Reflections on a Project Based Approach to Work Related Learning in Spatial Design

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Abstract: This paper reports upon the delivery of work related learning projects undertaken by spatial design students within the second year of undergraduate study in the UK The projects aimed to develop students' ability to transfer core design skills taught in their studio classes into diverse real-world scenarios, better preparing them for entry into the design profession by reflecting the variety of ways in which design is being called upon and applied within contemporary creative practice. The paper contextualizes this approach through a discussion of evolving practices within design, such as the increasing use of collaboration and the blurring of discipline distinctions, in contrast to the more discipline bound contexts of UK design education. Following the projects' delivery, a detailed analysis of students' reflective journals revealed aspects of common learning, including the ability to deal with ambiguity, the transfer leap of design skills across contexts, and recognizing the needs of others within the design process. The research contributes to new understandings of the relationships between pedagogical practices in design and work related learning experiences.

Keywords: design education; project-based learning; work related learning; transferable skills; collaboration; spatial design

Introduction

The design industry has evolved over the last decade, expanding its remit into new areas of activity as hybrid disciplines emerge from between the cracks of previously well-defined areas of practice. The evolution has been in response to an increasingly connected consumer environment, driven by technological, cultural and global communications developments. Within these contexts' designers do not work in discipline bound silos, as their role necessitates dialogue across a range of other disciplines to interpret, innovate and realize design solutions. This requires designers to transcend their traditional discipline boundaries, often working within teams "whose nature and constituency changes according to the project at hand" (Friedman 2012: 133). Consequently, the cross or multi-disciplinary contexts within which much design practice is now set, has led to the blurring of traditional disciplines, with those that were once recognized as discreet, and referred to as the classic design disciplines (Maeda 2016) such as fashion, product, interior or graphic design becoming ruptured and increasingly blurred (Rodgers 2008).

While the potential focus of design is boundless, this paper is concerned with the design of user experiences, through interaction with objects, spaces or services, with particular reference to the area of spatial design where these elements of user experience converge. The paper discusses evolving industry practices within design including the increasing use of collaboration and blurring of discipline distinctions, which is in contrast to the more discipline bound contexts of much UK design education. Specifically, the study reflects upon the delivery of a series of external facing collaborative projects, undertaken by spatial design students within the second year of study (level 5) of a UK undergraduate degree program. The projects, as Work Related Learning (WRL) experiences, aimed to develop the students' ability to transfer design skills taught in their studio classes into real-world scenarios, better preparing them for entry into professional design practice.

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Journal Title
Volume #, Issue #, 20##, https://<websitelink>.com

ISSN: ####-#### (Print), ISSN: ####-#### (Online)
https://doi.org/########################## (Article)

The projects reflected the variety of ways in which design is being applied, and the diverse contexts within which design skills are commonly called upon. As the application of design-led approaches increasingly influence our way of life, permeating into areas such as health, education, leisure, food, environment and our relationships with each other. Clients of design services in all forms are using designers more strategically across their organizations to help deliver growth and compete more successfully in local and global markets (Kiernan & Ledwith 2011). While there clearly remains the need to teach core discipline specific skills, for example, to address the increasing use of specialized digital design tools within professional practice, there is also the need to enhance breadth as well as depth in the graduate skillset, fostering what (Brown 2009) refers to as T-shaped individuals. Equipping graduates to succeed within such diverse range of practices and settings represents a significant challenge for design education to address, as much UK design teaching is still set within those traditional 'classic' discipline boundaries.

Design Context

Design in the contemporary commercial environment acts to address clients' interests holistically through the increasing use of collaborative and research driven activities. Framed as Design Thinking approaches, see Poldma (2016), these are strongly endorsed by design-led agencies such as IDEO and have been adopted by many educational institutions such as the Stanford D-School in the USA. Design Thinking approaches aim to establish market and consumer insights, informing organizational strategy and decision making, towards the delivery of design-led solutions, products or services. Within Design Thinking the application of human-centered research methods places consumer insights at the forefront of the design process. See Johansson-Skoldberg, U., Woodilla, J., & Cetinkaya, M. (2013) for further discussion on the application of Design Thinking.

Designers' engagement with what has become known as the fuzzy-front-end of the creative process is reshaping their practice and can lead to the "discovery of unmet and previously unarticulated needs" (Cooper & Evans 2006). Studies published by the UK Design Council (2009) highlighted the embedded use of design led processes amongst a number of the world's leading product and service-based organizations. The Double Diamond design process model (Figure 1) developed from the Design Council's earlier research studies and first published in 2005 with a recent update in 2019 provides a useful tool in indexing the range of activities associated with design and its scope of application. Firstly, in contributing to identifying problems, shaping organizational strategy, defining opportunities, and decision making (1st diamond) and secondly leading to the informed creation of solutions, products or service outputs (2nd diamond).

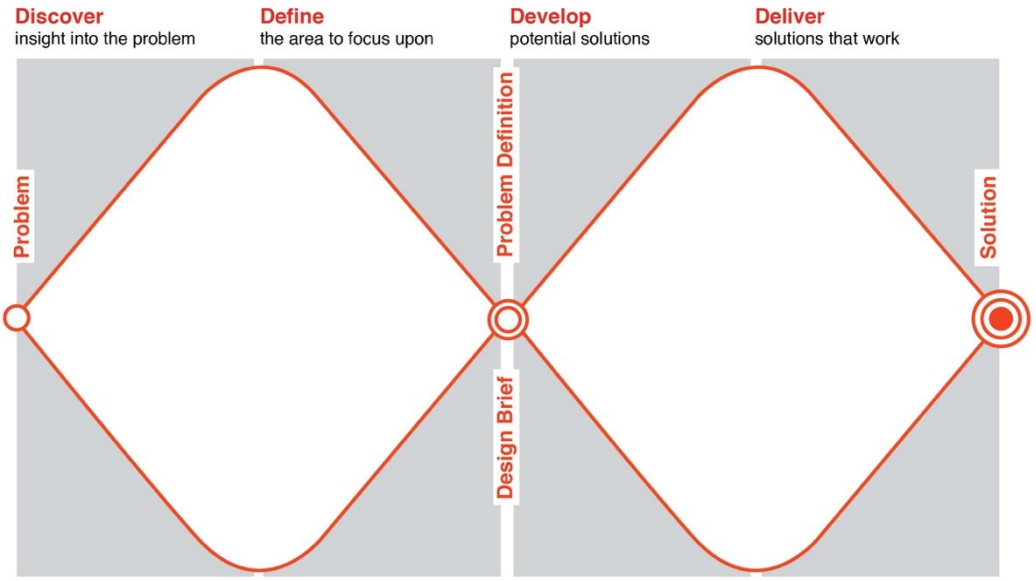

Figure 1: The Double Diamond Design Process Model
Source: UK Design Council 2005

Although this model makes a useful contribution in promoting the awareness of design-led approaches to innovation, it is perhaps also important to note its limitations as a condensed graphical representation of what may in reality be multiple diamonds of divergence and convergence, with layers of iterations buried within each phase. With its origins rooted in the work of Alex Osborn and Sid Parnes towards methodologies for creative problem solving (see VanPatter and Pastor 2016), the UK Design Council's Double Diamond representation of innovation and creative problem-solving processes may be seen as over simplistic. None the less, the model champions design's potential to contribute holistically in promoting both design thinking and the practical application of design within organizational philosophy and structure in a visually digestible format. As recalled by Anna White, a member of the team assembled by the UK Design Council in 2004 to examine ways of describing the design process, "it initially formed part of a drive to demystify design process and make it accessible to a non-design audience" (see Ball 2019). Ten years on, the UK Design Council's 2014 report, Leading Business by Design (Micheli 2014) identified examples of embedded practices in both traditional and non-traditional industries where design over the past decade had gained relevance in contributing to the way organizations are structured, how they operate and how they think. Further cementing designs value as an organizational tool to be embedded philosophically and structurally, enabling innovation to seed and flourish.

Design's expanding role over recent years is not isolated to large scale corporations or well-heeled agencies but is wide spread across the sector. Many have adapted their service offering by moving into the pre-design or pre-brief phase of the design process, incorporating New Product Development (NPD) methods more explicitly within the range of client focused services they offer. Design providers are managing the development of products and service interfaces holistically, from preliminary research to user feedback mechanisms that inform continuous enhancement of service and experience. The increasing spectrum of activities being undertaken by design providers necessitates an openness to collaborate, seek complimentary project partners and engage more diverse expertise from a range of disciplines as the application of design-led approaches gains acknowledgment across many sectors.

The adoption of collaborative and multidisciplinary approaches has enabled agencies to tender for bigger and broader projects than would have previously been possible. Design clients are also realizing the benefits of employing multi-agency approaches, such as Etihad Airlines in 2012 who orchestrated an international cross disciplinary partnership to realize their vision for inflight passenger experience. Peter Baumgartner, Etihad's CCO recalls "We said, guys, we made a decision, it's not you, it's not you, it's not you – it's all of you. We now want you to go back home and come back to us with an integrated proposal" (see Aircraft Interiors International 2014: 27). A trio of branding, product design and aviation interiors agencies were all hired to work collaboratively together with each agency offering highly valuable discipline specific skills and expertise. Examples such as this highlight the value of design-led roles within extended multidisciplinary teams, collectively providing the range of competencies required. Creative groups such as Assemble, winners of the UK Turner Art Prize 2015 (Guardian 2015) extend the use of human-centered approaches into social innovation and constituency led projects. Using participatory co-design and co-creation methods that seek to engage stakeholders in responding to society's big challenges such as healthcare, education and social wellbeing exemplifies the hybrid characteristics of much contemporary design and creative practice. As Young (2012) states, "it is design's ability to work creatively between disciplines that have renewed its capacity for great socio-cultural impact". Further to this is the recognition that "design's definition is moving from an elitist abstraction to an instrument that shapes the current cultural landscape" (Coleman 2015: 11).

Those previously mentioned traditional classic fields such as product or graphic design have fore fronted the evolution of practice in producing hybrid disciplines. For example, the emergence of user experience (UX) and user interface (UI) designers following developments in digital technology, along with the growth of gaming, digital animation, CGI, and the field of service design in responding to advancing consumer expectations. These new hybrid disciplines emerging from the classic fields of practice require highly specialized skills to meet the needs of their industries, but have also developed with the strong application of user-centered research at their core, informing design decision making through gaining greater understanding of human cognitive processes and emotive consumer insights. These evolving design practices present a challenge for the field of spatial and interior design, as they are commonly concerned with many functional and technical considerations that impact upon the human condition such as spatial planning, heating, lighting, material construction and environmental factors, but with a creative response often driven by a deference to architectural spatial typologies, rather than the application of user-centered design research. This perhaps "points to a future where spatial design is no longer like a classical orchestra where each one plays their part led by a conductor, but has…freedom for creative collaboration and co-designing" (Brown & Kallitsis 2017: 14). In moving the field from being about "feeling to knowing" (Coleman 2015: 11) in adopting more robust evidence-based approaches, industry commentators and design tutors are increasingly questioning what the value proposition of tomorrow's interior and spatial design graduates will be. Conversely, others within the field such as Budd (2011) argues that a purely evidence *based* approach to design has the potential to devolve professional practice into a commoditized process. Recent debates surrounding the proliferation of Design Thinking as an over simplified, and hollowed-out version of design resonates with this view (see Kimbell 2011 and Kolko 2018). So, seeking a more refined balance between the application of the designer's creative and intuitive self, within an evidence *informed* approach seems an increasingly desirable goal. There seems little doubt that "by problem solving with an evidence-based perspective, practitioners will be able to better justify and defend their design decisions" (Guerin & Thompson 2004: 4). In doing this the field has the opportunity to embrace more methodological and research-based activities that truly inform design solutions, reducing client risk and raising the future value proposition of the whole discipline area.

UK Design Education Context

UK design education is proud of its heritage, built on the traditions of well-established disciplines. A strong disciplinary focus can propel the teaching of design, and be powerful in shaping our students' perceptions of design practice, established within the constructs of taught subject boundaries. However, as Breslin & Jones (2014) observe, where the delivery of design education is bounded by traditional discipline practices, offering limited interactions across other discipline areas it can risk becoming evolutionarily isolated. Indeed, the discipline driven approach still practiced within much UK design education is considered by some to be in danger of becoming misaligned to the realities of real-world design activity (Kiernan & Ledwith 2014). The rise in interdisciplinary and collaborative practices have moved design from a sequential process to a concurrent model of team-based approaches, with "an increasing emphasis in design practice on the importance of developing new design knowledge and on articulating new design methods, processes and outputs" (Wilson & Zamberlan 2015: 12). Design tutors may be aware of this changing landscape, but can face multiple barriers when seeking better alignment with the dynamic nature of design practice, including; silo program delivery, student perceptions of degree level education, institutional inertia, and resistance to the examination of existing practices.

The current millennial generation of students have been characterized as holding unrealistic expectations of instant solutions and answers on demand, as the commodifying of their education into purchased bundles of knowledge sets learning against the clock. This often results in limited space for creative exploration as part of the learning process within a heavily metrics focused learning environment. Although there remains a range of highly valuable skills being taught across UK design education, from traditional craft processes to cutting-edge design software, expectations of instant learning and mastery of technical skills hampers the fostering of more incremental deep learning approaches and critical perspectives being developed (Ramsden 1992).

It has been since the publication of the Cox Review (2005) that calls have been voiced from UK government and industry commentators for academic institutions to address the need for broader graduate skills to be developed within design education. Successive UK government white papers have highlighted the need to focus attention on topics such as employer engagement, multidisciplinary approaches and the development of highly valuable transferable skills (Design Skills Advisory panel 2007 and 2008). Citing a comprehensive generic transferable skillset is hard to establish however, and there remains a lack of agreement on what is meant by generic skills, as discussed in (Green, Hammer, & Star, 2009), hence many varying lists of competencies exist. There does appear to be common ground in identifying skills of project management, interpersonal and negotiation skills, communication, team-working and critical analysis. Valuable research conducted by Smith & Paton (2014) proposes a transferable skills framework, indexing the application of a broad range of transferable skills within four core categories of Self, Information, Communication and Collaboration. While many publications exist on the changing nature of design practice towards adopting more multidisciplinary approaches, and the recognition that *softer* transferable graduate skills are in short supply, there remains limited research into the effective integration of such highly valued multidisciplinary and transferable skills the design curriculum. Some support the view that generic skills are best developed within specific discipline contexts, because attributes such as critical thinking and communication have different meanings in different disciplines (Keller, Chan & Parker 2010). The skills may also be more likely to occur when developed in diverse and complex situations, and when reflective learning processes have been applied (ibid).

Recent surveys carried out by the UK Quality Assurance Agency (QAA) and the UK National Union of Students (NUS) suggest that the development of transferable skills still appear

to be under-valued by most students, underlined by further findings that students report having "difficulty articulating how their skills can be translated into the workplace… and that the ability to demonstrate transferable skills and competencies appears critical in allowing graduates to transition into the labor market" (Universities UK 2016: 33). Despite this, many students remain fixated on acquiring the narrow band of skills and techniques traditionally associated with their discipline. The UK Higher Education Academy (HEA) report (2015) highlights, the need to develop an enhanced level of interdisciplinary provision within UK design education in-line with the changing landscape of creative industry practice, and in promoting higher level critical thinking, reflexive learning and effective communication skills. Valuable contributions from McCullagh & McFadyen (2015), and Cocchiarella & Booth (2015) demonstrate the development of collaborative practices within UK institutions. Though collaborative projects are commonly characterized as brief interventions inserted into the curriculum, not as core competencies for successful learning within it, the experience gained can often remain isolated and inert in the learners thinking (Davies & Mangan 2007). To be truly transformational not only in process but in the learner's habits of mind (Mezirow 1997) collaborations may need to be embedded throughout the learning experience and implicit to learning about creative practice. Such approaches are recognized as promoting higher learning within students and are at the center of higher education's core aims to achieve critically reflective learners (see QAA 2017). The value of collaborative activity on promoting deeper learning is well established within theoretical concepts such as Vygotsky's (1978) zone of proximal development. Viewing learning as an essentially social activity this also aligns to Lave & Wenger's (1991) theory of legitimate peripheral participation, within practice-based education. It is clear that universities must design courses that focus on process and student-centered activities rather than just subject content (Keller, S. Chan, C. & Parker, C. 2010)

Engaging in collaborative and shared discipline approaches has the capacity to expand students understanding of their own subject, exposing them to the broader contexts of their practice and recognize more clearly the networks which they exist within. As Berger (2004: 338) states, "the edge of our known frame of reference is the most precarious – and important – transformative space, as new meanings and values emerge and learning is expanded". (Doise & Mugny 1984) refer to the internal conflicts that individuals experience when realizing that their thoughts or ideas are inconsistent with other people's views or new information, leading to reflection and promoting the potential for conceptual change. Therefore, fostering learning that takes students beyond their existing thresholds of knowledge and understanding can provide many conceptual gateways in opening up new and previously inaccessible ways of thinking about something (Meyer & Land 2003). Leading people to see things they had not noticed before and to have choices they didn't realize they had (Kegan 1994).

The Study

Teaching Strategy and Method

In response to the evolving nature of design it was our department's ambition to provide students with a learning experience that more closely reflected the realities of professional practice and subsequently a greater level of preparedness for entering into the industry upon graduation. Part of this strategy was to incorporate a series of outward facing collaborative projects within the curriculum that provided context driven learning opportunities and developed the ability to transfer skills learnt in the design studio into real-world scenarios. Projects to support this approach were developed through engagement with civic organizations, local residents, and other stakeholders within the city. The projects were considered as Work Related Learning (WRL) experiences, defined by (Boud & Solomon. 2001: 4) as "university programs that bring together universities and work organizations to create new learning opportunities".

This study reports on eighteen of these external facing projects delivered over a two-year period, and undertaken by students within their second year (level 5) of UK undergraduate study. Each project was delivered over a duration of either six or twelve weeks within a 30-credit/15 ECTS units of study. Specifically, the Learning Outcomes required the students to; (1) Evidence a body of work that reflects professional practice experience, (2) Demonstrate an engagement in collaborative team-based and/or work-related learning activities, recording, managing and evaluating the process, and (3) Demonstrate an understanding of organizational awareness, identifying personal design directions. The teaching strategy utilized the UK Design Council's Double Diamond process model to support the navigation of projects and guide the application of design methods. Using the model as a visual reference within the projects' delivery also developed students understanding of the design process, highlighting the transitional stages of divergence and convergence, and helped to focus attention on specific activities within phases of the design process. Unlike the students previous learning experiences these projects would place them in unfamiliar and ambiguous scenarios, promoting the opportunities for deep learning through challenging discipline boundaries in thinking and practice.

The projects covered a wide variety of activities including the design and installation of public exhibitions, large scale event spaces and locally funded community projects. In these situated learning scenarios (Lave & Wenger 1991) students' developed their understanding of design practice through collaboration and shared experience, applying a range of co-design and participatory approaches, such as; engaging in open dialogue with stakeholders, seeing users as *experts* that are central to the design process, sharing insights and ideas through storyboarding, and creating user journeys together. The projects often involved working communally alongside diverse ranges of people from tradesmen to charity workers. Table 1, details each of the eighteen projects, including the partner organizations, project duration, and the number of students taking part in each project.

Table 1: Project Details

No	Project description	Organization type	Duration	Students
1	Design proposals for student wellbeing 'pop-up' spaces on campus	University department	6 weeks	4
2	Site measurement and feasibility studies	Not for profit urban developers	6 weeks	2
3	Design proposals for public collaboration and beta space	Publicly funded organization	6 weeks	3
4	Proposals for interior spaces and retail display units	Commercial retailer	6 weeks	4
5	Visitor studies and design proposals for enhanced engagement in gallery spaces	Gallery and exhibition venue, registered charity	6 weeks	4
6	Re-development of interior spaces for public use	Independent commercial bar and gallery venue	6 weeks	3
7	Interior and furniture designs for bar	Commercial, independent bar	6 weeks	3

	and performance space	owners		
8	Design of user centered training kitchen for the partially sighted	Registered charity	6 weeks	5
9	Design layout and specification of furniture elements for a TV studio 'white cube' space	Private sector organization	6 weeks plus summer volunteering	3
10	Design and build of a mobile exhibition to promote a new public library archive of material	Registered charity	12 weeks	4
11	Design proposals for public facing brochures and information points within an nature reserve site	Registered charity	6 weeks	3
12	Signage, youth and family zone designs within an International Music festival site	Mixture of public sector and creative partners	6 weeks plus summer volunteering	4
13	Design for architectural detailing within a community new build project site	Commercial urban design agency	12 weeks	2
14	Supporting the design and build of a community cinema	Artists collective and volunteer traders	6 weeks	3
15	Design of interior architectural fixtures within a site redevelopment	Commercial property developers	6 weeks	4
16	Design and installation of thematic elements within a music festival site	Private sector organization	12 weeks	5
17	Theatre set design and build	Community Theatre, Registered charity	6 weeks	2
18	Design and build of an exhibition piece to engage the public in short story writing and literature	Registered charity	12 weeks	3

The projects stepped outside traditional perceptions of the live project or office based placement commonly associated with project based learning and work related learning approaches, which although highly valuable, may not in most cases expose students to the complexities of client and stakeholder relationships, financial and real time constraints. In this sense, the projects in this study were higher risk than we had previously delivered due to their more ambiguous nature, with settings that challenged students to confront the complexities of real-world practice in reaching beyond the sanitized experience of their design studio classes. As highlighted by Keller, Chan & Parker (2010: 9) "it is not possible to capture the full scope of the messy political, procedural aspects of actual practice in the confines of an academic setting". In these projects the students were challenged to apply their practical and technical design skills within real-world scenarios, driving the development of their transferable skills, and the ability to

transfer design core skills across contexts – highlighted by Universities UK (2016) as valuable in translating learning into graduate success in the workplace.

All the projects were underpinned by processes of reflection and action, in line with Kolb's experiential learning cycle (1984) with each student's engagement in projects being recorded through a digitally submitted reflective journal as a core component of assessment. This emphasized value being placed on an engagement with *process* rather than the end *product* as a core learning objective. To support reflection and analysis, a series of prompt questions asked the students to consider: their overall experience of the project, what skills they felt able to readily apply, what aspects of the project they felt comfortable or uncomfortable with, what aspects of the project provided valuable learning, what challenged their assumptions, and if their view of design had been altered following their engagement with the project. A total number of 51 reflective journals were reviewed and thematically analyzed (Braun, V. & Clarke, V. 2012), representing a total number of 26 students. The projects were delivered concurrently in each of the two years, with individual students only engaged in one project at a time. The author formed part of the academic team supporting the delivery of the projects, so to mitigate against any researcher bias, the digital data gathering was anonymized and findings drawn exclusively from the reflective commentaries submitted.

Reflection on the Projects and Student Feedback

Data captured via the analysis of reflective journals has been synthesized in each of the following sections to provide an overview of the students' reflections. The headings titled; Discover, Define, and Deliver, align to the first three phases of the UK Design Council's Double Diamond model. Figures 2, 3, & 4 visually locate the projects within the Double Diamond model, illustrating each of the projects entry and exit points.

Discover

These projects engaged students from their inception, providing the opportunity to explore the full scope of each project's potential through initial partner and stakeholder meetings. While the students enjoyed these early discussions, it was evident that the speculative and ambiguous nature of the projects at this stage acted as a barrier to progress for some students. An analysis of projects entered at the Discover phase, see Figure 2, highlights that while all progressed well into the Develop phase of the design process, none of the projects progressed through to final delivery. Unsurprising perhaps as this demonstrates the more fragile nature of projects at the front end of the process where parameters are often yet to be established.

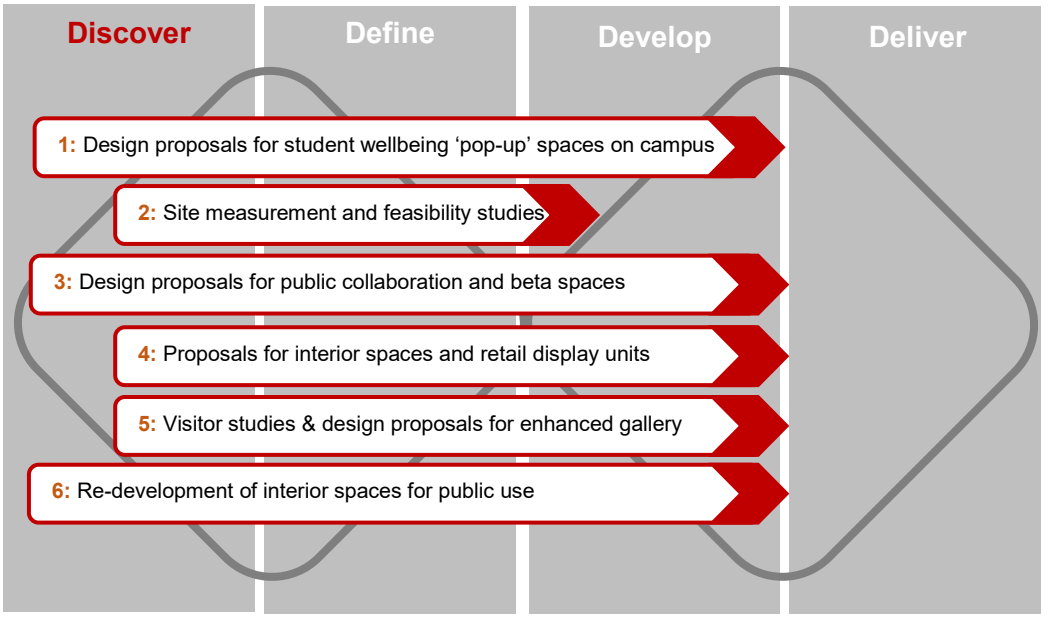

Figure 2: Discover Phase Entry Projects
Source: Spruce 2019

In the case of these projects, uncertainty in stakeholder requirements and a lack of distinction between what was *fixed* within the project and what was yet to be decided characterized the early discussions. Student reflections revealed that this was initially frustrating as the projects (unlike their more familiar studio projects) did not provide immediate and clear directions for design ideas. Instead, these projects required a period of scoping out and engaging design research methods, such as observational and participatory activities to generate qualitative understanding as well as site-based feasibility studies to establish raw quantitative data that would inform any subsequent design proposals. These initial exercises provided the project partners with tangible benefits in defining broad project requirements, identifying potential design directions, and external factors that may impact upon the project. From a student perspective it also highlighted gaps in knowledge to be addressed, better clarifying and informing the reasoning for design decision making. This echoes strongly Coleman's (2015) Future Vision proposition that seeks to move interior designers from being feelers to knowers in providing a substantially more defined value proposition for the field in-line with other design disciplines. Significant in the students' overall reflections was the expression of a greater holistic understanding of what designing actually involves. A number of students commented that engaging in these front-end activities prior to the formulation of a design brief changed their mental map of the design process, captured by one student's realization that "the role of the designer can begin long before you start sketching ideas and before a design brief is even established".

Define

Projects entered at the Define phase onwards, in the most part, benefited from partner and stakeholder commitments already being established. Characterized as projects with a recognized ambition, but an undefined design direction, such as project 8 (RNIB training kitchen) and project 9 (independent TV studio). In this sense these projects were at a less speculative stage and provided students with clearer goals and potential avenues for exploring design ideas. A number of students reflected that "finding my place" within these projects was less challenging than in the Discover entry point projects. Student reflections also suggested that as these projects

were at a more advanced stage, their role in the projects were clearer, so they felt more readily able to apply their design skills.

The review of design ideas formed the basis for dialogue with partners and other stakeholders in projects 7, 9 and 11 of this grouping. While this became a more familiar process to the students, with some resemblance to their university studio critiques, they found clearly articulating the viability of design ideas under scrutiny from external partners with particular point of view to be quite challenging. Upon reflection, all students commented positively on the value of these experiences in sharpening their awareness of the expectations placed on them as the designers within the process. This was also reflected in the initial stages of these projects often being characterized by the external partners expressing a "need for some creative input" and how they felt introducing a design input would "bring creativity to the project and help drive the project forward".

Through a process of working collaboratively with the partners in projects 8 and 10 establishing design ideas, a number of students expressed a strong sense of personal satisfaction in developing more refined proposals, as a result of co-designing with partners and stakeholders their processes integrated the analysis and iterative evaluation of ideas. Students reflected that this "offered more stable anchors for design ideas to be built upon" than they had previously experienced in other projects. Additionally, their reflections also suggested that the co-design approaches adopted within the collaborative projects provided "more confidence in defining directions and decision making". This was a significant leap in the application of their core design skills and the testing out of co-design approaches that had been taught in the university classroom setting.

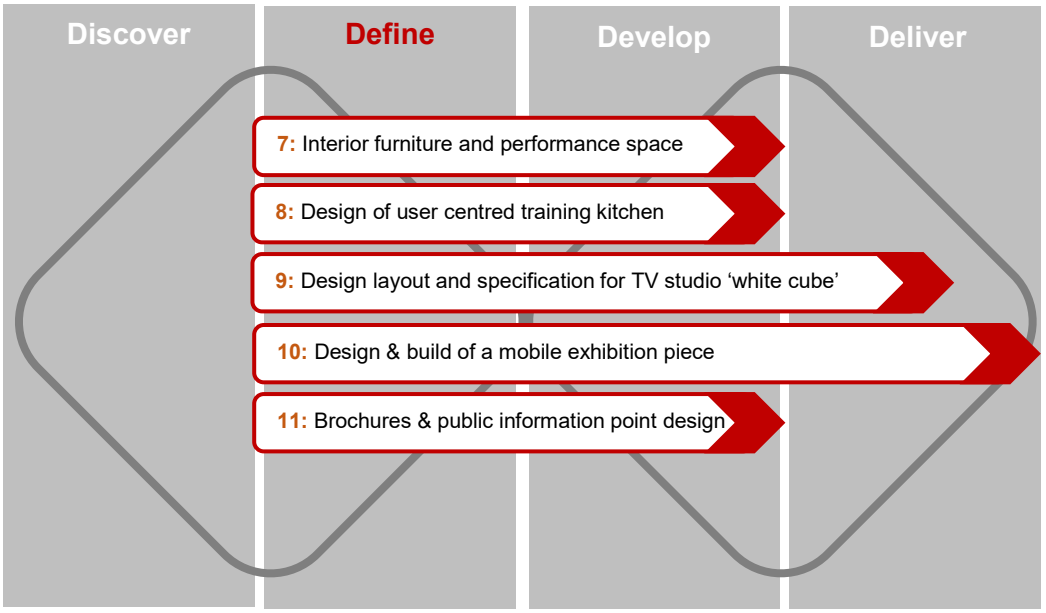

Figure 3: Define Phase Entry Projects
Source: Spruce 2019

The depth of immersion required within these projects in dealing with complex or competing stakeholder requirements resulted in a transformed view of design for some students, seeing the act of designing quite differently than they had prior to engaging in these projects. In particular, students' reflections on projects 9 and 10 which involved working through to the production of

specifications for the fabrication of components, materials and equipment costings, offering a real sense of professional practice where design ideas become reality.

Image 1: TV Studio & Festival Site Concepts
Source: Spruce 2018

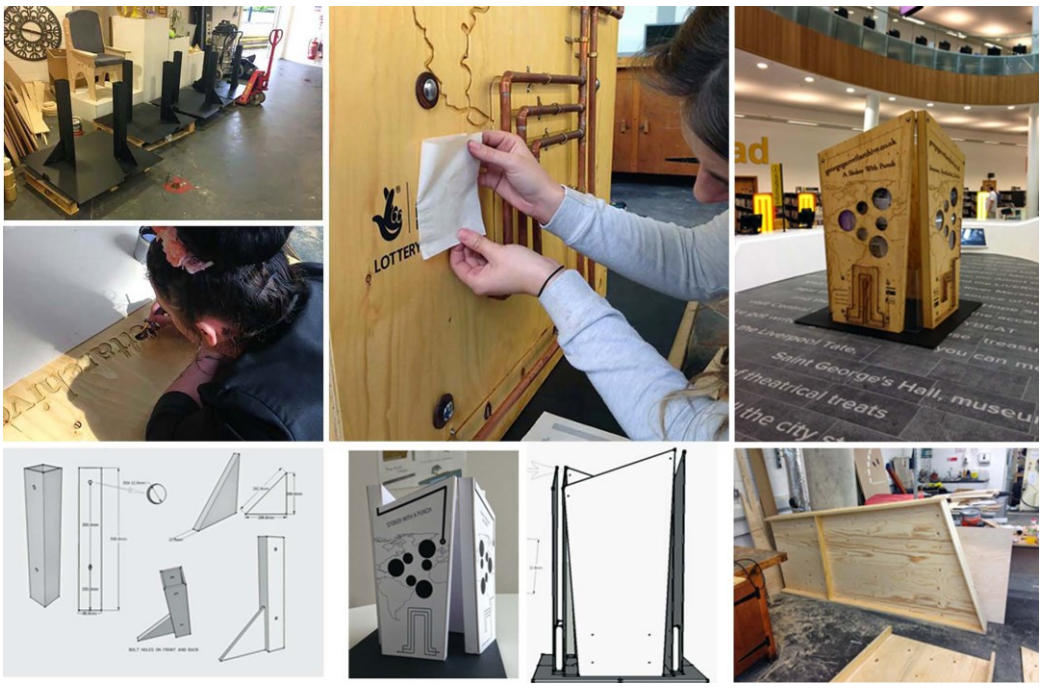

Image 2: Construction Images of Project 10's Exhibition Pieces
Source: Spruce 2017

Develop

In reviewing all the projects' that engaged students from the Develop phase onwards, five out of seven yielded realized outcomes that students were actively involved in producing, including exhibition pieces and festival installations. In these projects the design brief and other parameters were well defined prior to the students' entry. In this sense, the design activities took on a more traditional role within the projects. Students focused on performing functions, such as problem solving through generating ideas, and developing solutions for production within materials and other resource constraints. Gaining a sense of orientation within quite dynamic project environments proved very challenging for some students, with comments such as "I didn't feel able to get up to speed quickly enough" being common. The processes of specifying and detailing design proposals for fabrication and construction also provided some of the most challenging learning experiences of all. As one student reflected "This is a scary process, what if my drawings are wrong and the parts don't match up". For spatial and interior design students the physical realization of their design ideas is perhaps one of the least explored elements within degree level study, with projects seldom reaching beyond CAD visualizations and scale models. In the majority of projects within this grouping however, the translation of design ideas from concepts into physical realities formed an integral part of the process and provided those students with new confidence in their own abilities as fledgling designers. Summed up in the comment from one student that "This was an amazing result! I didn't think I was able to do this as a student".

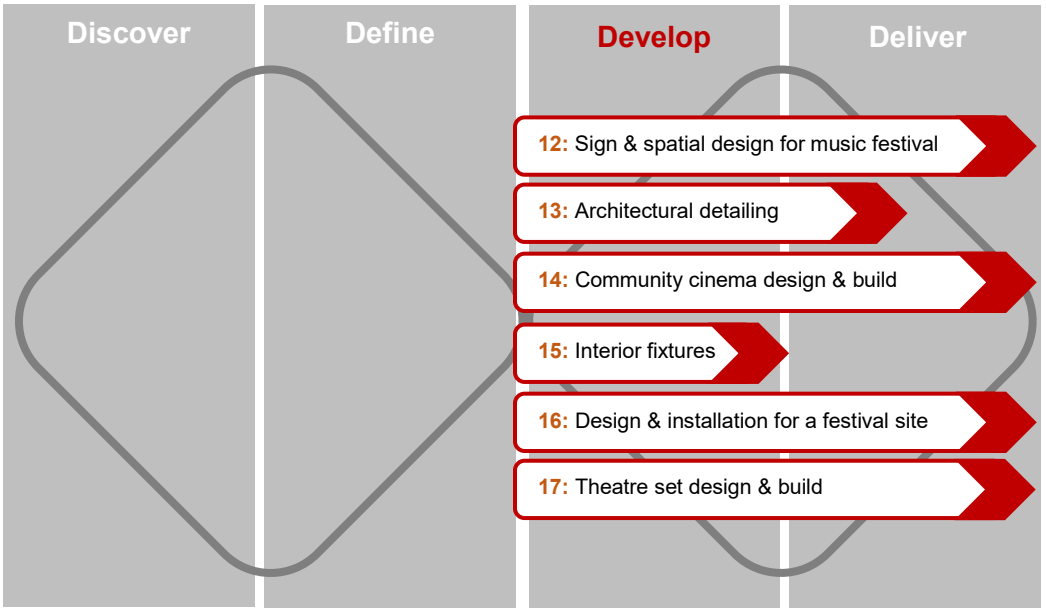

Figure 4: Develop Phase Entry Projects
Source: Spruce 2019

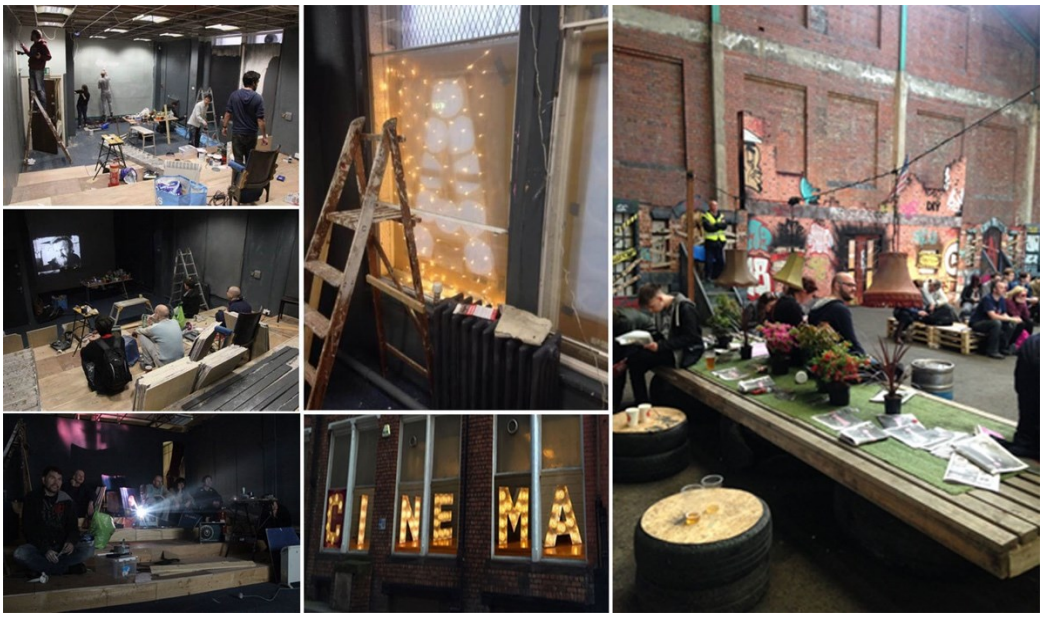

Image 2: Construction Images of Urban Cinema & Music Festival Projects
Source: Spruce 2018

Summary of Results

The projects discussed in this paper reflect the wide range of scenarios that students may face in their future practice as designers. Although the projects delivered different experiences, they collectively appear to have provided the basis for some common learning in line with our objectives for the introduction of work related learning projects into the curriculum. The key areas of learning resulting from the projects being; (1) dealing with ambiguity (2) transferring design skills across contexts, and (3) recognizing the needs of others.

Dealing with ambiguity

The projects tested the students' abilities to respond to unfamiliar and ambiguous situations, applying both their core design skills and broader transferable skills. In particular, the projects required the fore fronting of 'soft' transferable skills, using negotiation, team working, communication and analysis skills to successfully orientate themselves and navigate each of the projects. This is in line with Smith & Paton's (2014) research, suggesting that an embedded approach across disciplines provides the most likelihood for success in sustaining the development of transferable skills. By elevating the presence and value of such skills within core program delivery, these projects explicitly provided opportunities for transferable skills to be recognized, developed and their application reflected upon. This is also reflected in the explicit use of a design process model to support the navigation of ambiguous project scenarios. In utilizing the Double Diamond model and key methods within each phases of the process a number of the students moved from an initial state of feeling constrained by the use of methods and processes, to an understanding that their ability to employ methods, modes of thinking or particular processes enabled them to better understand and navigate the diverse sets of issues found within the projects. This developed their confidence and supported a recognition that methods are 'tools' at their disposal.

Transferring design skills across contexts

The leap of context required in the application of design skills was a key challenge for students in delivering the projects. This aligns to the understanding that although we may possess a host of subject specific and transferable skills, we don't always have the awareness of how to effectively apply them in different contexts. "We live in contexts, we learn in contexts, we work in contexts and no two contexts are exactly the same…Our ability to contextualize skills is as important as the skills themselves" (Kemp & Seagraves 1995: 316). Data gathered from student reflections in this study suggests that promoting the transfer leap of skills from use in familiar contexts to unfamiliar contexts greatly developed their confidence and level of competency in applying their design skills beyond the studio. Using the Double Diamond model as a visual framework for each of the projects also enabled students to more readily orientate and position themselves within a project's overall terrain – particularly when joining a project that may already be underway.

Recognizing the needs of others

Working collaboratively, navigating projects that involved real people with real issues and real needs placed students at their learning edge, described by Berger (2004) as the most precarious and transformative place in the learning process. Exposing students to a variety of agendas and stakeholder requirements within the design process developed their understanding of other viewpoints and sticky-needs (Von Hippel 2001) that are difficult to articulate out of context or experience but are recognized as essential information within an effective creative process. For many students this reframing of a problem, need or issue seen through the perspective of others was transformative to their existing understanding of design could be applied. As they evidenced a heightened sense of awareness of others needs and viewpoints, through initiating self-reflection within the projects, and replacing established perspectives when confronted with new knowledge or learning experiences.

Concluding Remarks

As burgeoning designers our graduates will be required to be flexible and adaptive, able to respond to given situations wherever they may find themselves being called upon. Within a creative environment of increasingly multidisciplinary practices, and the growing diversity of design's application across many sectors, how designers continue to articulate their value proposition is of key importance. In responding to this, the approach described in this paper aimed to develop students' design readiness, equipping them with the ability to apply their skills across diverse contexts by embedding the development of soft transferable skills in concert with the ability to competently transfer the application of core design skills providing a truly enhanced graduate skillset. While this project-based approach to work related learning continues to be developed, further longitudinal research studies have the potential to help to evaluate the impact of this educational experience upon our graduates professional working practices. The research contributes to new understandings of the relationships between pedagogical practices in design and work related learning experiences.

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