Abstract

Australian universities have a remit to produce work-ready graduates and engage students from equity groups. In engineering education, accredited Australian programs commonly respond to Engineers Australia's required engagement with professional practice by mandating completion of a specified number of hours in work-integrated learning (WIL) placements as a graduation requirement. Placements are frequently self-sourced, under/unpaid, full-time and available at set times. These conditions, largely beyond students' control, limit options for students supporting themselves through paid work and for students with family commitments. In an investigation framed by the theory of practice architectures, we addressed the question: What are the institutional preconditions shaping WIL placement practices that enable and constrain particular students' access to, experience in, and leverage of professional learning at work for their future careers? Our analysis of three individual student interviews identified key student practices—applying for, doing, and leveraging placements—that are enabled and constrained by material-economic arrangements in family, university and work life, cultural-discursive arrangements in career development activities and social-political arrangements in personal and engineering networks. Identifying this practice architecture is an important step towards an equitable transformation of WIL engineering placements practices.

Keywords: Work-integrated learning, engineering education, equity students, professional learning, practice architectures

Introduction

Work-integrated learning (WIL) is considered an important contributor to graduate work-readiness, supporting university students to develop technical and interpersonal skills, employability and pre-professional identity (Male and King 2014, Reddan 2016, Reddan and Rauchle 2017, Smith 2012, Smith et al. 2014, Jackson and Collings 2018). WIL is designed

to assist students in understanding the nature of work and modus operandi of the workplace while completing their studies, functioning as a 'key interface between students and industry… [which] enables students to practise applying their disciplinary knowledge in a supervised … work setting' (Jackson 2017, 835). Defined as 'Any arrangement where students undertake learning in a workplace outside of their higher education provider' (Australian Government Tertiary Education Quality and Standards Agency (TESQA) 2017, 1), WIL is 'real workplace experience that forms a part of your studies, for example: a practicum, work placement … internship … etc.' (Smith et al. 2014, 90). Placements involve spending time in discipline-related workplaces for an extended period of time (often three to six months). In disciplines such as medicine and nursing, WIL placements are required for professional registration (Billett 2009, Boud and Solomon 2001), while in others, such as business and creative industries (de Peuter, Cohen, and Brophy 2015), placements are an optional component of students' courses (Wilton 2012).

Engineering WIL practice lies between these extremes due, in part, to the influence of Engineers Australia, from whom Australian higher education institutions seek program accreditation. To be accredited, Australian universities incorporate Engineers Australia's strongly endorsed engagement with professional practice (Engineers Australia 2019) into their engineering program curricula, commonly requiring students to undertake a specified number of hours in WIL placements. While placements are highly regarded by students, employers and universities (Kinash and Crane 2015), in engineering they are commonly student-sourced and competitively appointed, rather than university-allocated. To support students, universities often invest resources to generate, sustain and promote opportunities with industry partners. This includes posting WIL vacancies through a centralised university or engineering-centric careers service. Paradoxically, while engineering skills and knowledge, as well as transferable interpersonal skills, dispositions and attributes (Bradley

2008, Male and King 2014, Small, Shacklock, and Marchant 2018) are often developed during WIL placements, these skills are also often required to obtain WIL placements, especially for students from equity groups (Hewitt, Owens, and Stewart 2018), who may not have the social contacts to readily secure placements.

Participation rates of students across all equity groups in higher education in general are increasing (Robinson 2018, Authors 2019a, Unversities Australia 2017), with students entering university from diverse backgrounds, and with varying levels of financial and social support. In Australia, equity status is applied to students with a disability; from low socio-economic status areas, regional and remote locations; culturally and linguistically diverse (CALD) backgrounds; who identify as Indigenous, and who are women in non-traditional areas (WINTA) including engineering where women constitute a visible minority; as well as students positioned at the intersection of multiple criteria (Department of Education 2017, Kaspura 2017).

Students from equity groups may be also first in family at university and/or lack professional contacts, making them less able than students with family or friends in engineering to tap into social networks to access WIL placements. The nature and quality of WIL placements make them crucial for developing students' employability (Smith et al. 2014, Reddan 2017, Kinash et al. 2015). Recent critiques suggest, however, that work-based internships and placements reflect 'class based privilege' (Shade and Jacobson 2015, 188); induce financial stress through students forgoing paid work (Grant-Smith, Gillett-Swan, and Chapman 2017); exclude academically lower performing students who are often in low socio-economic groups (Jackson 2020); require greater institutional and community assistance to support student wellbeing (Grant-Smith, Gillett-Swan, and Chapman 2017); and exacerbate financial and

time costs involved in travel to and accommodation in remote engineering sites, care arrangements for dependents, and/or risk of losing regular paid work (Hewitt, Owens, and Stewart 2018, Authors 2019b). To illustrate, a recent literature review of the experiences of CALD students enrolled in Australian universities suggests that the barriers such students face engaging and completing degree programs are created by institutional structures and priorities that are crucial for preparing students for study and employment, yet provide limited support in the form of language, navigational, pastoral and administrative assistance (Baker, Due, and Rose 2019). Although some universities provide institutional support to assist students from equity groups in accessing WIL placements, anecdotal evidence suggests these services are poorly utilised by students (Siebert and Wilson 2013).

Students from equity groups face additional barriers in the form of merit-based, competitive application processes for WIL placements. The absence of transparency regulating WIL in Australia places these students in vulnerable positions:

> [T]hey are typically going to an unfamiliar workplace, and are often driven by their need to complete a course, to develop their employability skills, and to gain workplace contacts and/or experience to facilitate their transition to paid work (Hewitt, Owens, and Stewart 2018, 264).

Financially exploitative WIL engineering placements are not the only risk for vulnerable students. While remuneration is important, students struggling to complete degree program may have no choice other than to work in places unrelated to their study, bereft of opportunities for professional learning and with poor quality supervision. More useful criteria for judging WIL placement quality than remuneration are the concepts of relatedness, learning and impact. Quality WIL placements, according to Drewery et al. (2016): are contextualised in professions or industries connected to students' chosen field of study and

career direction (relatedness); provide suitable learning opportunities (learning); and engender a sense of having contributed to the host organisation (impact) (Drewery et al. 2016, 267).

The value of WIL is clear, as evidenced by the scale and diversity of WIL in the tertiary education sector and the proliferation of research across disciplines, educational institutions, industries, students and researchers alike (Björck 2018, Cameron 2019, Francisco 2019, Hamilton et al. 2018, Hewitt, Owens, and Stewart 2018). Quality WIL placements, however, involve university and industry stakeholders collectively generating, administering, supervising and evaluating WIL placements to ensure relatedness, foster learning, and constitute value for students and industry alike. Facilitation of graduate outcomes for all students in their transition from university to employment requires a whole-of-institution approach to WIL placement practices (Baker, Due, and Rose 2019).

Seeking insights to guide institutional change, we aimed to better understand how engineering students experience WIL placements, with a particular focus on students in equity groups. Like Hewitt, Owens, and Stewart (2018), we anticipated that these students may have magnified and/or unique stresses that impact wellbeing and/or hinder access to quality engineering WIL placements, as well as less discretion to decline or avoid unpaid, underpaid or otherwise less than ideal placements than their contemporaries. Identifying these stresses is important, despite the paucity of studies examining WIL through a lens broader than the student experience alone. The theory of practice architectures (Kemmis, Wilkinson, et al. 2014) provides a lens that enables us to include student experiences and also extend our inquiry to the institutional set of arrangements and intersubjective spaces that shape these experiences.

Similarly to Goldsmith, Willey, and Boud (2019) and Goldsmith and Trede (2019), we used a practice architecture framework that enabled us to link what students say about their WIL placement experiences to an examination of the broader practice arrangements that govern these experiences. From this perspective, we understand WIL placements as sites of professional learning at work constituted in and by practice architectures in which different practices interdependently interact with others in a broader practice ecology of engineering education. This approach guided us to ask: what are the institutional set of arrangements shaping engineering WIL placement practices that enable and constrain particular students' access to, experience in, and leveraging of professional learning at work for their future careers?

In this paper, we will show how the preconditions in institutional WIL practices generate barriers for engineering students from equity groups in accessing, undertaking and leveraging quality WIL placements to complete graduation requirements and further their careers. This is significant for universities in Australia and internationally because of the current focus on WIL to address the need to prepare work-ready graduates while supporting all students in the successful transition from university to employment. The focus on WIL moves adult learning practices beyond educational institutions alone, while our use of the theory of practice architectures extends its application beyond its origins in primary and secondary education to higher education and professional learning at work. We next outline the theory of practice architectures, describe our approach to data collection and analysis, report and discuss the results of the analysis, and conclude with implications for institutional engineering WIL practices.

Theory of Practice Architectures

Two inter-related practice theories framed our approach: practice architectures and practice ecologies (Kemmis, Wilkinson, et al. 2014). This perspective, developed in relation to pre-service teachers, defines practice as:

> 'a form of socially established cooperative human activity in which characteristic arrangements of actions and activities (doings) are comprehensible in terms of arrangements of relevant ideas in characteristic discourses (sayings), and when the people and objects involved are distributed in characteristic arrangements of relationships (relatings), and when this complex of sayings, doings and relatings 'hangs together' in a distinctive project' (31).

To unpack this idea, a particular practice shapes and is shaped by practice architectures that constitute the preconditions enabling and constraining the sayings, doings and relatings made possible by distinct practice-arrangement bundles that hang together in the practice project (Kemmis, Wilkinson, et al. 2014, 13). Here, project refers to the intentions of those involved in particular practices and the things they take for granted that exist in the intersubjective spaces in each site and are enacted through the media of three dimensions: in language in semantic space (sayings); activities and work in material economic time-space (doings); and solidarity and power in socio-political space (relatings) (14). Practice ecologies theorise social practices, such as WIL, as a complex—or ecology—of practices that intersect and develop in intersubjective space in particular sites. These practices shape and are shaped by practice architectures that enable the characteristic practice sayings, doings and relatings to hang together in projects. Projects in turn, are shaped by practice traditions that constitute the

practice history and collective memory of sayings, doings and relatings that allow them to be reproduced.

Participants in a community of practice, such as engineering, encounter each other in intersubjective spaces that lie between people that are constituted in three dimensions—semantic space, physical space-time, and social space—that are always enabled and constrained in three arrangements—cultural-discursive, material-economic and social-political. These arrangements are associated with three kinds of media or types of things that enable and constrain human action and coexistence—forms of understanding such as shared languages and discourses that shape how we interpret the world (sayings), modes of action or work and activity realised in material things (doings), and social things or the ways of relating to one another and the world through social groups and relationships, such as power and solidarity (relatings) (Kemmis, Wilkinson, et al. 2014, 27–29).

Participation in WIL, for example, requires participants' social engagement in interpretative practices, acquired over a lifetime, through which they orient themselves to a shared culture through language and symbols, the material space in which they inhabit, and the social and political arrangements that contain and control conflict, solidarity and selfhood and identity as members of particular communities. This is achieved through educational projects that are composed and constituted in forms of understanding (sayings), modes of action (doings) and ways in which people will relate to one another and the world (relatings), that are 'bundled together' (3). From this perspective, individual will, understanding and action are orchestrated in collective social-relational projects, such as professional learning at work, while at the same time, individual and collective participation in practices is shaped by the practice architectures—the cultural-discursive, material-economic and social-political

arrangements present in or brought in to a site—that hang together intersubjectively in the practice project (33). These relationships are explicated in Table 1 (Kemmis, Heikkinen, et al. 2014, 157).

[Insert Table 1 here]

WIL engineering placements in our analysis are,

> Sites of [students'] professional learning at work constituted in and by practice architectures in which a number of interdependent different practices are interrelated with others in a practice ecology of engineering education (Kemmis, Wilkinson, et al. 2014, 21).

The site is both the place where the practice occurs and the set of preconditions that make the practice possible, while simultaneously enabling and constraining the intersubjective spaces in which people encounter each other (and things) (Kemmis, Wilkinson, et al. 2014, 14). The practice-arrangement bundles that hang together to make this site possible (preconditions) include the shared language of job applications and work-readiness; material-economic arrangements in universities and industry; and the socio-political arrangements between students, employers and universities.

Importantly, however, 'we cannot transform practices without transforming existing arrangements in the intersubjective spaces that support practices' (6). Transformation in such sites requires the reconfiguration of practices, practice ecologies and the conditions under which they transpire (v). Practice architectures enables us to explore the ways a number of different interdependent practices shape and hold in place Australian engineering WIL

placement practices as a site for students' professional learning at work 'both in terms of the agency and actions of individuals, and in terms of the cultural-discursive, material-economic and social-political enabling preconditions that make these practices possible' (15). This exploration, we argue, is a move towards transforming the practice ecology of engineering WIL placements to enable equitable access to quality experiences for all students.

Method

In this paper, we present analysis of three student interviews that are part of a larger mixed methods (Creswell and Plano-Clark 2014) study that identified the implications for equity and diversity in an investigation of student experiences in WIL engineering placements across four Australian universities . The study provided insights to guide recommendations to improve engineering WIL placement practice in relation to access, quality and wellbeing for students in equity groups (Authors 2019c).

In semi-structured interviews averaging one hour in duration, students were first asked for demographic details, then to describe their placement experiences, how they secured them, what or whether they were paid, the work in which they engaged and what they learned during the placement, how the placement influenced their study options and career direction, and what kind of support they received during the placement, including whether they undertook other paid work. Students also had the opportunity to describe obstacles and difficulties as well as successes and realisations that formed part of their experience.

We used the theory of practice architectures as an analytical tool, similarly to Goldsmith, Willey, and Boud (2019) and Goldsmith and Trede (2019), adapted from Kemmis, Heikkinen, et al. (2014, 158), to explore the institutional preconditions—cultural-discursive,

material-economic and socio-political arrangements—in the intersubjective spaces that shape engineering WIL placement practices.

[Insert Table 2 here]

To show how these arrangements shaped strikingly different student experiences, we compared interview accounts of Miriam, Ramed and Brad. These students and their placements are introduced next.

Miriam

Equity group status applies to Miriam through the intersection of criteria: residential postcode, as Muslim, and a Woman in Non-Traditional Areas (WINTA). Twenty-five years old at the time of the interview, Miriam had unsuccessfully applied to more than fifty companies, sometimes even cold calling, before she undertook her first WIL placement at the end of the fifth year of her degree. This was secured through a serendipitous opportunity offered outside the standard vacation-work timeframe:

> It was very last-minute, it wasn't advertised through the vacation program that is usually advertised earlier. It was just to finish off those few projects that the control systems engineer didn't have time to (Miriam).

Miriam's placement was drive in drive out, on a swing basis, which meant working eight days onsite and six days off. On her days off, Miriam also worked three part-time paid jobs to cover living expenses for her and her partner.

Ramed

Ramed has equity group status because of his family's residential postcode and CALD background. He was 23 at the time of the interview and moved cities for his first placement,

after unsuccessfully applying to more than twenty companies. Unwilling to take an unpaid placement, Ramed eventually secured his first placement at the end of the fifth year of his degree through a family contact:

> I was having a bit of trouble finding an internship, so my aunty is an associate of that company, so I kind of had an in at that company in that sense. So yeah, I moved to Melbourne to facilitate that.

While this first placement was paid, Ramed regularly worked unpaid overtime hours on the placement, rendering it underpaid. For his second placement, Ramed undertook paid work at a larger, well-resourced multinational company.

Brad

Brad was 21 years old at the time of the interview. Financially comfortable, Brad's family supported his private secondary school education, enabling him to choose not to work while studying.

> My parents didn't let me have a job at school, because they said, you're at school, have fun outside of school, and then I got a scholarship for my first year.

Brad undertook a placement in second year, which was secured through a contact in his social network, without engaging in a formal application process. This was a well-paid placement in a mid-size Australian company that provided Brad opportunities to engage in mechatronic experimentation with new equipment.

Miriam, Ramed and Brad were selected because their contrasting experiences illustrate how the cultural-discursive, material-economic and social-political arrangements in WIL placement practices constrain and enable each student's experiences in professional learning at work through placements. Their interview accounts were representative of the interviews across the larger participant group, providing an opportunity to provide an in-depth

exploration of their placements and the preconditions that enabled and constrained these experiences.

Findings and discussion

Our analysis of the students' accounts identified three key student WIL placement practices that are shaped by broader institutional WIL practice architectures: applying for, doing and leveraging engineering WIL placements for their future careers. The findings from our analysis follow, each section with a brief introduction and the analytical table (Goldsmith and Trede 2019) linking students' accounts of their sayings (S), doings (D) and relatings (R) in WIL engineering placements to the cultural-discursive (CD), material-economic (ME) and social-political (SP) arrangements structuring and holding inequitable WIL placements practices in place (Kemmis, Wilkinson, et al. 2014, 22).

To help read the tables: the first row documents the institutional cultural-discursive (CD – shared language of work readiness and graduation requirements) arrangements that shape the specified practice, which we link to direct quotes cited from students' interview accounts of sayings (S – what students say) that point to those arrangements. The second row documents the institutional material-economic (ME – financial, regulatory, legal requirements) arrangements that shape the specified practice, which we link to students' accounts of doings (D – work and activities) that point to those arrangements. The third row documents the institutional social-political (SP – professional and family networks) arrangements that shape the specified practice, which we link to students' accounts of relatings (R – interpersonal interactions and relationships) that point to those arrangements.

Applying for engineering WIL placements

Different arrangements enabled or constrained each student's efforts in securing an engineering WIL placement. Here, institutional WIL practices include university degree program requirements with which students must comply to graduate, the engineering student recruitment processes used by employers, and the graduate recruitment function of placements for industry partners.

[Insert Table 3 here]

Ramed and Miriam saw competitive application processes as a time-consuming, frustrating and often demoralising way to secure a WIL placement. Both of these students described how and where they looked for opportunities, which were predominantly unsuccessful, and their increasing sense of desperation given they were both close to graduation without completing the requisite professional experience hours. In contrast, Brad secured his placement in second year by tapping into his sporting network and without engaging in the application process.

Securing a placement for Ramed meant moving to Melbourne to take up an exploitative position sourced through a family contact, while Miriam's experience was simultaneously serendipitous and also negatively impactful, with the company's tardy onboarding process necessitating the completion of a second placement in order to graduate. In contrast, Brad enjoyed the benefits of a permanent employee, without being required to work overtime.

Doing engineering WIL placements

Similarly, three arrangements enabled or constrained the work and activities in which each student engaged during their engineering WIL placement. The activities that were available

to each student, and how they experienced them reflected their response to institutional practices, such as everyday working conditions, work and safety environment, accommodation for cultural and religious difference, as well as work and extra-curricular interactions with colleagues during the placement.

[Insert Table 4 here]

Brad recounted the freedom his placement facilitated to make mistakes while engaged in workplace learning, while Miriam described being left alone, with little feedback or support from her absent placement supervisor. Ramed told of being exploited by unpaid overtime, with little power not to refuse, with few resources to facilitate professional learning in what he described as primarily administrative tasks supporting the engineers. Ramed and Miriam's experiences point to powerlessness and an absence of relatedness, learning and impact in contrast to Brad.

Leveraging engineering WIL placements for future careers

This section addresses the three arrangements that enabled or constrained each student's capacity to leverage their engineering WIL placement for their future careers. It is important to note here, that while Ramed and Miriam faced difficulties securing and doing their placements while Brad did not, both Ramed and Miriam articulated their placement experiences as productive of rich, professional learning that they could apply to further their careers on graduation. It is important to note that while Miriam and Ramed might not have received the same quality WIL opportunities as Brad, they could not have known this without comparing themselves with peers. This points to the lack of transparency around institutional WIL practices, and the range in quality and opportunity they afforded different students.

[Insert Table 5 here]

For Brad, the placement in second year meant he was not at risk of not completing hours for graduation, while experiencing opportunities to engage in billed tasks, which points to impact, and seemingly unlimited support from his manager that facilitated his professional learning and development of leadership skills, which points to learning and relatedness. Brad was on the front foot at the outset.

For Ramed, the placement experience, although quite exploitative, enabled him to build confidence in his employability in future positions. His criticism of the institutional arrangements that require completion of hours points to the constraints that reduce options for students from equity groups such as Ramed, forcing them to do un/underpaid placements rather than jeopardise their financial situation or likelihood of graduating.

For Miriam, the benefit of her less than ideal placement was learning the importance of social and professional interactions in the engineering workplace, despite the obstacles she had to navigate as WINTA and CALD. Miriam demonstrated resilience in her approach and reported an increased understanding of the obstacles her chosen profession might include.

Conclusion and implications

The findings reported here draw on the theory of practice architectures to identify the links between institutional WIL placement practices and industry graduate recruitment practices that shape the preconditions enabling and constraining engineering students' access to,

undertaking, and leveraging of quality WIL placement experiences which contribute to the development of their professional identity and employability.

Engineering WIL placements initiate engineering students into disciplinary and professional practices (Kemmis, Wilkinson, et al. 2014, 37). Students who successfully apply for, undertake and leverage WIL placements for their future careers become initiated into professional and engineering practices by learning the dispositions appropriate to the practices into which they are being initiated – forms of understanding (sayings: cognitive knowledge), modes of action (doings: skills and capabilities), and ways of relating to one another and the world (relatings: norms and values).

The outcomes of WIL engineering placements for students include dispositions developed (knowledge, skills, values), practices learned (how to do things), and ways to inhabit the intersubjective space of the practice (becoming an engineering professional). Through WIL placements, students learn how to live as engineering professionals by initiation into forms of knowledge that foster individual and collective self-expression, modes of action that foster individual and collective self-development, and ways of relating that foster individual and collective self-determination. Our analysis has shown, however, that Miriam, Ramed and Brad's experiences in applying for, undertaking and leveraging WIL placements for their future careers were in turn shaped by a set of enabling-constraining conditions constructed through a practice architecture entangling students' social and professional network practices, university WIL engineering placement practices and industry student and graduate recruitment practices.

If a student is a member of an equity group, then the landscape shifts. The institutional cultural-discursive arrangements make securing engineering WIL placements a formal, inflexible, time-specific, value-laden and competitive process. Equity students have to navigate time consuming application processes, while other students who know who to speak to, what to say and how to say it often sidestep this process in securing placements through social contacts. The material-economic arrangements based on traditional industry 12-week vacation work reduces options to experience quality placements for students who work paid jobs that coincide with the placement timing, which may be further complicated by organising costly care for dependents, or relocation with additional travel and accommodation costs. These arrangements may also provide equity students less discretion to undertake quality unpaid placements that could enhance their professional development.

We have argued that the completion of a specified number of hours in WIL engineering placements as a graduation requirement constitute an inequitable ecology of professional learning at work practices that make it easier for some students to access, experience and leverage for their future careers and not others. This insight provides the impetus for a reconfiguration of WIL placement practices that may needed to disrupt the collective reproduction of social exclusion. Such a transformation requires new languages and discourses; new material and economic arrangements supporting different ways of doing things; and new social and political arrangements supporting new kinds of relationships within the practice architecture of Australian university WIL engineering placements (Kemmis, Wilkinson, et al. 2014, 3).

This study addressed the paucity of empirical research that investigates possibilities for transforming WIL placement practices that shift the focus of reform discourses from a deficit

model of students from equity groups to a broader focus on university WIL practices and industry graduate recruitment practices. While the scale of the study inhibits generalisation, the findings are transferable to other disciplinary and educational institutional contexts that offer WIL placement experiences that enhance the development of student professional identity and employability.

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References

Authors. 2019a.

Authors. 2019b.

Authors. 2019c.

Australian Government Tertiary Education Quality and Standards Agency (TESQA). 2017. Guidance Note: Work Integrated Learning. edited by Australian Government Tertiary Education Quality and Standards Agency (TESQA). Canberra: Australian Government.

Baker, Sally, Clemence Due, and Megan Rose. 2019. "Transitions from education to employment for culturally and linguistically diverse migrants and refugees in settlement contexts: what do we know?" *Studies in Continuing Education*:1–15. doi: 10.1080/0158037X.2019.1683533.

Billett, Stephen. 2009. "Realising the Educational Worth of Integrating Work Experiences in Higher Education." *Studies in Higher Education* 34 (7):827–843. doi: 10.1080/03075070802706561.

Björck, Ville. 2018. "The idea of academia and the real world and its ironic role in the discourse on Work-integrated Learning." *Studies in Continuing Education*:1-16. doi: 10.1080/0158037X.2018.1520210.

Boud, David, and Nicky Solomon, eds. 2001. *Work-based Learning: A New Higher Education?* Buckingham: Open University Press.

Bradley, Allan. 2008. Accreditation Criteria Guidelines Document Accreditation Management Systems Education Programs at the Level of Professional Engineer. Institution of Engineers Australia.

Cameron, Craig. 2019. "Risk management by university lawyers in work integrated learning programs." *Monash University Law Review* 45 (1):29–69.

Creswell, John W, and Vicki I Plano-Clark. 2014. *Designing and Conducting Mixed Methods Research*. 2nd ed. London, Thousand Oaks: Sage Publications, Inc.

de Peuter, Greig de, Nicole S Cohen, and Enda Brophy. 2015. "Interrogating Internships: Unpaid Work, Creative Industries, and Higher Education. Introduction." *tripleC* 13 (2).

Department of Education, Skills and Training. 2017. 2016 Appendix 2 – Equity groups. Australian Government.

Drewery, David, Colleen Nevison, T Judene Pretti, Lauren Cormier, Sage Barclay, and Antoine Pennaforte. 2016. "Examining the Influence of Selected Factors on Perceived Co-op Work-term Quality from a Student Perspective." *Asia-Pacific Journal of Cooperative Education* 17 (3):265–277.

Engineers Australia. 2019. Accreditation Management System: Accreditation Standard – Higher Education. Engineers Australia.

Francisco, Susanne. 2019. "Developing a trellis of practices that support learning in the workplace." *Studies in Continuing Education*:1–16. doi: 10.1080/0158037X.2018.1562439.

Goldsmith, Rosalie, and Franziska Trede. 2019. "Mentoring students or supervising workers? Engineering supervisors' perceptions of student interns' learning and work." 4th International ProPEL Conference, University of Technology Sydney, 9–11 December 2019.

Goldsmith, Rosalie, Keith Willey, and David Boud. 2019. "Investigating invisible writing practices in the engineering curriculum using practice architectures." *European Journal of Engineering Education* 44 (1–2):71–84. doi: 10.1080/03043797.2017.1405241.

Grant-Smith, Deanna, Jenna Gillett-Swan, and Renee Chapman. 2017. WiL Wellbeing. Exploring the Impacts of Unpaid Practicum on Student Wellbeing. Perth, WA, Australia: Curtin University.

Hamilton, Kyra, Shirley A. Morrissey, Lara J. Farrell, Michelle C. Ellu, Analise O'Donovan, Tanja Weinbrecht, and Erin L. O'Connor. 2018. "Increasing Psychological Literacy and Work Readiness of Australian Psychology Undergraduates through a Capstone and Work-Integrated Learning Experience: Current Issues and What Needs to be Done." *Australian Psychologist* 53 (2):151–160. doi: 10.1111/ap.12309.

Hewitt, Anne, Rosemary Owens, and Andrew Stewart. 2018. "Mind the gap: Is the regulation of work-integrated learning in higher education working?" *Monash University Law Review* 44 (1):234–266.

Jackson, Denise. 2017. "Developing Pre-professional Identity in Undergraduates Through Work-integrated Learning." *Higher Education* 74:833–853. doi: 10.1007/s10734-016-0080-2.

Jackson, Denise. 2020. "Applying academic selection criterion to work-integrated learning programmes: risk management or perpetuating inequality?" *Teaching in Higher Education* 25 (1):98–115. doi: 10.1080/13562517.2018.1541884.

Jackson, Denise, and David Collings. 2018. "The Influence of Work-Integrated Learning and Paid Work During Studies on Graduate Employment and Underemployment." *Higher Education* 76:403–425. doi: https://doi.org/10.1007/s10734-017-0216-z.

Kaspura, Andre. 2017. The Engineering Profession. A Statistical Overview, Thirteenth Edition. Barton, ACT, Australia: Institution of Engineers Australia.

Kemmis, Stephen, Hannu LT Heikkinen, Goran Fransson, Jessica Aspfors, and Christine Edwards-Groves. 2014. "Mentoring of new teachers as a contested practice: Supervision, support and collaborative self-development." *Teaching and Teacher Education* 43:154–164. doi: http://dx.doi.org/10.1016/j.tate.2014.07.001.

Kemmis, Stephen, Jane Wilkinson, Christine Edwards-Groves, Ian Hardy, Peter Grootenboer, and Laurette Bristol. 2014. *Changing practices, changing education*. Edited by Stephen Kemmis, Jane Wilkinson, Christine Edwards-Groves, Ian Hardy, Peter Grootenboer and Laurette Bristol. Singapore: Springer Science+Business Media.

Kinash, Shelley, and Linda Crane. 2015. "Enhancing graduate employability of the 21st century learner." International Mobile Learning Festival 2015: Mobile Learning , MOOCs and 21st Century Learning, Hong Kong, May 22–23, 2015.

Kinash, Shelley, Linda Crane, M-M. Judd, K. Mitchell, M. McLean, C. Knight, D. Dowling, and M. Schulz. 2015. Supporting Graduate Employability from Generalist Disciplines Through Employer and Private Institution Collaboration. Final Report Prepared for the Australian Government, Office for Learning and Teaching. Bond University.

Male, Sally A, and Robin King. 2014. Best Practice Guidelines for Effective Industry Engagement in Australian Engineering Degrees. Australian Council of Engineering Deans Inc.

Reddan, Gregory. 2016. "The Role of Work-integrated Learning in Developing Students' Perceived Work Self-efficacy." *Asia-Pacific Journal of Cooperative Education* 17 (4):423–436.

Reddan, Gregory. 2017. "Enhancing Employability of Exercise Science Students." *Asia-Pacific Journal of Cooperative Education* 18 (1):25–41.

Reddan, Gregory, and Maja Rauchle. 2017. "Combining Quality Work-Integrated Learning and Career Development Learning Through the Use of the SOAR Model to Enhance Employability." *Asia-Pacific Journal of Cooperative Education, Special Issue: Advancing the WIL curriculum to enhance graduate employability* 18 (2):129–139.

Robinson, Belinda. 2018. Data Snapshot 2018. Universities Australia.

Shade, Leslie Regan, and Jenna Jacobson. 2015. "Hungry for the Job: Gender, Unpaid Internships, and the Creative Industries." *The Sociological Review* 63 (1_suppl):188–205. doi: 10.1111/1467-954x.12249.

Siebert, Sabina, and Fiona Wilson. 2013. "All Work and No Pay: Consequences of Unpaid Work in the Creative Industries." *Work, Employment and Society* 27 (4):711–721. doi: 10.1177/0950017012474708.

Small, Lynlea, Kate Shacklock, and Teresa Marchant. 2018. "Employability: A Contemporary Review for Higher Education Stakeholders." *Journal of Vocational Education & Training* 70 (1):148–166. doi: 10.1080/13636820.2017.1394355.

Smith, Calvin. 2012. "Evaluating the Quality of Work-integrated Learning Curricula: A Comprehensive Framework." *Higher Education Research & Development* 31 (2):247–262. doi: 10.1080/07294360.2011.558072.

Smith, Calvin, Sonia Ferns, Leoni Russell, and Patricia Cretchley. 2014. The Impact of Work Integrated Learning on Student Work-Readiness. Final Report 2014. Sydney, NSW, Australia.: Charles Sturt University, CQUniversity Australia, Curtin University, Deakin University, Macquarie University, Queensland University of Technology, Swinburne University of Technology, The University of Newcastle, University of Canberra, University of Western Sydney.

Unversities Australia. 2017. "Key Facts and Data." [Web page]. Universities Australia, Last Modified 27 March 2017, accessed 18 September.

Wilton, Nick. 2012. "The impact of work placements on skills development and career outcomes for business and management graduates." *Studies in Higher Education* 37 (5):603–620. doi: 10.1080/03075079.2010.532548.

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