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Projects of Consequence: Interdisciplinary WIL Projects Designed to Meet the Needs of Partners and Students

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Abstract

The focus of this paper is the design and development of an innovative project-based work-integrated learning (WIL) course that enables undergraduate students from all faculties to work in interdisciplinary teams with partner organisations from the public, private, and community sectors. Projects are co-designed with partners interested in students from multiple disciplines bringing insights to problems that might not otherwise be resourced by their organisation. These 'projects of consequence' are unstructured, ambiguous and complex, requiring student teams to synthesise their different disciplinary knowledge. Student learning is supported by course curriculum design that includes proven pedagogical practices such as: ongoing feedback from partners; students working in autonomous small teams; academic supervision of teamwork; learning support before and during project work; debriefing; providing a safe, supportive space to experiment with new ideas, embracing the prospect of failure and to develop resilience; all underpinned by reflection so as to process, understand and integrate students' experiences. The versatility of the course design was demonstrated by the rapid change from face-to-face delivery to an entirely online learning environment in response to the COVID-19 pandemic. The challenges and adaptations include changes to the way student teams worked, the additional support needed by students, and adjustment in the mode of interactions with partners.

Keywords

non placement work-integrated learning, project-based WIL, interdisciplinary teams, academic supervision, COVID-19 global pandemic, resilience

Introduction

In the 2020 Summer session, a small teaching team from the central Work Integrated Learning unit (WIL Central) at an Australian university launched a project-based WIL course available to undergraduate students from all faculties to work in interdisciplinary teams with partner organisations from the public, private, and community sectors. Projects are co-designed with partners interested in students from multiple disciplines bringing insights to problems that might not otherwise be resourced by their organisation. These ‘projects of consequence’ are complex, requiring student teams to synthesise knowledge and skills from their different disciplines while engaging in team-based problem-solving, critical thinking, innovation, and oral and written communication. The versatility of this project-based WIL course design became evident in the second iteration with a move to a fully online environment due to the COVID-19 pandemic. This provided some key lessons on effective course design and delivery for both face-to-face and online project-based WIL.

In designing the course, the teaching team scaffolded the development of skills and capabilities essential for the twenty-first century workforce, including: the ability to deal with ambiguity and solve complex problems beyond the confines of siloed disciplines; flexibility and adaptability to new jobs and careers within a constantly evolving workplace; innovation and entrepreneurship requiring critical thinking and creativity; and working with people and teams requiring interdisciplinary collaboration, open-mindedness, self-awareness and respect for others (AiG 2018; Balliester et al., 2018; Rumbens et al., 2019; Tytler et al., 2019; WEF, 2018). Whilst placements have featured prominently in traditional WIL courses, the teaching team purposefully chose interdisciplinary partner projects as the course model to provide an effective learning environment to assist in preparing students for the workforce.

Blumenfeld et al. (1991) argue that project-based learning enables students to “pursue solutions to nontrivial problems by asking and refining questions, debating ideas, making predictions, designing plans and/or experiments, collecting and analysing data, drawing conclusions, communicating their ideas and findings to others, asking new questions, and creating artefacts” (p. 371). In their study of the theory and practice of project-based learning, Helle et al. (2006) reiterate that central to this pedagogy is a “question or problem that serves to organise and drive activities; and these activities culminate in a final product that addresses the driving question” (p. 288). It is the second feature, they explain, that of “constructing a concrete artefact”, that “distinguishes project-based learning from problem-based learning”, the former forcing “the student or student team to think through the steps of the construction process, and in some cases to execute them in an orderly fashion just like a construction team” (p. 291). This provides students with “a very concrete and holistic experience regarding a certain process” (p. 308).

Further benefits of client-based projects used in WIL courses (also called ‘consulting projects’ and ‘industry projects’) include their viability as an alternative to internships, which may not suit all students and “can be more taxing on an organisation in terms of resources and time required to meet the demands of the intern” (McLay and Skelton 2007, p. 166). In considering ‘inclusive WIL’, Sachs et al. (2017) identify project-based WIL as providing opportunities for students who might “experience barriers to undertaking a placement located within the workplace” such as “those with more ‘visible’ or obvious needs such as disabled, ESL, and international students, and students experiencing less obvious or ‘invisible’ barriers such as mental health issues and those with parallel work and/or carer responsibilities” (p. 25).

Heriot et al. (2008) point to consulting projects used in business courses as a valuable pedagogy that requires “interaction between a student or a team of students and a real business owner faced with a real problem or issue that needs to be resolved. They take the student out of the comfort of the classroom right into the real world” (p. 475). In their report to Australia’s Chief Scientist, Edwards et al. (2015) recommend industry projects as an effective approach for the large number of STEM students who undertake WIL, in particular Engineering students, because projects are “increasingly recognised for their efficiencies in terms of employer to student ratios, and for their abilities to draw out graduate capabilities in relation to teamwork” (p. 60). Project-based WIL has also been identified as an innovative approach to scaling workforce learning opportunities while accommodating the needs of partner organisations (UA 2019). Kay et al. (2019) include project-based WIL courses among those “that overcome constraints to [partner] engagement, particularly for small to medium enterprises (SMEs)”. Project-based models also enable “deeper and more collaborative partnerships where industry partners have input into the design of WIL activities and events” (p. 404).

The second intentional design feature of the course was to provide students with the opportunity to work on projects in interdisciplinary teams. ‘Interdisciplinary’ is used here to describe an approach that facilitates the drawing together and integration of “different forms of knowledge to explore a problem and produce insights that are more than the summing of disciplinary parts”. In contrast, a ‘multidisciplinary’ approach provides “an additive collection of disciplinary perspectives” (p. 343) but lacks the synthesis of an interdisciplinary approach (Pharo et al. 2014). The value of students working in interdisciplinary teams is evidenced by Pharo et al. (2014) who point to studies indicating “students with formal training in interdisciplinary learning are better able than their disciplinary counterparts to synthesise disciplinary contributions and, thereby, handle the emergent, ambiguous, contradictory and context-dependent nature of many social and environmental problems” (p. 342). Johansen et al. (2009) provide further evidence for this in their study of student perceptions of the effectiveness of working on a project in interdisciplinary teams from creative and business disciplines.

Marchioro et al. (2014) examined a project-based WIL course involving interdisciplinary teams from within a business school, and found that by requiring students to introduce, explain and justify the language and knowledge specific to their own discipline, the students experienced a deeper level of learning and developed “a more business savvy perspective” (p. 366). As Sachs et al. have argued (Sachs et al. 2017), interdisciplinary teamwork also provides benefits for international students undertaking WIL courses, enabling broader collaboration with a greater range of local students. Each of these factors are evidenced in this WIL course, where local and international students are enrolled, students have the opportunity to view problems in a more holistic way, and to apply the knowledge and skills learned in their specific disciplinary domain to problems that, due to their complexity, require the convergence of thinking from many disciplines.

Course Description

In this project-based WIL course, students work in small teams (3-4 students) on a project co-designed by university staff and the partner organisation. This ensures the project has appropriate scope, is do-able in the time available, is open to multiple solutions, and that outcomes have significance for the partner organisation. The course may be undertaken in

intensive mode or over a term. Intensive mode operates over four weeks, with students based on campus in week one and week four. They are hosted at their partner organisation in weeks two and three where they continue to work with their academic supervisors with frequent input and feedback from the partner staff. The term-long option has students undertaking weekly three-hour workshops over ten weeks undertaken across the university campus and partner organisation's office. While at the organisation's office, students interact with partner staff to gain deeper insights to the purpose of their projects with feedback on their work.

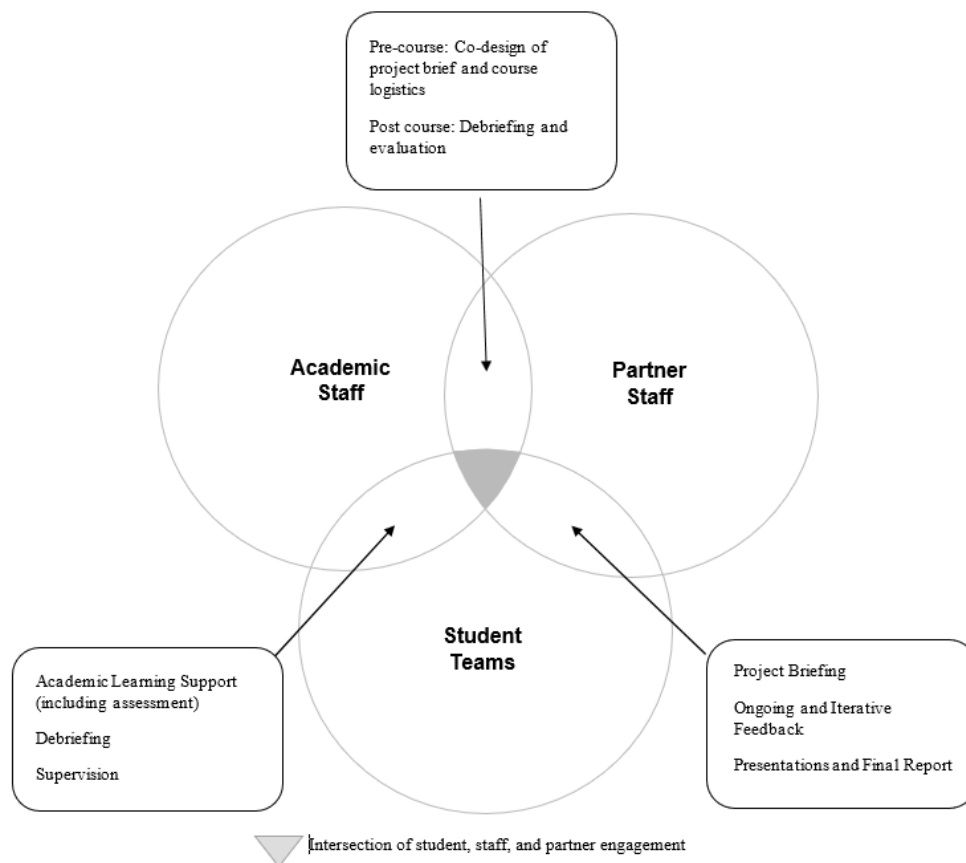
Course partners have included medium and large businesses, state and federal government departments, and community and arts sector organisations. The projects have centred *inter alia* on technology and AI solutions to customer service challenges, methods for gathering information from citizens to inform future government decision-making, soft-power diplomacy through addressing public health issues in the Indo-Pacific region, assisting rural and regional businesses to access global markets, heritage and conservation issues, and a museum's approach to climate change outreach to young adults. These projects benefit from having students contribute their diverse disciplinary and personal backgrounds in working together on the problem definition and final recommendations.

Intentional Course Design

The course has intentionally incorporated several pedagogically important design features that are captured in Figure 1 and discussed in detail later in this section. In sum these design features are:

- projects sourced from partners and co-designed with academic staff;
- projects that are important to the partner;
- unstructured, ambiguous problems, with no single known solution;
- integrated, ongoing input and feedback from partners;
- interdisciplinarity;
- students working in autonomous small teams;
- academic supervision and advice, and learning support;
- safe space to fail and develop resilience; and
- reflection.

Figure 1. Interactions in project-based WIL



In the following discussion we draw on research from the January 2020 student cohort who participated in a small pilot study (n=16) that sought to explore student perceptions and experiences with these pedagogical approaches to WIL. Students undertook a short survey and participated in focus groups that were recorded, transcribed, and thematically analysed. Although not directly asked about their experience in the course, many chose to comment on aspects that stood out to them, and relevant comments are used in the discussion below. Human Ethics Approval was sought and granted (Approval Number: HC190996).

Fundamental to the course curriculum design are high quality, authentic projects. In this context, authentic means that the “task resembles those required in professional life” (Oliver 2015, p. 62). For maximum benefit, the projects must be carried out “with appropriate levels of autonomy and responsibility and [have] meaningful consequence” (Smith et al. 2016, p. 199). This gives students the opportunity to learn in the context of real-world problems for which partners are keen to find solutions, or to develop a range of solutions and different ways of approaching the problem. Partnering with interdisciplinary teams of mostly young adults also promises different perspectives for these organisations. The opportunity to contribute to a project that makes “a meaningful or worthwhile contribution” (Drewery et al. 2016, p. 267) is appealing to students who value making a real-world impact.

The projects are typical of those encountered in professional life and are deliberately unstructured with a scope that may initially be unclear. As one student observed they are *'open-ended ... there is not right or wrong answer'* (Student 1). This contrasts with many university projects as observed by another student: *'I am extremely unprepared with ambiguous requirements in the workplace because the school assignments are always very structured and clear'* (Student 2). Undertaking projects where the answer is not known, the structure and scope needs to be defined before the project can begin, and where many parameters are unknown, or unknowable is a unique experience for many students and provides preparation for professional challenges they will encounter in the workplace.

Although professionals often work with others from different disciplinary backgrounds, this is not common for university students who mostly collaborate with others from the same discipline or faculty. Learning how to work effectively in interdisciplinary teams is vital to graduate success, as our students attest: *'...every one of our team are from different faculties, so I think everyone had their own way of thinking and collaboration. It is [a] really important skill to be able to practice in the workplace in the future'* (Student 3) and *'I think what I learned from that is not rejecting ideas just because it's different to mine'* (Student 4).

The importance of professionals working productively in teams is highlighted in many studies and surveys about employability skills, e.g. the *AAGE Employer Survey 2020*, where it featured third in a list of graduate attributes assessed by Australian employers. Teamwork is an important part of this course and students work continuously in their teams. These teams do not resemble the groups commonly used in university courses: *'...the fact that [my teammates] were mentally supporting each other and then they had my back, I think that was really important. I think I actually learned what teamwork was and how to have that distributive leadership'* (Student 5) and *'[teamwork in other courses] is more competitive than collaborative, which is why I did not really enjoy [it], because they're more like pulling each other down to praise themselves, than together going up'* (Student 6).

Much is done to ensure teams can work productively and cohesively. Information about good practice and the theory as to how teams function well are highlighted during the introduction to the course and revisited throughout. Teams do much of their work together under direct academic supervision, which supports functional team dynamics. Periodic reflective activities focus on team effectiveness, for example asking students to articulate each member's strengths and to consider how they can improve teamwork to harness these to optimise outcomes. Assessment features team artefacts such as a partner presentation and final report/project prototype and reflects the quantity and quality of effort that students put into these deliverables, tempered by peer assessment to enable a variance of marks based on each student's individual contribution. Thus, assessment is designed to enhance and reward teamwork.

An important course goal is to provide a place for students to take risks in a safe and supported environment. In most university courses, students cannot afford to attempt creative solutions for fear of failure and the subsequent impact on their grades. In this non-placement WIL course, ongoing feedback from partners and supportive team members make it possible to try and fail and try again, before the final assessed report. Resilience is needed to recover from failure and is not an easy attribute to develop. From a synthesis of the literature around resilience in higher education in Europe, Amsruda et al. (2019) found that "a learning culture characterised by trustworthiness appears to be a catalyst for developing resilience in nursing students" (p. 1). As one student in this course observed, *'You don't feel afraid to fail because*

it's like I can trust that whatever I'm telling you, it won't be judged like, "she's so stupid." but it's like, "How can we make this person better?"" (Student 8).

A primary difference between the kind of projects students undertake in this course and 'mock projects' is that partners take the role of clients (Edwards et al. 2016, p. 18). This means the partner client has ongoing engagement with the students. The partner introduces the project brief and any necessary background, answers students' questions, listens to their ideas and provides ongoing feedback as the students generate and test ideas. As one student observed: *'you're working ... with partners that give you real time feedback and also having that constant support along the way'* (Student 7). As part of their assessment, students convey their ideas through a final presentation and either a design prototype or final project report, specifically intended to reflect workplace outputs rather than more traditional academic tasks.

As part of the academic support for this course, the teaching team offers a holistic, scaffolded approach to learning support (Rowe and Winchester-Seeto forthcoming). This includes preparation for learning, learning reinforcement throughout the course, as well as synthesis and reflection on the experience, using debriefing and carefully designed assessment tasks. The learning support focuses on teamwork, project development techniques, reflective practice, dealing with feedback, and any specific academic knowledge and skills that arise.

In contrast to many forms of placement WIL, the role of the academic in project supervision is of vital importance. Academics actively supervise students on a day-to-day/week-by-week basis, offering feedback, advice and guidance, acting as a critical friend, encouraging teamwork, modelling good practice, and troubleshooting where necessary. The academics strive to maintain a positive, collaborative and supportive learning environment, recognised as one of the fundamental elements of supervision (Winchester-Seeto et al. forthcoming). This kind of academic supervision is under-recognised in theoretical models of supervision, and academics and partner staff provide different and complementary input to the course (Winchester-Seeto et al. 2016).

Underpinning all student learning in WIL is reflective practice, so that students can process and understand their experiences (Harvey et al. 2010). Reflection is introduced early in the course and practised regularly through activities that feature individual reflection, debriefing, and sharing experiences with others (Rowe and Winchester-Seeto forthcoming). A final reflection assessment task is designed to encourage integration of theory and practice, allow students to explore their personal and professional development throughout the course, and to consider their capabilities relative to their future needs.

Moving the course online in response to the 2020 global pandemic

The versatility of the course design was demonstrated during its second iteration, which was underway when the COVID-19 global pandemic was declared in March 2020. Social distancing regulations required that all university courses be taught fully on-line, and so the course needed to transition rapidly into a virtual format. The guiding principle in taking this course online was to ensure that the technology was used to meaningfully support student learning. The teaching team was particularly keen to foster the work of the students' interdisciplinary teams, maintain ongoing interaction with partners, and support the students' reflective practices.

The course was moved into a virtual classroom, (Moodle Collaborate Ultra©), which allowed for webinar style interaction with students and virtual breakout rooms where student teams could work together online. Students needed to adapt quickly to in-class changes and to also trial different modes of communicating outside of class time. Many reflective, deliberative and debate style activities adapted quite readily to the online format. Communicating with partners was more difficult as they were unable to access most of the online options due to their own secure online systems. To ensure continued connection for strong partner input we resorted to emailing documents developed by students to outline their ideas and ask questions, and feedback was similarly emailed for distribution to students. The final presentation was moved to a recorded video format and links were sent to the partners.

Overall, the course worked very well online, and students were, on the whole, generous, adaptive and helpful. Of course, there were challenges and concerns. Firstly, students did not have equal access to fast internet, which reduced the quality of the learning and teamwork experience. Some students studied under very difficult physical circumstances, as well as personal issues related to the pandemic. This required extra time and compassion from the teaching team who instituted an additional consultation period each week where students could book 15 minute sessions. This also allowed the staff to check in and offer pastoral care to students where needed. The main challenge was to try to help students learn to work effectively as a team in an online environment.

There were two silver linings from this forced experience. The teaching team learned that more is possible in a virtual learning and teaching environment than was originally anticipated. It was different to in-person classes, and so adaptation in approaches and thinking was required. The academics had a mix of previous experience with online teaching (from extensive to novice), but their job was made much easier with support from professional staff who provided technological expertise and were able to troubleshoot when needed. The second positive outcome was that, although it was a difficult situation for the students, they are now much better prepared for the virtual workplace having developed their online communication, collaboration, and negotiation skills.

Although the online version of the course was largely successful, there remain some issues that require further adjustment and creative thinking. Working closely with partners to find the best ways to facilitate interaction with students in an online environment is important, and the solution may vary from partner to partner. Ideally, partners need to be able to access the same technology platform used by students in the course in order to facilitate quality and timely input. It is important to remember that everything takes much more time in an online teaching situation than in a face-to-face class, and therefore time management is important, as is reducing the amount of content and activities intended for each teaching session. Online learning is a very intense experience and so it is essential to interrupt the intensity with reflective and whole-of-class social activities. The latter also help students develop a social connection to team-mates, which is more challenging when they cannot meet socially face-to-face.

Conclusion

The deliberate approach taken by the teaching team to develop a non-placement WIL course that incorporated both project and interdisciplinary pedagogical design features has proved

successful in providing partners and students with the opportunity to engage in ‘projects of consequence’. Partners are able to gain access to new ideas and inputs to problems that might not otherwise be resourced by their organisation through contributing to the co-design of the projects and the outputs produced by the students. Although originally designed for a face-to-face format, the course was able to readily adapt to fully on-line delivery mode with the onset of COVID-19. In the process, the teaching team learned that the main key to success is to ensure that course delivery stays true to the original pedagogical goals, even if they are achieved in a different way. Time management is also important as activities take more time when conducted online. Further, accommodation must be made to ensure that students have equitable access to technology during and between classes, and to ensure that partners can engage regularly with students to provide quality input and feedback on their project artefacts.

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