which we will attend and frame the context in which we will attend to them' (Schön, 1983, p. 40). Each individual designer then further narrows these parameters and establishes their individual 'placement' within that frame. While this collaborative agenda is not formally assessed, its importance in shaping individual projects is emphasised from the outset (in the introduction to the studio) and is reinforced at each review through the comments and questions asked by each new critic. It will ultimately be communicated using a variety of formats including exhibited drawings, verbal presentations supported by PowerPoint presentations and films, and

3 *'Reviews' or 'crits' will be discussed in chapter 8 (page 163)*

4 *The students may agree for example that all projects should as far as possible encourage biodiversity, and this may be interpreted more specifically as it relates to a specific site or programme*

often physical models. The *vision*, how it is developed, and the methods used to communicate it, are decided by the students - they therefore vary for each context studied and each academic year.

As discussed previously (*page 97*) all representations, whether two, or three-dimensional, cannot be considered neutral. They are *authored* - the result of a series of conscious and unconscious decisions. Drawings and models made by multiple authors may reveal the traces of many different perspectives, and how these have been aligned through processes of discussion, critique and compromise. They evolve through several iterations and over many weeks. They depend on the students sharing skills, time, and material resources to overcome challenges as they arise and to achieve the best outcome possible.

8.2: The model

A model is more universally accessible than an orthographic drawing (which relies on its reader's familiarity with drawing conventions and ability to appreciate scale) and arguably more *neutral* as it does not prescribe a singular viewpoint. Despite this it will still reflect a series of authorial decisions including its scale and extents, the material(s) and the methods employed in its construction, and the cost and time resource that are invested in that construction. In this respect, the design of a model can begin to mimic real-world practice constraints - a position not often found in academic architectural design studios where the physical outcome of a design process is rarely an artefact in the form of a building.

At its most basic level a physical model is usually used to show the topography, natural and built form, where new proposed structures are located and what form they take. Depending on its scale, and on how early in the development of projects the model is constructed, it may also be used to test *massing*[5] models as part of a design development process.

Scale and extents:

As evident in Emma's models discussed in chapter 6 *(page 135)* analogue architectural drawings and models are constructed at a specific scale - for example 1:20 might be used to communicate construction details; 1:100 of the same building would effectively show the relationship between rooms; and 1:500 might be used to explain the relationship to the wider context. The digital space, which is now most commonly used for constructing design drawings and models, is potentially infinite and scaleless. Only when digital drawings or models are physically printed will the scale selected dictate what kind of information they communicate and how they might be used.

5 *Massing models test the size and form of a building, usually in the context of its surroundings.*

The larger the scale selected, the more depth and detail a model can show; the smaller the scale the more difficult it becomes for a viewer to project their imagination into the space portrayed, it becomes more abstract - a phenomenon known as 'gulliver's gap' (Porter 1997). However, too large a scale and the model's physical size when constructed in real space may become impractical. There will be a relative impact on cost, time to produce, and the materials and methods of construction that can be employed. It should also be noted that larger and more detailed, does not necessarily equal *better* - a smaller scale will necessitate editing of content, and can therefore reveal insights which might be lost amongst 'too much information'. A balance must be found between a reasonable (achievable) size and a reasonable scale which can adequately communicate the context and illustrate design proposals.

In parallel with a scale, it is necessary to agree on how much of the physical context will be included - the model's *extent* - as this will also dictate how large the final model will be. This inevitably becomes an exercise in agreeing on what is minimum required to adequately explain the projects and their contexts, what in addition may be fundamental to understanding the wider place, and what can reasonably be excluded and/or shown via other means. While the model does not prescribe a single viewpoint, in agreeing to its extents its authors have selected a frame - they have literally decided on where to 'cut'.

8.2.1: Timeline: the model as design project

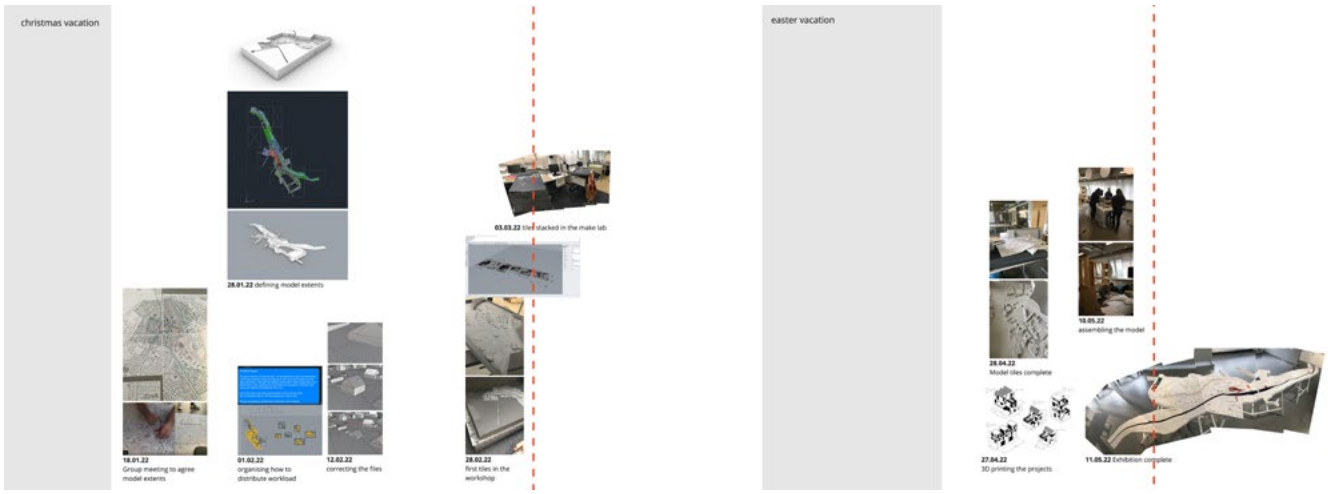

Figure 8.2: the timeline of the scale model - the red lines were major review points.

The first stage in the design of the model of was a studio meeting to agree on its extents, held in the first week of the second semester. This was a 'hybrid' meeting as some of the students were not yet back in the studio, so while several students worked around printed maps, others followed the conversation and contributed via smartphones and i-Pads. The printed drawings laid out on the studio floor allowed the students to discuss and agree on where lines needed to be drawn - enough area to show different aspects of the context and proposed interventions while appreciating the size any consequent physical model would be.

The decisions taken at this meeting were not considered final. The proposed scale was reduced to ensure that the final model would be achievable, and the students' initial ambition to include the entire area within the town centre boundary was reconsidered. Ultimately some built-up areas which were not viewed as key were excluded and more of the landscape context along the river included. At one point in this extended conversation[6] the possible size of the model was marked-out in masking tape on the floor, allowing the students to visualise how much of their final exhibition space the model would occupy.

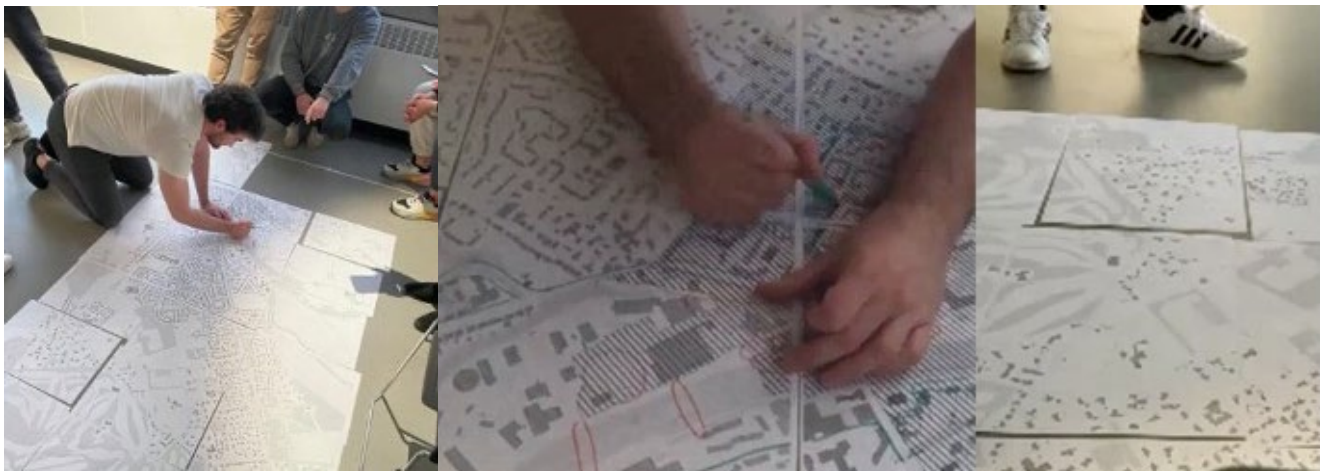

Figure 8.3. designing the site model 17.01.22

Early on the students decided not to place the model on a base. A more usual approach would be to draw a rectangular frame around the area to be modelled and to construct everything within this frame but the edges of this model were dictated by built and topographical features - some existing and some designed as part of the students' proposals. The rationale for this approach was twofold: the more material which could be cut away, the cheaper and faster the model would be to construct; but also the 'frayed' edge allowed primary roads to extend indicating connections beyond what was actually shown. Axis lines terminating in key landmarks were also included without the necessity to include all the intervening context - this meant that the model could reveal more effectively the *primary elements* which the structured the townscape (Rossi, 1984). Key to the model's final form was the river, which was clearly revealed as the armature or spine which both defined the town and simultaneously divided it in two[7].

The students decided to construct the model by 'CNC routing'[8] - replicating a digital 3D model physically by progressively routing away material from a solid block to reveal the form. The students had access to a CNC

6 The conversation went on (intermittently) over several days before final decisions were taken.

7 Historically Blairgowrie developed at a strategically significant crossing point on the river Ericht and grew rapidly in the nineteenth century due to the power it provided for textile mills. The modern town is formed of two settlements – one (more prosperous) to the West of the river, the other (more deprived) to the East. The two are linked by only two bridges, a busy road bridge leading directly into the centre of the town, and a pedestrian footbridge 10 minutes walk North. A significant element of the student's vision was to 'stitch' connections across the river at several new locations.

8 Computer Numerical Control

router located in shared workshop facilities but given the restrictions on access necessitated by Covid protocols they were not permitted to manage this process themselves. Instead they were required to send digital files to workshop technicians who would then process these.

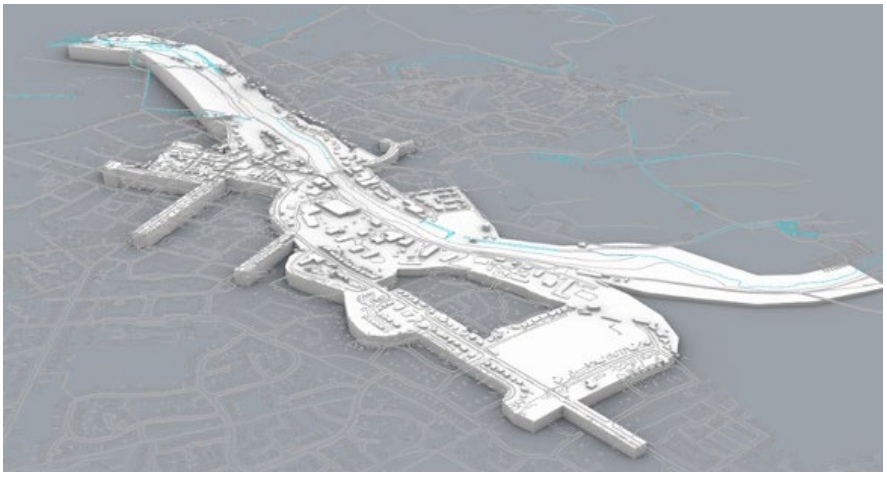

Figure 8.4: Digital model 28.01.22 - how much might be cut away, how much must be included in order to adequately explain the projects and their relationship to the town?

The material chosen was a high-density foam insulation board which could subsequently be sanded and painted. This material was cost-effective and quick to machine. Given the model's size, time was an important consideration - the workshop has only one CNC router which must be shared between all students across art and design disciplines. High-density foam is available in standardised sizes and depths, and the router has a maximum bed size and depth to which it can cut, both factors meant that the model was designed as a series of *tiles* which could be joined together once complete. These were mapped out over scaled drawings in to ensure minimal material wastage.

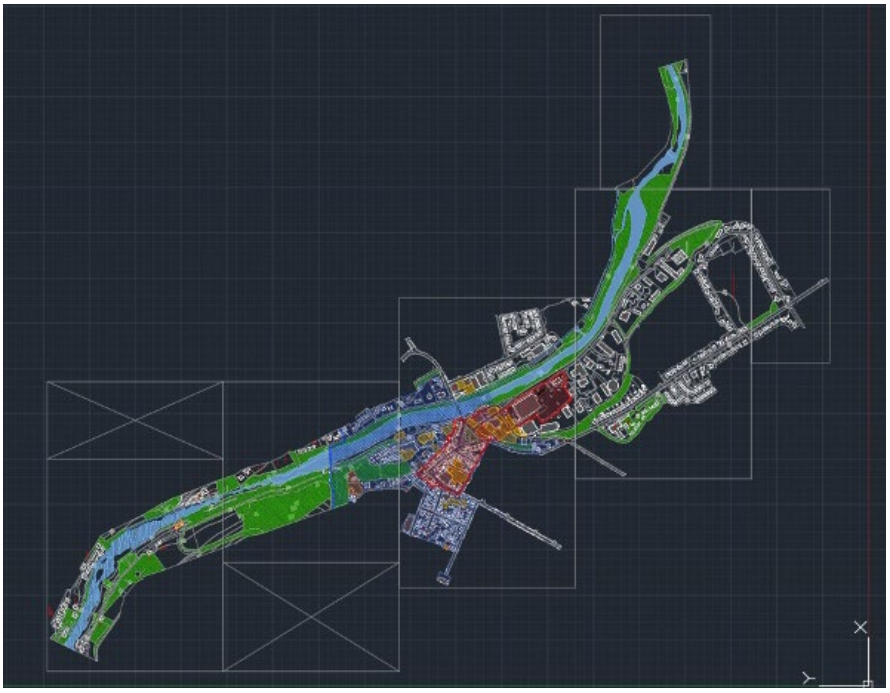

Figure 8.5: Digital model overlaid onto material 'tiles' - this drawing brings the representational scale of the model 1:1250, together with the actual scale of the material it will be cut from.

During the period between the end of January and the end of March, the digital files that would 'instruct' the router were built, corrected and re-built in response to a series of software compatibility problems, some of which only become evident once a tile had emerged from the machine. Each of the students had taken responsibility for constructing a specific area of the digital model, however their software skills varied so a combination of different modelling packages[9] was used. This resulted in 'glitches' when the individual models were combined. The work was coordinated by the student in the group most experienced and skilled in using modelling software and he also liaised with the workshop technicians. Ultimately, to finally resolve these 'glitches' and ensure the model could be successfully delivered on time, this student rebuilt all the digital files using a single software package.

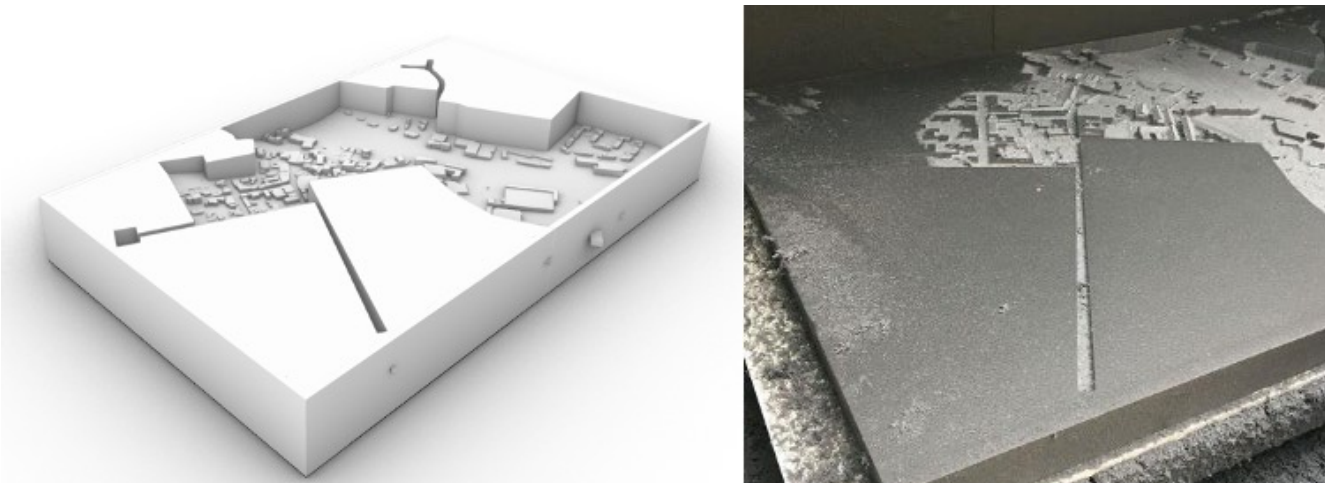

Figure 8.6: A digital model of one 'tile' and its physical equivalent emerging on the CNC router

Figure 8.7: 3D-printed individual design projects

The cumulative effect of these delays meant that the foam tiles in their final *cut* form arrived in the studio in late April. This allowed minimal time for finishing and refining the model as it coincided with final submissions of individual project work. To present their model in the exhibition the individual tiles were cut down and connected to make a single form, then painted white to create a uniform surface. Woodland was indicated using dressmaking pins. Significant existing buildings and the students' individual projects (which had been separately 3D printed) were added – these were painted according to an agreed colour-coding which was also used to identify the individual projects, connecting the model with the drawn presentations. Lastly, the finished model was mounted on trestle supports and positioned centrally in the exhibition space.

This final stage of hand-finishing the model was completed over a very short period. All the students participating both in taking quick decisions and complet-

9 *'Sketchup' is commonly used, however it is less effective for modelling topography than 'Rhinoceros' which is more complex to learn.*

ing the necessary work. In contrast to the precision of the remote digital modelling process, this was loose, messy, and spontaneous.

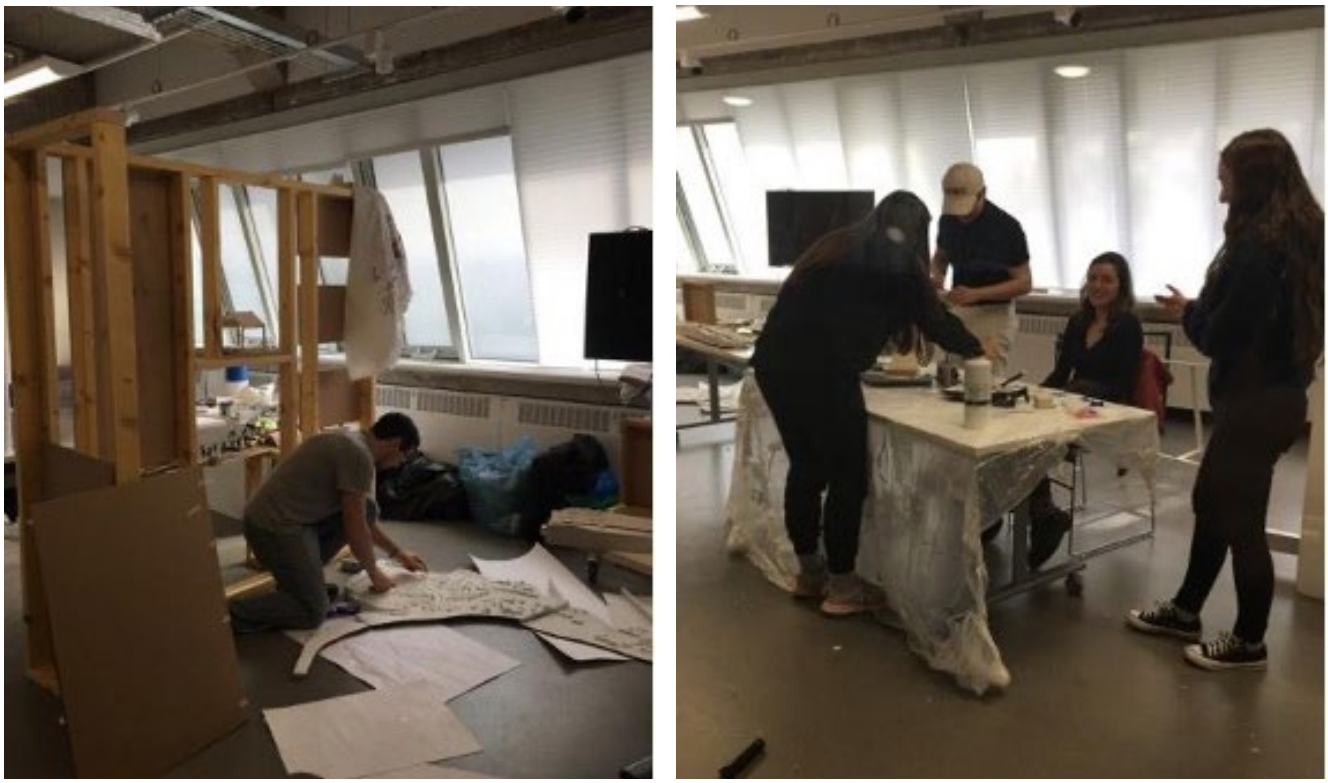

Figure 8.8. Assembling the Model 7.05.22

Technology as both enabler and roadblock

The production of the model depended on drawing data from digital sources[10] and translating this into physical form using software, and it relied on external actors in the form of material suppliers, specialist technicians and available space in the workshop. There were therefore multiple points of potential failure. The source drawings were digital, the students were working on laptops to produce 3D digital models and much of the communication around the model was also digital, the students using social media between themselves and email when consulting with the technicians. The data travelled and was translated ultimately by machines into a physical form, only at this final point returning to the physical studio. While all the students participated, not all were equally confident doing so, the process therefore depended heavily on those who were more experienced in using modelling software to take both the lead and a larger share of the work. It was ultimately also inefficient, one student commented that the ambition to save time by sharing out the work as far as possible had in practice resulted in the construction process taking longer to complete[11].

The students' original timetable aimed to complete the model by early March. In practice it returned to

10 Digimap subscription enables students to download OS map data.
11 This was volunteered by the students in conversations recorded post-submission (17.05.22)

the studio a matter of days before the final submission. It was therefore used only in communicating design proposals in the final examination and degree show – a centrepiece around which discussions with examiners could take place, but too late to be used as part of the process of testing ideas either independently or in collaboration. The ambition to make presentation artefacts to a high standard for reviews, examinations, exhibitions and ultimately professional portfolios can compromise their use as tools within a design process, a *presentation* is prioritised over a *working* model which would be more valuable. This is a position which may be unwittingly reinforced by the emphasis placed on graphic communication skills in assessments and in professional awards. In this case, even if the model had completed according to the students' initial timetable, it would be probably not have played a significant role in shaping design decisions, the 'key moves' being made between January and March. It was always designed as an exhibition piece.

As a communication tool a model is useful, allowing students to see aspects of their work which are not always evident in digital space. Emma commented that it was not until she saw the physical size of the shared model constructed in the exhibition that she was able to appreciate how far her chosen site was from the centre of the town, this was despite her having walked the path in reality on several occasions. As a collaborative space, the physical disconnect enforced by the use of digital tools to produce the model appeared in sharp contrast with the proximity required for making the physical artefacts, this was evident in both the final stage of constructing the model *(Figure 7.8)*, and even more so in stitching the map which often saw two or more students working on different sections of the same length of cloth over extended periods.

8.3: The stitched map

The literal 'stitched map' emerged as an idea at the design reviews held in early December - the first time that the students had formally presented their shared *vision* for discussion with external critics. Preparatory discussions between the students had coalesced around metaphors associated with textiles: what if they *stitched* isolated places together by creating new bridges or paths? Could the different zones identifiable in the plan of the town be considered a *patchwork*? Textile metaphors are relatively common in discussing urban design (for example - the urban *fabric*) but the adoption of one less common term - *hemming* - to describe restricting suburban sprawl, led the group to focus on them as a shared way of understanding and describing all their work. This led ultimately to a looser and less accurate representation of place than would be conventional, but one which was layered with metaphor and meaning.

The term *soft* when applied to urbanism commonly indicates an approach which is less prescriptive and more open to change and/or adaptation. Designers might be less concerned with the hard-edged, static physically constructed aspects of urban space – the buildings and structures that are the central concern of architecture - and more with what may be less tangible aspects of space, how it is used, occupied and experienced

(Raban, 2017)[12]. In this instance textile metaphors carried an association with *soft* urbanism, and also implied working over and between the existing city as opposed to erasing it:

> Tears, holes, creases and traces left in the tapestry expand into departure points… juxtaposing layers of fabric, and the stitching and mending of an otherwise compromised weave, exposes a new collective societal narrative (de Bonnieres, 2021).

Architects have over centuries developed orthographic drawing techniques and conventions which enable them to accurately communicate built form, that is the 'brittle' city (Sennett, 2017), making a 'soft' representation of the student's intended *soft urbanism* meant stepping beyond the conventional boundaries of the discipline.

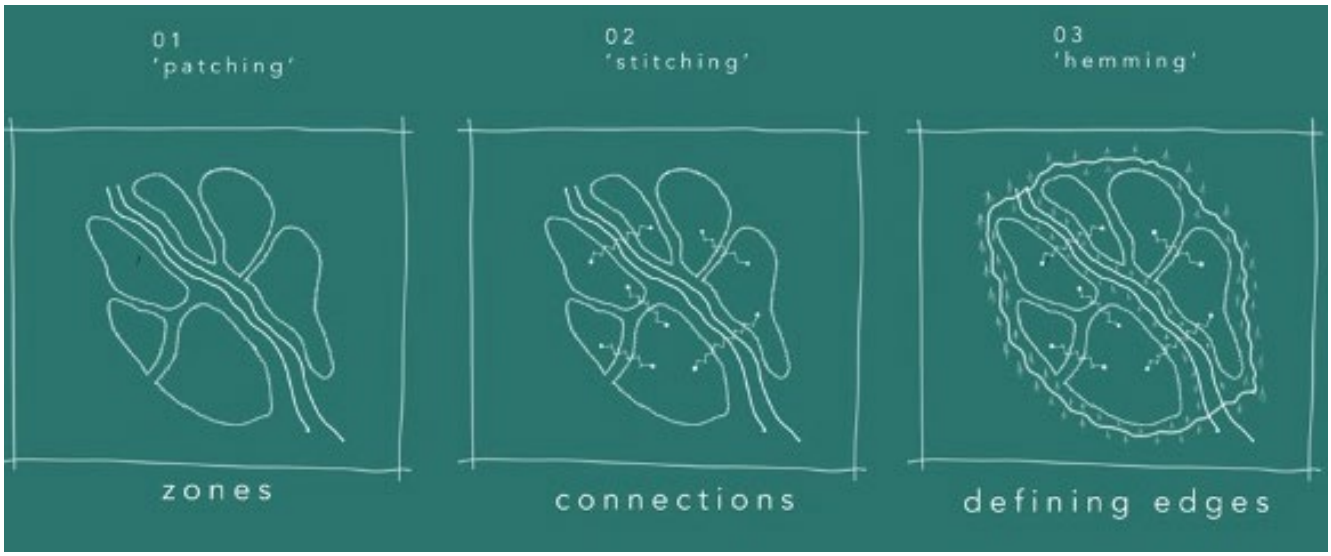

Figure 8.9: Screenshot of the students' shared presentation for reviews 7.12.21.

8.3.1: Timeline: stitching ideas

It is perhaps useful to first relate how the leap was made from the use of textile metaphors to verbally describe the approach taken, to the decision to make a textile drawing. Reflecting[13] on this the students explained how this unfolded during one group meeting held in preparation for the December review:

One of the students happened to use the word *patchwork* to explain his individual project idea. This was then identified by other students as a useful term which might be applied more widely in the group – could it be used as a title which could describe the whole studio vision? Were there other textile metaphors which might

12 Two separate origins and therefore readings exist of the term 'soft city' –' soft architecture' has been ascribed to the architect Arata Isozaki (1970) who used it to consider the parallels between readings of architectural space and computer hardware/software - I.e. built form/ operating systems, it has evolved from this to refer to digital systems and infrastructure overlayed on urban spaces, in parallel the term 'soft city' was used by Jonathan Raban for his reading of London in 1974 and it is this psychogeographic interpretation that is referred to here. The term has been popularised more recently by David Sim in his book 'soft city'(Sim, 2019)

13 The process and reflections described here were outlined by students at a meeting held on 17.05.22

also be applicable? Several students then started searching for other terms which might be useful (on their phones). The students' conversation then moved on to discussions around a large plan of the town – what would be the best way to illustrate their individual projects on a shared drawing? Given their previous discussion, a 'throw-away' comment was made by one student – why not show them as *stitched*? This suggestion may have been initially meant as a joke, it was interpreted by at least one student as a drawing rendered in *Photoshop* to look like stitching (he was sceptical that an actual stitched map was achievable) but the group agreed it was an interesting suggestion. They immediately visited the textile workshops in the adjacent building to investigate. The work-in-progress in the textile workshops allowed the students to envisage some possible methods for translating their proposals into fabric. The textile design students they met explained where they could begin - by printing an outline onto calico - and whom they should approach for help. The group therefore nominated one student to lead the project who was tasked with contacting specialist staff and sourcing materials.

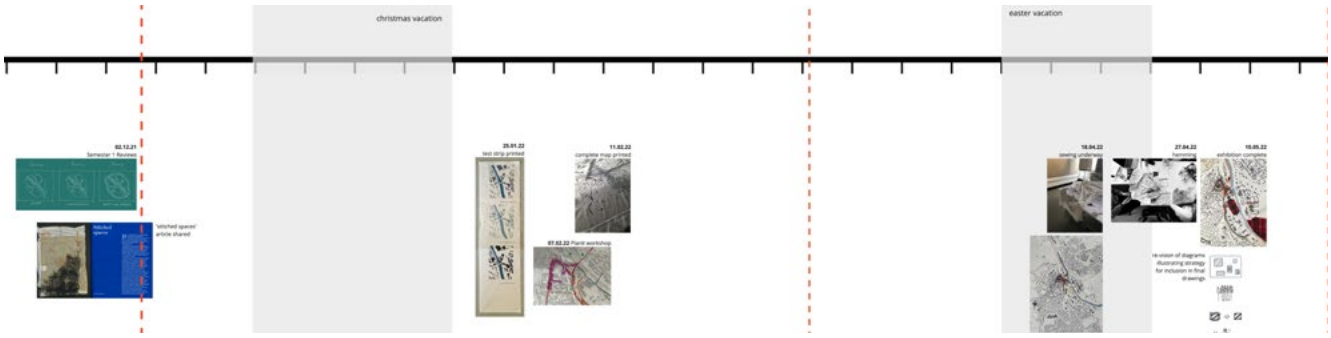

Figure 8.10: The timeline of the stitched map.

Having decided to proceed (backed by positive feedback at the December review, and advice from the staff in textiles) initial test prints were made by the textile workshop to explore colours and line-weights. The students opted to use a 'figure ground' map of the town as a base[14] and to print at a relatively small scale allowing them to include the entire central area of the town on one length of fabric.

The printed calico background was delivered to the studio by mid-February, however it remained set to one side until early April. Despite almost unqualified enthusiasm from every external critic, the students were unsure how to begin working on the fabric. They said they felt 'intimidated' by the amount of work they assumed it would entail; they knew that this map would form part of their final exhibition and they feared making mistakes which might not be easily reversible.

Work started on the fabric in the final weeks before the exhibition. Once the first stitches had been made, the students quickly discovered that unpicking a line drawn in thread is easier than one drawn in ink; that

14 *a drawing originating in Gestalt philosophy which deliberately excludes all information beyond blocking in built form and thereby revealing the legible space between buildings as a 'figure'*

the process could be quick and sketchy rather than meticulous, it was not possible to be precise and they were therefore liberated from the obligation to try; and that the act of making repetitive stitches can create welcome *thinking space* when completing a final-year thesis. In retrospect they enjoyed the opportunity to step away from their laptops while still being productive, they used the time to have useful conversations with their peers[15].

Figure 8.11: Stitching the map, May 2022

Stepping into the textile studio was a literal crossing of disciplinary boundaries, and one that the students felt empowered to do for two reasons. Firstly, a recent change in the administrative structure of the university had made them students of the *College of Art and Design*, as such they knew staff would be more willing to help them and while workshop time would always be prioritized for textile students, they had a 'right' to be there *(page 92)*. Secondly, they were undertaking a course which described itself as *interdisciplinary* which they took as encouragement and permission to explore adjacent territories.

Risk

> 'a preparedness to explore, to hold oneself out to new experiences' (R. Barnett, 2009, p. 433);

In adopting stitching as a method, the students were choosing to engage with the unfamiliar - stepping beyond comfortable territory where they were confident and had previously demonstrated a degree of skill, and

15 *Recorded conversation 17.05.22*

into a space where they had little control[16]. They had no experience in textiles and had never seen stitching used as a method in architecture. They were unsure of their own abilities and how their experiment would be received by examiners, critics, and peers. Attempting a stitched map as a central part of their final year degree show meant taking a risk - they were working outside conventionally understood disciplinary skills and knowledge. According to Barnett, to 'hold oneself out to new experiences' (Barnett, 2009) should be valued as a core outcome of professional education; the wicked problems of professional practice are 'likely to be positions of open-endedness, of value conflict, of insufficient information and so forth; in short, situations of complexity'(Barnett, 2006, p. 51) and therefore he argues a professional curriculum needs to go beyond skills and knowledge and make space for building 'authenticity'. In choosing to work in this unfamiliar, way the students were challenging their own accepted 'norms'.

Figure 8.12:The stitched map under construction

The 'stitched map' was an innovative approach. The students may have felt 'intimidated' but the risks involved were in reality minimal. It may not have *worked*, but this would have made little difference to the students' individual degree outcomes. Where courage was required was in accepting the lack of control this approach entailed. The stitched map had no precedent, and therefore no easily understood measure of success. It was necessarily imprecise and open-ended, this made it a reflection of a less prescriptive approach to working with urban contexts, but placing an amateur attempt at embroidery in a *public* space for assessment and exhibition was uncomfortable. These young graduates had been educated to appreciate more conventional disciplinary values of precision, rigour and accurate use of accepted drawing conventions, this forced them to challenge their learnt understanding of *good*. One student's comment when discussing their exhibition with external examiners 'so ugly it's beautiful' perhaps demonstrates how far he had stepped outside his disciplinary comfort zone - and how important the *safety in numbers* of working within a larger studio group had been in giving him the confidence to do so.

16 It is entirely possible that traditionally 'gendered' disciplines also play a role here – Architecture and Planning remain male-dominated professions (although the student cohort in architectural education is now 50/50) whereas textile design is overwhelmingly female. While the MArch and Up students would be unlikely to acknowledge this as a factor in increasing their perception of 'risk' it would be strange if it did not play a role, even at an unconscious level. The student nominated to contact textiles, was female and the student who liaised with technicians in the digital workshop was male.

8.4: Going Public: The Exhibition

Every model shows a different degree of representation, but all are real (Eliasson, 2007)

To understand how it might act within a design process it is necessary to go beyond describing what a model or drawing *is* and consider what (and who) it is made for, and what it is designed to communicate. As discussed above, neither the model nor the stitched map were used as part of a design process in, for example, the way that Emma's cardboard models were *(page 135)* - they were designed explictly to communicate. Through their design and making process however, both acted as a focus which could prompt and shape discussion, ultimately helping the students to develop and clarify their shared vision. As can be seen in the timeline mapping events in the studio *(Figure 5.4)* and as will be discussed in chapter 8 *(page 163)*, each review created a catalyst. Discussing *how* to communicate their shared vision, forced the students to think collaboratively, and in more depth about *what* they were communicating.

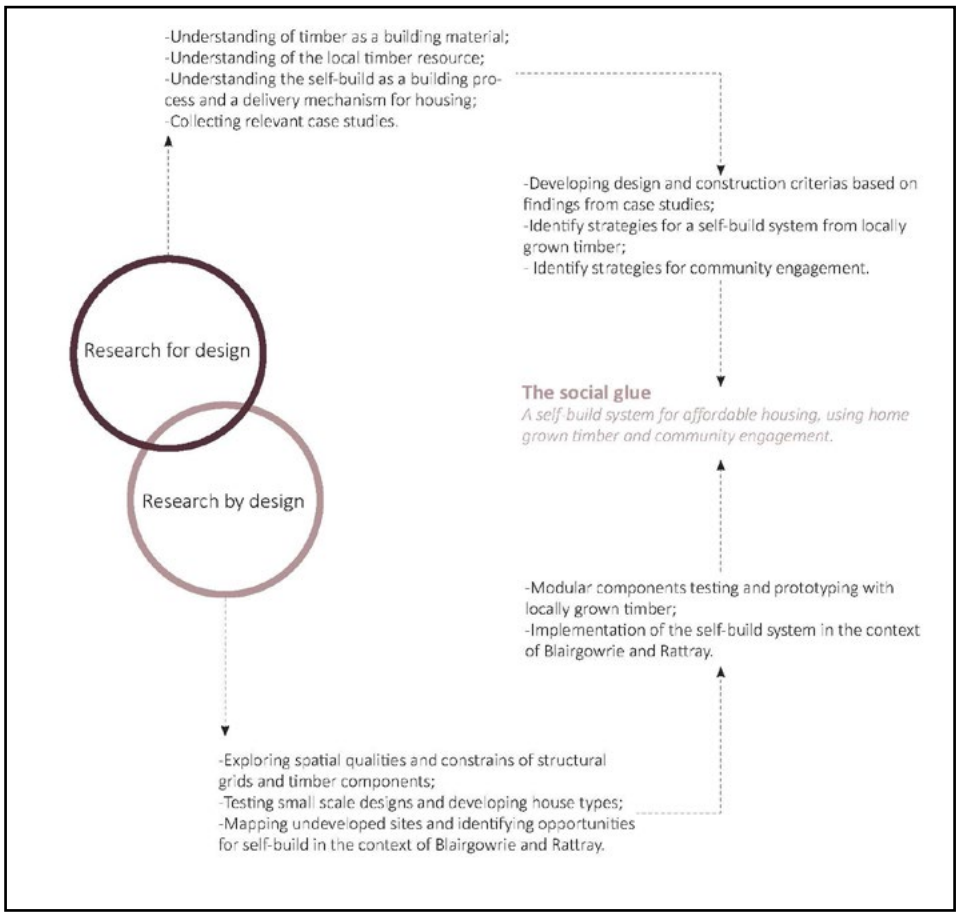

Figure 8.13: Dori's diagram of her process, illustrating her dual modes of design and design research.*

The students in M.Arch & UP were engaged in *design research* projects *(page 33)*. They developed design projects to address design problems, but these were in parallel being used as a framework to structure critical enquiry. The students were therefore working between two modes as illustrated in Dori's diagram *(Figure 7.13)* - research *for* design and research *by* design (Till, 2005). The two representational artefacts the studio

ultimately produced, the model and the stitched map, might be positioned narrowly on either side of a (fuzzy) line demarcating the two. The model represents the physical framework within which the design projects were sited, describing how they physically related to each other and to the context; the stitched map came closer to communicating the critical framework they used to underpin their shared approach to research agendas. They were interestingly balanced: one was hard-edged, 'measured' and precise - recognisably within, and easily understood using disciplinary *codes*; the other was soft, imprecise, and intentionally incomplete.

How these two representations were arranged to be read in parallel, and in the context of the studio (now cleared and reconfigured as an exhibition space) was also the subject of a collaborative design process. The stitched map was hung as a banner from the ceiling, deliberately emphasising its material quality and its position as something *other* than the architectural drawings pinned to the walls. Its position in the space meant it acted as a backdrop to the model when viewed from the entry to the exhibition space. One artefact was always seen in the context of the other - together they acted as the introduction to, and the centrepiece of, the students' presentation of their individual work.

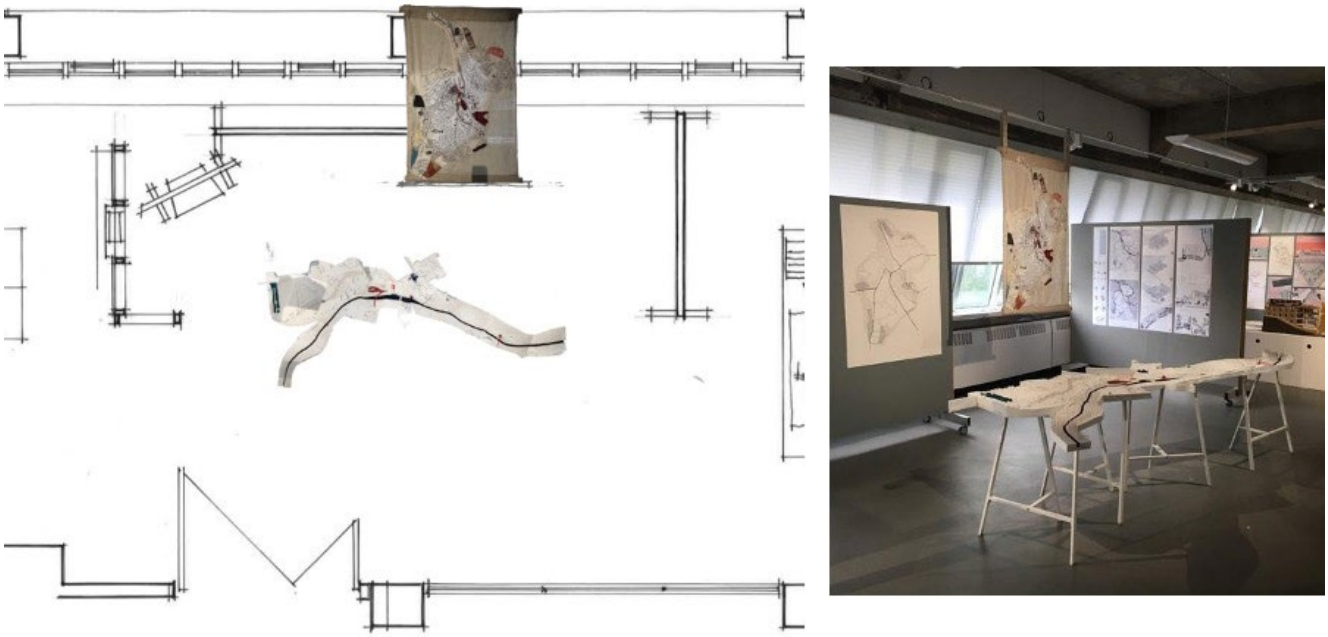

Figure 8.14 artefacts in dialogue. MArch with UP exhibition May 22.

The design processes which shaped the model, the stitched map, and the wider exhibition, were carried out in the knowledge that these things would be used by critics and examiners to evaluate individual design research projects; specifically how well these projects related and responded to their wider context and the agenda of the studio. They had therefore been *framed* for this audience (Ferracina, 2018). While it was not explicitly discussed in these terms, the students were attempting to demonstrate their value as future professionals about to embark on their careers in practice - their disciplinary skills and knowledge, their creativity and capacity to innovate, but also their ability to think critically and to work collaboratively.

In asking our students to make a degree show exhibition as their final examination we are shaping their graduate portfolios to appeal to a discipline-specific professional audience of potential employers. This perhaps perpetuates what is well-understood as 'good' within this closed circle, and can ultimately stifle innovation. Being willing to attempt something different in this context demonstrates the 'openness to new experiences' that Barnett advocates (2009). The *model* was designed to speak to a professional audience utilising 'codes' in the form of scale etc. which allowed it to be easily read (Ferracina, 2018). In its final iteration it began to take on some of the qualities explored in the *stitched map* (its colour palette and the use of dressmaking pins) but it remained a conventional architectural artefact. It did what it needed to do - it explained the physical context. The *stitched map's* value was in rendering visible the complex theoretical framework that the students had explored. The stitched map was viewed by critics as something designed to address a broader audience[17] but it was still a scaled drawing which utilized symbols and abstract metaphors, so it was perhaps *less* easily 'readable' than the model, which was a precise, unambiguous reproduction of topography and form *(page 102)*. The stitched map's imprecision meant that was more open to interpretation - it invited discussion engaging *with* rather than communicating *to* its viewers.

Robert Smithson's dialectic of *site* and *non-site* suggests that his sculptural works can be designated one or the other - they are positioned *in* a landscape (site), or they are a representation of a landscape displaced to a gallery (non-site) (Spens, 2007). Rendell notes in her discussion of this concept that despite first appearances, an architectural representation is not necessarily *non-site* - because of the centrality of drawing in architecture *(page 61)* it is in effect a *site* of critical discourse. What is illustrated does not exist in physical form but as a virtual reality (Medway & Clark, 2003) for its designers, and what it represents is not only an imagined physical form, but an interrogation of architectural ideas:

> the relationship constructed between imagined and real becomes quite complicated here. In professional practice, architectural drawings describe an intended physical construction, whereas critical practitioners often use the same codes to question the assumptions implicit in architectural discourse. Here the sites of architectural education, exhibitions and publishing are essential to architectural design in providing places to explore the critical and conceptual potential of architecture (Rendell, 2006, p. 40)

The model and the stitched map can be considered provocations to their audience(s). In the case of the model, the more conventional: what if we built here? How might the town work then? But in the case of the sewn map: what if we thought about urbanism like this?

17 This was mentioned in external examiners reports, as a positive commentary on the work

8.5: Conclusion

> To approach drawings as merely static objects… truncates their usefulness in architectural practice but also obfuscates the necessary role they play in organizing interactions, and collaborative imagining, among architects. (Murphy, 2004 p.125)

Even where relatively prescriptive disciplinary codes are used the process of making representations necessitates a filtering - what should be included and what set aside? All drawings and models are *authored* however neutral they may appear. Where these representations are shared what is often an intuitive decision-making process must be articulated, debated and agreed upon. This process might conclude with the most conventional, widely accepted drawing or model - a format which offends no one - but in practice it may also create a framework which allows students to share risk.

Drawing - two or three-dimensional, analogue or digital - is central to an architect's practice (Hill 2005). The construction of these artefacts was central to the way that the studio organised itself, evolved and communicated its shared intent. While they did not play the conventional role of an *object language* (Cross 1982) in the design process (that of 'seeing-moving-seeing' as described in the previous chapter *page 127*) the collaborative design and making process their production entailed created a space for dialogue. They clarified how the students viewed the context in which they were working, and how they understood their shared *vision* (Gottschling, 2018). Stitching the map required them to invent a new shared language out with their disciplinary comfort-zone.

Where the model proved significant was in the collaborative design process which shaped it. The *editing* process necessitated by the pragmatics of construction forced the students to cut away all but that which was necessary to show their context. This revealed the primary role that topography - specifically the river - played in structuring and in dividing the town into distinct areas, and enabled the students to see problems and opportunities where 'stitching' the banks together through the introduction of new connections could make a significant difference. The *hands off* construction process proved complex and challenging: the students had to work independently and collaboratively to solve problems, balance each others' strengths and weaknesses and take collective responsibility. This experience perhaps more closely mimics the situations they will encounter in a professional studio environment than the independent design projects which make up much of their academic course. Throughout their careers they will be required to work effectively in teams.

The stitched map took a more innovative, *critical* approach to conventional representational techniques and perhaps, therefore, had a more central place in shaping discourse. The students used it to clarify their understanding of the concepts and themes which were shaping both their shared, and individual, approaches to design[18]. Ultimately, the model communicated disciplinary knowledge and skills - a degree of competence

18 The students' individual projects were explained their presentations partially through how they aligned with the various textile metaphors that had been agreed - patching, hemming, darning, embellishing and stitching.

which enabled the students to confidently position their work in the context of their architectural peers - but the *stitched map* was radically different, pushing both its authors and its audience to question their own assumptions and expectations. It displayed no great skill in needlework - it is not conventionally *beautiful* but it created conversations within and beyond the studio.

The exhibition created a stage for *reflection-forward* allowing the students and their audience of challengers and mentors (Blyth and Van Schaik 2013) to visualise the spatial and intellectual connections between the projects and to the wider context. The clarity of the spatial proposition communicated through the model, allowed for the more open-ended and provocative conversation facilitated by the stitched map.

Figure 8.15: The group presentation deliberately juxtaposed hand-drawn, loose representations of the textile metaphors they had adopted, with a more conventional scaled plan colour-coded to explain where their projects were situated.

Emma's models & Catriona's drawings - degree show 18/05/22

9: Going Public: Positioning Ideas in a Dialogic Space

> Graduate attributes for an age of uncertainty are to be developed not only over time, but through a continuing dialogue – as it were – between situations for reflection and situations of challenge. (Barnett, 2006)

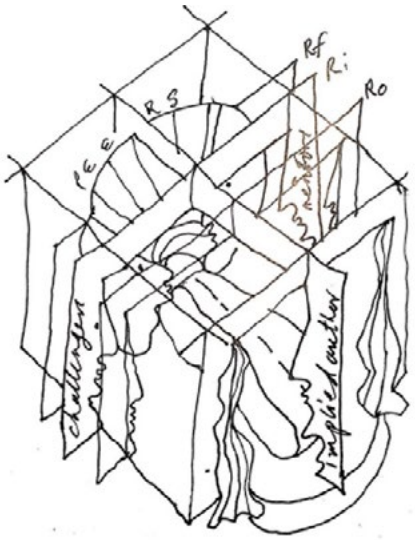

Figure 9.1: The Social Theatre of Practice (Blythe & Van Schaik, 2013, p. 68)

Leon Van Shaik's diagram as discussed in chapter 3 *(page 50)* locates the design work produced in the studio on a 'social stage' between the 'implied author' - the position taken up by the designer - and their peers. 'Challengers' and 'mentors' occupy the wings creating frames through which the work is viewed (Blythe & Van Schaik, 2013). Who these *challengers* are and what they represent has the potential to impact on the development of both the work, and the position of its *author* - that is their emerging professional identity.

The *site(s)* identified in the following narrative existed on specific days in specific places. They were temporary physical *stages* created for timetabled review events across the session, but as implied in Blythe and Van Schaik's drawing *(Figure 8.1)* the *social theatre of practice* is not only a physical layout, it is constructed by dialogue.

During 2021-22, five separate 'review' events were timetabled. Each had a specific purpose shaped by the point in developing design proposals that the students had (or should have) reached by that point. The events were choreographed in differing ways - online and/or in studio; with or without a wider audience; around shared maps and drawings; or focusing on individual work. Each review brought together a differing cast of *challengers and mentors* affecting the way that the students both prepared for and responded to critique.

The positioning of ideas in a more public forum has the potential to alter the direction of work, and perhaps also the perspectives of the students. There is little space here to enter into the complexity of debate around the effectiveness or otherwise of 'crits' in architectural education, but this story considers the process and potential value of *going public* for students on the threshold between academia and practice. Stepping beyond the familiar boundaries of institution and academic discipline to invite critique may be uncomfortable, but in examining the data produced by the academic session 21-22 I have been forced to question just how *public* our reviews and exhibitions were, whether in the future we should widen our cast of 'challengers', and be more willing to accept risk.

9.1: The place of reviews in architecture/design education

> Just a few times a year, the student project is constructed, held for a fleeting moment in the temporary space of the crit before dissipating. It materialises between the walls, tables, the floor… the crit can be performed in multiple dimensions, dancing between the flat vertical surface of the wall and the horizontal plane of the floor or tabletop, on which a collection of three-dimensional artefacts and models are gathered. (Beaumont, 2022)

While the terminology used may vary between institutions, a *review* is often called a *crit* (short for critique) and in some contexts a *jury*, the practice is central to studio education in design disciplines (Flynn et al., 2022, Silberberger, 2020). Students are asked to pin up or otherwise display drawings and to verbally explain their work to a panel of tutors and external critics. This is done in the presence of other students and ideally includes their contribution in the discussion - an individual's work is used as a learning tool for the wider class. Traditional reviews normally take place over one or two days; each student is allocated approximately 30 minutes to present and to respond to questions. They will be timetabled to occur at significant points in a design process and are often also used at their conclusion as part of a formal assessment process.

Signature pedagogies

The *review* might be understood a *signature pedagogy* in architecture (Shreeve et al., 2010, Crowther, 2013, Sims and Shreeve, 2012) - a form of teaching not limited to any one teacher, programme of institution but characteristic of a discipline, one that 'organize(s) the fundamental ways in which future practitioners are educated for their new profession' (Shulman, 2005, p. 52). Shulman argues that while signature pedagogies may arise in many disciplines, those which have developed in professional education have become most distinct as here students must learn how to 'act'.

The persistence of practices such as the crit/review relies to an extent on assumptions of how best to teach a discipline - *signature pedagogies* can become embedded and unquestioned habits. They also play a significant role in defining the boundaries of a discipline and/or profession:

> pedagogical signatures can teach us a lot about the personalities, dispositions and cultures of their fields… they are important because they are pervasive. They implicitly define what counts as knowledge and how things become known. They define how knowledge is analyzed, criticized, accepted, or discarded. They define the functions of expertise in a field, the locus of authority, and the privileges of rank and standing. (Shulman, 2005, p. 54)

While reviews are practically universal in architecture and design schools – it has become widely accepted that the practice raises significant concerns often around student health and well-being (Anthony, 1991; Webster, 2005, 2007; Sara and Parnell, 2013; Silberberger, 2020). As Shulman notes, across professional disciplines all signature pedagogies rely on the inter-active participation of students, usually within a public forum, and that the consequent 'uncertainty, visibility, and accountability inevitably raise the emotional stakes' (2005, p. 57). Students in architecture have described *reviews* as a significant source of stress and anxiety (Sara and Parnell, 2013) a situation hardly conducive to critical reflection. The spatial layout of a review emphasises the unequal power dynamics at play. Students most commonly stand in front of their exhibited drawings, faced by a row of seated critics, their peers forming an audience behind. Students begin by making a verbal presentation of their work which has been described as a 'sales pitch' (Silberberger, 2020) the critics then ask questions and making comments on what they have done; a construct that appears designed 'for confrontation rather than dialogue' (Sara, 2022, p. 45).

In response to these concerns the majority of schools in the UK have taken some action to moderate practices, and some recent experiments have been trialled which re-design reviews to the extent of effectively eradicating them in their most 'traditional' form[1]. Over the last 20 years the University of Dundee has evolved to a position where *crits* are always termed *reviews* and they are never used as a forum for summative assessment, but in most other respects the format remains stubbornly familiar. Even in the most radical reinventions the principle of open *public* discourse centred around students' ideas remains core.

1 *Notably at TU Dublin (Flynn et al, 2022)*

9.1.1: What is a review for?

> At the very least crits are an inefficient use of teaching resources, and their function seems to be more ritualistic than directly productive (Price & Mahon, in Flynn et al., 2022, p. 41)

If *reviews* can be unnecessarily traumatic and are potentially open to abuse, why do they persist? First, a review is seen as an opportunity for immediate and direct feedback. Students can benefit from the 'fresh perspectives' of both their peers and external critics - a form of critical reflection *with others* which may enable them to progress their work in new and unexpected directions. Secondly, in an ideal scenario, a review creates a forum for critical discourse 'critical design thinking is made visible and explicitly valued' (Sara and Parnell, 2013 p 102). Blythe and Van Schaik are not explicitly referring to a review when they draw their *social theatre of practice* but they do identify that reflection within this context 'includes those with whom we share a position as well as our challengers: those who to some extent resist, call to account and probe what we do by holding alternative positions' (Blythe and Van Schaik, 2013, p. 65). The format of the review makes this metaphorical theatre temporarily physical.

Students also use the review process to develop visual presentation and verbal communication skills. Verbal skills are rarely taught in architecture schools. Students are expected largely to *learn through doing* in a reflection of the process by which they learn design skills through engagement with design projects - a *reflective practicum* (Schön, 1987). To the uninitiated outsider (and to students in the early years of their architectural education) the rituals of a review may appear daunting, but students in their final year do not usually view them in this way; they have learnt how to present their ideas succinctly and with at least the appearance of 'confidence', and how to listen and learn from critique[2]. Reviews are also invaluable in punctuating what may be an extended design process, marking project stages and imposing interim deadlines which help students to manage their workload. The necessity to present work *publicly* means that students place expectations on themselves more than these being externally imposed - they must have enough to discuss, they must communicate this clearly enough to be understood, or their work may not measure up to that of their peers[3] and opportunity for useful feedback may be lost.

Even where *reviews* are separated from *assessment* critics remain in the position of 'passing judgement' on the work presented, and in doing so they determine what is considered appropriate and/or valued within the discipline (Sara and Parnell, 2013). This may be a tacit agenda but it effectively polices the disciplinary boundaries. *Reviews* centre on representations – students display and verbally explain their drawings and models, and these remain the focus of critical discourse (Murphy, 2004). Through experience, students learn to anticipate what material in the form of drawings and models they may need to adequately and accurately explain their work; to anticipate where questions may arise and what they may therefore need to refer to; and also what

2 *This is evident particularly in interdisciplinary reviews involving MSc Spatial Planning students who often have little experience of reviews.*

3 *This is a particular problem with respect to wellbeing - these expectations may often be self-imposed, but they still generate unhealthy competition and consequent overworking, sometimes resulting in a culture of 'all-nighters'.*

9.1.2: The timeline of reviews: 21-22

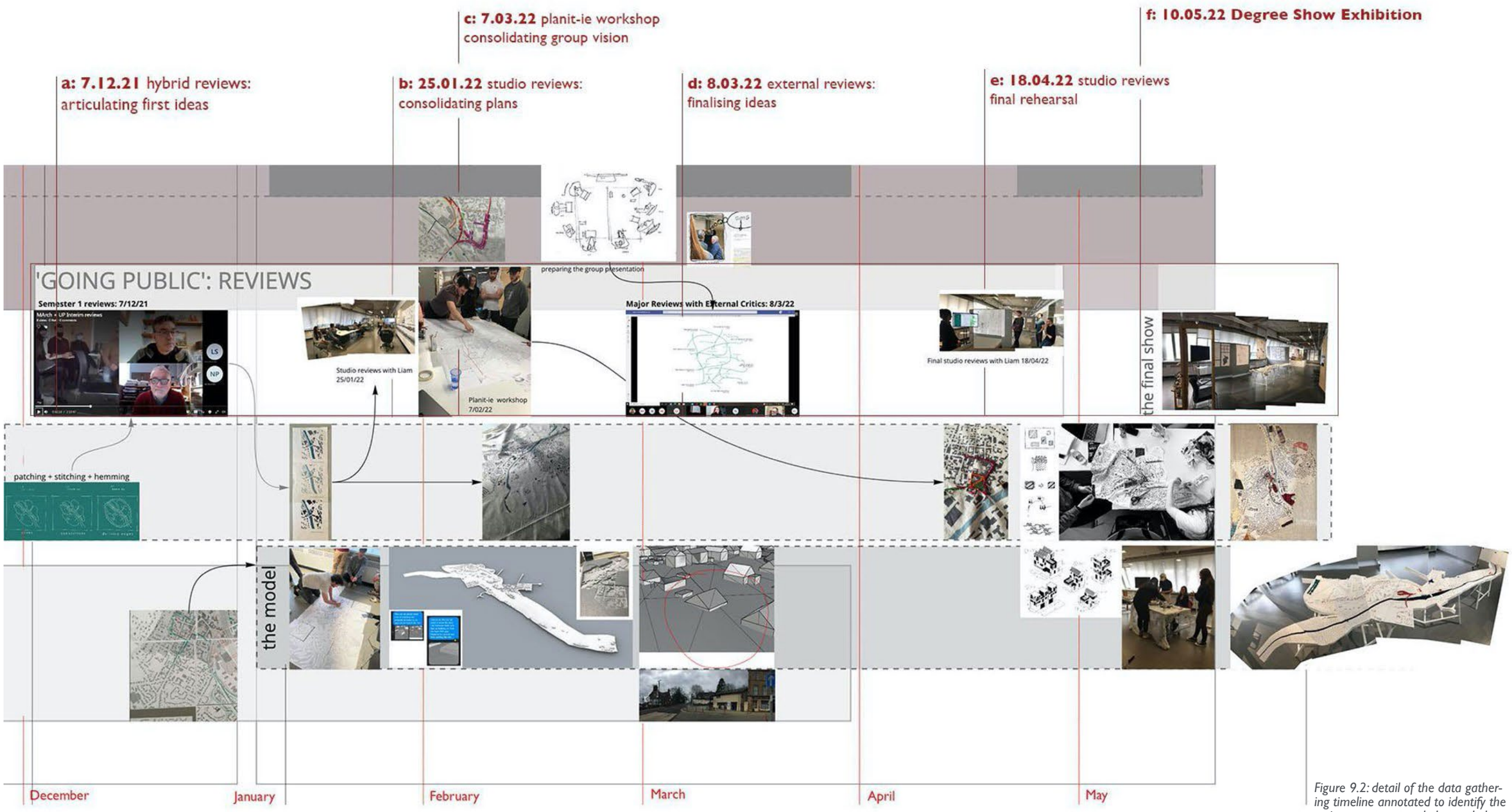

Figure 9.2: detail of the data gathering timeline annotated to identify the review events expanded upon below.

kind of representations will be easily understood and valued by critics - what is, and what is not, considered acceptable. In this context are the students learning how to be *critical*? To think independently and creatively? Or only what may be valued by those individuals who have been invited to critique their work - how to *act* the signature pedagogies of the discipline?

9.2: Observing reviews

a) Hybrid reviews: articulating ideas

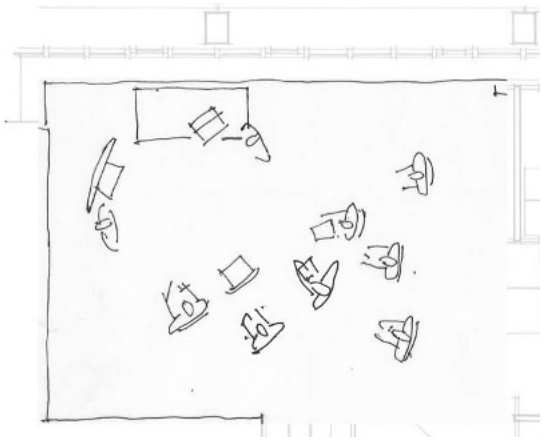

Figure 9.3: (07/12/21) initial reviews for design research project(s)

These reviews were conducted primarily online. At this point in the session, Covid 19 restrictions meant only students and members of staff were permitted inside the building, and that anybody in the studio was required to wear a mask, and not to move around the studio. The review involved two members of staff (including myself) and two external critics, an experienced local practitioner, and a senior civil servant from the Scottish Government (both architects). While staff and students were in the studio space, external critics were online, therefore all the work was presented via 'teams' in the form of PowerPoint presentations.

This was the students first opportunity to articulate both their shared group vision and the proposed focus and aims of their individual design research projects. As has been discussed in the previous chapter (page 153), this was the occasion for presentation of the textile metaphor as an approach. This became a major focus for the remainder of the year.

b) Studio reviews – consolidating research plans

These reviews were held in the first week of semester 2. There had been sufficient time to digest and respond to the formal critique of their early ideas (7.12.21) but as we had only recently returned to studio after the vacation this review aimed to 'set the agenda' for semester 2 and ensure that no time was wasted. In order to make this a significant 'event' and to ensure a fresh critique (an audience who had not seen their work before) - a recent graduate (Sam) was invited to lead the reviews. I was present, but only contributing to the conversation when necessary.*

These reviews were held in the familiar studio space. They had one specific requirement as discussed in chapter 6 (page 118), while the majority of the work could be digital, all the students were asked to include at least one physical drawing/print or physical model as a central part of their presentation. This was done partly to allow the reviews to leave a physical trace (at least temporarily) in the studio space and thereby allow for a more public reflection/reminder of the point they had got to in the project and what they were attempting to achieve.

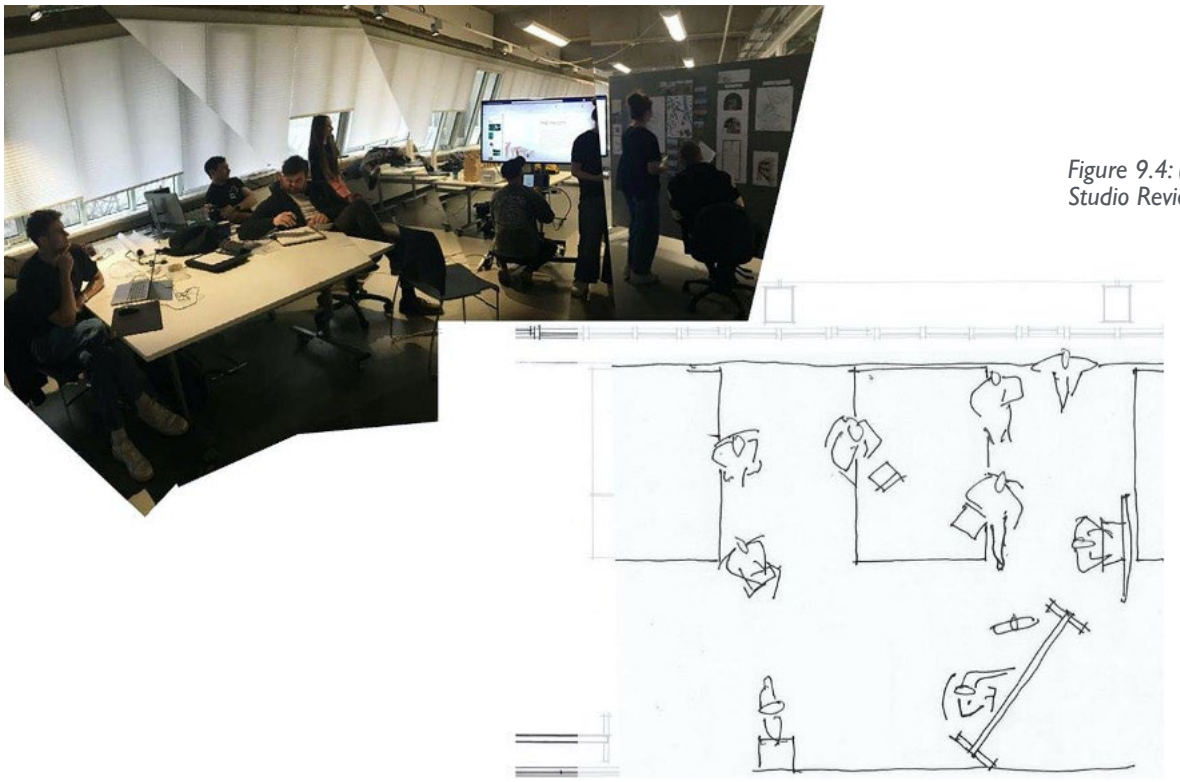

*Figure 9.4: (25.01.22,) Studio Reviews with Sam**

c) A workshop with a professional design studio: 'brainstorming'

This studio workshop was also facilitated by a graduate (Hazel) who was joined by her supervisor in practice. They work in multi-disciplinary design studio engaged in several major urban design projects and based in the North of England. Their status as potential employers, and the studio's distant geographical location, meant that these visitors were more remote from the studio - they were guests.*

The timing of the event was dictated by the visitors' availability. Because this was within two weeks of the studio review (25/01/22), and because the presentation made by Hazel and Julia focused on large-scale strategic visions, a shift was made from individual presentations to a round-table workshop format which considered only the studio's shared approach to the town. Having presented their group agenda in the morning, it became clear that the students were not yet demonstrating a thorough and detailed understanding of the context. For the afternoon therefore, all the students gathered around a large printed map - expanding on contextual information and 'brainstorming' what key moves they could make to address specific problems in response to a series of questions and prompts from their studio guests.

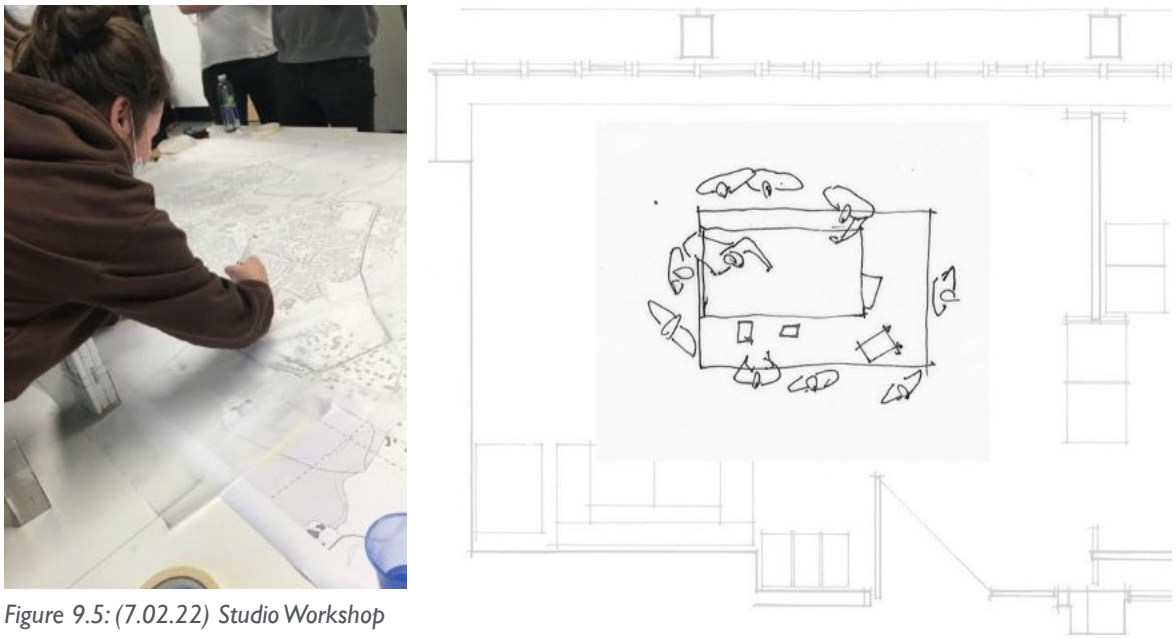

Figure 9.5: (7.02.22) Studio Workshop

d) External reviews: finalising projects

While these reviews were technically 'interim' this was the last opportunity for feedback which could significantly impact on the direction of the project(s) and was therefore considered the major review of the academic session. This event was conducted over two days, the first being partially online, the second wholly in-person. This review was deliberately taken out of the studio and into a more public review/exhibition space which is open to the central circulation space of the building. This made the occasion more formal – to be 'taken seriously'. There were three external critics: two who had seen the work at the outset (7.12.22) and one who was the principal of a major UK architecture practice (and who had been extensively referenced in several of the students' projects). Students were free to choose how they wished to present their work - most used a large screen but two opted to print drawings.

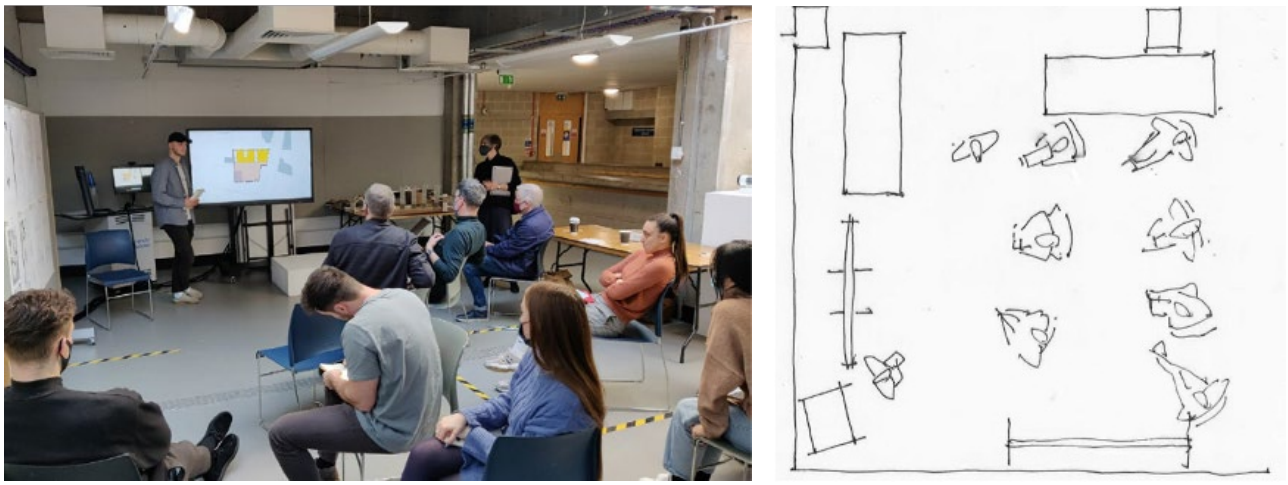

Figure 9.6: (08.03.22) Final external reviews in the review space.

e) *Final studio reviews: the 'dress' rehearsal*

Figure 9.7: (18.04.22) running through presentations

These were less 'reviews' than a final 'dress rehearsal' - an opportunity for the students to outline their presentations to an 'external' audience (Sam - the same recent graduate who looked at their work in January). This was not a formal presentation, the students had plans for what they intended to show and discuss, but in many cases not even an unfinished version of their final drawings/models. The focus became the group presentation which had been side-lined in favour of individual projects in the rush towards submission. Sam* was able to re-centre the shared vision by emphasising its importance based on his own recent experience of the external examination process - the group presentation of a holistic vision would ultimately shape the external examiner's understanding of each individual project.*

9.3: The review as a dialogic space

> Dialogic assumes that meaning is never singular but always emerges in the play of different voices in dialogue together (Wegerif 2013, p.3)

The space of a dialogue can be understood to have both an inside and outside. Inside this space, questions lead to further questions, participants ask for each-others help and advice, and perspectives may be altered as a result of seeing problems and issues from another's point of view. From an ANT perspective, as has been discussed, the participants in a studio dialogue might be extended to include design tools, drawings and models (Cook et al., 2020, Davidsen *et al.*, 2020).

The reviews described above might be understood as *dialogic spaces*, but the asymmetric power relationships evident in the review context make this questionable (Scagnetti, 2017). However carefully a review is choreographed to ensure that students are comfortable, and however well-briefed and experienced their critics, the 'publicness' of the context, and the pre-prescribed roles of the participants will make open dialogue challenging. The description of a review event itself as a *dialogic space* should therefore not be transcribed too literally. Dialogic space is created by the tension between different perspectives (Palmgren-Neuvonen et al., 2021) – this may be *facilitated* by a review event but extends beyond its boundaries in time and space and may refer to people, ideas and places beyond this context – all might be considered *actants* influencing its shape.

The 'necessity of production'

> A studio is a place of study. Use the necessity of production as an excuse to study. Everyone will benefit. (Mau, 2010 -2014)

The challenge of communicating complex ideas in a visual format for reviews in 21-22 instigated collaborative conversations which might otherwise have been skipped in favour of individual project work. These conversations sometimes resulted in significant *creative leaps* (Cross, 1997). A reading of the wider studio's *timeline (Figure 8.2)* reveals the role that review events played in the clarification of the key ideas which framed the studio's shared strategy and vision. The students were required to externalise their ideas - to 'go public' - and to do so succinctly. As has already been noted in the previous chapter, this prompted the adoption of textile metaphors at an early review (07/12/21) and the positive feedback this received encouraged the students to further develop these ideas *(page 152).*

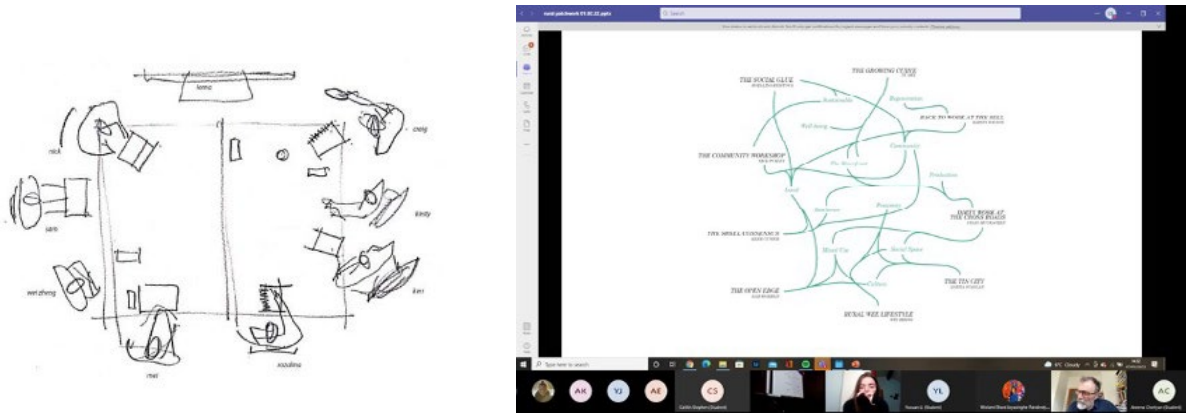

Figure 9.8: Immediately before the review, the students met to finalise the presentation of their group vision (fieldnote 8.03.22). Part of this was the diagram shown here which illustrated the connections between their research projects.

This, and the example shown in *Figure 8.8,* might be understood as moments where the necessity of production acted as a catalyst for the students *thinking together* (Wegerif & Mercer, 1997). This happened not during the review, but in the group discussions held in preparation for it. As Cross notes, a shared design project often acts as an effective frame for creative collaboration (Cross, 1982) and this could be read as an example of 'distributed creativity' resulting in 'collaborative emergence' (Sawyer and DeZutter, 2009). In this instance the students were faced with a layered collaborative design problem: how to adress the problems of the urban context, and within this how to communicate their approach as a group. Designing a presentation is a design problem in itself.

Even in the most structured, traditional *crit* the material artefacts are catalysts for, and actants in, the dialogue. Following their initial presentation students usually cede the floor to their critics, but their drawings and models remain the centre of attention (Lymer, 2010). Comments and questions are generated by the drawings presented and they can be used to respond - where language is usually considered to be verbal/written – in a review it is at least partially visual/material (Sara, 2022). As demonstrated by the examples above

the production of material artefacts in advance of review, and the persistence of these artefacts (often in the studio) after the event effectively extends their zone of influence and effect far beyond the temporal site of the review itself *(page 105)*.

9.3.1: Critical friends/challengers and communities of practice

Blythe and Van Schaik distinguish challengers from peers: 'those with whom (to an extent) we share a position and those who resist by presenting alternative views' (Blythe and Van Schaik 2013, p.65) but this distinction may not always be clear-cut or fixed. Individuals can adopt different roles within a review dialogue as it evolves, and the way that a review is constructed - how formal or informal - will contribute to shaping these positions. Recent literature challenging the traditional *crit* format has understandably focused on the evident power asymmetry between students and critics but is arguably more an aspect of the system to be continually alert to, and to consciously manage, than one which should always be eradicated. Where Sam* was a *mentor* in January *(a: page 168)* his role as *challenger* was necessary in April *(e: page 171);* and the formality of the external reviews in March *(d: page 166)* gave the students confidence that their work was of interest to experienced professionals working at the forefront of practice.

Figure 9.9: Maps constructed in the workshop (c) (7.02.22) were ultimately transposed onto the stitched map later in the semester.

The *brainstorming* workshop (c) in February *(page 165)* was choreographed in a way which positioned critics within the dialogue/dialogic space creating a much more direct relationship between the participants. In this instance students, external critics, and staff (myself and a colleague from planning) worked together to draw over a rough, shared map. We pooled our combined knowledge of the place to draw-out new insights into how it might operate. Individuals were able to see familiar problems from other perspectives. In this instance work was not presented for critique and there was no hierarchical row of critics facing students defending their work, instead all worked around the same table. All parties had equal access. The shared purpose of constructing a drawing, including the haptic, non-verbal connection made by tracing over and adding annotations to it, created a productive *dialogic* space (Sara, 2022). Feedback here was *interpretive* - understanding what the students were attempting to achieve, and *generative* - making suggestions of things they might consider rather than *judgemental* (Scagnetti, 2017). The rough lines drawn during this session were ultimately translated into the stitched map.

Critical friends

Rather than *challengers* our external critics in the brainstorming workshop (c) *(page 165)* were acting more as *critical friends* - a trusted person who will both ask provocative questions and offer constructive critique (Costa and Kallick, 1993). McClean and Hourigan identify the peer dialogue which occurs in academic design studios as a 'critical friend' relationship (2013). This relies on the positioning of participants as simultaneously both 'insiders' and 'outsiders'. The individual students remain authors of their individual projects enabling their studio peers to act as critical 'sounding boards' while remaining invested in the overall success of the project. As a member of the academic staff, while I might like to perceive my role in respect of the students as that of a *critical friend*, my ultimate obligation to grade their work creates too great an imbalance and positions me instead as a *challenger* and/or *mentor*. Sam*, as a former student who knew the students well, might occupy a position on the boundary between *critical friend* and *mentor/challenger*, and might take up any of these roles depending on the circumstances. For studio reviews (b) and (e) the students went through the accustomed ritual of organising the studio space for review[4], and took up their familiar positions, but were notably more relaxed in how they occupied the space.

The expert critic

> If one wants to join a dialogue it is wise not to butt in too abruptly. It is best to take time initially just listening to what people are talking about and learning how they are talking about it. (Wegerif, 2013 p.4)

The invited critics who occupied positions as *challengers* were not technically sitting in academic judgement, they played no role in assessment, but they were invested with power. This was partially because their status as *invited* critics - in inviting them I was recognising their expertise. All were also experienced professionals, they were leaders in their fields and in some cases potential future employers. The reviews created an opportunity for feedback and validation from practitioners themselves responsible for making excellent work. Feedback from these sources is valued by students over and above that of their peers (McClean and Hourigan, 2013). In inviting these individuals, I gave my students an opportunity to engage with practitioners working at the forefront of their field, but I have also positioned them as *masters* whose comments might be understood as 'correct', as opposed to starting points for debate. It is perhaps inevitable that my invited critics are people *I* respect, whose positions I can identify with my own even where their area of expertise differs. In asking them to participate to the studio's discourse I was perhaps 'validating and empowering private judgements of taste by institutionalising them' (Price & Mahon, 2022, p. 42).

4 It should be noted that the impact of Covid 19 spatial restrictions may have impacted on how reviews were 'choreographed' – it is difficult to draw any meaningful conclusions when so many limitations were necessarily made on proximity, movement, and the use of physical material.

Communities of practice

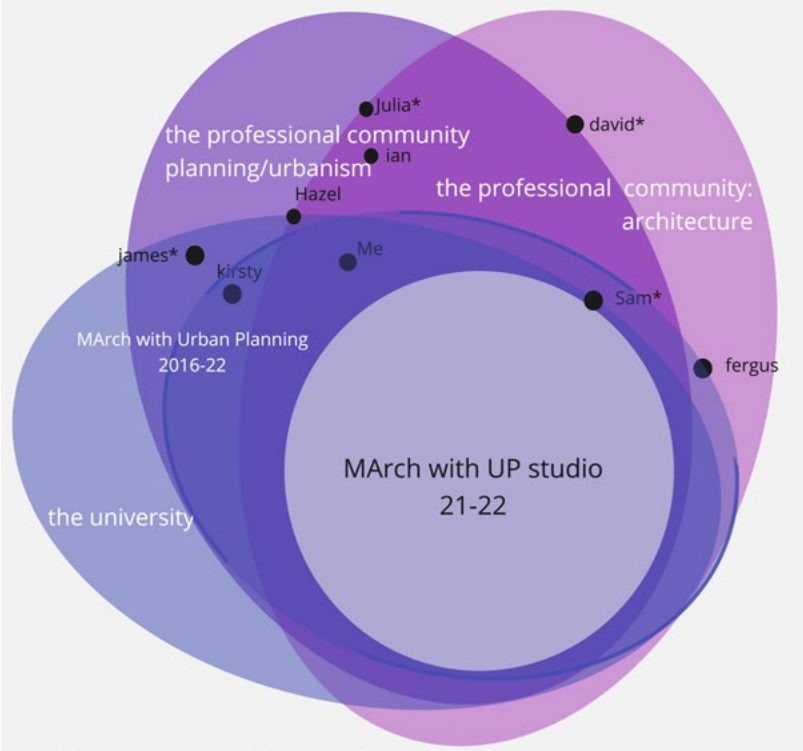

Figure 9.10: overlaying the identifiable communities of practice, and locating critics with respect to these, as insiders, outsiders or boundary dwellers

I have previously identified the studio as a classic *community of practice* (*page 51*) - the positions of our various challengers can be roughly located with respect to this. The studio community exists within larger overlapping and intersecting communities – that of the institution and of the professional discipline(s). There is also a more nebulous extended boundary to this specific studio community, that of *M.Arch with Urban Planning* beyond this cohort. This identifiable as a community of graduates and studio contributors with a shared interest in the programme. All our challengers sit comfortably within one or more of these communities, but while both Julia* and Hazel* (c) might be positioned further 'outside' the studio than might appear comfortable, the choreography of this event - a 'round table' - facilitated a less formal/hierarchical spatial relationship. Conversely, the format of review (a) was more 'traditional', but Sam's* position on the periphery of the studio community meant that the atmosphere was informal and discursive.

Peer dialogue can be characterised as 'active and discursive'. That between students and tutors/critics can position the student as more 'passive', receiving critique which they may then act upon (McClean and Hourigan, 2013). Many of the formats proposed as alternatives to the traditional architectural 'crit' aim to level the field between participants and several adopt a round-table approach[5]. These alternatives employ tactics designed challenge the status of the tutor as expert/master who is always 'correct' and require students to adopt more active, critical positions – knowledge in these spaces could be co-constructed rather than externally imposed.

5 *Notably the work of John Barton at Stanford University, which informed the work done at TU Dublin.*

Insiders, outsiders... and real outsiders...

The traditional format of architectural reviews, that is each student's work being presented in turn to be critiqued by a panel of (almost exclusively) architects, reinforces the myth that architecture is the product of an individual, autonomous architect (Flynn et al., 2022). Despite M.Arch & UP's ambition to be transdisciplinary, none of the contributors shown in Figure *8.10* are located outside the constituent disciplinary communities. Critics may temporarily adopt proxy roles as potential users and/or consultants to test design solutions (Lymer, 2010) in an attempt to replicate the complexity of what is fundamentally a transdisciplinary practice, but how far it is possible to temporarily inhabit another viewpoint is open to question. In practice, architects will be required to present their ideas not to their disciplinary peers (using disciplinary language) but to engineers, planners, clients, users and wider stakeholders. By excluding other voices and prioritizing our own disciplinary 'experts' as invited critics, architecture schools perpetuate disciplinary 'norms' and prescribe an interpretation of excellence that is 'disciplinarily constructed' (Flynn et al., 2022). It is important to question who we are designing *for*. As noted in the previous chapter *(page 157)*, representations are made to communicate with an audience, in selecting that audience for them we may be encouraging young architects to make work which is primarily designed to satisfy their disciplinary peers. In designing the built environment we are dealing with problems which have no single solution. In this context the need for debate on what constitutes *good*, who defines this, and on whose behalf, is paramount (Sara, 2022).

Studio as a protected space?

> The practicum is a virtual world, relatively free of the pressures, distractions, and risks of the real one, to which, nevertheless, it refers. It stands in an intermediate space between the practice world, the "lay" world of ordinary life, and the esoteric world of the academy. (Schön, 1987, p. 37)

The critics I invited to participate in studio reviews were all individuals with relevant expertise in architecture and urbanism, even those recent graduates who may only have been working in practice for a relatively short time bring an experience of how urbanism is delivered in a contemporary professional context. While they are in most cases architects, these individuals worked in a variety of professional contexts, from large multi-disciplinary studios to sole practitioners, to public service roles developing urban policy at national level. They were able to look at urban problems from a variety of perspectives, but they were all invested in the core approaches which define the *M.Arch & UP* agenda. They were all also familiar with the format, structure and expectations of architectural education, including its signature rituals. While visiting expert critics may bring fresh ideas and new insight to the problems that the students present to them, they do so within an academic framework that they understand. They know what the student will be expected to deliver for assessment and target their comments to support and not undermine this. They will challenge, but not too far.

A *design-research* thesis project can be understood as a *provocation* – an exploration of 'what if' rather than a fully resolved answer to a question, but this is not always evident to disciplinary outsiders who may read the presented drawings in the same way they would a planning application. Innovation entails taking risks.

Students need to have the freedom to explore radical alternative routes towards sustainable urban environments and the academy affords them the opportunity to take risks where consequences are limited. We are not attempting a facsimile of practice and must take care not to regress into the polarisation of *pragmatists versus artists (page 32).*The studio needs to work in balance: to be a 'safe' educational space which enables students to *think the unthinkable* while insulated from the sometimes narrow preconceptions, short-termism and self-interest of the 'public', but ultimately it may be counterproductive to exclude the conflicting demands and messy reality of 'users' (Till 2003). When, if not the final year of their professional education, should students be exposed to challengers *outside* their discipline? Kreber's pedagogies for civic-mindedness suggest that students should be encouraged to 'take risks', and that this *includes* 'go(ing) public' by subjecting their ideas 'to the critical scrutiny of others', but she goes on to say that this should be 'in an environment of trust' (Kreber, 2014, p.98). Whether drawn from within or outside the profession and/or institution, challengers must be invested in the ultimate success of the project (Costa & Kallick, 1993) - in this instance that *project* is the student's education, not their design - and critique from whatever source must be constructive if we are to enable trust and avoid generating the 'fear and anxiety' identified by Sara and Parnell (2013).

Ultimately it may be necessary to question the expectations that I and my invited critics have of a final-year project in architectural education. While encouraging students to take risks, we are perhaps falling back on tired assumptions of what is *good*. The students graduate into a rapidly changing professional environment, and a climate emergency which is fundamentally shifting how we think about buildings, cities, and resources, does architectural education adequately reflect this? Tatjana Schneider has questioned the academic discipline's emphasis on projects which must be drawn, suggesting that despite the turn towards architecture as a social discipline and to 'real' projects, the willingness to accept work which steps outside familiar disciplinary expectations remains limited - 'projects that require comprehension beyond quickly digestible illustrations will lead to disapproval similar in intensity to that caused by utterly fantastical projects' (Schneider, 2016, p. 63). Pelsmakers has recently suggested that architects must broaden their understanding of beauty/delight[6], beyond its usual association with the visual and towards what is 'morally justifiable' (2022) and Till has called for 'good' architecture to be redefined as that which is low-carbon, low-impact and which promotes climate and social justice (Till 2023). We may set out learning outcomes which emphasise 'innovation', 'creativity' and 'criticality', but in reality a project which subverts the normal expectation of a set of beautiful drawings, of beautiful spaces, challenges both the academic and professional community.

6 Architecture as defined by Vitruvius is utilitas, firmitas venustas – commonly translated as 'commodity, firmness and delight' i.e. a combination of the science and art, to facilitate human occupation.

9.4: Conclusions

> Architecture, as a profession, promotes a series of self-referential and autonomous values… Architectural education explicitly inculcates these values through its processes and rituals…. the studio as setting, and design criticism (jury) as ritual, establish attitudes and values that are then played out in the black box of the profession. (Till, 2003, p. 166)

Architectural education evolved as a reflection of practice and the 'studio' method as a simulacrum of apprenticeship in practice – but in a contemporary context it is not clear whether the expectations of the profession act as a break to rethinking architectural education, or vice versa. To return to Shulman's analysis of signature pedagogies in the professions, he suggests that 'if you wish to understand why professions develop as they do, study their nurseries' (Shulman, 2005, p. 52). If this is true, what might *reviews* suggest about what (and who) is valued by the profession? Perhaps, as Dutton suggests, it serves primarily to reinforce 'systems of hierarchy which require a strict division of labour... an orientation to means rather than ends and the ethic of competition to ensure work compliance and intensity' (Dutton, 1987, p. 18) but this was not my experience of the 21-22 reviews described above. Critics acted as 'challengers' not because they disagreed with the students' positions or propositions, but to help them identify and address the multiple complexities and contradictions that their ideas provoked. Fresh eyes, looking at projects from new perspectives saw opportunities (and problems) that may have been overlooked. While it is true that the dynamics of a review are asymmetric, (I have been witness to many reviews which would lead me to the same conclusion as Dutton) the *M.Arch & UP* students were not 'defending' their ideas but participating in critical discourse while clearly conscious of the experience and expertise of their critics. They were stepping beyond their closed academic *community of practice* and learning how to become members of a wider professional community (Scagnetti 2017).

If *dialogic* learning is characterised by 'the emergence of new perspectives from an interplay of voices' (Cook et.al., 2020, p1) then to return to Blyth and Van Schaik's 'social theatre of practice' (2016)- the stage here might be understood as a *dialogic space*, one which is focused on the design as represented by the models and drawings positioned at its centre. The participants take up understood positions: the implied author and their peers have formed a community through both informal peer learning in the studio *(page 174)* and the necessity of shared design outcomes *(page 172)* (Ashton + Durling, 2000; Corazzo, 2019), *mentors* and *challengers* are positioned on this community's periphery *(page 175)*. Conversations before the review might be visualised as a round table: each member participating equally, each person's action depending on the one before (Sawyer and DeZutter, 2009). In the context of the review itself, each individual is then asked to consider their own intent/position and see their work in the context of not only that of their peers but subject to external challenge. They are required to look at their designs, and those of their peers, through the frame created by their challengers.

This narrative began from an observation that 'going public' with their ideas instigated productive critical dialogue between the students themselves, not *at* the review, but in preparation for it. I have attempted to

map both how these events worked to structure discourse as they unfolded; how they punctuated the work across the year; and how individual critics and the positions they adopted influenced the direction of the projects that the students developed. In doing so I've become more aware of the limitations of the *review* framework as well as its strengths. Constructive critique is always likely to be valuable and the opportunity to engage in a critical discourse, structured around material artefacts and positioned in a semi-public forum, means that this critique can benefit a wider constituency beyond the individual whose work may be the focus. These material artefacts can continue to exist and play a role in the studio beyond the temporal site of the review. But, in limiting who may participate in this discourse - who is permitted to ask questions - we are in danger of reinforcing rather than demolishing disciplinary and professional silos, of inculcating 'self-indulgence at the expense of public need' (Strathern 2004, p.4).

The internal street

10: Conclusions: Drawing the Stories Together

Design studios remain ubiquitous in design education. Considering them only as a physical space in which to teach undervalues the central role they play, one which may not be evident or well-understood in the wider context of higher education. If studio teachers cannot articulate how studio works, the physical space is in danger of being lost to the 'value for money' logic of hot-desking. This study has revealed the way that studio operates as a rich *social theatre of practice* (Blythe and Van Schaik, 2016), one which enables students to evolve a critical position as they embark on practice in a complex, rapidly evolving professional landscape. It has also highlighted the importance of both the physical space of the studio and material tools and artefacts which are entangled in studio practice, in how studio works.

Until relatively recently there had been few in-depth studies of design studio pedagogy and practice (Mewburn, 2012) but as design schools have become more integrated into the mainstream higher education system, they have been expected to rationalise and to justify teaching methods which were hitherto simply accepted. Building on the design methods movement of the 1960s and 70s, and catalysed by Schön's work to legitimise studio pedagogy in the 1980s, there is now a growing body of work which considers the studio from differing perspectives and through different lenses. Schön argued that an architectural studio - a place which draws together theory and practice in the context of problem-based learning - might be a model for professional education across other disciplines (1987). As a studio teacher I would agree, studio pedagogy encourages students to become active learners, often co-constructing knowledge around shared tasks and a studio which engages students in addressing live concerns through a shared, often semi-public discourse, might have been designed to deliver on Kreber's pedagogies for *civic-mindedness* *(page 65)*. This account considers the specific context of a 'transdisciplinary' design studio and the additional dimensions this lends to design problems. It

also adresses the material and spatial that Schon downplayed in his explanations (Mewburn, 2012) seeking to recognise non-human, and human actors and the key roles they play. It adds to the body of knowledge around studio pedagogies by examining how *places* work to gather things, practices, and people - to structure critical discourse, to construct knowledge and to shape future professional identities - and it focuses on a *transdisciplinary* studio, an approach which is currently under explored but which may be critical to future practice.

What aggregated meaning or message might be drawn from the three *sites* I have focused on and the practices which unfolded around them? This conclusion returns to the initial aim I set out for this study - to explore how a transdisciplinary urban studio might support students in developing a critically reflective approach to their practice. It sets out what the three stories taken together might reveal, what remains unanswered, and what implications this study may have for my own practice and that of others.

10.1: How *designerly* studio practice engenders critical discourse

This study set out to investigate how important studio methods and practices, specifically the 'designerly' or 'solution-focused' ways of thinking that students adopt (Cross, 2011) might contribute to the development of critical approaches to practice. I wanted to examine how discourse and collaboration were engendered by the studio environment, and the way that students used artefacts, materials, and spaces to structure that discourse and collaboration.

Through observations, particularly of the studio table as it evolved (as recorded in *chapter 6*), it is evident that studios can encourage critical discourse; at first sight by simply positioning individuals in proximity to their peers. Unlike the lecture theatre however, the use of design tools and methods tends to involve or result in material *things*; these things invite discourse and have the capacity to *speak* for their authors even when those authors may not be physically present in the space. The solution-focused approach (Cross 2011) that designers adopt generates multiple potential solutions through an iterative process of trial and error. This process is externalised through drawing and modelling, it becomes *material* and therefore a visible part of the studio's wider discussion of appropriateness, innovation, and potential solutions.

The necessity to produce shared representations for presentation and discussions at reviews (as discussed in *chapter 7* and *8 (page 166)* creates a more formal and structured fora for collaboration. In the *M.Arch with Urban Planning* studio these representations act as a canvas upon which to project individual projects and a frame through which to read them, but more importantly the students who make them engage in a shared design process – dialogic learning which produces far more than only the material artefact (Wegerif, 2013). The students must negotiate a shared understanding of a specific place and the challenges it faces, they must consider this into the broader context of urban problems. They must *frame* problems, having been presented

only with a problematic situation (Schön, 1983), and develop proposals to address these to which they can all subscribe. They bring their individual experiences and preoccupations, as well as their skills to this shared space, the 'necessity of production' (Mau, 2010 -2014) instigating and structuring the spaces of discourse.

Higher education faces funding shortfalls: material artefacts and the permanent studio spaces which enable their production may legitimately be questioned in the move towards digital tools and the convenience and resource efficiency that they promise. When students are not being *taught* in a space, why can't that space be used by another class? If drawings and three-dimensional models can be produced (and shared) online, then why should institutions continue to facilitate the construction of models and the printing of drawings? Why print drawings which will likely end up in a recycling bin, when they can be displayed on a digital screen? Why build a physical model when so much space and material might be saved by constructing it in a digital space? These arguments make economic sense and are increasingly difficult to resist when both institutions and students are mindful of costs and in the post-pandemic context of 'hybrid' delivery. But in this argument the studio space is equated to a classroom and how material artefacts act in studio practices is misunderstood. If we cannot articulate their value, then they may be value-engineered out of existence.

This study was conducted in the wake of a pandemic which temporarily forced all academic design studios to switch to digital sharing platforms, a circumstance which has generated a significant body of research examining how studio pedagogy might work in a digital environment[1]. The resourcefulness exhibited by studio staff and students during 2020-21 demonstrated that while the standard digital platforms developed for education are rarely suitable, alternatives are possible[2] and advances continue to be made. It would be naive to assume that studios cannot and should not evolve. Nor do I wish to romanticise hand-drawing or suggest that hand techniques are in some way preferable to digital. This would deny the advantages that the massive technological developments of the past thirty years have brought to design and to education practice. Education must reflect this shift and ensure graduates are ready to enter the contemporary professional environment. But an academic design studio is not a professional studio - our remit is not to replicate practice, or even just to 'train' graduates. The studio is a place where students learn how to be designers through iterative processes of *seeing-moving-seeing* (Schon and Wiggins 1992). It is a collaborative space where each individual is feeling their way towards an understanding of their professional identity by engaging not only with their own work, but also with that of their peers. The material artefacts which form part of a design process make this visible. Students see, and often see potential in things that their peers may undervalue or even consider mistakes. Over-curated digital sharing platforms often hide this process - students must actively *choose* to upload work-in-progress rather than it is simply leaving it on the table or pinned behind them on the wall. It is not possible to anticipate exactly what digital tools may be available to us in the next decade – but articulating what we

1 The Design Research Society has published a number of studies on this..

2 Where virtual learning environments are only designed to facilitate verbal discussion, any visual interaction being slow and limited, platforms developed for professional collaboration such as Miro and Mural can enable more collaborating sharing of visual artefacts.

need those tools to facilitate may enable their designers to problem form/frame appropriately to meet this requirement. The complexities inherent in constructing a digital facsimile of studio practice should not be underestimated.

10.1.1: Critical position/practice

As well as learning how to be designers, students must learn how to be *professionals*. The discourse that emerges in a studio shapes both the project outcomes and the positions which the students adopt - in relation to the wider disciplines of architecture and urban planning, and their approach to their future practice. The work that the students produced in 21-22 was particular to them. It emerged from the context they were given and was shaped by their individual interests, experiences, and preoccupations *(Figures 6.13, 6.14, and 6.15 page 132)*. But given the shared concerns which were also evident *(Figure 6.21 page 139)* around the table described in *chapter 6,* the projects and positions that students ultimately evidenced may have been radically different had they chosen to work alongside a different group. Their work may have been subject to formal reviews conducted by internal and external critics, but it was the continual constructive challenge from the students who sat across the table, or at the other end of the studio, or even those that passed by along the internal street, which meant the students were asked, and asked themselves, critical questions every day. Creativity is 'distributed' in a studio environment, perhaps also *criticality* (Sawyer and DeZutter, 2009, Glaveanu, 2014).

The economic case for studios, (however tenuous) is currently made primarily on the nature of the work being carried out - visual, and often large scale; and on disciplinary norms in creative/visual disciplines – schools will be unwilling to surrender studio space as long as it continues to be provided by their competitors. The capacity of studios to act as *dialogic* spaces engendering critical discourse is rarely discussed. While Schön's argument for studio pedagogy may have been based more on the potential of 'coaching' there may still be lessons here for other, non-visual, professional disciplines - how much can/should be 'taught' and how much might be learnt through collaborative, project-based exercises which require students to engage with their peers and with real-world issues?

10.2: The transdisciplinary context

The above discussion might be applied to any academic design studio, but I have framed this doctoral study around urbanism, and specifically *transdisciplinary* urbanism. So how far was this studio characterised by its transdisciplinary agenda, and how might this inform the development of *critical practice*?

Because of pragmatic constraints around timing, this study focused on studio practice within a module which

did not include students from different disciplinary backgrounds. The shared studio module was completed in semester one and was therefore more compromised by pandemic limitations on the use of the studio. In these already challenging circumstances I did not want to risk impacting further on the development of student work. How such cross-disciplinary teams might work to inform a student's emerging critical position remains an area worthy of exploration, but not one it was possible to address in this study.

Studio learning depends on creative discourse - informal conversations which happen in studio, and more structured encounters in the form of tutorials and reviews. As students progress through the years of their academic course their teachers should become less important in shaping this discourse, their peers more so – the studio progressively operating as a more level *dialogic* space rather than in a hierarchical 'master/apprentice' form. The M.Arch with Urban Planning studio differs from the norm as its students will often work in direct collaboration with those from other disciplines, they are therefore required to 'think between'. As Rendell points out, this 'demands that we call into question what we normally take for granted... our methodologies, the ways that we do things, and our terminologies' (Rendell, 2003 p. 224). For architecture graduates who will spend their professional careers working in multi-disciplinary design teams and who will be required to communicate with clients, users and wider communities, the lessons learnt here will be practically useful. More importantly perhaps, students embark on this final year of study with a shared level of disciplinary expertise and confidence, but they willingly step – as a studio – into unfamiliar and potentially risky territory[3]. They take on a different *interdisciplinary* identity from that of their peers who remain in M.Arch, and they use their studio to negotiate new positions informed by these new perspectives. Working in a collaborative, interdisciplinary context forces a questioning of disciplinary *truths* which can become lazily accepted within a disciplinary echo chamber.

10.2.1: Architecture's 'outside'

> The disregard for climate breakdown is consistent with a view that architecture is an autonomous and self-defined discipline detached from external dependencies (Till, 2023)

The nature of the work that the students were engaged in producing – projects which combined architecture and planning-orientated concerns - was different to that of their M.Arch peers. This changed the nature of the problems that the students identified as starting points; the ideas and themes that these projects explored; and how they took design decisions. They took a broader and more holistic view of urban places and considered with more clarity the wider implications of interventions in those places (spatial, economic social and temporal). They were also able to imagine other kinds of solutions not limited to proposing a building. They were required to reconsider in whose interests they were acting *(page 55)*. The identification of 'wider society' as the 'client' perhaps immediately suggests a more explicitly ethical approach – all projects were measured against their potential impact on *place* in all its dimensions.

3 *a safety in numbers which empowered the 21-22 studio to divert into textiles (page 155)*

Returning to Clancy's definition of critical practice (Clancy 2020b, *page 53*), that it must be important, questioning, and/or 'sustain a reaction', it is useful to consider the studio's work through this lens. It is perhaps evident that urban places are fundamental to human health, well-being, and flourishing and therefore urban problems are *important*; but how we 'frame' urban problems is linked to Clancy's second point – how, and using what criteria, we *question*. Working between and across disciplines requires students to consider urbanism from different perspectives - to broaden the frame through which they structure their understanding and perhaps subtly (in some instances radically) alter their position.

Clancy's third point, that to practice *critically* might mean producing work capable of 'sustaining a reaction', implies making work which questions, challenges, critiques or brings new insight to existing knowledge, and also placing that work into a public domain. While knowledge can be embodied in physical artefacts *(page 57)* these artefacts must be read/interpreted, and that knowledge is therefore not always explicit. The requirement to disseminate knowledge is implied in *design research (page 33)* but not necessarily in *design* (Rendell, 2004, Till, 2005). M.Arch with Urban Planning students (in common with many postgraduate architecture programmes) are required to articulate the ideas underpinning their work as well as its formal outcomes; how those ideas have evolved in the context of other work capable of 'sustaining a reaction'; and by 'stepping back' to consider the wider applicability and potential of what has been proposed. *Design research* projects begin a discourse in the 'semi-public' space of the studio (Schutz, 1999), but also contribute to studio culture by being transmitted to future studios, and to a wider 'public' via exhibition, presentations and sometimes publication[4].

Critical analysis, awareness and understanding may be embedded within academic expectations at this level of study (SCQF level descriptors 2023) yet draft professional criteria currently undergoing formal consultation (ARB 2023) emphasise threshold *design*, not design *research* skills. They require that graduates be competent to apply ethical standards, but not that they should practice ethical 'know-how', a characteristic which might be built through subjecting their ideas to critique in a semi-public forum (Kreber, 2016). A transdisciplinary urban studio creates a setting which might have been explicitly designed to address Kreber's characteristics of education for civic-mindedness (Kreber 2016b). It addresses real problems/concerns of social relevance and asks students to apply knowledge and creativity to these, to question their assumptions and beliefs and to test their ideas through a 'public' discourse.

Crossing institutional boundaries

It is perhaps a fundamental flaw in this study that despite aiming to reveal how studio shapes emerging professional identities, it does not explore this question with graduates. How does their 'position' alter once em-

4 The work of the 20-21 studio was presented by students at a conference organised by the Perth City Leadership Forum in November 2021, and that of the 21-22 at the Essential Shifts conference at Robert Gordon University in June 2022.

bedded in the commercial constraints of practice? Does what they have learnt continue to inform how they approach real-world practice? This falls outside the scope of what was possible within this study but remains a question for the future. Those graduates who have been part of this research - those who returned to participate in reviews (Sam* and Hazel*) represent those who have forged 'hybrid' careers *(page 22)*. The majority of graduates follow more conventional paths. It would be useful to explore how far their brief trans-disciplinary academic experience has influenced their approach to architectural practice - have they retained their appreciation of complexity and a 'wider community' focus or not?

The problems that M.Arch with Urban Planning students engage with are *real-world*. The possibility of working with live situations as they emerge, and of building these into the work as it develops creates a rich and multi-dimensional context for critical discourse, one which is real but at the same time protected from the necessary constraints imposed by real-world practice. Students have the freedom to speculate *what if?* without being required to justify their most radical ideas as entirely realistic propositions. However, the students' understanding and experience remain sited in the university and their perspective is still that of aspiring, rather than actual professionals. They are outsiders, effectively role-playing theoretical projects as *live* and dependent on the consultants and community representatives they may meet to buy into that pretence.

Academic projects which are truly '*live*' can be transformative learning experiences for the students who participate in them. They embed students within the complexity of practice, working directly with communities and resembling Kreber's interpretation of 'pedagogy *with* the public' *(page 65),* but the potential to *critique* wider agendas may be compromised. It is also questionable how transformative student projects can be for their clients without the support of a sophisticated institutional framework - *live* projects must be carefully resourced, managed and supervised (Harriss and Widder, 2014). What potentially makes the M.Arch with UP students' contribution valuable is perhaps not as deliverable pragmatic solutions to immediate problems, it is in beginning public conversations and instigating debate around the future of *place*s. They have enough breadth of vision to be able to envisage possible alternative futures and are, to an extent, liberated from the minutia which constrains day-to-day professional practice. However the obvious tension between a truly *transdisciplinary* design practice and the use of this approach to frame primarily *theoretical* projects remains unresolved. Students are not experienced or confident enough to be able to effectively argue where fundamental changes may be necessary, and where communities may be conservative, resistant, and focused on vested interests, and they may not be mature enough to balance this critique with knowledge drawn from other sources. How far it is possible to push a *live* agenda and at the same time imagine radical alternatives to current models of urban development remains an open question.

The public forum: redesigning the review.

The requirement to test and explain your ideas in a public forum, to critically reflect and to do so in a way that is intelligible to others, is (on balance) an advantage of pedagogies in visual disciplines - but it is also a

practice which should be continually re-evaluated. Reviews can prepare students to speak openly and confidently, navigate between often conflicting perspectives, accept critique and to use it as a reflective tool; but educators, as critical practitioners, also have an obligation to question beliefs and assumptions and the choreography and composition of 'reviews' have changed very little since the Oxford conference of 1958. Each review event I observed in 21-22 involved all participants – staff, external critics, and students - in making complex, but largely intuitive judgements on when to play *challenger*, when *mentor*, and when *critical friend*. This is perhaps something too often left to chance. The *choreography* of a review can alter the dynamic of the discourse which emerges. This study has not attempted to repeat work which challenges the traditional format or to suggests alternatives, but a review cannot be a useful opportunity for reflection if it is seen by students as only an ordeal to be endured (Sara and Parnell, 2013).

In a studio which aims to be *transdisciplinary,* the first and most obvious measure is to reconsider who should be included. In professional practice graduates will still need to communicate with their disciplinary peers, but this is not (usually) where communication failures lead to poor professional practice. Conversely, poor communication with clients, communities, and consultants is a common source of complaint, as Wainwright points out:

> Architects are notoriously bad communicators. They have a tendency, while attempting to stride the multiple disciplines of construction, philosophy, sociology and art, to speak an opaque private language that is legible to none (2023)

Education largely leaves this skill to be learned in practice. Communicating beyond the discipline(s) and institution plays little role in even this *transdisciplinary* academic studio. Excluding external voices from this discourse risks the students' emerging critical 'positions' being framed from a purely academic and disciplinary perspective.

Communication skills in architecture extend beyond spoken and written language. It is telling that our external examiner praised the *stitched map* as an attempt to communicate not with a sophisticated disciplinary audience but a wider constituency *(page 159)* and that one of the students called it (affectionately) 'ugly'. A degree show marks a transition from the academic to the professional context: students cease being students and start being graduates. Work is edited, tidied up, *beautified* to fit with disciplinary expectations which celebrate architectural form. A parallel event, more subversive but less 'high-stakes', which enabled students to engage with a broader notion of *going public* by presenting and arguing their ideas with a more diverse audience, may ultimately be more meaningful in shaping future practitioners.

Reviews, and even more so final exhibitions, can reinforce competition where collaboration results in more useful learning. Through their five years of studio projects students become accustomed to the individual 'pin-up' where their work is viewed in parallel to that of their peers. They follow social media and websites which post the 'best' architectural drawings and encourage students to try new techniques which emulate these.

These drawings can be exquisite artefacts *in their own right* which demonstrate an impressive level of skill; but an exhibition of beautiful drawings, of beautiful objects and spaces glosses-over bigger contextual questions. A building can be relatively easily represented through drawings. Its social, economic, and political dimensions might be visually mapped, but how these emerge, interconnect and impact on the lived experience of place is less easily communicated through conventional visual means. Drawing what can't easily be drawn is a useful skill which may ultimately assist in communicating with a broader audience, but these drawings may be more *infographic* than *orthographic*. Broadening the traditional expectation to encompass more than individually produced drawings of buildings represents a more significant cultural shift than may be appreciable outside the discipline. In the context of the public degree show exhibition (and its digital equivalent the exhibition website) the work of the MArch with UP studio is seen in direct comparison with, and inevitably measured against, that of all other architecture graduates in their year. Whatever we may do within one institution to challenge disciplinary conventions, until the wider profession is prepared to accept alternatives as legitimately *architectural,* making anything other than a conventional set of drawings of a building will remain a risky choice.

10.3: Implications

10.3.1: For my own practice: agency

The observations of the studio across all three *sites* led me to conclude that while external feedback was important (the studio would not have had the confidence to pursue their stitched map without the encouragement of external critics working at the highest level of practice) it was the conversations that review events provoked – in anticipation and in retrospect – which were ultimately most valuable. Reviews played a role in structuring the year, they enabled the students to plan work on their individual projects, understanding what needed to be resolved, by when. They acted as a common framework to bring the students together, creating a catalyst for shared decision making and discussion.

Looking at each of these three *sites*, I have become more aware of my own role as a teacher in each, and how visible I was. At the students' table I was an invited guest usually once per week - the students set the agenda for discussion. While I might ask them challenging questions if I felt they were missing (or deliberately avoiding) some key issue, their work followed the path they wanted to pursue. In the case of the shared representations they were given a clear goal at the outset – to communicate a shared intent – while the form this took was not prescribed. This prompt created the framework for design discussion. I was party to this in its early stages but my presence gradually became superfluous as the students found a way to work together and began to pursue their own ideas, clarifying what their vision was and how best to communicate it. Reviews were the forum for 'challenge', both the individual projects and the group's 'vision'. My role here was to design this structured framework – to set the timetable of the year, to choose who would be invited to contribute,

to manage each review day sometimes intervening in the conversations which emerged - but as far as possible having done this I stood back. This is the *site* where my presence is most clearly evident.

I had always suspected but am now more convinced that my role in the studio as a teacher in a post-graduate studio is, and should be, as marginal as possible. I am there to support if necessary; I can act as mentor and occasional challenger; I may occasionally insert a provocation into ongoing studio discourse - but the most important participants are the students themselves. It is my role to create the best possible environment for discourse to emerge. To refer to Blythe and Van Schaik, I've constructed the theatre, but now I stand to one side – intervening in the discourse from time-to-time, but not directing it. 'Teaching' studio at this level is a delicate balance between support and challenge, between structuring learning, and stepping back to ensure that the students take ownership. It is not always easy to stay at one remove, but I am not acting as an expert or 'gatekeeper' to disciplinary (or interdisciplinary) knowledge here and neither am I acting as a 'coach' (Schon 1983).

This study afforded me the opportunity to reflect on the accumulated experience of thirty years working in architectural studios through the lens of one extraordinary year. I delayed my planned observations from the 20-21 session because my aim was to focus on studio practice, not its translation into digital space. In actuality the studio in 21-22 was not 'normal' - it remained compromised, more ordered, regulated, and tidier than any studio I have previously experienced. In retrospect this meant that the study captured a unique period. Limiting what the students were permitted to do and how they were able to use the physical space revealed the importance of aspects of normal studio practice which might otherwise have been overlooked. I have been forced to challenge some previous assumptions, for example the construction of the shared model did *not* in this instance build an understanding of the context - the students may have learnt something about project management through making it, but it was simply a communication tool. In other instances what I had previously suspected was the case has now been consolidated - the accumulated detritus of a design process is not just *mess* it is a tool for critical thinking which has the capacity influence thinking beyond its original author, to distribute creativity. Beyond the circumstances, the session was 'unique' in that this group of students were also (as every group is) – they brought their own individual experiences, skills, and personalities together to act creatively. No group I have worked with before has decided to 'stitch a map' and it may never happen again.

I have also been required to interrogate what makes the M.Arch & UP studio, as *transdisciplinary*, different from those others for which I have previously been responsible. I'm forced to conclude that while the working between and across disciplines requires students to significantly broaden their perspective, there is unexploited potential in working across the boundaries of the academic institution. What we have done to date is only a tentative step.

From a personal perspective, the necessity when working across the boundaries between visual/spatial disciplines and education, to explain exactly what I do as an architect and a *studio* teacher has forced me to question my own accepted truths, but also to appreciate the strengths of studio pedagogy that I intuited were there but perhaps failed to fully understand. I have been required look closer and from other angles.

10.3.2: For research: thinking visually, and across disciplines

I had not anticipated at the beginning of this study the role that tools other than written language might play in constructing and communicating this study. Visual methods, including drawing and ethnographic mapping may be increasingly common as data collection methods in social sciences, but these are most usually the work of participants to be analysed by others (Corazzo and Gharib, 2021, Heath et al., 2018). Architects are trained to think spatially, and to communicate using drawings which translate those spaces from three to two dimensions. Accepting that this is how *I* construct knowledge; that drawing might be an equally valid way of recording, analysing, reflecting on and communicating data; and that knowledge can be embodied in visual artefacts as well as in written texts, has enabled me to make connections which might otherwise have been lost in a purely linear narrative.

Architects do not *look* at drawings, they *read* them. The visual/spatial languages that architects commonly use may not be so easily understood outside the discipline, and the aim must be to communicate complex messages in a format most intelligible to the widest possible constituency, but I would argue it is legitimate to expand the methods by which 'academic' knowledge is usually constructed and communicated. Visual research values made *artefacts* as integral to its outcomes, and *design research* (such as that conducted by the MArch with UP students who participated in this study) is centred on visually communicated designs. It may be that as Cross argued

> There are forms of knowledge peculiar to the awareness and ability of the designer, just as other intellectual cultures in the sciences and the arts concentrate on the forms of knowledge peculiar to the scientist or the artist (Cross 1999, p. 5).

Bringing my own *designerly* way of thinking and knowing to bear on this doctoral study in education has led me to interrogate in more depth exactly how a design process might work and to appreciate its complexity. Designing is inventing – the drawings which have been included in this study have been designed as tools to visualise, analyse and organise knowledge.

I referred to my methodology as a *spatial bricolage*; to 'places' that gathered material and practices (Cresswell, 2014); and to these as 'sites' in that they created a context for action (Burns and Kahn, 2005). The stories which narrated what and how things happened can be read independently or woven together, they work as 'spatial trajectories' guiding the reader (de Certeau and Rendall, 2011). As a participant, I am more visible in some stories than others, but I am also the narrator or in this instance the *bricoleur*; while they may be constructed of things 'to hand' I am always implicated in that they are shaped by my intent.

10.3.3: Contribution to studio literature

This study is not the first to seek to render visible the intangible/invisible contribution of both formal and informal collaboration and discourse in an academic design studio (Vyas, 2009, Corazzo and Gharib, 2021, Gray, 2013, McClean and Hourigan, 2013). Nor is it the only study to use a socio-material approach (Yaneva, 2005, 2009). Where this adds to this body of knowledge is primarily in its context, that of a *transdisciplinary* studio. According to Doucet and Janssen's definition (2011) transdisciplinary urban practice is characterised by an engagement with critical (and ethical) practice. Students must learn how to be design professionals – how to navigate wicked problems in a super-complex and highly contested context (*page 49*). Academic transdisciplinary studios are rare, and not often the subject of comprehensive study. This is perhaps as a consequence of boundaries often erected by disciplines and even more evident in architecture where they are policed through accreditation, but effectively addressing contemporary urban problems will necessitate working 'across'.

10.3.4: For the academic studio and professional landscape: future practice

> I've run out of patience with, and we have run out of time for, the voices saying, 'this is not architecture' (Lokko and Hughes 2021).

Higher Education is increasingly operating in a climate of metrics, where we must demonstrate value and returns; and our graduates must deliver pre-prescribed, easily measurable outcomes. In an educational studio this is overlaid with the additional complexity of professional accreditation criteria, which are necessarily discipline-specific and therefore inclined to narrow rather than broaden the frame of reference *(page 34)*. The necessity of building an *ethical* approach to practice is increasingly recognised by architectures professional and statutory bodies, but what this means and how it might be delivered is under-explored. This study makes the argument for stepping outside our current conception of disciplines in the built environment. It challenges institutions and professional bodies to reconsider what may be 'essential' to curricula, teaching methods, and assessment at this level. The ARB and RIBA are both seeking to mandate 'ethical practice' in revised educational criteria (2023, 2020) but separating these *outcomes* from attributes/qualities such as criticality or critical thinking may diminish their meaning.

Ultimately practicing *critically* means exercising professional judgement; engaging with *real-world* issues of importance; and contributing to public discourse around those issues. It means an individual must be continually open to questioning themselves and their motivations, and take responsibility for their decisions and actions. Instead of side-lining *ethical practice* taught delivery *(page 54)* an alternative would be to embed this approach through the way that studios are configured, to work across disciplinary and institutional boundaries, and to design our studios in ways that value agency over 'groupthink' *(page 33)*. What if all architecture schools were to structure their final degree assessments around Hunter's question to his London School of

Architecture students: 'who does the world need you to be as a designer'? (Hunter, 2021 p. 22)*(page 51).*
As Till has recently argued, Architecture as a discipline needs to question what it considers *good*, in his view away from formal, aesthetic and ultimately stylistic concerns, and towards those projects that prioritise climate and social justice (Till, 2023).

While architects often describe their practice as inherently 'interdisciplinary' in an academic context we often remain stubbornly unwilling to engage beyond traditional disciplinary boundaries - time spent not designing buildings is too often viewed as time wasted. But, as has been discussed urban problems are too multi-dimensional to be addressed by professions (or individuals) working in isolation. In our current context of climate emergency and increasing inequality, how do we shape future professional education to meet future needs?
I would not deny the importance of disciplinary knowledge - this is what enables interdisciplinarity - but allowing the space for students to meaningfully step outside/across disciplinary boundaries and to see the world from alternative positions may be fundamental in shaping a critical approach to their future professional practice.

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Appendices

1.project information sheet

Supporting Critically Reflective Practice in a Transdisciplinary Design Studio
Helen O'Connor: EdD Project, University of Sheffield.
16.02.2021

I would like to invite you to take part in a research project. Before you decide whether or not to participate, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask me if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

The project is being undertaken as part of my Doctorate in Education at the University of Sheffield. I am interested in how the *transdisciplinary* nature of the MArch with Urban Planning (i.e., engaging directly with other disciplines and with community stakeholders to address live problems) may affect how students develop an understanding of their professional roles and responsibilities; their approach to ethical and/or critical practice. Understanding this could inform how universities and professional bodies think about architectural and planning education in the future. The project builds on informal observations and conversations I've had with students, visiting critics and graduates over the years since we started running the programme, but the active data gathering aspect of the project will take place between May 2021 and September 2022. I'm aiming to complete the project by January 2023.

As a current student/ a graduate of the programme, or a member of staff/external collaborator engaging with the programme I am interested in understanding more about your experience and your views. All graduates and current students are being asked if they would like to contribute.

You are under no obligation to participate; this is entirely voluntary. If you *do* decide to take part, you will be asked to sign a consent form, but should you decide that you would rather not, please be assured this will not in any way impact on your engagement in the course, or on your assessment. You may be happy to participate in some aspects of the research, but not others, and you have the option to specify this on the consent form. I appreciate that participation in any discussions and workshops outside of normal studio activities may take up valuable time and you should be mindful of this. Sessions will always be arranged in consultation with you, and to suit your timetable, but **you can also choose to withdraw from participation at any time. You do not have to give a reason.** If you do wish to withdraw please contact me on the email address below

Please note that that choosing to participate in this research does not create a legally binding agreement, nor is it intended to create an employment relationship between you and the University of Sheffield.

What's Involved:

Observations: Firstly, I am intending to carry out observations of studio events and workshops, both in the studio and on-site, in order to understand more about the dynamics of interdisciplinary studio interactions – how students work together and how groups and individuals arrive at design decisions and how these are then discussed with external stakeholders such as council or community representatives. I'll be making detailed notes but may on occasions also use photography and/or audio recording, where I do use these tools, I will explicitly ask for your permission, even where you may have already given general consent through the form which accompanies this sheet

studio discussions around the Arbroath High Street model, 2017.

Any audio and/or video recordings of your activities made during this research will be used only for analysis and for illustration in conference presentations and lectures. No other use will be made of them without

your written permission, and no one outside the project will be allowed access to the original recordings. For all observations, you will be given sight of any materials generated to ensure they are accurate, and that you are happy for your participation on this occasion to be included in the wider study.

Part of recording the work of the studio, will include reproducing images of the work students produce. Again, where this is the case, I will explicitly ask your permission, and if you do not wish to remain anonymous you will be given full credit as the author of any images used.

Interviews and Group Discussions: I would also like to conduct interviews with **students** studying on the course, in order to understand your motivations, your experience of the course as you progress through the year, how you see your future career developing, and how you understand your professional role in relationship to wider societal concerns, e.g. urban growth, sustainable development etc; with **graduates,** in order to understand your motivations for opting the initially follow this pathway, your experience of it, and whether it has influenced your subsequent approach to your professional practice, and with **UoD Staff/external contributors** who have engaged with the programme in the past, in order to understand based on your professional experience, how this approach might differ from courses you may have been involved with in the past, and where you might see advantages and disadvantages in a transdisciplinary, studio-based approach to professional education in your area of expertise.

These interviews will normally be done on a one-to-one basis, and organised to suit your timetable, but where it is possible and appropriate, I may ask if you are willing to participate in round-table conversations. Both discussions and interviews will be informal and open-ended conversations around the issues rather than set questions – I am interested in your honest opinions. I'm aware that your time is already under significant pressure. Any interviews and discussions will be timetabled with your agreement, and not for busy periods in the teaching timetable.

community engagement event
Photo Rebecca Foy 2020

The research has been designed to focus specifically on a key aim of the course – that of enabling students *to position themselves as innovative, principled and skilled individuals, able to operate within an increasingly complex and diverse profession,* reflecting current ARB/RIBA 'graduate attributes' for part 2 accreditation.

I hope there may therefore be tangential benefits for students in asking you, as participants, to consider these aspects of your education and to engage in a structured discourse around the issues raised with peers, recent graduates and external contributors. The opportunity to reflect upon and engage in discourse about these aspects of your role, may also help students and recent graduates to prepare for aspects of the ARB/RIBA Part 3 and/or your application for chartered membership of the RTPI. However, you do not need to participate in this research in order to fully participate in the M.Arch with Urban Planning.

It is my intention to share the outcomes of this work with you as it progresses, through a diary in the form of a project blog, and review presentations to which you will be invited.

Whilst there may be few immediately tangible benefits for those people participating in the project, it is hoped that this work will inform future course development in built-environment disciplines and may influence professional bodies in considering the future shape of professionally accredited courses.

Confidentiality:
All the information that we collect during the course of the research will be kept strictly confidential and will only be accessible to myself and to my supervisors at University of Sheffield. You will not identified in any reports or publications unless you have given your explicit consent for this. If any images of your work are included, unless you wish to remain anonymous you will be given full credit for this material.

According to data protection legislation, we are required to inform you that the legal basis we are applying in order to process your personal data is that 'processing is necessary for the performance of a task carried out in the public interest' (Article 6(1)(e)). Further information can be found in the University's Privacy Notice https://www.sheffield.ac.uk/govern/data-protection/privacy/general.'

As I may be collecting some data that is defined in the legislation as more sensitive (e.g. you may wish to discuss your political, religious or philosophical beliefs should these impact on your personal approach to your professional practice), I also need to let you know that the following condition in law will be applied : that the use of your data is necessary 'for archiving purposes in the public interest, scientific research purposes or statistical purposes' (9(2)(j)).

All the data collected will be pseudonymised unless you have indicated that you are happy to be identified, and beyond myself and my supervisors at The University Sheffield, will only be shared with other members of staff at [redacted] where it may directly contribute to improvements in the course, and where I have your express permission to do so. Likewise, you will not be identified in any subsequent publication, unless you have explicitly given your consent for this. Your personal data will not be retained beyond the end of the project.

A Data Controller is the 'organisation which determines the purposes and means of processing personal data'; in this instance this is the University of Sheffield. This means that the University of Sheffield is responsible for looking after your information and using it properly - the project has been ethically approved via the University of Sheffield's Ethics Review Procedure, as administered by the School of Education.

If something goes wrong…

If you have any concerns (e.g. regarding how the research is being conducted) please talk to be me in the first instance, but if you want to make a formal complaint, then you should then approach my research supervisors at the University of Sheffield (contact addresses are listed below). If your concerns relate to any impact on your own studies at the [redacted] you may also wish to include in the Head of Architecture and Urban Planning (Cameron Wilson) in your email.

If you feel your complaint has not been handled to your satisfaction by my supervisors, you can then contact the Head of the School of Education at University of Sheffield, who will then escalate the complaint through the appropriate channels. If the complaint relates to how your personal data has been handled, information about how to raise a complaint can be found in the University's Privacy Notice: https://www.sheffield.ac.uk/govern/data-protection/privacy/general.

Finally, thank you for reading this, and giving it your consideration. I would very much appreciate your contribution in developing this project over the next few months. You'll given a copy of this information sheet to retain, together with your consent form if you are comfortable participating, but should you need an additional or replacement copy, please ask.

Contacts for further information:

Helen O'Connor: h.m.oconnor[redacted] / hoconnor2@sheffield.ac.uk
Matthew Building, [redacted]

Research Supervisors:
Dr Becky Parry: R.L.Parry@sheffield.ac.uk / Dr Jessica Bradley: Jessica.bradley@sheffield.ac.uk

[redacted] **contacts:**
Cameron Wilson: c.m.wilson[redacted]

2. consent form

Supporting Critically Reflective Practice in a Transdisciplinary Design Studio

Consent Form

Please tick the appropriate boxes	**Yes**	**No**
Taking Part in the Project		
I have read and understood the project information sheet dated 26.01.2021 and the project has been fully explained to me. (If you will answer No to this question please do not proceed with this consent form until you are fully aware of what your participation in the project will mean.)		
I have been given the opportunity to ask questions about the project.		
I agree to take part in the project. I understand that taking part in the project will include (you may choose not to agree to some or all activities and permissions listed):		
I agree that my participation in some studio coursework activity will be observed		
- observed coursework activity may be audio recorded. I agree to being audio recorded and for transcripts of appropriately pseudonymised audio recordings to be used in the research. **All participants will be notified, and their express permission sought, at any session which is being recorded in this way.**		
- while I am participating in observed coursework activity photographs will be taken. I agree to being photographed and for these images be used in the research. **All participants will be notified, and their express permission to be photographed sought, at any session which is being recorded in this way.**		
I agree to participate in focus group discussions and workshop activities		
- focus groups and workshop activities may be audio recorded. I agree to being audio recorded and for transcripts of appropriately pseudonymised audio recordings to be used in the research.		
- focus groups and workshop activities will be photographed. I agree to being photographed and for these images to be used in the research.		
I agree that elements of the visual and written work I produce through studio coursework and workshops may be used for purposes of analysis in the research		
I agree that elements of the visual and written work I produce through studio coursework and workshops may be used for the communication of findings and included in subsequent publications*		
I agree to participate in interviews		
- whilst I am participating in this interview audio recordings will be made. I agree to being audio recorded and for transcripts of these pseudonymised audio recordings to be used in the research.		
I understand that by choosing to participate as a volunteer in this research, this does not create a legally binding agreement nor is it intended to create an employment relationship with the University of Sheffield.		
I understand that my taking part is voluntary and that I can withdraw from the study at any time; I do not have to give any reasons for why I no longer want to take part and there will be no adverse consequences if I choose to withdraw.		
How my information will be used during and after the project		
I understand my personal details such as name, phone number, address and email address etc. will not be revealed to people outside the project.		
I understand and agree that my words, and images of my work may be quoted in or used to illustrate publications, reports, web pages, and other research outputs. I understand that I will not be named in these outputs unless I choose to be identified.		

I understand and agree that other authorised researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form.		
So that the information you provide can be used legally by the researchers		
I agree to assign the copyright I hold in any materials generated as part of this project to The University of Sheffield*. * the copyright to visual work produced by students as part of their coursework remains their own and may only be used with their express permission. Images of student work will be fully attributed to the individuals concerned should they be used in subsequent publications, and should those individuals wish to be identified.		

Name of participant [printed] Signature Date

Name of Researcher [printed] Signature Date

Project contact details for further information: Helen O'Connor: h.m.oconnor@dundee.ac.uk / hmoconnor2@sheffield.ac.uk

Supervisors:
Dr Becky Parry, School of Education, University of Sheffield: r.l.parry@sheffield.ac.uk &
Dr Jessica Bradley, School of Education, University of Sheffield: Jessica.bradley@sheffield.ac.uk

Head of the School of Education:
Professor Rebecca Lawthom: r.lawthom@sheffield.ac.uk

3. ethical approval

Downloaded: 12/09/2023
Approved: 19/02/2021

Helen O'connor
Registration number: 180243576
School of Education
Programme: EdD

Dear Helen

PROJECT TITLE: supporting critically reflective practice in a transdisciplinary design studio
APPLICATION: Reference Number 037871

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 19/02/2021 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 037871 (form submission date: 16/02/2021); (expected project end date: 31/12/2022).
- Participant information sheet 1086705 version 4 (16/02/2021).
- Participant consent form 1086706 version 2 (16/02/2021).

The reviewers have left the following comments reguarding the application:

Thank you for making the changes suggested, and I wish you the best of luck with the project.

If during the course of the project you need to deviate significantly from the above-approved documentation please inform me since written approval will be required.

Your responsibilities in delivering this research project are set out at the end of this letter.

Yours sincerely

ED6ETH Edu
Ethics Administrator
School of Education

Please note the following responsibilities of the researcher in delivering the research project:

- The project must abide by the University's Research Ethics Policy: https://www.sheffield.ac.uk/research-services/ethics-integrity/policy
- The project must abide by the University's Good Research & Innovation Practices Policy: https://www.sheffield.ac.uk/polopoly_fs/1.671066!/file/GRIPPolicy.pdf
- The researcher must inform their supervisor (in the case of a student) or Ethics Administrator (in the case of a member of staff) of any significant changes to the project or the approved documentation.
- The researcher must comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data.
- The researcher is responsible for effectively managing the data collected both during and after the end of the project in line with best practice, and any relevant legislative, regulatory or contractual requirements.

4. Extract from transcript (meeting with students 17.05.22)

Transcript: Mon, May 30, 2022 1:59PM 56:21

00:00 Me: *Could you just sort of talk about model first? Maybe? Yeah. And I'm assuming I'm coming straight to you. Because I'm right in thinking you really took the lead on the model?*

00:22 Euan: Yeah, getting the stuff CNC'd. Definitely. Finishing touches, I think was more you two. But I think how did we actually, why did we agree to do the model, I think it was just, we were struggling with topography, explaining that in a map form. So we just needed some kind of large scale model that showed the topography. So I think we started off with, I went on to Digi maps, found the contour heights and everything and put it through CAD. And then I took that into Rhino. And that seems to be the one that we use in this studio. And it's the best way to get like nice curvy, like topography. So I used that and I split it into tiles, so that it'd be easier for people – we could get it split it up. So I changed it to SketchUp format, which is more what these guys use. Hoping that we could divvy up the tasks, but by sending it to SketchUp that ended up causing problems down the line when I sent it to Rob, because when you change file formats, it just changes about just different languages, different software. So yeah, we managed to get the tiles all sorted, sent it down to Rob. And I think he did one. After that he was like 'no this is too much hassle, trying to get each one to work'. So I think we had a bit of back and forth for weeks. Either he was going to fix it, or I was going to fix it and then he went on holiday, then I just I was like, I'm just gonna fix this myself. So I did, I did all the tiles myself but I had to get rid of pitches because it was just taking too long to do all the pitches on your own. And then sent it to rob in a couple of days. Because it was just straight. So he give us all the tiles, I think the heights were a wee bit off? I'd asked him to do it, as 40mm deep tiles, and a couple of 60mms, But because he wanted to just use 40mms it meant that some of the heights were a bit off so we had to use like, chips and things to get the heights right. We just use the bandsaw or people at the workshop did, trimming extra edges off - then I went to cut the river out. But then I think we did a couple of things. I think also the little buildings on it. I just got everyone to either send a little massing model that they already had over the building. And I just made it so you can 3d print it or got I think James, I think he sketched a couple in his book. And I just took it to the cad suite. We just made a couple massing models, and he gave it to Innes to just put it through the 3d printer.

03:17 Me: *but, presumably because of the timing. You weren't really able to use the model?*

03:30 Euan: No actually yeah…This is more just we had all these ideas. And that's the finished piece.

03:36 Me: *I know you all kind of did to kind of do the SketchUp models and stuff. Were you only using the Digimap data for that, or you also kind of looking at photographs or personal experience or anything when you're kind of..*

04:01 Euan: For the model? So yeah, I think there was a couple of bits like where Tescos is I knew just looking at the model. It wasn't like the elevation wasn't different enough so you can tweak it, but it's quite

difficult to tweak something that's so curvy.

04:19 Emma: I don't know if we each took a tile that related to us or if it just kind of worked like that because I know I have the one with the mills, that people might not necessarily know what looked like so that I was kind of able to look at the photos that I'd taken and more accurately do them. I know that Philip had one of the ones in the middle where he was kind of working so…

04:44 Euan: I think that was probably more luck than planned Yeah. But I think the way we divvyed it up was - its a bit of a nightmare putting those pitches on – so we thought people that are more confident at 3d modelling we'll give them more pitches, because I'll be able to do it quicker. So that's

04:59 Catriona: There's not many people in our group that would probably say they were confident, Yeah, maybe. Yeah, everybody uses different software.

05:12 Euan: Yeah, that's what's really hard. Some people prefer Photoshop just do like nice collages and things. Some people like CAD

05:19 Catriona: ArchiCAD

05:20 Euan: XXX doesn't even use SketchUp we all use different software, but it's the same in practices, practices use different software.. it worked out eventually

05:36 Me: *You said you're using your background knowledge in order to inform the model. did building the digital model for your site teach you anything that you didn't know?*

05:51 Emma: I think it did probably help more looking at i t in the landscape because I was able to kind of split that into the section and do drawings from there, because before I'd always just been working from the pad and seeing the you didn't really get the I guess from the sketch model that I actually did, I mean, I obviously knew how the ground changed around it a n d I could draw that on, but I think ha v i ng the actual model not even that model but the model of the whole of XXXX because that's obviously just a section of it , the model that Craig had originally uploaded it was much more context around it. So I think that helped just by actually positioning it obviously helped within my thesis

06:40 Euan: as soon as we put all the tiles together you went 'look how far away my building is'

6:49 Emma: When you actually, see it like that and you realise that it is, you know, like a whole tile or more away fromeverybody else's it did make me realise how far away mine was which I didn't even get from the map - I think because you're always zooming into maps you don't really appreciate the distance but actually having it set out like that yeah

07:13 Me: *So who took the decision to paint the model smartie colours ?*

07.17 Euan: I think we were just all sitting round and you know…

07:23 Catriona: Well no, a lot of people wanted to pay them all black and I was like well the feedback you have on colour see where it goes? Maybe it will differentiate the projects - It was like, Yeah, okay.

07:40 Catriona: Yes if you choose the colours that fine Yeah. And then with the trees me and Lai where we just had you and Emma decide to move it into needles. And then me and Lai had finished painting the buildings and we were going to put the trees in and then we were like, what we paint them like green or something. James came in and like what are some of them are orange of something that you know, like make it more contrasting. We just decided that we were going to paint them

08:17 Euan: Its turned out pretty good. Like the pins keep that sewing theme. Yeah. That's nice with the map behind it

08:28 Catriona: I feel like towards the end, like there was definitely a plan to start and then towards the end it was just seeing what's going to work

08:37 Euan: there is definitely a point when you're doing group work where you just have to make decisions. You can't have Everyone agreeing it's just you've got to just do it

08:49 Emma: Its what the majority wants or whoever is in at the time just has to make the decision. Just quite often what we ended up doing

08.53 Me: *Did you have any arguments?*

08:55 Catriona: I think things generally in our group worked quite well, people were quite good at even if you were annoyed at people

09:07 Emma: I think people would kind of discuss their point of view and you would understand where they come from, and then we would normally reach some kind of compromise if people weren't happy.

09:17 Euan: We all printed or exhibition stuff on a Sunday. So on the Monday we were a bit more relaxed. So we focused on the model and I know that Philip and others were still printing some stuff so they like appreciate that they need to stop printing their stuff and I think the same on Tuesday I think

09:34 Emma: our group I was saying even we've all been quite good at dipping in and out of group work just the past few weeks. Anyway, we've been doing some of us have been more organised in printing and so

we can help with that. And then if something else comes up like doing that, so then they had to finish their's so yes, we're quite good at actually. Like dipping in and out of groupwork with you can appreciate when other people have gotten the workload – its ok to dip in and out

10:11 Me: *why do you think the group works maybe worked better for you? Or is it just because you know, most of you know each other really well.*

10:25 Catriona: And even the people like I didn't really know James until this year, but he's just quite easy.

10:32 Euan: We Just get on outside as well.

10:37 Emma: been quite good friends up until this point. Or like, a lot of us had

10:48 Euan: Because we had such a small year, you can have to say, you get little small groups that have their own your own little smaller groups, but

11:03 Emma: We were quite lucky some of ours just merged together.

11:05 Euan: As people leave and some people come in, they just start merging together, depending on what studio you're in. This has happened quite naturally. Yeah. A little easier.

11:17 Emma: Yeah, the group work hasn't been easy at all points, throughout the year, but the majority of it, it's always ended up fine.

11:24 Catriona: It might have been actually quite good that there is probably a variety of skills that is like you're good at the model making no one's gonna be argue with you about like how you do Rhino. Everyone's just like we trust you. Then towards the end, and everybody can lean toward the aesthetic - you're in charge of colours.

11:58 Euan: We've all got our wee individual skills.

12:02 Catriona: And I think we think with the textile map nobody knew what to expect from it. So anything was going to be there was nothing to argue. If there's something on the wall that will work.

12.10 Me: *So where did the idea come from originally?*

12:20 Catriona: So I think it began with a Lai using a word, I think, was it patchwork or something? Yeah. He said something. And then we were like, I think at that point, we were trying to come up with a group name.