Preparing doctoral candidates for employment: Delivering research and employability skills training in the PhD via work-integrated learning

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Despite significant recent changes to the doctoral training environment, particularly provision of employability skills during candidature, there is a paucity of research investigating best practice in this area. This paper describes a case study in how various pedagogical theories, curriculum co-creation, lifelong learner, adult learning, cognitive load, spiral learning, reflective practice, and community of practice theories, were applied at an Australian university to develop and implement a Graduate Certificate aimed at increasing work readiness by delivering research and employability skills training to PhD candidates. Outlined are the rationale, student interest and theoretical basis underpinning this program, and its integrated suite of work-integrated learning (WIL) activities. Comparison against an emerging framework for high quality WIL demonstrated key alignments between the program and the quality WIL framework. These alignments highlight important considerations for comprehensive training of PhD candidates, together with recommendations for future research into WIL and employability training for PhD candidates.

Keywords: PhD training; curriculum co-creation; innovation; professional identity; employability skills

For over a decade, traditional views of doctoral training, centered on preparing PhD candidates for secure academic positions, have been changing. Access to tenured academic positions has been dwindling due to factors including the rise of insecure, short-term positions, and the increasing number of PhD graduates worldwide. Related to this, the number of candidates interested in pursuing non-academic careers has also been increasing. Fewer than half of Australian PhD candidates plan to pursue academic research careers (McGagh et al., 2016), a figure that has trended downwards (Edwards et al., 2011; McCarthy & Wienk, 2019). In fact, international studies confirm that the employment opportunities for PhD graduates are in a state of flux (Germain-Alamartine et al., 2020). At the same time, businesses in Australia and elsewhere often view PhD graduates as lacking in key skills required to transition from academic research to other employment sectors (Department of Innovation, Industry, Science and Research, 2011), yet a recent analysis found that PhD-level skills are in high demand (Mewburn, 2019; Mewburn et al., 2017; Mewburn et al., 2018). Moreover, Australia underperforms in industry–university collaborations (DESE, 2021b), despite the higher degree research training system being identified as critical to Australia's future economic strength.

Universities play a pivotal role in pursuing fundamental (blue-skies) research, where clear applications of research outcomes are not always immediately apparent. Related to this, research candidates are trained to become stewards of their discipline, learning how to conserve disciplinary knowledge, generate new knowledge, and transform knowledge across academic boundaries (Walker, 2006). While these important university functions will continue, the tertiary environment is evolving, with an increased emphasis on providing employability skills training relevant to academic and non-academic workplaces. The inability to efficiently and effectively transition PhD graduates into non-academic

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careers in other countries has resulted in highly skilled postdoctoral workers not achieving the full economic benefits associated with the community's, and their personal, educational investment (Cyranoski et al., 2011; "Fix the PhD," 2011; Kobayashi, 1999). Thus, there are strong individual, social and economic imperatives demanding improved training of PhD candidates in areas outside their core research discipline, to maximize the benefits of their research education.

Approaches to Employability Skills Training for Australian Doctoral Candidates

Research training institutions and broader professional bodies, such as the Australian Council of Learned Academies (ACOLA), have recognized the need to include broader skills training within research training degrees, to maximize successful candidate transition into post-academic employment. This includes incorporation of employability training activities within the PhD candidature. For example, the now defunct Commercialisation Training Scheme (ended 2011) enabled Australian universities to deliver research commercialization training to PhD candidates via graduate certificates. While student surveys indicated "98% of students were satisfied or very satisfied with the training", concerns included "a lack of exposure to practical skills; difficulties balancing CTS training in conjunction with their research studies; and that some courses were not targeted to the needs of research students" (DESE, 2010; Howard, 2015, p. 13). Currently, the Australian Government supports inclusion of WIL activities within PhD candidatures in a number of ways: through support of the Australian Postgraduate Research Intern (APR.Intern) program; via changes to the Research Training Program to promote inclusion of a 60-day internship (DESE, 2021a); and through the National Priorities and Industry Linkage Fund that, amongst other goals, aims to "increase the number of internships, practicums, and other innovative approaches to work-integrated learning" (DESE, 2020, para. 2) including to PhD candidates (e.g., through HEIMS Code E593).

Coinciding with these sector changes, Australian universities have taken varied approaches to employability training for PhD candidates, with training typically free-of-charge and administered through a Graduate Research Unit, School or equivalent. For example, Monash University offers PhD candidates a choice of completing either: formal coursework subjects in research methods or content; industry partnerships; or 120 hours of professional development activities; The University of Queensland offers a Career Development Framework consisting of workshops and other activities related to research skills, transferable skills and professional skills; The University of Wollongong offers a 4-year 'integrated' PhD program consisting of an initial year of research skills and coursework subjects (that complement the candidate's thesis area) followed by three years of PhD research; Flinders University provides compulsory research and employability skills training based on the Vitae Researcher Development Framework; and The University of Tasmania offers a 4-subject Graduate Certificate in Research program for Higher Degree Research (HDR) candidates, with the aim of equipping candidates "with generic and transferable skills and an understanding of social and ethical responsibility" (University of Tasmania, 2022, Course objectives section, para. 1).

Paucity of Research into Best Practice for Employability Skills Training for Doctoral Candidates

These varied approaches indicate there is no single, accepted approach to embedding employability skills training within Australian doctoral programs. Varied approaches offer the opportunity to tailor programs to the needs of specific candidate cohorts and environments, as well as the opportunity to explore and learn from approaches for different educational contexts. Nonetheless, there is relatively little published research investigating best practice for provision of employability skills and WIL activities for PhD candidates (Valencia-Forrester, 2019). For example, a recent report into WIL in

Australia did not include assessment of WIL opportunities for higher degree by research candidates (including PhD candidates) as they were considered "beyond the scope of the survey" (Universities Australia, 2019, p. 6). This is despite WIL activities being recognized as providing undergraduate students a competitive edge in the labor market; a key desired endpoint for PhD graduates as described above.

Given this sector context, this paper presents student survey data related to research and employability skills training during doctoral studies at an Australian university, Western Sydney University (WSU), as well as a case study describing the role of pedagogy in developing a doctoral-level program to deliver this training during the PhD candidature. Here, research skills are defined to include research and discipline-specific knowledge required to complete the PhD (typically provided through the PhD candidature), as well as ancillary skills that increase research efficiency (e.g., skills for literature assessment, academic writing, project management, academic research communication). Employability skills training is defined as training that harnesses "one's skills, knowledge and other attributes in order to add value across a range of different contexts across the life course, including employment and career, as well as community and civic engagement" (Bridgstock & Tippett, 2019, p. 11). This term encompasses concepts described by other terms such as 'professional skills' 'transferrable skills' 'vocational skills' and 'core skills' (DESE, 2019). Thus, employability skills training as defined here includes provision of skills related to development of professional identity, critical thinking, cross-sector communication, teamwork, and innovation.

The paper begins with an analysis of undergraduate and postgraduate student perspectives on the preferred approach to providing research and employability skills training to doctoral candidates. This analysis, that includes descriptions of the survey methodology and positionality of the researchers, leads to an examination of how key pedagogies (curriculum co-creation, lifelong learner, adult learning, cognitive load, spiral learning, community of practice, reflective practice) underpinned development of an evidence-based, candidate-centered, appropriately-staged and holistic approach to both research and employability skills training during doctoral studies. Particular consideration is given to the stage-specific progression of WIL activities in the program, in relation to an emerging framework for provision of high-quality WIL, that leads to identification of areas for future research into doctoral-level employability skills training.

METHODS

Survey Design Data Collection and Analysis

The undergraduate and postgraduate student surveys were performed with approval from the WSU Human Research Ethics Committee (H10003). The survey approach employed a total population sampling or census approach (Daniel, 2012). Survey questions related to offering employability training topics in the areas of bookkeeping, accounting, economics; project or business management; management/mentoring; negotiating/networking; human resources; education/curriculum methods; commercial, company or patent law; public health/epidemiology; safety/risk management; marketing, media or communications.

Case Study Analysis

Analysis of case studies can provide useful insights through in-depth analysis of a bounded system, where the case study is: 1) particularistic; 2) descriptive; and 3) heuristic or experiential. For the present case study, Merriam's process was broadly used (Merriam & Tisdell, 2016). Firstly, a literature review

of Australian and international PhD training programs led to the hypothesis that determining student perspectives on employability training would provide useful insights for development of a bespoke employability training program for WSU PhD candidates. This hypothesis was tested using surveys of WSU students. Subsequent development of the case study was guided by various pedagogies (including curriculum co-creation, lifelong learner, adult learning, cognitive load, spiral learning, community of practice, reflective practice) to design and implement a progressive, stage-specific sequence of authentic WIL activities related to the doctoral context that delivers both research skills training and employability skills training to PhD candidates.

Researcher Positioning

Prior to outlining the survey data and case study, the researchers and investment in the topic are briefly described.

The lead author has developed and delivered non-credentialed and credentialed doctoral-level training programs in a variety of disciplines, and involving WIL, for 15 years. He played a foundational role in proposing, gathering evidence for, and gaining initial approvals for the case study, the Graduate Certificate in Researcher Development, Engagement and Impact (GCREDI). He further contributed to evolution of the GCREDI in collaboration with other key contributors, in particular, former Deans of the WSU Graduate Research School: Professor James Arvanitakis (who drove development and formal approval of the GCREDI); as well as Professor Caroline Smith and Professor Adam Possamai (who facilitated evolution of GCREDI WIL components). He is the current coordinator for four GCREDI subjects.

This perspective was complemented with the positionality of the co-author who is trained as a mixed-methods researcher and sociologist and has experience in the study of experiential learning and WIL. Joining the GCREDI program as Course Coordinator in 2020, she developed four new subjects within the program, including content expansion and integration of WIL activities into two existing subjects. She contributed to the evolution of the GCREDI in collaboration with the lead author, and former WSU Graduate Research School Deans. She is the current Course Coordinator of the GCREDI, and coordinator for four GCREDI subjects.

The third author co-developed the GCREDI in consultation with a number of researchers (including the lead author), industry representatives (private, public and non-for-profit), as well as PhD graduates and candidates. He has since left academia and is working for an international research exchange program that includes PhD candidates.

The familiarity of the three researchers with the program and its partners provide them with unique insights into this research topic. However, this positioning as insiders to the program may also limit their ability to provide perspectives unencumbered from institutional knowledge of the program.

WSU STUDENT PERSPECTIVES ON POSTGRADUATE EMPLOYABILITY TRAINING

Undergraduate Student Survey Data

To better understand how WSU students viewed the relevance of employability training for PhD candidates, a survey was performed to gain perspectives from both undergraduate and postgraduate students. The survey of undergraduate students revealed responses from the majority of WSU Schools (Figure 1A). The proportion of female to male undergraduate students who completed the survey (65%

to 35%, respectively) was similar to the ratio of WSU students obtained through previously published student satisfaction survey (SSS) data (62% to 38%, that was "representative of the university's profile") (Grebennikov & Skaines, 2009, p. 73). It was also similar to the ratio (71.8% to 28.2%, respectively) reported for a survey of Australian undergraduate WIL students (Jackson, 2013). Additionally, the distribution of students across years of study here (8% 1st year, 17% 2nd year, 75% 3rd year or higher) was also closely similar to that previously reported (Jackson, 2013), and indicated the majority of survey responses were obtained from students approaching graduation and future employment or study.

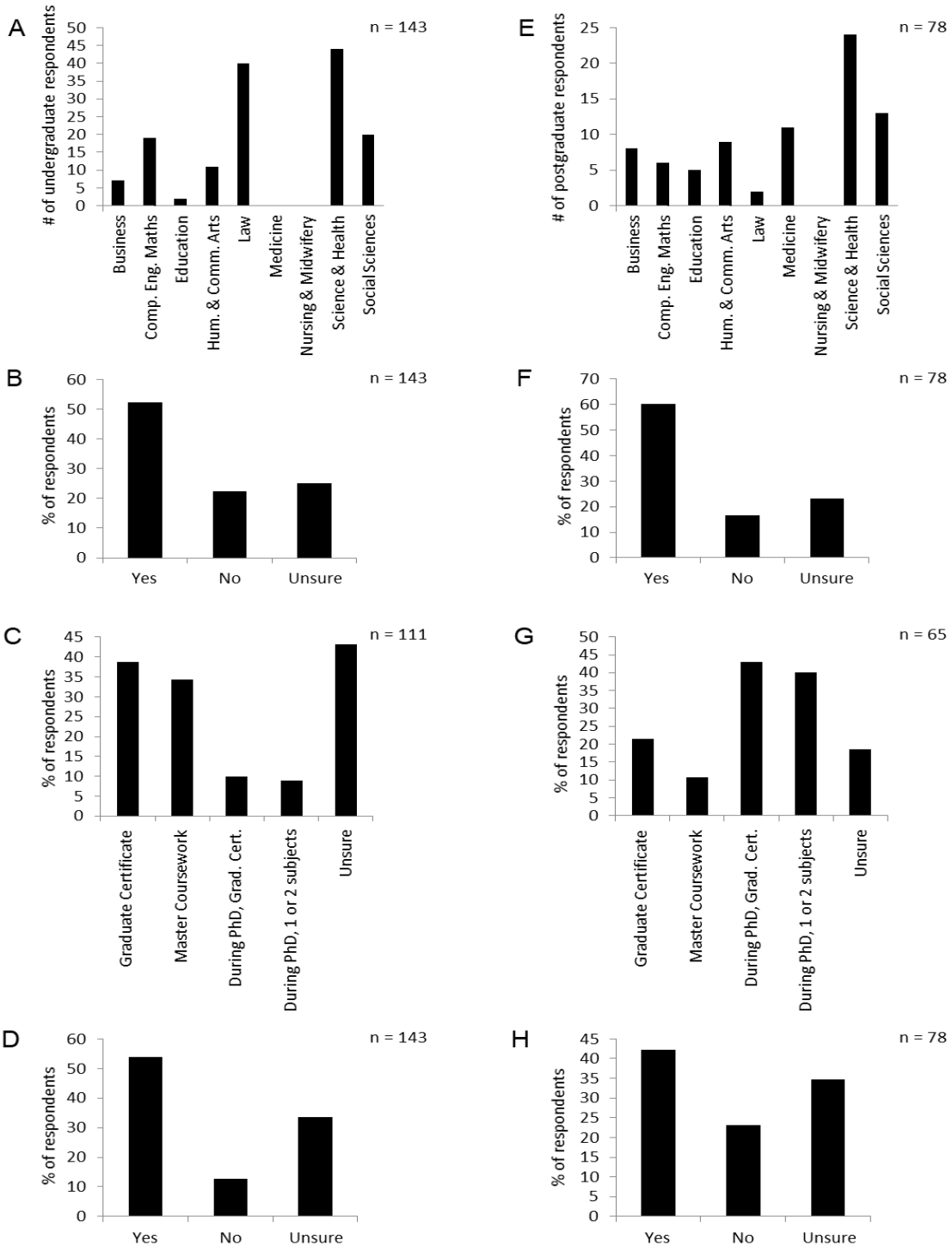
The Schools for which no responses were received teach courses with high-levels of inherent employability training as defined here, that is, Medicine and Nursing/Midwifery, suggesting students in these Schools have little immediate interest in undertaking additional employability training. The high representation of responses from students within the School of Law, and the School of Science and Health, may reflect a heightened awareness of the need for key employability skills for graduates in these sectors, as recognized by the need for employability skills for law graduates (University of Wollongong, 2022), and anxiety within the sector about a lack of job opportunities for law graduates (Bentley & Squelch, 2014; Law Society of New South Wales, 2014; Tadros, 2015). The undergraduate survey responses showed the majority of students (53%) would consider enrolling in postgraduate subjects related to employability skills, with another 25% unsure; less than a quarter of the undergraduate students indicating they would not (22%; Figure 1B). The most preferred delivery method for employability skills training was via a Graduate Certificate (Figure 1C). More than half (54%) of the undergraduate students thought future PhD candidates might choose between universities based on whether employability skills were offered to PhD candidates (Figure 1D), surprisingly consistent with the proportion of PhD candidates looking for non-academic employment. Only 13% of the undergraduate respondents thought access to employability skills training would not be a factor in university choices by future PhD candidates.

Postgraduate Student Survey Data

Analysis of the postgraduate student survey data showed responses were received from all WSU Schools except the School of Nursing and Midwifery (Figure 1E). Similar to the undergraduate survey, this is perhaps unsurprising as this School has inherent relevance to employment settings even within the PhD program. Student demographics showed the ratio of female to male respondents was 54% to 46%, similar to the gender distribution obtained via previously published surveys of WSU postgraduate students (i.e., 57% to 43%) (Grebennikov & Skaines, 2009). Most respondents were PhD candidates (90%, compared to 8% Master and 2% other), and approximately 21% of the respondents were in their 1st year of candidature, 24% in their 2nd year, and 55% in their 3rd year or later. Together, these demographics suggest the postgraduate survey data was representative of WSU PhD candidates, particularly those approaching graduation and future employment.

The postgraduate survey responses showed 60% of postgraduate students would consider enrolling in postgraduate subjects related to employability skills, with only 17% indicating they would not (Figure 1F). The most preferred delivery method for employability skills training was via a Graduate Certificate during the PhD (Figure 1G). Only 23% of WSU postgraduate students thought future PhD candidates might not choose between universities based on whether employability skills were offered to PhD candidates (Figure 1H). In contrast, 42% thought future PhD candidates would base their university choice on whether employability skills are provided, while 35% were unsure.

FIGURE 1: Undergraduate (A-D) and postgraduate (E-H) survey responses



Note. (A, E) Distribution of respondents across Schools. (B, F) Responses to the survey question: Would you CONSIDER studying any of the above subjects as a POSTGRADUATE student to increase your competitiveness for employment or promotion? (C, G) Responses to the survey question: What would be your preferred method for enrolling in any of the above subjects as a POSTGRADUATE student? (D, H) Responses to the survey question: Do you think future PhD students might choose between universities based on whether or not the university offers training in any of the above subjects during PhD candidature?

Survey Data Caveats

It is worth noting the total population sampling approach used here has the potential to introduce biases if responses are received from only a subset of the overall population. Receipt of undergraduate responses from almost all WSU Schools suggests a wide variety of students completed the survey. As mentioned above, the relatively large number of responses received from students in the School of Law, and the School of Science and Health, likely reflects changing employment dynamics in these sectors, findings that are worthy of future investigation at WSU. Nevertheless, similarities in responses between the Schools, between undergraduate and postgraduate students, and with previous surveys of WSU students (Grebennikov & Skaines, 2009), suggests the data broadly reflects the views of students across WSU. As 75% of the undergraduate survey responses, and 55% of the postgraduate student responses, were from students in the 3rd or higher year of their degrees i.e., students closest to entering the workforce, this suggests the results represent the preferences of students with the greatest interest in employability training programs.

CASE STUDY: THE WESTERN SYDNEY UNIVERSITY GCREDI

As shown in Figure 1, the surveys indicated WSU students were most interested in having PhD candidates receive employability training via a Graduate Certificate during the PhD candidature. Accordingly, the Graduate Certificate in Researcher Development, Engagement and Impact (GCREDI) case study was developed with two key aims in mind: 1) to provide formal training in research skills early during the GCREDI and PhD candidature (specifically targeted to the PhD candidate's stage and abilities), in order to aid candidate progression through key PhD candidature milestones; and 2) to increase provision of employability skills later during the GCREDI and PhD candidature to facilitate development of a professional identity, employability skills and an understanding of innovation needs and processes relevant to each candidate's desired career path. Embedded into these two scaffolds is a progression of WIL activities that contextualize the research and employability skills training in relevant, real-world work experiences, to aid learning and to increase employment prospects (Table 1).

The GCREDI, administered by the WSU Graduate Research School, is a 3-year, part-time, voluntary course. Candidates undertake four core subjects, one elective subject from a choice of three electives on offer (related to policy, entrepreneurship/innovation, or academia), and a final capstone core subject, from a total of eight available subjects (Figure 2). Typically, candidates enroll in one subject per semester, but this can be varied depending on candidate need. To align with sector norms, the GCREDI was structured as free-of-charge for domestic PhD candidates, and international PhD candidates on a scholarship. The voluntary nature of the GCREDI enables candidates to opt out of the program, for example, should they have sufficient prior employment experience in their chosen career field at the time of commencing their PhD candidature at WSU. Development of the GCREDI aligned with recommendations from the 2016 ACOLA Report (McGagh et al., 2016). For example, Key Finding 4 that states:

> Broader transferable skills development is a necessary aspect of HDR training. Although many universities have made significant investments in this area, transferable skills development is not as strongly embedded in our research training system as it is in some other comparable research training systems around the world. Skills development must be flexible and candidate-directed and take into account the diverse backgrounds and experience of candidates. (p. xiii)

TABLE 1: WIL activities within the GCREDI subjects.

Subject	WIL activity/assessment related to Research/Employability skills
1 Researcher Knowledge & Development	RS: Creation of an Early Candidature Plan ES: Creating an online professional identity
2 Career and Personal Development	RS: Confirmation of Candidature RS: Researcher Development Framework ES: Career options and planning
3 Knowledge Translation	RS: Academic research communication/presentation RS/ES: Annual Progress Report ES: Stakeholder communication plan
4 Researcher Engagement & Impact	RS/ES: Collaboration in/outside academia RS/ES: Annual Progress Report ES: Non-academic research messaging
5A So, You Want to Be an Academic	ES: Training/development/recognition for Higher Ed Teaching ES: Development of a teaching philosophy ES: Training/development/recognition for Higher Ed Research
5B Applied Innovation & Entrepreneurship	ES: Developing a company proposal and business plan
5C Research and Public Policy	ES: Real-world public policy proposal/article/mainstream article
6 Grant Proposals and Applications	ES: Fellowship application proposal ES: Externally partnered Innovation Team Challenge project

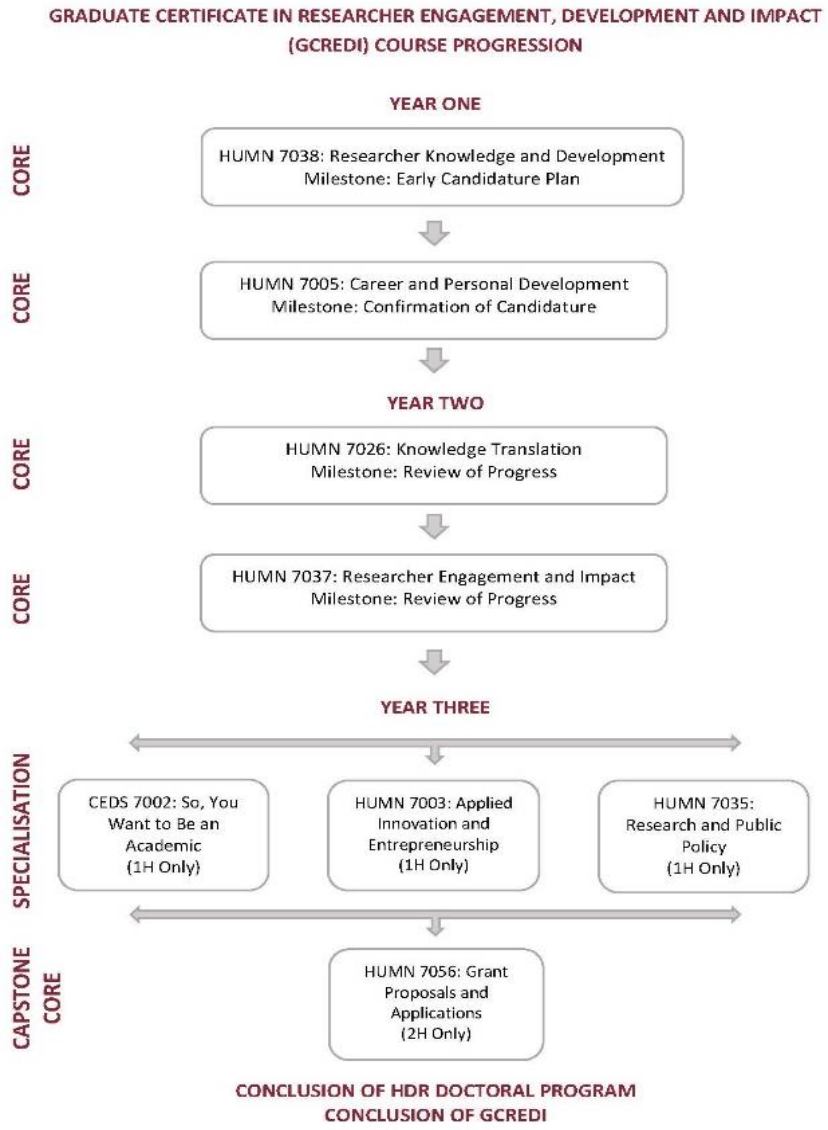
Note. RS = research skill; ES = employability skill.

A Case Study Using Co-Creation to Provide Doctoral-Level Research and Employability Skills Training

To maximize the relevance of the case study to doctoral candidates, concepts of curriculum co-creation were embedded from the outset. Curriculum co-creation (Dollinger et al., 2018) is underpinned by an emphasis on both value co-produced between an organization and users (here, WSU and students, respectively), and consideration of how the co-produced curriculum is used (experience, personalization, and relationship). The above survey-based approach was used for initial curriculum co-creation, with census sampling chosen to avoid the potential for biases that might arise from more targeted sampling methods (Bovill, 2020). The student survey data was used to personalize the program to future PhD candidates by incorporating student preferences into the choice of formal, credentialed delivery mode (i.e., Graduate Certificate concurrent with PhD candidature) used to deliver research skills training and employability skills training to PhD candidates.

Subsequent development of the GCREDI program content, integrated WIL activities, and assessments occurred around two key scaffolds aligned with the PhD candidate learning journey: 1) a scaffold of critical PhD candidature milestones to guide progressive delivery of training in research skills (including literature reviewing, ethics, project management) in a manner that supports on-time thesis completion; and 2) a scaffold of employability skills that provides progressive delivery of WIL activities (matched to both the stage and career interests of the doctoral candidates) to facilitate development of a professional identity, employability skills and an understanding of innovation needs and processes. To explore the WIL elements within the case study, the pedagogy and structure of the program are further examined below.

FIGURE 2: GCREDI program and subject structure.



Lifelong Learner and Adult Learning Theories for Staged Delivery of Research and Employability Skills

Development and implementation of the GCREDI course content was underpinned by a variety of pedagogies, including the 'lifelong learner' pedagogy. This pedagogy aims to support the knowledge and innovation economy in a learning society (OECD, 2000; UNESCO, n.d.) a key desired outcome within the current Australian doctoral training environment. In the lifelong learner paradigm, learning opportunities position students for success during their studies, while also maximizing their ability to quickly contribute a knowledge-sharing/innovation mindset to an employment setting (Osborne et al., 2007). Exploration of the lifelong learner pedagogy as applies to international doctoral candidates studying in New Zealand argued for developing capacities and a mindset for lifelong learning through "disciplinary enculturation, skills development, familiarity with academic conventions, and effective

mentoring and healthy supervisor-supervisee relationships." (Li, 2016, p. 740). Thus, lifelong learner pedagogy was used to scaffold staged delivery of the research skills training such that delivery of this training was weighted to earlier in the GCREDI program (and PhD candidature) where it is most needed by newly enrolled doctoral candidates (Table 1), thereby promoting research-related disciplinary enculturation and familiarity with academic conventions. Similarly, lifelong learner pedagogy was used to conversely scaffold delivery of employability skills training, such that this training was weighted to later in the GCREDI course (and PhD candidature), where it is most needed by doctoral candidates who are preparing for thesis writing, thesis submission, and subsequent employment (Table 1), thereby promoting employment-related disciplinary enculturation and familiarity with non-academic conventions. In this way, both the research skills training and employability skills training were scaffolded against critical PhD candidature milestones (early candidature/learning plan, confirmation of candidature, annual progress reports, and thesis development). As described below, lifelong learner pedagogy was also used to design the elective subjects to foster candidate-guided career specialization, and for development of workshops to facilitate both mentoring and peer communities in each GCREDI subject.

Elements of adult learning theory were also used to guide development of the GCREDI course. Adult learning theory pays attention to aspects such as the learning context for the individual learner (e.g., how the learner processes information, how learning enables empowerment and independence), self-directed learning, and transformational experiences (Merriam, 2008). Staged, complementary delivery of the research skills training, employability skills training and related WIL activities across the GCREDI enables the individual learners to receive this content in the correct context (early in candidature for research skills, later in candidature for employability skills). Self-direction was embedded via asynchronous subject content delivery, enabling candidate-led choice of WIL content and/or activities, choice of focus for written assessment topics, and choice of elective subject. Transformational experiences were embedded through inclusion of reflective activity (e.g., focusing on ethics and methodology), professional mentorship (including through assessment feedback, and development and implementation of a mentorship program for each candidate), and WIL activities not provided in other doctoral training programs, such as the Innovation Team Challenge Project in the capstone subject (Table 1).

Cognitive Load Theory and Spiral Learning Theory to Manage Cognitive Load Related to the GCREDI

While provision of employability skills is recognized as necessary to improve doctoral training, doing so creates a risk of cognitive overload in PhD candidates (where mental demands are greater than the candidates' mental abilities) as a result of candidates being asked to simultaneously undertake the rigors of doctoral training and employability training. The staged delivery of research and employability skills training during the GCREDI, and the parti-time delivery of the 6-required GCREDI subjects across the three years of PhD candidature, addresses this at a macro-level, enabling PhD candidates to focus on research development early in their PhD candidature and preparation for employment later in their candidature.

At the micro-level of content development, cognitive load theory and spiral learning theory were applied to minimize the potential for cognitive overload. Cognitive load theory is based on a model of human information processing that consists of three main elements: sensory memory (i.e., sensory information retained briefly after a stimulus has ceased); working memory (i.e., small amounts of information able to be held and used while executing cognitive tasks); and long-term memory (i.e., large amounts of stored memory that can be accessed over extended periods of time) (Atkinson &

Shiffrin, 1968). Cognitive load theory therefore provides a framework for understanding the efforts (or loads) required during a learning exercise. These loads include intrinsic load (the number and interactivity of elements that need to be processed and learnt), extraneous load (the mental effort required to process ancillary elements such as how information is presented, associated instructions, etc.), and germane load (the amount of memory required to integrate new information) (Abeysekera & Dawson, 2015). To do this, the GCREDI subject assessments were scaffolded against the PhD candidature milestones so the intrinsic load within the research skills and employability skills content was delivered at appropriate stages of both courses, to avoid overwhelming candidates with unnecessary information better suited to delivery later in the PhD candidature. Extrinsic load is managed by providing content through flipped classrooms (Abeysekera & Dawson, 2015), synchronous and asynchronous content delivery, and weekly voluntary workshops and informal drop-in discussion sessions, thus enabling feedback, mentorship and a peer community that also help offset the isolation often associated with doctoral studies (Ali & Kohun, 2006). Germane load is managed by staged delivery of WIL activities as part of the program assessments, including WIL activities that develop a candidate's professional identity via an ePortfolio. To further minimize the potential for cognitive overload, spiral learning theory (Harden & Stamper, 1999; Horvath, 1964), where key concepts are presented repeatedly in a curriculum, with deepening complexity or in different applications, was used as an adjunct to cognitive load theory. In this way, new content builds upon prior learning, to provide domain-specific knowledge and employability skills while minimizing the potential for cognitive overload.

An additional approach to managing cognitive load includes providing the content flow to PhD candidates at the start of the GCREDI subjects so candidates are aware of the content progression and thus become primed to be receptive to the content. Short lectures are delivered synchronously approximately every fortnight, with recordings made available for asynchronous access by candidates in their preferred timeframe. Flipped classroom pedagogy is used (Abeysekera & Dawson, 2015), including both pre- and post-lecture tasks to complement the lectures and weekly workshops, so as to stimulate reflective engagement with the content by the PhD candidates. Guest lectures from relevant content experts both within and outside academia are also included within the subjects to ensure currency and wide applicability of the content. Access to supplementary workshops is also provided, together with a workshop map that outlines all research and development activities and workshops offered by WSU to HDR candidates.

The Workshop Map illustrates how particular workshops may be relevant to each subject within the GCREDI and the candidate's PhD progression. Underpinned by the lifelong learner pedagogy, this mapping exercise was developed in order to support the ongoing development of GCREDI candidates beyond the coursework of the program and works hand-in-hand with each candidate's researcher development framework developed as part of the GCREDI subjects. Thus, the mapping provides a structured overview of workshop activities available to GCREDI candidates, with recommendations on when specific activities are relevant to their GCREDI and doctoral learning journeys. This workshop mapping makes the wealth of available workshops more accessible and less overwhelming to candidates and supports the ongoing learning and skill development of researchers at all stages of their careers and in all employment settings.

Engaging with Research and Employability Skills via Sequential Stage-Specific Authentic WIL Activities

As discussed above, delivery of research skills and employability skills training within the GCREDI occurs in an inverse, stage-specific manner (Table 1). Specific content was developed using Bloom's

taxonomy (Anderson & Krathwohl, 2001; Bloom, 1956; Gogus, 2012) to ensure the learning objectives within the GCREDI subjects, provided through the subject Learning Guides, were clearly articulated, and matched to the appropriate stage and capabilities of the PhD candidature learning journey.

Research skills delivered in the early GCREDI subjects coincide with the early stages of PhD candidature, when candidates typically need greater assistance to understand the research skills necessary for candidature progression. In year one, the core subjects provide training in research skills such as literature reviewing, introduction to writing resources, research methods, and ethics (semester one), followed by candidature planning and skills for building researcher networks (semester one). This initial research skills training helps PhD candidates understand the need for, and provides the tools to, develop their researcher identity. The formal GCREDI subject assessments for this content are scaffolded to critical PhD milestones through authentic WIL experiences related to academic research. For example, creation of the Early Candidature Plan (Table 1) develops a formal written research document (required for PhD candidate progression) that begins to develop academic communication, research ethics, and project management skills, while helping to embed new discipline-specific knowledge. These skills are reinforced through the subsequent GCREDI assessment, the creation of the Confirmation of Candidature document and associated presentation. Thus, provision of this research skills training in the first year of the candidate's parallel GCREDI and doctoral journeys helps contextualize and provide skills for the candidates to navigate critical initial PhD milestones. During year one of the GCREDI, the employability skills training is limited to: initial establishment of an online professional identity via LinkedIn or candidate-managed website; and use of the Vitae Researcher Development Framework (Careers Research and Advisory Centre, 2011) as an introduction to communication and project management skills (by mapping out a living researcher development plan for the duration of their candidature and research career beyond).

In year two, the GCREDI subjects provide WIL activities that deliver both research and employability skills, and in some cases dual purpose skills (Table 1). This includes communication theory, as well as planning and delivery skills to relate research discoveries to both academic and non-academic stakeholders. The WIL-related assessments for these skills include: development and submission of an annual progress report describing the candidate's doctoral research progress (thereby aiding identification of candidates experiencing candidature challenges); and development of communication plans for research stakeholders outside academia (thereby progressing development of the candidate's professional identity and ability to communicate the value of their research both within their field and to future employers). These WIL activities create: i) a broader understanding of the social and employment contexts of their research, ii) formal opportunities to reflect on their desired career path; iii) potential employer networks and associated cross-disciplinary communication skills (by analyzing their broader research stakeholders inside and outside academia) and iv) a knowledge platform from which the PhD candidates can choose an elective subject in year three that is most suited to their career interests.

In year three, previously delivered research skills training is reinforced through a WIL activity involving submission of an additional annual progress report (Table 1), which also provides an additional opportunity to identify candidates facing challenges. The year three GCREDI elective and capstone subjects also provide further opportunities for curriculum co-creation through personalization (Dollinger et al., 2018). These personalization opportunities include the ability to choose training in employability skills most closely aligned to the candidate's career preference through the policy, entrepreneurship, or academia elective subjects (Table 2). The content within these specialization subjects provides PhD candidates with foundational career knowledge to help them

contextualize their combined prior knowledge and experiences, including from undergraduate degrees and their earlier PhD/GCREDI learning journeys. This enables the candidates to create a coherent narrative of their education and research choices as they relate to their evolving career journey, including how their knowledge and skills can add value to potential employers.

TABLE 2: GCREDI specialization subject content areas.

Industry	Policy	Academia
Entrepreneurial and research leadership	Analysis of public policy in local, national and global contexts	Planning for research and development as early career researchers
Innovation and entrepreneurship	Recognition and appraisal of sources of existing public policies, their purpose and the processes used in their development	Developing short and longer-term mentoring plans
Case studies in commercial entrepreneurship	Evaluation of how policies can be designed to support basic principles of social justice	Academic CVs
Case studies in social entrepreneurship	Examination of alternative approaches to identification of public policy issues, research methods, implementation and analyses	Philosophies linking teaching and learning in higher education
Intellectual property and the process of research commercialization	Preparation of a draft public policy journal article or general audience article on a topic chosen by the PhD candidate	Identifying and applying for employment opportunities in academia
Identifying market opportunities, and driving forces of enterprise success (finance, cash-flow, resources, logistics and strategy)	Charting careers in public policy and public policy research	Self-management of research projects as early career researchers
Business hub models for Indigenous businesses.	Demonstrating knowledge of Indigenous Australia through cultural competency and professional capacity, with focus on research for public policy and justice; and legal research and public policy	Indigenizing the curriculum in higher education, and decolonizing higher education

The inverse delivery of research and employability skills training also helps to naturally support the concept of stewardship within development of the candidate's professional identity. Front-loading research skills training helps promote acquisition and conservation of key discipline-specific knowledge, and efficient processes to generate and contextualize new knowledge. End-loading of employability skills training, which includes stakeholder management and communication skills, helps promote transformation of knowledge across traditional academic and non-academic boundaries with the potential to aid both 'blue skies' research and applied research.

An additional personalization option is provided through the choice of real-world WIL activities in the capstone subject. For this subject, candidates can choose a set of WIL activities and assessments that

provide employability skills related to academia, namely, development of a real-world fellowship or grant proposal. This WIL activity also supports completion of the candidate's PhD thesis, by providing draft content for the thesis general discussion section. Alternatively, candidates can choose a set of WIL activities and assessments that provide employability skills through the Innovation Team Challenge. In this set of WIL activities, the PhD candidates work in highly diverse teams on a challenge supplied by an external partner that requires the team to apply their individual skillsets to develop, integrate and propose innovative solutions to the challenge. This relevant, real-world WIL activity creates new employer networks, an understanding of the need for innovation outside academia, and a deeper understanding of (and positioning for) post-PhD employment.

Reflective Practice and Feedback

Reflective practice, defined as integrating the theory and practice of learning by reflecting on learning (Thompson & Pascal, 2012) is an additional key element within each GCREDI subject, included to facilitate candidate self-assessment and to reinforce the lifelong learner pedagogy. Three approaches are taken to minimize potential issues relating to low-quality or low accuracy self-assessments. First, reflective writing theory and skills are introduced in the first GCREDI subject, and further developed in the second GCREDI subject. Second, the reflective writing pieces are classified as assessment items within each subject, resulting in detailed feedback on the approach to (rather than the specific content of) the reflective practice. Third, candidates receive training in academic or specialized writing for a non-specialized audience as part of the GCREDI. This is an ongoing process throughout the GCREDI and is further supported by assessment feedback provided to candidates with the aim of supporting their development of this skill. As part of this process, the PhD candidates are also introduced to the United Nations Sustainable Development Goals, to enable their reflective practice to be based within a wider social context than their PhD candidature and individual career goals.

Written, in-depth assessment feedback is another crucial element within the GCREDI subjects, to aid learning and performance. Feedback is provided based on the principles of Hattie and Timperley (2007, p. 104): i.e., effective feedback "needs to be clear, purposeful, meaningful, and compatible with students' prior knowledge and to provide logical connections." Accordingly, feedback is tailored to individual candidates and assessment items. Positive aspects of the candidate's performance are highlighted to enhance confidence in their abilities, as higher self-confidence (and self-efficacy) has been associated with increased academic performance (Honicke & Broadbent, 2016). Where relevant, balanced and respectful critical appraisal is also provided to identify potential areas for improvement. This includes reference to relevant lectures or other GCREDI content, and/or learning strategies, to help guide subsequent candidate learning and improvement. Where appropriate, feedback on the assessment items for the WIL activities in the elective and capstone subjects can include additional assessment feedback obtained from non-academic experts in different sectors (industry, philanthropy, etc.). Provision of feedback via the weekly workshops and informal drop-in discussion sessions enables candidate achievements to be highlighted regularly, further contextualizing formal feedback on candidate assessment items.

Optimizing GCREDI Delivery to Stimulate a Doctoral Peer Community and Provide Pastoral Care

Doctoral studies are known to involve key challenges that affect candidate feelings of isolation versus a sense of belonging and community, with studies finding 64% of students experience a sense of loneliness (Sibai et al., 2019). In turn, these challenges affect candidate stress levels, engagement and attrition. These challenges occur on a backdrop of increasing expectations and institutional pressure

for PhD completion to occur within 4 years of full-time candidature, and preferably by three years (Torka, 2020), that adds additional stress to doctoral candidates (Beasy et al., 2019). Balancing these pressures, particularly candidate isolation, through socialization is critical (Gardner, 2010). As summarized by Jones (2013) "student socialization is the key to a positive experience and is most influential in positive outcomes of the PhD" (p. 99).

To address this issue, there is evidence group supervision or cohort pedagogies can enhance the doctoral journey (Fenge, 2012). For example, some professional doctorates employ a collaborative cohort model (Burnett, 1999) where candidates attend cohort meetings (in-person or remotely) facilitated by an academic supervisor. This model reduces isolation, and candidates who participate "are more likely to submit their thesis, whilst gaining a greater breadth of knowledge" (Fenge, 2012, p. 405). The process of doctoral candidates being able to tell their story shows that "learning extends from the individual to the group through this process" (Fenge, 2012, p. 405). This is reinforced by Ali and Kohun (2007, p. 42) "In doctoral studies, encouraging social contact and providing social support goes a long way in minimizing the effect that social isolation has on students." While doctoral supervisor contributions (such as supervisor quality and candidate/supervisor relationship) are key factors that influence candidate experiences and attrition (Jones, 2013), socialization is a "determining factor in doctoral student success and retention" (Gardner, 2008, p.125). Socialization through peer contact helps: dissolve boundaries and reduce feelings of isolation; provide work culture training (in knowledge, skills, values, attitudes, habits) that prepare for current and future environments (Bragg, 1976); and helps candidates address questions such as "Can I do this?" "Do I want to be a graduate student?" "Do I want to do this work?" and "Do I belong here?" (Golde, 1998, p. 56).

The case study presented here addresses these issues by including in each subject weekly, non-compulsory, combined workshops/informal drop-in discussion sessions (in-person or online). These workshop sessions provide opportunities for PhD candidates from different Schools and research areas to: connect; reflect on content and assessments; reflect on their candidatures and careers; and ask questions related to GCREDI subjects, the course, and their research candidatures. From an administrative perspective, these weekly workshops also provide an additional opportunity to identify potentially at-risk candidates, either through the infrequency of interactions or through the questions asked and/or support being sought. Thus, as well as providing additional opportunities to discuss the GCREDI content, the weekly workshops also provide a peer community often lacking during PhD candidature (that can lead to negative experiences and candidate attrition) (Ali & Kohun, 2006), as well as an opportunity for pastoral care from subject coordinators for PhD candidates in need.

GCREDI Uptake and Candidate Response

The GCREDI was first offered in the second semester 2018. At that time 17% of first year PhD candidates (11 of 64) enrolled in the program. By the time the first GCREDI cohort had reached the anticipated 3-year completion time (semester one, 2021), 33% of eligible PhD candidates were enrolled in the GCREDI, indicating both increased visibility of the program to newly enrolled PhD candidates and increasing recognition by new candidates that the program has value to them. Reasons why many candidates chose not to enroll in the GCREDI, and why a small number withdrew from the first subject, will be examined in a future study. Of the candidates who have completed the GCREDI to date, 65% completed on-time, 23% completed 6-months early, and 12% completed 6-months late. The response to the program from enrolled candidates has been highly positive, with the overall satisfaction rated at 100% in 2020 as per the Student Feedback on Units, Course Level Results 2020 report (internal WSU data released June 2021).

DISCUSSION

The role and format of Australian doctoral training programs has been changing, particularly over the past few years. Employment, economic and social pressures (both domestic and international) are changing the way PhD candidates, universities, State and Federal governments, and industry/community organizations view doctoral training (DESE, 2021a; New South Wales Department of Education, 2021; DESE, 2020). These pressures include changes to the number and stability of academic positions, the need for academics to engage with industry (Whelan, 2017), and associated changes in student preferences for academic/non-academic employment. These changes represent a significant shift from the traditional model of postdoctoral employment. More recent changes to the Australian postgraduate training environment include: changes to the Australian Government's Research Training Program, such as the new 60-day industry internship scheme that aims to increase university/industry interactions, by increasing the weighting within research block grant allocations for PhD candidatures completions that involve a suitable internship (DESE, 2021a); and establishment of the National Priorities and Industry Linkage Fund that has dual aims of improving engagement between universities and industry, and producing 'job-ready' graduates through different forms of WIL (DESE, 2020).

What is Best Practice for Doctoral Employability Training?

To date, WIL in PhD training remains relatively unexplored (Valencia-Forrester, 2019). Approaches taken by Australian universities to employability training for PhD candidates are not uniform (other than being fee-free). For example, they include: the abovementioned informal, non-credentialed programs that occur parallel to the PhD candidature (e.g., Monash University, University of Sydney, University of Queensland); formal, credentialed programs that often occur before the candidate's research occurs (e.g., University of Wollongong, University of Tasmania); and access to internship opportunities such as those provided through APR Intern (APR.Intern, 2015). In this regard the GCREDI represents a unique, composite approach: a formal, voluntary, part-time, fee-free, credentialed training program completed over three years to provide staged-delivery of both research and employability skills.

The GCREDI approach enables PhD candidates to receive: i) progressive delivery of research skills from the beginning of the program (when they are most relevant and beneficial for research progress and thus creating a scaffold journey); ii) progressive delivery of employability skills weighted towards the end of the program (when they are most relevant and beneficial to subsequent employment); iii) delivery of the training grounded in important pedagogies that minimize the cognitive load while also providing a peer community during candidature (that offsets challenges such as isolation, attrition, completion pressure); iv) the ability for students to tailor their GCREDI subjects and WIL activities to best suit their career goals; and v) formal recognition of program completion on the candidate's testamur. In this way, the GCREDI design directly addresses concerns arising from the now defunct Commercialisation Training Scheme relating to the lack of practical skills. The GCREDI also addresses the need to balance the demands of employability skills training around doctoral studies, the need to target employability skills training to the needs of research candidates, and the need for improved doctoral employability training (DESE, 2010; Howard, 2015; McGagh et al., 2016).

An additional aspect of the GCREDI approach is that its design is founded upon student training preferences obtained from, and consistent across, both undergraduate and postgraduate students at WSU. Thus, development of the GCREDI as a formal graduate certificate to deliver employability

training represents a form of student co-creation in employability training. Additional co-creation opportunities are included by enabling candidate choices in terms of elective subject and specific WIL activities (e.g., in the capstone subject). This approach is consistent with recent research that found delivery of employability skills should be specifically-tailored to student cohorts to ensure alignment with the particular needs of the cohort (Scott & Willison, 2021). Whether the preference for delivery of employability training via a Graduate Certificate is unique to the student population demographics of WSU and Greater Western Sydney (e.g., relatively high numbers of first-in-family students and/or culturally and linguistically diverse students), or is representative of student populations in other locations and institutions, may be worth further investigation as it could impact the enjoyment, engagement and effectiveness of employability training experienced by PhD candidates (Trowler, 2010). Related to this, it is interesting to note that the student demographics for the surveys described here were similar to student demographics obtained from published WIL-related surveys of both WSU and Australian students (Grebennikov & Skaines, 2009; Jackson, 2013) suggesting potential wider applicability of the survey findings and case study presented here.

Exploration of the GCREDI Work-Integrated Learning Activities for Employability Skills Training

A key pedagogical element within the GCREDI is the incorporation of relevant WIL activities to drive development of research and employability skills. The recently published Quality WIL Framework, while not intended to be definitive or a checklist (Campbell et al., 2021, Appendix A), nevertheless provides a useful guide by which to consider the WIL opportunities within the GCREDI. Within the Quality WIL Framework, four broad categories, called domains of practice, are defined for WIL activities:

1. student experience,
2. curriculum design,
3. institutional requirements, and
4. stakeholder engagement.

Each of these domains has a guiding principle to aid collection of evidence to demonstrate quality during different phases of WIL activities (preparation or 'before'; delivery or 'during'; and feedback and reflection or 'after'); and the guiding principles are reflected in a set of Standards that aim to reflect indicators of a quality WIL activity.

GCREDI Work-Integrated Learning and the Student Experience Domain

For the domain of Student Experience, the guiding principle is that "a quality WIL experience should provide students with a scaffolded, connected and supported pedagogical experience" (Campbell et al., 2021, Appendix A). As outlined above, the GCREDI subject progression and content is underpinned by a variety of relevant pedagogies aimed at providing relevant content at the correct candidature stage, while minimizing the potential for cognitive overload and matching their candidature and career needs and timelines. In addition, prior to any GCREDI WIL activity, PhD candidates receive preparatory material in the form of lectures and non-compulsory workshops that provide both the content and context required to successfully complete the WIL activity. Overall, these approaches suggest good alignment with Quality WIL Framework Standards 1.1 to 1.3 (i.e., preparation for learning in the workplace; connection to prior/future learning/work; and alignment with learning goals/capabilities). During the WIL activity, the weekly workshops within each GCREDI subject provide additional opportunities for PhD candidates to engage with the Subject Coordinators to explore the scaffolded nature of the GCREDI content, and to raise and discuss any concerns they might have related to the

WIL activity. In this way, the workshops provide opportunities for PhD candidates to obtain support and guidance while they undertake and complete each WIL activity, reflecting Standards 1.4 to 1.6 (i.e., safe/supportive experiences; scaffolded learning opportunities; and provision of support/guidance).

In terms of feedback and reflection opportunities after completion of GCREDI WIL experiences (Standard 1.7), PhD candidates submit assessments as part of each WIL activity, and then receive detailed written feedback that highlights well-performed aspects of the WIL activity/assessment and, where appropriate, recommends potential ways for improvement and additional learning. PhD candidates can also provide feedback on each WIL experience either directly (during the weekly workshops) or anonymously (via the WSU-administered surveys 'Student Feedback on Unit/Subject' and 'Student Feedback on Teaching'). To date, the feedback received in this way has been highly supportive, both directly, and anonymously via the student surveys that show high student satisfaction. Candidate feedback also indicates the GCREDI content provides problem-solving frameworks that aid progression of PhD research.

The GCREDI completions, as well as regular informal feedback from PhD candidates, suggest the WIL activities are well prepared, relevant, enjoyed, and aligned with prior and subsequent content. As the GCREDI progresses, it will be important to obtain additional evidence to test this assumption and to identify areas for continued improvement (Scott & Willison, 2021; Valencia-Forrester, 2019). This will be achieved through targeted surveys and focus groups specifically designed to further investigate the relevance of the GCREDI to all stakeholders, and to identify any unmet needs. For example, surveying GCREDI graduates and industry groups, as well as candidates who opted not to undertake the program.

GCREDI Work-Integrated Learning and the Curriculum Design Domain

For the domain of Curriculum Design, the Quality WIL Framework's guiding principal is that "a quality WIL curriculum should contain embedded, accessible and transformative learning and assessment within an intended and enacted curriculum" (Campbell et al., 2021, Appendix A). The overall design of the GCREDI WIL activities, whereby research-related skills are weighted towards the beginning of the program and employability-related tasks are weighted toward the end of the program, is inherently aligned with the Framework Standard 2.1 (WIL embedded through whole-of-qualification curriculum design). The currency of the GCREDI curriculum is maintained through incorporation of a large number of guest lecturers sourced from current content experts employed in academic and non-academic sectors across a wide range of disciplines.

Standard 2.2 recommends students and industry stakeholders be engaged as co-creation partners for WIL activities. The survey of WSU undergraduate and postgraduate students that preceded and guided creation of the GCREDI provides a reasonable foundation for co-creation of the program. The choice of elective units, and WIL activities in the capstone subject, provide additional opportunities for curriculum co-creation with the GCREDI/PhD candidates. Nonetheless, identification of additional opportunities for PhD candidates to guide evolution and improvement of the program will be beneficial. To this end, the anticipated focus groups mentioned above should identify valuable new insights from the PhD candidates to guide GCREDI improvements. Inclusion of industry and community partners in the capstone subject's Innovation Team Challenge WIL activity also provides opportunities for external stakeholders to be co-creation partners in the course. Further investigation of the performance and outcomes of this unique WIL activity is planned, in order to assess the potential for increased involvement of external stakeholders across the breadth of the GCREDI.

Standard 2.3 recommends WIL activities reflect professional accreditation requirements and ongoing career and employability development. In Australia, most doctoral degrees do not lead to professional accreditation beyond successful completion of the thesis and conferring of the PhD (Australian Qualifications Framework Council, 2013). However, the recognized need for improved employability training for Australian PhD candidates (to best position graduates for employment) led to recommendations to embed transferrable skills training in doctoral training (McGagh et al., 2016). Consequently, inclusion of the GCREDI on the candidate's testamur provides a surrogate professional accreditation for the WIL activities performed during the GCREDI. For example, WIL activities in the elective and capstone subjects that prepare PhD candidates for key tasks required for academic employment (e.g., the fellowship/grant WIL activities) or for non-academic employment (e.g., the externally partnered, team-based innovation challenge). These WIL experiences provide candidates with a working knowledge of key tasks related to their chosen career paths, which is aligned with Standard 2.5 (authentic tasks, alignment with learning goals and graduate outcomes). Additionally, in response to COVID-19, the GCREDI WIL activities were reviewed to ensure compatibility with online delivery. Recent research suggests these types of online WIL increase WIL equity and accessibility (Bell et al., 2021) which is aligned with Standard 2.4 (equity/accessibility).

At the end of each semester, the GCREDI Subject and Course Coordinators reassess and update both the GCREDI Learning Guides provided to candidates (that map learning to learning outcome), as well as the subject-specific online information portals within the e-learning system through which PhD candidates engage with the GCREDI subjects. These updates aim to ensure the program, and the Learning Guides and e-learning sites for each subject, are current and take into account PhD candidate feedback and any changes in WSU policy, thereby aligning with Standards 2.6 and 2.7 (learning measured against learning outcomes; benchmarking to identify areas for improvement) as well as Standard 2.2 (students as curriculum partners).

GCREDI Work-Integrated Learning and the Institutional Requirements Domain

For the Institutional Requirements Domain, the guiding principle is that "quality WIL activity across institutions should be evidenced by the proper management of staff, risk management and reporting around WIL experiences supporting continual improvement" (Campbell et al., 2021, Appendix A).

Ideation and the initial program proposal for the GCREDI occurred at the same time WSU was designing and implementing the Master of Research program, a Master level program scaffolded on the Bologna Process to ensure compatibility in standards and quality for higher education qualifications (Kehm, 2007; Sadlak, 2004). Accordingly, development of these two higher-degree training programs was able to share values, goals and principles within the WSU strategic and operational environment (Standard 3.1). It should be noted that these two programs were launched within two years of each other and operationalized in part by the same group of scholars together with others (e.g., Prof. Alphia Possamai-Inesedy, WSU, led the design). As such, the resulting GCREDI design is compatible with being preceded by either a Masters degree, or a 1-year Honors degree. Alignment with the WSU strategic and operational plans was also extended to the individual GCREDI WIL activities that, as described below, were developed in consultation and collaboration with various divisions within WSU whose role is to support WIL.

To date, the information technology support, and the administrative systems and support, required to effectively delivery the GCREDI have typically been adequate and appropriate once the PhD candidates have been enrolled in the program (Standard 3.3). On the relatively few occasions where

enrolment-related issues have arisen (e.g., progression to the next subject, access to the subject-specific e-learning platforms), these issues have been resolved relatively quickly within the current systems and support available. It will be important to ensure this remains the case as the financial consequences of COVID-19 influence, and potentially reorder, current teaching priorities that impact on the GCREDI.

The main caveat to the effectiveness of the GCREDI support systems was difficulties in automating provision of GCREDI-related information to new PhD candidates who enroll outside the main undergraduate student enrolment periods. As a result, PhD candidates enrolling at 'non-standard' times throughout the year needed to be manually approached about GCREDI enrolment. This technical issue, that has now been resolved, likely led to some PhD candidates not being able to avail themselves of the GCREDI opportunity. In support of this, instances occurred where PhD candidates enquired about GCREDI enrolment up to 18 months past initiation of their PhD candidature. Improved advertising of the GCREDI, both internally and externally, would be beneficial to further avoid this issue by increasing knowledge of the program to potential and new PhD candidates.

In terms of WIL governance (Standard 3.2), the GCREDI has defined governance structures for its WIL activities, both across the program (through the Course Coordinator) and within each subject (via the Subject Coordinators). Consistent with Standard 3.5, the Innovation Team Challenge WIL activity within the GCREDI capstone subject was developed in collaboration with the WSU Office of General Counsel, with advice provided by the WSU Placements Hub. Through this process a range of appropriate legal documents were generated for use when a GCREDI WIL activity involves engagement with an organization external to WSU. These documents ensure all parties involved in the WIL activity are appropriately protected (i.e., PhD candidates, WSU, and the external partners).

Anecdotal feedback from PhD candidates suggests the WIL activities progressively staged across the GCREDI subjects provide a useful and relevant scaffold for learning. However, being a relatively new program, it has not yet been possible to track longer-term outcomes arising from the GCREDI training. Specific outcomes that might be useful to investigate include length of time to post-PhD employment, average starting salary, industry of employment, and relevance or utility of the GCREDI WIL activities to post-PhD employment activities (i.e., Standard 3.7). Establishing robust and cost-effective approaches to gathering this information will be important for continued improvement of the GCREDI, and to ensure appropriate resourcing as the number of PhD candidates enrolled in the program continues to increase. Doing so will effectively address the Quality WIL Framework Standard 3.6 (appropriate resourcing) and Standard 3.4 (targeted staff professional development).

GCREDI Work-Integrated Learning and the Stakeholder Engagement Domain

For the final domain, Stakeholder Engagement, the Framework's recommended guiding principle is that "Quality WIL experiences are supported by engagement, connection and responsiveness to the dynamic expectations of diverse stakeholders, industry, community, government, higher education sector, professional bodies, students" (Campbell et al., 2021, Appendix A). At present, a large number of guest lecturers from a wide range of sectors and employment types provide content within the GCREDI subjects. The content they provide helps prepare the PhD candidates for their WIL activities (Standard 4.1). As all the GCREDI WIL activities are now delivered online, health and safety review of partner sites (Standard 4.2) is not necessary. For the externally partnered WIL activity in the GCREDI capstone subject, policies and procedures are in place for quality assurance of partnership agreements, definition and assignment of intellectual property, supervision responsibilities, etc. (Standards 4.3 and 4.6) and these policies and procedures are available to all the GCREDI subjects should the need arise.

Consistent with this, regular communication occurs with all internal and external partners prior to, during, and after partnered WIL activities (Standards 4.4 and 4.5).

Areas for Potential Improvement of the GCREDI Work-Integrated Learning Activities

While the GCREDI continues to be delivered, there are areas to evolve the program, and potential future challenges. These include establishing how to: 1) increase equitable access to the GCREDI for all PhD candidates (e.g., inclusion of international PhD candidates not on scholarship); 2) best align the GCREDI with changes to the Research Training Program such as the new 60-day industry internship scheme (DESE, 2021a); 3) best align the GCREDI with the National Priorities and Industry Linkage Fund (DESE, 2020); and 4) continue evolving GCREDI WIL activities, for example, by further increasing engagement with industry and community organizations across the course, and by obtaining and responding to additional feedback from PhD candidates during the program and after graduation. These challenges also represent opportunities to undertake important and opportune research to further define best practice in training PhD candidates in WIL activities, research skills and employability skills, an area that to date is relatively unexplored but crucial to Australia's future success.

CONCLUSION

The higher degree research training system in Australia, that includes PhD candidates, is recognized as critical to Australia's future economic strength. The research graduates produced through HDR training provide a pool of highly qualified researchers for a wide range of research and non-research positions, both within and outside academia. The need for improved employability training for doctoral candidates is a key, recent recommendation of the Australian Council of Learned Academies. Important changes to policy frameworks, including the Research Training Program and the National Priorities and Industry Linkage Fund, are placing increasing emphasis on employability training and the role WIL can play in doctoral training. The GCREDI is unique as a credentialed, co-created, part-time program delivered in parallel with doctoral studies, that combines staged delivery of research skills training, employability skills training, and WIL activities. By combining the concept of stewardship with the use of WIL and employability skills training, the GCREDI provides candidates with a deeper understanding of how their knowledge is relevant within their own academic discipline, but also relevant to and transferable beyond their discipline. The GCREDI is deliberately tailored to meet the evolving needs of PhD candidates at specific times across their candidature while minimizing cognitive load, and while providing a peer community to offset challenges that affect doctoral attrition and completion rates. Being underpinned by lifelong learner pedagogy, the GCREDI is designed to produce PhD graduates for the knowledge and innovation economy, attributes widely recognized as crucial to Australia's future prosperity, by providing graduates with key knowledge and skills to foster innovation and cross-disciplinary communication (and thus aid rapid productivity in an employment setting). Evaluation of the GCREDI WIL activities against the Quality WIL Framework identified both broad and important alignments, as well as areas for future investigation to ensure continued excellence and relevance in the program and its delivery. The GCREDI therefore provides a contemporary example for evolution of existing, or development of new, doctoral training programs beyond WSU. A diversity of evidence-based approaches to doctoral training, including the GCREDI, will offer valuable opportunities to tailor programs to the specific needs of particular PhD candidate cohorts, while also providing new insights that have potential to further advance this important field.

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About the Journal

The International Journal of Work-Integrated Learning (IJWIL) publishes double-blind peer-reviewed original research and topical issues dealing with Work-Integrated Learning (WIL). IJWIL first published in 2000 under the name of Asia-Pacific Journal of Cooperative Education (APJCE).

In this Journal, WIL is defined as "*an educational approach that uses relevant work-based experiences to allow students to integrate theory with the meaningful practice of work as an intentional component of the curriculum. Defining elements of this educational approach requires that students engage in authentic and meaningful work-related task, and must involve three stakeholders; the student, the university, and the workplace*". Examples of practice include off-campus, workplace immersion activities such as work placements, internships, practicum, service learning, and cooperative education (Co-op), and on-campus activities such as work-related projects/competitions, entrepreneurships, student-led enterprise, etc. WIL is related to, and overlaps with, the fields of experiential learning, work-based learning, and vocational education and training.

The Journal's main aim is to enable specialists working in WIL to disseminate research findings and share knowledge to the benefit of institutions, students, co-op/WIL practitioners, and researchers. The Journal desires to encourage quality research and explorative critical discussion that leads to the advancement of effective practices, development of further understanding of WIL, and promote further research.

The Journal is ongoing financially supported by the Work-Integrated Learning New Zealand (WILNZ; www.wilnz.nz), and the University of Waikato, New Zealand, and received periodic sponsorship from the Australian Collaborative Education Network (ACEN) and the World Association of Cooperative Education (WACE).

Types of Manuscripts Sought by the Journal

Types of manuscripts sought by IJWIL is primarily of two forms: 1) *research publications* describing research into aspects of work-integrated learning and, 2) *topical discussion* articles that review relevant literature and provide critical explorative discussion around a topical issue. The journal will, on occasions, consider good practice submissions.

Research publications should contain; an introduction that describes relevant literature and sets the context of the inquiry. A detailed description and justification for the methodology employed. A description of the research findings - tabulated as appropriate, a discussion of the importance of the findings including their significance to current established literature, implications for practitioners and researchers, whilst remaining mindful of the limitations of the data, and a conclusion preferably including suggestions for further research.

Topical discussion articles should contain a clear statement of the topic or issue under discussion, reference to relevant literature, critical and scholarly discussion on the importance of the issues, critical insights to how to advance the issue further, and implications for other researchers and practitioners.

Good practice and program description papers. On occasions, the Journal also seeks manuscripts describing a practice of WIL as an example of good practice, however, only if it presents a particularly unique or innovative practice or was situated in an unusual context. There must be a clear contribution of new knowledge to the established literature. Manuscripts describing what is essentially 'typical', 'common' or 'known' practices will be encouraged to rewrite the focus of the manuscript to a significant educational issue or will be encouraged to publish their work via another avenue that seeks such content.

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