Scaffolded, simulated work-integrated learning in design education: Beyond the live project

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COVID-19 calls for new approaches and frameworks for the delivery of work-integrated learning (WIL). Standalone WIL opportunities are also increasingly difficult to realize, with the current economic climate limiting industry resources available for placements and WIL partnerships. The hybridized WIL model presented in this paper thus proposes the scaffolding of simulated WIL experiences into core undergraduate design curriculum to promote deep, authentic, transformational learning, fostering broader student employability. Noting a gap in design educational research relating to embedded scaffolded WIL, the paper refers to examples of scaffolded WIL experiences across core design studio subjects of a four-year embedded honors interior architecture program. Conceived as a way to prepare students for more significant standalone, cross-disciplinary and cross-national WIL, the authors argue that this model develops the professional skills required by industry and better prepares students to navigate the dynamic real-world problems that societies face, particularly during the pandemic.

Keywords: COVID-19, design education, scaffolded WIL, simulated WIL, authentic learning, live project

Within tertiary education, work-integrated learning (WIL) experiences build the career readiness and global citizenship that industry requires of 21st -century graduates, yet these opportunities are often offered as discrete experiences or in isolation to students' core curriculum. This is an issue that affects many programs including those delivered within the framework of design education. Indeed, a gap was identified in design educational research relating to embedded scaffolded WIL. To address this gap, the paper positions the embedding of scaffolded WIL experiences across core design studio subjects of a four-year embedded honours interior architecture program as a hybrid form of WIL. This model was conceived as a way to prepare students for more significant standalone, cross-disciplinary and cross-national WIL, and ultimately, for professional practice. With limited precedent of embedded WIL in design-based education to draw from, the program staff developed a holistic scaffold for student learning involving stakeholder engagement, industry mentorship, knowledge exchange workshops and student reflection.

METHODOLOGY AND RESEARCH AIM

To evaluate the broader success of WIL integration into core curricula, staff conducted a preliminary qualitative study and survey of student experiences for one core design studio undergraduate subject (under ethics approval HC190329). The design studio project, learning activities and outcomes were mapped according to O'Shea's (2014) four categories: "complex workplace-based WIL experiences; complex on-campus simulated WIL experiences; simple on-campus simulated WIL experiences; and simple workplace-based preparatory activities" (Sachs et al., p. 10). Thirty-five student responses were thematically coded and triangulated by mapping their perceived skills development and learning experiences against O'Shea's (2014) framework. Preliminary analysis of these responses suggests (and

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is supported in the literature by Doolan et al., 2019; Rowe & Zegwaard, 2017, and others) that integrating scaffolded WIL experiences into core curricula has had multiple positive outcomes for the students, as will be elaborated in the discussion below.

This paper forms part of a larger research project that seeks to re-frame the scholarly discussions of studio teaching and pedagogy (curriculum design). It aims to highlight the nuances of studio-curriculum and studio teaching strategies beyond the standalone, so-called "live project" model involving an external stakeholder; thereby highlighting the unique value of each embedded simulated WIL component within a scaffolded model supporting student development. Whilst the live project model is commonly adopted by universities globally as a means of offering architecture students the opportunity for workplace practice-learning, this review of the research in this area argues that there is an opportunity to define the live project model as a form of WIL. By subjecting the live project to an analysis as a form of WIL, this paper seeks to argue that live projects form an embedded, scaffolded core subject in design studio education, rather than discreet, standalone offerings.

DEFINING THE HYBRID WORK-INTEGRATED LEARNING MODEL

To understand the opportunities for WIL offerings within core design curriculum, it is necessary to first define key WIL terms and contextualize them within the tertiary design education context which, to the authors' knowledge has not previously been done before. In doing so we contribute a design education voice to the current scholarly dialogue and through hybridization of terms offer a type of a hybrid WIL model that has not yet been framed in design education literature. WIL is an umbrella term for the integration of academic theory with workplace application (Patrick et al., 2008; Smith et al., 2020; Xia et al., 2015). It is characterized by the engagement of three main stakeholders: student, university, and workplace (industry/community). This paper and its design education case study focuses on what could be considered as a hybrid form of WIL, that is composed of embedded (core-curricula) simulated (emulates practice processes and contexts) and scaffolded (builds across whole program stream) WIL involving external stakeholders in the design and delivery of core studio-based design curricula. Scaffolded WIL involves a sequence of WIL experiences that structure core disciplinary subjects within a program curriculum (Jackson, 2015; Kaider & Bussey, 2018; Zegwaard & Rowe, 2019). Scaffolded WIL is also a form of embedded WIL in which: "employability-related activities are those integrated into curricula as a formal component of students' learning and may form part of their assessment." (Jackson & Bridgstock, 2020, p. 2). For the purposes of this paper, simulated WIL includes activities that are structured to include real stakeholder engagement, professional design practice processes and opportunities for Industry recognition.

Scaffolding Work-Integrated Learning in Design Education to Foster Authentic and Transformational Learning

Scaffolding within design education involves specific considerations. To maximize the learning afforded through WIL experiences, several scholars suggest that core curricula should integrate employability-focused learning opportunities (Billett, 2011; Ferns & Zegwaard 2014; Gardner 2013; Zegwaard & Rowe, 2019). Much of this research is focused on enhancing the professional skillsets of students. According to educational scholar Stephen Billett (2011), sequencing WIL experiences throughout a program, and including WIL experiences early on within it, may help students to determine an area of specialization that is best suited to them. In the context of a creative, design education, offering multiple WIL experiences allows students to be exposed to varying clients and different design typologies, that may assist students in determining which typology of design/architecture they may pursue post-graduation. That said, much of the discourse on the

integration of real-world project learning opportunities in design education focuses on raising awareness of the social and civic responsibilities of design professionals. This paper suggests that scaffolded WIL within core studio-based design subject not only prepares students for the problem-solving skills required of professionals but enables a transformative educational experience for the learners. In the context of design studio teaching, this "authentic" (Oliver, 2015, p. 62) learning differentiates scaffolded embedded WIL experiences from the discrete learning involved in "single standalone offering" (Zegwaard & Rowe, 2019, p. 328).

In examining how WIL can create authentic learning experiences, we draw on the authenticity-proximity framework developed by Oliver (2015). To assess the effectiveness of tasks relating to employability, WIL activities are mapped on the axes of authenticity ("how closely a task resembles professional level challenges") and proximity ("how closely the context resembles a professional environment"), to develop a framework of categorizing WIL activities as high (tasks closely resemble tasks undertaken in professional life, in settings that resemble professional contexts), moderate (tasks closely resemble tasks undertaken in professional life, in simulated contexts), and low (tasks take place in professional contexts, however tasks do not resemble tasks undertaken in professional life) (Oliver, 2015, p. 61-62).

THE PARTICULARS OF WORK-INTEGRATED LEARNING IN DESIGN EDUCATION

Many providers of higher education within the creative arts in Australia now offer WIL experiences within their curricula (Collis, 2010; Daniel & Daniel, 2015). However, WIL has a shorter formal history in the creative industries in Australia than other higher education fields (Daniel & Daniel, 2015) and as a result, minimal research has been undertaken in this area (Daniel & Daniel, 2015; Hains-Wesson 2012). Nonetheless, there is an emerging field of research on WIL experiences in architecture, interior design and industrial design demonstrating the benefits of WIL, including expanding knowledge of work practices and the opportunity to benchmark creative work against industry standards (Daniel & Daniel, 2015; Franz, 2007). Recent research on creative industries' graduates showed that embedded WIL experiences "were perceived as broadly useful to graduates' skill development, gaining of relevant experience, provision of networking opportunities, and employment prospects", and that students within creative industries were strongly interested in non-workplace-based WIL such as for-credit projects, consultancies and industry panels as forms of WIL (Jackson & Bridgstock, 2020, p. 11). One study, undertaken at an Australian university, investigated a creative industries subject integrated as a core subject within the curriculum involving direct engagement with industry professionals (Daniel & Daniel, 2015). It suggests that direct engagement with practitioners increased students' sense of agency, self-management and insight into career planning, as well as providing students with insight into industry and expanding their industry networks (Daniel & Daniel, 2015).

WIL models must also be designed to meet the particular characteristics of the creative and design industries. Creative industries graduates tend to work in project-based portfolio careers (Bridgstock, 2006; Collis, 2010) in a complex and competitive sector that is "characterized by non-linear career paths driven by the individual" (Daniel & Daniel, 2015, p. 199). For this reason, it has been suggested that WIL models from other disciplines have limited applicability to pedagogical models for the creative industries which thus required their own nuanced models developed in consultation with industry (Bailey et al., 1998; Collis, 2010; Jackson & Bridgstock, 2020). A notable issue is the need for creative industries educators to create a program that balances student creativity and individual expression while connecting it to the realities of industry (Daniel & Daniel, 2015; Helyer & Lee, 2014).

The History of WIL in Design Education: The 'Live Project' Model

In design and architectural education programs within the built environment, most universities throughout the UK, the US, Europe and Australia offer a 'live project' design studio. Usually these live project design studios are offered as discreet, standalone subjects. Anderson and Priest (2012) establish that live projects share three common elements: a client, a brief and a site. Chiles and Till (2007) expand this definition to encompass having a real client, a real project, a real problem, done in real time, with the opportunity to realize a design project through building at a 1:1 (real) scale. Furthermore, Chiles and Till (2007, p. 1) assert that live projects reject the separation between "practice and education", "real and theoretical", and thereby enable the student to be "creative within constraints". Anderson and Priest (2012) point out that "live projects are often understood as 'building' projects happening outside the studio, as if in opposition to design studio projects" (p. 50).

The live project model is one way that universities seek to bridge the gap between academic learning and workplace practice in architectural education. A recent study of the state of architectural education within Australia revealed that industry practitioners have indicated a desire for graduates to have more practice-based knowledge, which has been an ongoing theme in architectural education for over a century (Maroya et al., 2019). The study highlighted that students, academics and industry partners identified needs to integrate a combination of practice and university-based learning within architectural education, and to ease the transition from university to the workplace for graduates (Maroya et al., 2019). The live project model, located in settings that resemble the workplace, and with tasks that resemble professional practice, offers one way to address the integration of practice with university learning. On this basis, it can be argued that while it has not yet been characterized this way, the live project model is a type of WIL. It can be classified as a moderate to high level WIL activity using Oliver's framework, (2015) as it resembles tasks that are required in professional life (authenticity), and can occur within a professional context or within a university context (proximity).

Existing research on the live project model suggests it promotes deep, transformational and authentic learning. One Australian study examined a suite of interdisciplinary, standalone design electives offered within a built environment faculty and which incorporated community-based live projects with the aim of exposing students to issues of civic responsibility and ethical practice (Corkery et al., 2007). Its authors found that students developed a capacity to work with real clients, communities and project sites, while working independently and collaboratively. They found "a significant potential for interdisciplinary design studios to provide integrative and personally transformative learning experiences for students and community members" (Corkery et al., 2007, p. 1). More significantly, the live project encourages students to become aware of their civic and ethical responsibilities as professional designers, also a marker of authentic learning (Chiles & Till, 2007; Corkery et al., 2007). Notably, Chiles and Till suggests interactions with real clients is not only empowering, but fosters "their creativity" (p. 2). As such, the live project model demonstrates the potential to achieve deep, transformational, and authentic learning outcomes for students.

Limitations of the Standalone Live-Project Model in Design Education

However, there are numerous constraints to offering live projects. From a financial standpoint, students and the university often accumulate costs and deplete resources when taking on live projects. Chiles and Till identified that students often take on the costs of travel and disbursements in live project settings, and that industry partners sometimes view student work as the equivalent of unpaid labor (2007). To this end, the Work-Integrated Learning in Universities Final Report (Universities Australia,

2019) identifies the need to ensure that WIL experiences are accessible for all students, with emphasis for Australian universities for international students, Indigenous students and students from low socio-economic backgrounds. The National WIL Strategy (Universities Australia et al., 2015) similarly identified the need to ensure equitable student access and participation in WIL. Additionally, the design and delivery of industry-focused WIL experiences demand additional and sometimes significant staff resources that impact workload (Daniel & Daniel, 2015; Draper & Hitchock, 2006; Universities Australia et al., 2015). To address this problem, Chiles and Till encourage industry partners to invest into the projects within the live project model (Chiles & Till, 2007).

The realization of a built project is often a key aspiration of the live project model. This relies upon funding for materials and resourcing in terms of manual labor for construction. Live projects are dependent upon the development of strong relationships between the university and key industry stakeholders. Due to a variety of reasons, partner industry stakeholders may not be willing or able to offer real, built projects for students to work on. Furthermore, there is a contradiction between the uniform timetable of the academic semester, and the varying nature of the schedules of real projects within the built environment. Time constraints are identified as a limiting factor in live projects, with live projects being too long or too short (Chiles & Till, 2007).

One issue of the live project model is that they are contingent on community circumstances and external stakeholder briefs, so often can only be offered as discreet subjects either as standalone offerings within a core curriculum or as an elective subject. Some studies suggest that these standalone WIL experiences are not as effective as those which are embedded throughout the program curriculum (Bates & Hayes, 2017; Rowe & Zegwaard, 2017). The sequencing of WIL experiences across multiple years within degree programs is also important (Zegwaard & Rowe, 2019), as is the need to develop more integrated approaches to learning and work (Billett, 2011; Coll & Zegwaard, 2011; Jackson, 2016; Johnston, 2011; Smith et al., 2018; Zegwaard & Rowe, 2019). Thus, while live projects are a form of WIL that offer students the opportunity for authentic, deep, and transformational learning, there are many limiting factors that hinder the live project model from being implemented nor is it always accessible and equitable. The current standalone model of live projects, whilst valuable, should ideally be embedded and scaffolded as part a series of WIL experiences from "simple" building to "complex" (O'Shea, 2014; in Sachs et al., 2017, p. 10) across core design studio curricula.

Scaffolding Live-Project' as Simulated WIL Experiences Across Core Design Studio Curricula

Scaffolded WIL activities foster deep, authentic, and transformational learning (Oliver, 2015), which in turn, leads to greater employability outcomes for students. Deep, authentic, and transformational learning are considered higher order learning experiences that equip students with the ability to navigate a fast-paced, changing world. In a design curriculum, these learning experiences enable students to discover new perspectives on their work, to situate their work and research within the larger context of society and the world, and to explore the ethical responsibilities and civic/social impact of their work. They also provide students with opportunities to develop their confidence, ability to collaborate with others and navigate varying personalities, and hone their skills in verbal and graphic presentations to outside audiences.

Simulated WIL within the design studio incorporates a series of experiences and activities already embedded within studio project briefs that authentically mirror the phases of a real-world design project. These include an external stakeholder or client's input and feedback, industry mentorship and offer students the ability to develop confidence, ability to work with outside audiences as well as with

different team members and stakeholders. It also allows students to engage with an outsiders' perspective of their work and situate their learning within the social, civic, and ethical context of the outside world. By bringing in an outside perspective, students are offered the ability to reframe their work through new perspectives. In this regard, simulated WIL in the design studio fosters deep, authentic, and transformational learning and through these experiences, students develop their employability skillset. Employability is defined as "a set of valued and valuable skills which are necessary but not sufficient for gaining employment" (Sachs et al., 2017, p. 7), and further, employability skills enable students and graduates to "discern, acquire, adapt and continually enhance the skills, understandings and personal attributes that make them more likely to find and create meaningful paid and unpaid work that benefits themselves, the workforce, the community and the economy" (Oliver, 2015, p. 56). Simulated WIL develops students' understanding of the industry and civic context of their work, whilst also developing personal attributes and skillsets such as confidence and collaborative practices critical in creative industries; thereby through deep, transformative and authentic learning experience, simulated WIL in the design studio develops employability outcomes for students and graduates. Furthermore, by embedding simulated WIL experiences holistically scaffolded throughout an entire program, students are offered the opportunity to develop and expand upon their employability skillsets through repeated and incremental transformational learning experiences, building towards better preparedness for more significant standalone, cross-disciplinary and cross-national WIL, and ultimately, for the 21st century challenges of professional practice.

STUDENT PERSPECTIVES

Whilst further research is needed to establish the efficacy of this proposed hybrid WIL model in design education, preliminary analysis of student feedback for one core studio subject within the four-year undergraduate program of focus showed that students experienced transformational learning experiences in developing skills and attributes relevant to both educational and work practices, as well as opportunities for critical review and feedback on their work. These preliminary findings suggest that the simulated WIL experiences provided students with the ability to develop skills and personal attributes such as confidence, presentation, communication, and teamwork. Student 1 refers to the:

> opportunity to continue to practice my skills (presenting, networking, ideating, learning etc.) will always be paramount to my career development, so having this experience has only assisted me to continue to grow and learn. For someone who has had a few years of contact with the industry, what this experience gave me was one of the first opportunities to present work that was solely my own to a body of professionals for critical review and feedback. (Student 1)

Student 2 similarly said:

> the frequent presentations we are made to undertake in the university environment have enabled me to go into the workshop with confidence and excitement. Going into the [stakeholder vision] workshop to meet a group of people who we are ultimately inspiring to be one day would be quite daunting without the support of the tutors and lecturers within the built environment faculty. (Student 2)

Similarly, Student 3 commented that the subject was:

> so important in developing not only my skills as a university student studying interiors, but also my people skills. The nature of the industry is so focused around collaboration and working as a team, so doing this "for real" is very encouraging and inspiring. (Student 3)

The unique learning environment of design studio encouraged critical review and feedback on student work, whilst also allowing students to be exposed to new perspectives from within and outside of the industry. Student 4 reinforced this point, showing how the subject connected them to industry practices, stating "the subject was challenging in a way which propelled abstract thinking, pushing myself to create design solutions through procedures which are reflective of industry practices", whereas student 5 commented on how the subject developed their knowledge within and outside of design: "the best part of this subject is gaining knowledge about the topic chosen for the design, where you not only learn about the design aspects but also outside the field". Student 6 also commented on the value of outsider perspectives in developing their confidence:

> With regards to the [deep dive] event, it was great to see a broader perspective of ideas from both design and non-design perspective. I also gained confidence in seeing the commonalities of our thought with industry leaders and challenged with the new perspective and thought for future design concepts/projects. (Student 6)

Furthermore, the simulated WIL experiences appear to have created a sense of agency and ownership in tackling a design project brief, itself an indicator of deep authentic learning. Student 8 said:

> Having a project that was tangible and available for us to physically visit and interact with the clients who inhabit the space definitely created a larger sense of ownership of the space. This gave more realistic parameters to our brief, which also helped give a more realistic experience of how a client briefing/meet would start and progress through different stage. (Student 8)

Similarly, Student 9 reinforced the value of connecting her learning to real-world environments, thus strengthening her skillsets and knowledge. In her words: "I felt much more connected to the reality of the situation, rather than having a theoretical or conceptual brief".

In the context of Oliver's framework for WIL, where effective WIL tasks are both authentic in resembling professional tasks, and proximal in resembling a professional environment (Oliver 2015, p. 61-62), these student insights reinforce the impact that a hybrid WIL approach within design education can have on the authenticity of student learning and development of students' employability. Given this is a preliminary study, these findings also suggest further investigation into hybrid WIL, across an expanded number of design studio subjects, is warranted.

CONCLUSION

Embedding and scaffolding WIL experiences in core design curricula offer effective and diversified pathways to the authentic and transformative learning associated with graduate employability. Moreover, by establishing the standalone live project design studio as a form of WIL, and subjecting it to an analysis of WIL best practices, this paper contributes to and expands the scholarly discourse on WIL within design education, offering new perspectives on current educational practices. This approach may prove to be particularly valuable in addressing the emerging shortages of WIL experiences resulting from the ongoing economic disruption of COVID-19. To this end, scaffolded embedded WIL offers a mechanism for building resilience, and scalability, into WIL in tertiary design education moving beyond the post-pandemic state.

Furthermore, the paper posits simulated WIL environments as an alternative to the live project model in design education when its logistical constraints, such as funding, and equitable access for all students make these projects unviable for some programs. The preliminary review of student

feedback from such an embedded design studio subject demonstrates the potential for these simulated, scaffolded WIL experiences to move beyond the standalone live project design studio as a form of WIL.

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