The development of work-integrated learning ecosystems: An Australian example of cooperative education

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Cooperative education and principles associated with learning ecosystems appear throughout the literature. However, the application of cooperative education and learning ecosystems to work-integrated learning has not been fully examined. Furthermore, the applicability of learning ecosystems within work-integrated learning to specific professional practice domains has similarly not previously been examined. The development of domain-specific work-integrated learning ecosystems and an explanation of how they might apply to cooperative education in higher education, the purpose of this paper, are explored from three sequentially related conceptual levels: Level 1), a proto-theoretical model of cooperative education > Level 2), a functional model of a work-integrated learning ecosystem > Level 3), an example of an applied model of a work-integrated learning ecosystem. Specifically, the paper explores how policing, presented here as a working example of a socially important practice domain, has been developed into a work-integrated learning ecosystem within the Australian higher education context.

Keywords: Cooperative education, learning ecosystems, work-integrated learning, professional studies, policing

This research centers on cooperative education (co-op) and its intersection with two contemporary educational concepts: learning ecosystems and work-integrated learning (WIL). Cooperative education, as a valued pedagogical construct, has been known for more than 50 years (Casey & Goodyear, 2015; Sovilla & Varty, 2011). Indeed, its applicability to higher education and work has been the subject of particular and diverse interest. For example, Pennaforte and Pretti (2015) explored co-op and organizational commitment in French undergraduates entering the workforce; Drewery et al. (2016) examined its relation to the vocational self-concept of undergraduates; Andrade et al. (2018) considered it in terms of entrepreneurship and job creation in Canada; and Raelin et al. (2014) investigated whether participation in co-op increases the persistence of women and men in engineering undergraduate studies in the United States. Studies on co-op have also extended into Australian settings, with consideration given to the alignment of reflective practice and a co-op curriculum built on a work-integrated learning pedagogy being one such example (Harvey et al., 2010; Lucas, 2017).

Jiang et al. (2015) took the challenge of documenting the impact of co-op even further. These authors analyzed 19,093 job placements of engineering students with 4,709 employers in 1,817 cities and 76 countries, finding that students performed better at work and found placements with an increasing emphasis on leadership in their senior years, and senior students specifically acquired non-engineering skills that increased their abilities for more diversified placements. The study identified the ability to learn and develop interpersonal and problem-solving skills as the most significant characteristics of co-op students, attributes which suggest the so-called "soft skills" that might be overlooked in strictly technical learning environments. These data and findings suggest co-op, while including learning through work, is not only aimed at achieving job-preparedness and employability but results in the

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development of transferable skills at a higher cognitive level when associated with higher education programs. Ralls et al. (2018) extend this systemic creation of educational value by highlighting

> an increasing acknowledgement that our education systems need to adapt and change in order to respond to rapid global shifts in economic and technological development, moving from a landscape of distinctly different and clearly boundaried education institutions towards the creation of more flexible cross-sector ecosystems of teaching and learning. (para. 2)

In particular, co-op, as expressed through WIL, is concerned with what students do in both educational and work environments and how the two are integrated in order to enrich both student learning and organizational outcomes. These structures can be used repeatedly with almost any subject matter, thus making for a transdisciplinary framework or, as argued in this paper, a 'learning ecosystem' in which multidisciplinary practices can be accommodated within work-integrated research projects. As disclosed by Ralls et al. (2018), learning ecosystems can form within the context of co-op. Learning ecosystems (including their variations as 'learning communities' and 'networks of practice') are characterized by the creation of what are called 'learning hubs' providing "connectors through which knowledge passes and ultimately collaborative action takes place" and can be defined as "interdependent combinations of different species of providers and organizations playing different roles with learners in differing relationships to them over time and in varying mixes" (Organization for Economic Co-operation and Development [OECD], 2015, p. 17). The aforementioned definitions of co-op and learning ecosystems as provided by Ralls et al. and OECD are the ones subscribed to in this research.

As noted above, co-op is affiliated with work because many aspects of cooperation in education have commonly occurred as a result of industry partnerships (e.g., Borrell-Damian, 2009), actuated as either partnerships of educational institutions and government agencies or educational institutions and the private sector, or both, including in relation to research-practice partnerships (Coburn & Penuel, 2016; Rampersad, 2015). However, despite the apparent synergy between higher education and the world of work more generally, inquiry has yet to fully document the unique underpinning of the partnerships created through work and learning ecosystems, although the work of Rook and McManus (2016) on WIL in Australian universities and their ability to prepare students for the world of work, contributes directly to this topic.

It is not within the scope of this paper to articulate the distinguishing features of all forms of learning associated with work, nor is it within scope to describe their various incarnations as work-based learning (Major, 2016), workplace learning (Gamrat et al., 2014), work-applied learning (Zuber-Skerritt, & Abraham, 2017), service learning (Valencia-Forrester et al., 2019), or practice-based learning, problem-based learning and the flipped classroom (Thai et al., 2017). This statement is especially true if the various national contexts of each incarnation of learning associated with work are considered. Certainly, each learning pedagogy associated with work has its own distinct characteristics and, in some cases, these can be significantly different, but most differentiators are also somewhat nuanced and subtle. What binds them is a fundamental concern for intentional learning through work and action built on a foundation of experience and reflection, and these have been well documented (Illeris, 2018; Wain, 2017).

The focus of this paper is on the specific applicability of learning ecosystems to WIL, partly because WIL is a pedagogy that has gained traction when associated with learning, work and their joint relation to problems in practice, and partly because it is the pedagogy upon which the higher education setting

for the present study is based, and is thus the approach with which the authors are most familiar. Noted is the emphasis WIL places on individualized learning shaped by reflection, the context, situation, sets of activities and social relations, an individual's prior learning and experience, and the social dimensions in which each of these elements occur (Bruno & Dell'Aversana, 2018; Siebert et al., 2009). According to van der Laan and Neary (2016), such an approach

> recognizes that individuals' careers are usually based on formal qualifications supplemented by action learning gained while working…[and] is primarily concerned with learning not teaching. While the delivery of [of this approach to learning] involves some teaching, learners are guided rather than directed. The focus is not so much on what is being learned, although this remains important, but on how we best learn. (p. 268)

This individualized process is reinforced by "cognitive resources" and, as a result, learning is said to be enhanced by being re-situated in each new context, enriched by the integration of personal and re-situated knowledge leading to the creation of insight and understanding (Eraut, 2000; Siebert et al., 2009). Thus, WIL is a type of learning associated with work, which characterizes any learning whether formal, informal or non-formal, occurring within the wider world of work. What differentiates WIL is that learning is intentional and related to specific outcomes of the higher education framework within which it is offered. The intersection between work and higher education, in the present example, is called a work-integrated learning ecosystem.

Van der Laan and Neary (2016) have also pointed out learning related to work "recognizes that learning is most effective and authentic through the engagement with others" (p. 269), whether it be in a place, community of practice or amongst peers. This reflects Dewey's notion of authentic learning being facilitated through experiential and social learning, with the latter suggesting a cooperative approach. Raelin (2011) goes further by proposing that such as approach is not simply about pedagogy but is "a philosophical approach that characterizes how learners develop their knowledge to participate effectively and democratically in a civil society. It is concerned with how to make learning arise from our mutual experience with others, in particular, from our work together" (p. 17). To that end, Raelin argues that theories associated with learning through work are

> . . . expressly merged with practice, while knowledge is considered to be fluid and changeable. Learning is centered on reflection on work practices. Hence, it offers practitioners faced with the relentless pace of pervasive change an opportunity to overcome time pressures by reflecting upon and learning from the artistry of their action. (p. 17)

More recent concerns have centered on work-related problems, particularly messy, co-produced and wicked problems, and their solutions (e.g., Fergusson, 2019; Toledano-O'Farrill, 2017).

The site for the present research is the Professional Studies program at University of Southern Queensland (Fergusson, Allred, & Dux, 2018; Fergusson, Allred, Dux, & Muianga, 2018; van der Laan & Neary, 2016; van der Laan & Ostini, 2018). Within this program, which has been structured according to foundational WIL principles, are the Master of Professional Studies (Research) (MPSR) and Doctor of Professional Studies (DPRS) higher degrees by research (HDR) programs for mid- to senior-career professionals. According to van der Laan and Ostini (2018), "driven by lifelong learning imperatives, self-directed career development, and a credential-driven employment environment", non-academic mid- to senior-career professionals are "increasingly turning to higher education for (a) validation of the knowledge gained informally and non-formally in their practice, and (b) non-traditional academic offerings that contribute to their professional development" (p. 14).

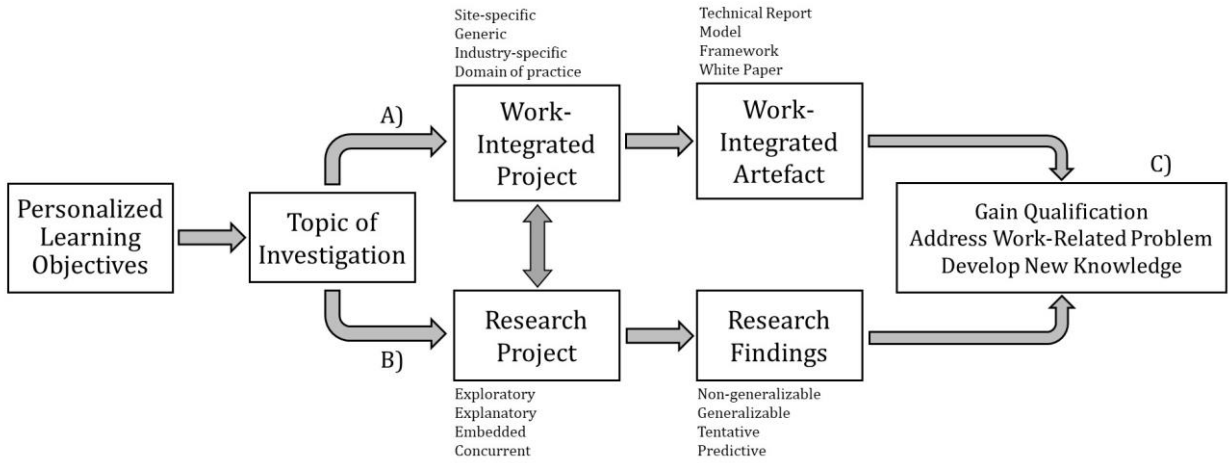
These two Professional Studies qualifications are the product of parallel streams of work-integrated inquiry, as shown in Figure 1: A) a work-integrated project; and B) a research project. Based on personalized learning objectives and a topic of investigation, stream A) is carried out in a specific work environment or can be identified as a demarcated site-specific, generic, industry-specific, or practice domain project of relevance to any 'type of work'. As such, the work-integrated project has a start-stop point and timeline, an identifiable set of goals, objectives and milestones, a budget, a list of participants and materials, and so on. The work-integrated project results in the production of an artefact, which can include project or technical reports, a model or framework, or a policy white paper. Typically, artefacts become part of the accumulated wisdom (i.e., the embedded intellectual capital) of the employee, sole practitioner, work location, organization, and/or practice domain.

The second stream B) relates to the research project designed to measure, test, assess, evaluate, or otherwise investigate the nature, scope, and outcomes of the work-integrated project A), and typically uses a mixed methods research design to do so. Research designs for such inquiries may be exploratory, explanatory, embedded, or concurrent and can lead to the types of non-generalizable, generalizable, tentative, or predictive research findings typical of most scientifically guided research projects. It is the implementation of these two streams of work-integrated learning and research, built upon a foundation of personalized learning, which characterize the Professional Studies HDR program and together the streams form the basis upon which a practitioner gains the MPSR or DPRS qualification, addresses a work-related problem, and contributes original findings which enhance collective knowledge, as expressed by C).

The relationship of the Professional Studies program to WIL practices such as providing access and equity in higher education (van der Laan & Neary, 2016), being a source of innovation in higher education (van der Laan et al., 2017), engaging in micro- and macro-cycles of reflective practice (Fergusson, van der Lann, & Baker, 2019), advancing professional practice (Fergusson, Allred, Dux, & Muianga, 2018), and its association with first principles of science (Fergusson, Shallies, & Meijer, 2019) has been well documented. The program's ethos and transformational characteristics have also been examined (Fergusson, van der Lann, White, & Balfour, 2019). Moreover, the university and its learning collaborators assess the outcomes from Professional Studies against a multi-disciplinary framework of standards and levels (i.e., Australian Qualification Framework Level 9 for the master's and Level 10 for the doctorate degrees).

To complete the task of articulating a work-integrated learning ecosystem within the Professional Studies program, the present study considers the topic from three sequentially related conceptual levels: Level 1) a proto-theoretical model of co-op; Level 2) a functional model of a work-integrated learning ecosystem; Level 3) an applied model of a work-integrated learning ecosystem.

FIGURE 1**:** Two parallel streams A) and B) of work-integrated learning in Professional Studies.



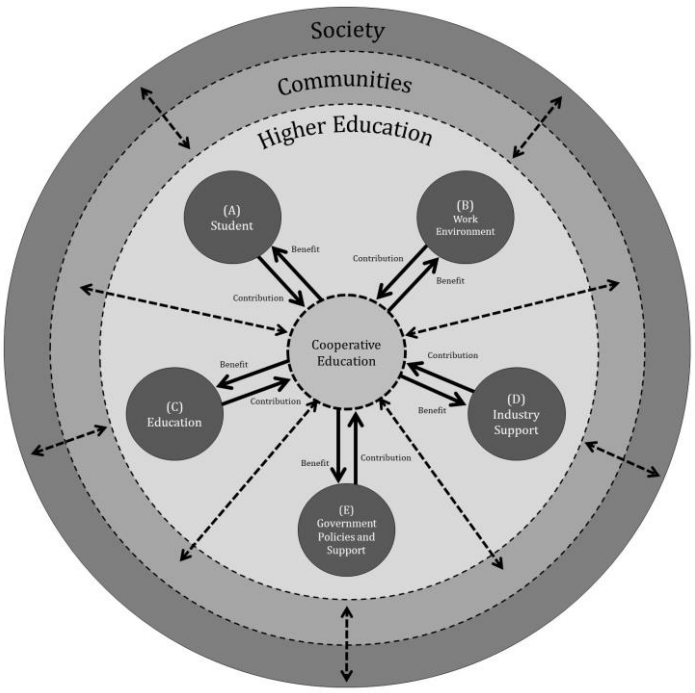
*Note***.** (University of Southern Queensland, 2013).

LEVEL 1: PROTO-THEORETICAL MODEL OF COOPERATIVE EDUCATION

A fundamental premise of co-op, underpinned by Social Constructivism, is that learning is transactional and a basic human right. This premise is informed by Dewey's (1938) theory of experiential and social learning. Pedagogical attitudes which embrace and foster such a 'cooperative' view of education include: knowledge is a social construction; everyone involved in co-op contributes to the construction of knowledge; access to knowledge is the right of every person who wishes to learn; a learner-centric focus within the learning and teaching process is required in education; and congruent behavior is the most efficient in cooperative situations. These attitudes can be operationalized into principles of co-op which encourage interdependence, professionally inclusive and parallel interactions, equal access and participation, personal responsibility and accountability, open and flexible structures, and competence and capability development.

To further these attitudes, this study has adopted at Level 1 a systems view of co-op showing the main advocates of cooperation and how they interact within the cooperative framework. Level 1 also shows the inputs (contributions) to and outputs (benefits) from the educational process (i.e., what Ralls et al. call 'connectors through which knowledge passes') within a higher education context to produce the proto-theoretical model shown in Figure 2. This diagram shows the association of co-op to higher education, the communities within which higher education are embedded, and the broader societies in which these communities exist, a philosophic commitment which Raelin (2011) has suggested develops the type of knowledge required to participate effectively and democratically in a civil society.

FIGURE 2: Proto-theoretical model of co-op and its relation to higher education, communities and society.



The model shows that co-op is the product of five advocates or, to paraphrase the OECD, different species of providers or organizations coming together to contribute to and benefit from the exchange of experience, knowledge, data, expertise, know-how, and so on. Each advocate plays a different role

and adopts different relationships over time and in varying mixes of input and output. The five advocates to the model are: (A) the student; (B) the work environment; (C) the higher education institution and educational context more generally; (D) industry support; and (E) government policies and support.

The model assumes that each 'species of provider', while interacting with other advocates within the boundaries of the ecosystem, contributes something of value to, and benefits in some practical way from, participating in the co-op process, which ultimately has implications for higher education, the communities in which it operates, and society more generally. For example, the student (A) contributes energy, time and skills, and benefits by gaining knowledge and a qualification; the higher education institution (C) contributes support services, such as a library, financial aid and counseling, and benefits from the enrolment of the student, the knowledge they create and their payment of fees. Hence, (A) contributes to and benefits from (C) and (C) contributes to and benefits from (A).

In these ways, co-op can be viewed as a form of dynamic biomatrix system (Dostal et al., 2012), consisting of both activity systems (such as teaching and learning systems) and entity systems (such as the ethos and governing systems of the institution) which combine to form what Dostal et al. (2012) call "one interdependent whole" (p. 7). How this interdependent and cooperating whole is activated through a functional model of a work-integrated learning ecosystem is illustrated in Level 2.

LEVEL 2: FUNCTIONAL MODEL OF A WORK-INTEGRATED LEARNING ECOSYSTEM

Figure 3 takes the generic proto-theoretical model and, using the Professional Studies program as its working example, ascribes a name to each of the five advocate types (A)-(E) to illustrate the real-world elements of a functional work-integrated learning ecosystem. In keeping with WIL practice in higher education, advocate (A) becomes a career professional; advocate (B) becomes the space or place in which work is carried out, including organized workplaces and work spaces as well as communities of practice (for example, settings in which self-derived rules, systems, and ways of working are carried out, as in the case of a sole practitioner); advocate (C) becomes, in this case, the Professional Studies HDR program; advocate (D) becomes the domain or discipline specialist who cooperates with and contributes to the WIL ecosystem; and advocate (E) becomes the regulatory and funding authority (i.e., government agency or other authority).

Figure 3 also identifies the contributions and benefits of each advocate. For advocate (A), contributions include the professional's work experience, attitudes of altruism, activism and passion, and their work-integrated research project; benefits include gaining a qualification, increased learning, knowledge construction, research experience, a project artefact, and a publishable research paper (a specific output of the Professional Studies program). For advocate (B), contributions include a real-world project site in which (A) can engage in a work-integrated project while addressing a specific problem at work, an endorsement from the work environment, and a source of primary and secondary data and research project participants. Benefits gained by the work environment (B) include evidence-based solutions to problems, the recognition that comes from on-site research, potential organizational and/or community improvement, a more capable and qualified practitioner, as well as a project artefact which becomes part of the organization's or community's memory and record.

For advocate (C), contributions to co-op include the provision of learning opportunities for (A) through an online learning interface (i.e., the learning management system), workshops, conferences, writing bootcamps, webinars, so-called 'authentic assessment' methods (Reynolds & Kearns, 2017), and other means of blending the delivery of learning and teaching, access to knowledge associated with research and publishing skills, a community of learners and other university support services, such as library resources and counseling, and the granting to (A) of a qualification at the end of their HDR program. Benefits to (C) include access to researching professionals (A) and industry collaborators and partnerships (B) and the recognition that comes with it, a contribution to academic knowledge and

original research, and project artefacts in the form of published theses, and other documentation and data.

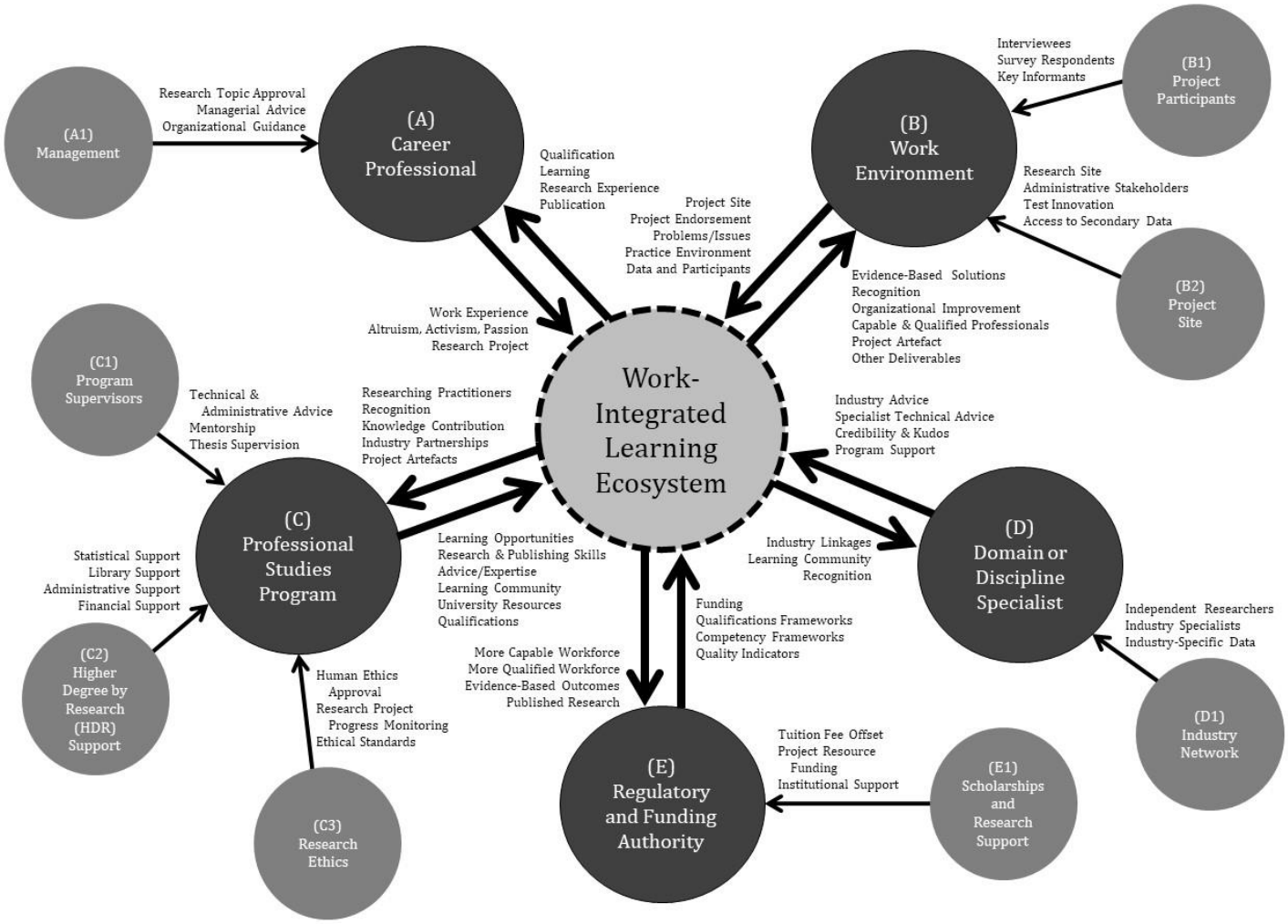
For advocate (D), contributions include specialist technical and industry advice, increased program credibility and recognition for (A) and (C) as well as overall program support; benefits to (D) include linkages to the learning ecosystem and other communities of disciplinary and non-disciplinary practice, and professional and personal recognition. In this example, advocate (E) contributes funding and the regulatory and graduate attribute frameworks within which the program operates. Benefits to (E) include a more capable and qualified Australian workforce, a range of evidence-based outcomes and intellectual property across different industrial sectors, and well as the publication of practice-based research outcomes and evidence with which to support them.

At this point it is necessary to differentiate between an organizational interaction with the ecosystem and a community or similar entity's interaction with the ecosystem. Not all WIL takes place within the context of a specific organization, and as such the systemic interactions of advocates differ based on the location of that learning. For the purposes of this paper, WIL as a pedagogy is situated within an organizational setting, but other, less formal and traditional, work-related settings are possible.

To more fully activate the proto-theoretical model, Figure 3 also identifies inputs to the model by sub-advocates who sit behind and support the main advocates. These are for advocate (A), a management advocate or internal work champion within the organization (A1) who helps approve the research project and provide managerial advice and organizational guidance on (B) to (A). The management advocate (A1) can also help (A) develop practicable and valuable research questions, prepare appropriately to conduct work-integrated research, identify sources of secondary data within the organization and how to access them, and help (A) position themselves politically to be both a manager or leader within the organization while also being an insider-researcher.

For advocate (B), project participants (B1) are peers who become potential interviewees, survey respondents, or key informants in (A's) stream A) research project, and the project site (B2), which serves as the source of secondary data and is the location of the research phenomenon under investigation; (B2) may also have its own research ethics approval process. Similarly, the Professional Studies program (C) has three subordinate advocates: (C1) program supervisors who provide technical and administrative advice, mentoring and thesis supervision to (A) as well as coordinate access to domain specialists (D); (C2) HDR technical support, which provides statistical, financial, administrative and library assistance to (A); and (C3) a human research ethics committee which advises (A) on ethical considerations in research and approves their applications for conducting work-integrated research, most typically in research involving human participants in semi-structured interviews, focus groups, and/or surveys.

FIGURE 3: Functional model of a work-integrated learning ecosystem.



Domain or discipline specialists (D) may also call upon subordinate advocates from their industry networks (D1) to provide independent specialist advice and data, and sub-advocate (E1) is the source of government scholarships and other resources, which can help (A) secure grants and tuition fee offsets, waivers and research funding. (E1) also provides high-level institutional support in Australia to (C) through such vehicles as The Higher Education Support Act 2003. How this functional model of a WIL ecosystem can be activated and applied to the organizational context of higher degree research is the subject of Level 3.

LEVEL 3: APPLIED MODEL OF A WORK-INTEGRATED LEARNING ECOSYSTEM

From this perspective, a WIL ecosystem occurs when the intersection of WIL and a learning ecosystem is operationalized in the context of a professional practice domain. A professional practice domain is defined as a work-related practice or discipline in which stakeholder-participants have been formally or informally organized into: A) recognizable and agreed structures of policy (e.g., pre-qualifications, roles and governance); B) narrative (e.g., an accepted ethos and history); C) competency (i.e., a complex construct which includes an individual's skills and abilities, values, beliefs, motives, attitudes and personal traits; D) capability (i.e., higher order thinking and behaving, which reflect both broader and deeper expertise, sometimes referred to as "advanced practice" (Fergusson et al., 2020); and E) interdependencies among advocates (i.e., process-oriented interactions, discussions, negotiations, and speculations among advocates yielding knowledge and decisions, Black et al., 2006).

The present study is consistent with Queensland University of Technology (2014), which points out that within a professional practice domain "congruencies and tensions [can be] identified, allowing for an increased understanding of what may be shaping practice decisions and behavior" (p. 1) leading to a "notion of 'best fit' between the practitioner and the practice context" (p. 4). Professional practice domains within the Professional Studies program include: 1) nursing, midwifery, allied health and clinical practice; 2) sports medicine and science; 3) policing, 4) fire and emergency services; 5) environmental impact and sustainability science; 6) curriculum and assessment specializations; and 7) private corporate and consulting practices. Sub-domains within practice domains, such as the five in nursing proposed by Kring (2008), are also possible, but sub-domains like leader or expert practitioner elements, do not form part of the present WIL ecosystem model.

For the purposes of this study, the professional practice domain of policing has been used to exemplify and provide the concrete nomenclature and impact of what is meant by an applied WIL ecosystem. This identification is relevant because elsewhere the synergy between investigative practices of police detectives and social scientists, in which they both develop lines-of-inquiry and draw on multiple sources of evidence to make inferences about people, trends and phenomena, has been more formally argued (Fergusson, Harmes et al., 2019). That research examined the various direct and indirect lines-of-inquiry and the main sources of primary and secondary evidence used in work-related research, a topic which is also relevant here because a number of researchers in the Professional Studies program are also detectives with the Queensland Police Service and other Australian police services.

Moreover, the cooperative aspects of learning and the public cooperative imperatives of community policing, particularly for minority and at-risk groups within Australian society (Murphy & Cherney, 2011), are also synergistic. This next generation view of policing and police culture, a view based on diversity and transparency (rather than paramilitarism, athleticism and camaraderie) historically called "community policing" (Cunneen, 1992), is the subject of recent research by Campeau (2019) in Canada and by Jackson et.al. (2018) in the United Kingdom. Of interest in the present context is the observation

that like the Professional Studies program, policing research uses mixed methods to examine social problems and matters of policing importance (e.g., Kiedrowski et al., 2019).

The five advocates to the applied policing model in Figure 4 are: (A) a police officer with the rank of Senior Sergeant or above (i.e., Inspector, Superintendent, etc.); (B) the work environment of community policing; (C) the specific work-integrated learning and research project being conducted within the Professional Studies program; (D) policing specialists, including intelligence analysts and criminologists; and (E) the Department of Education and Training of the Australian Government, which supports the Professional Studies program and University of Southern Queensland more broadly. Figure 4 identifies the contributions to and benefits from the WIL ecosystem for each advocate.

For advocate (A), contributions include 10+ years of policing experience, an attitude of altruism, activism, and passion for change in policing, and research projects in contemporary policing. Benefits include the MPSR and DPRS qualification granted to (A) by (C), and research experience in and publications on policing for (A). Recent work-integrated research project examples include: evaluation of a Culturally and Linguistically Diverse (CALD) training program for police recruits, an investigation into ethical police standards and the implications associated with crossing professional boundaries, and a case study analysis of whether earlier disclosure of evidence by Queensland police to the Office of the Director of Public Prosecutions reduces the length of case disposition.

For advocate (B), contributions include real-world professional practice environments and challenges in policing, and access to policing data and reports. Benefits to the police agency include greater evidence-based policing (Telep & Somers, 2019) and thereby increased police legitimacy, social and political recognition and community awareness of innovations in policing, and specific community policing problems addressed and promoted, with a focus on prevention programs. For example, a current work-integrated project concerns the investigation of viable ways to help Aboriginal and Torres Strait Islanders return to North Queensland after becoming homeless in Cairns as a result of long-distance travel to attend regional court hearings (Kinchin at al., 2016). Such projects complement other indigenous policing initiatives, such as Aboriginal Community Patrols aimed at intervention in situations where Indigenous people are "at risk of enmeshment in the criminal justice system, or where they face multiple hazards associated with community disorder, alcohol, drugs and violence" (Blagg & Valuri, 2004, p. 313).

For advocate (C), contributions include providing (A) with learning opportunities, the development of research and publishing skills, the advice and expertise of academic and other industry partners, a well-developed learning community of scholars, university resources, and the granting of accredited qualifications. Benefits to (C) include program and institutional recognition from, in this example, the Queensland Police Service, the Queensland Government, the University Southern Queensland academic community and broader society, an increase in the number of researching practitioners in Australia, the contribution of original knowledge to both policing and WIL, increased industry partnerships, and project artefacts in policing that increase public service effectiveness and capacity.

FIGURE 4: Applied model of work-integrated learning ecosystem using policing as the professional practice domain

For advocate (D), contributions include project advice to (A) and (C) on policing, specialist technical advice on policing, and support and recognition for, and credibility to, the Professional Studies program. Benefits to (D) include industry recognition for policing specialists, participation in a policing learning community, and professional linkages to other police officers and services. Advocate (E), in addition to funding, contributes in this example the Australian Qualifications Framework (AQF) and Quality Indicators Code for the Responsible Conduct of Research. Benefits to (E) include a more capable and qualified Queensland police force, increased evidence-based policing outcomes, and published policing research in the Australian context, which is lacking in the academic literature. For example, the contribution of a Professional Studies project, which examines whether restorative justice (Joudo-Larsen, 2014) is a more viable approach to youth offending than the current model, qualifies as both socially and governmentally important.

The Level 3 model also lists sub-advocates who contribute to the WIL ecosystem. These include: (A1) police service senior managers; (B1) peers, prosecutors, coroners and the general public and (B2) internal policing research sites and community sites, both of which directly participate in and draw from the communities in which they serve, as shown in Figure 4 and consistent with the philosophical underpinnings of co-op presented in Figure 3; (C1) policing content and research supervisors, (C2) statisticians, specialist librarians and counsellors, and (C3) University of Southern Queensland's research ethics committee; (D1) forensic scientists, criminologists, and social justice advocates; and (E1) the Research Training Program (RTP), which is the Australian Government's initiative to fund HDR programs and work-related research (C) and postgraduate student researchers (A).

Other important, but less-evident, features of the applied Level 3 policing model include: 1) seminars held by the Deputy Commissioner of Queensland Police Service to share information, coordinate problem solving, and update advocates (B) and (C) on the progress of research projects; 2) joint research and publishing projects conducted by (C1s), which involve participation by (As); and 3) the development of professional networks and initiatives which reach into other areas of professional practice and governance, particularly those involving (B) and (C) cooperating with (E).

DISCUSSION AND CONCLUSIONS

While the impact of this model on advocates and policing will be the topic of separate research, a preliminary observation is relevant in this context. To paraphrase one recent Queensland Police Service graduate from the MPSR program who investigated heavy earthmoving equipment theft in Queensland, the work-integrated learning ecosystem effectively embedded academic research practice and capacity within the Queensland Police Service, thereby supporting and furthering the collaborative goals of what he called the "Queensland Police Service Visiting Fellows Program". He reported the ecosystem model harnessed his curiosity and skills in identifying and addressing emergent and unique crime issues, and thereby helped build his individual and organizational capacity, confidence and expertise. In this way, the Professional Studies program fostered evidence-based policing, helping transition the Queensland Police Service from, in his words, an implementer to an innovator. In this way, he said, the program helped position the Queensland Police Service as a leading Australian law enforcement agency, informed and strengthened its operational practice through research, and applied academic rigor to the evaluation of police programs, strategies and outcomes.

According to this Senior Sergeant, the research he conducted under the auspices of the Professional Studies program therefore: a) delivered pioneering analysis and assessment of a unique crime class; b) made 16 recommendations to address crime reduction, data quality, and enhanced investigative

techniques; c) improved heavy equipment recovery and industry partnerships; and d) delivered the Queensland Police Service strategic goal of "working in partnership with the community to stop crime" In these and other ways it can be said the policing WIL ecosystem achieved its learner-centric goals while fulfilling its mission of social responsibility and justice.

Such views are reflective in Australia of those expounded by Reinhard et al. (2016) who said

> throughout the world, universities of cooperative education have had a major impact on their countries and regional economies, by preparing graduates for the world of work, applying their research skills to identifying the problems and needs of society and industry, and together finding solutions to those problems. (p. 249)

Indeed, Van der Laan and Ostini (2018) have explored innovation in higher education, pointing out that universities must "avoid becoming redundant in their mission to contribute to the advancement of communities, work, innovation, the economy, and ultimately society", and that HDR programs related to work should be "socially useful and make significant workplace and professional contributions rather than simply [resulting in] professional accreditation for working within universities" (p. 11). Thus, programs such Professional Studies, which shift the "balance of power" by promoting "an equal partnership between the academy and the workplace" (Wildy et al., 2015, p. 765), should be "valued by universities and society for [their] role in developing provident futures" (van der Laan & Ostini, 2018, p. 11).

Van der Laan and Ostini (2018) have identified and explained some of the key challenges faced by higher education in achieving these so-called "provident futures", among them: a) postgraduate research programs which have been slow to adjust to social change by holding on to traditional paradigms related to quality of scholarship rather than research impact; b) lack of agreement in the higher education sector as to whether it is even the mission of a university to prepare people with workforce skills; c) the need to design educational models which address a shift (from economies built in the information age) to economies dependent on conceptual workers; and d) how to meet the "dramatic increase in demand for 'fit-for-future' postgraduate programs that develop higher-order [i.e., work-related] capabilities" (p. 4). "If the mission of universities is to educate, conduct research, and engage with their communities", van der Laan and Ostini go on to argue, "it is increasingly difficult to justify an attitude of detachment between universities and fit-for-work education especially as it relates to cognitive abilities" (p. 11).

Built on the foundations of a WIL pedagogy, the Professional Studies program at University of Southern Queensland has modeled a co-op approach, which embraces the potential of learning ecosystems across a variety of professional practice domains. Research from these domains, both in an organizational context and increasingly from a non-employment, non-workplace specific perspective, is beginning to emerge in the published literature. Such development persuasively, albeit now only partially, speaks to the type of innovation in higher education necessary for universities to engage with communities and work environments, and reaches beyond the mere economic to engage society and build individual and institutional agency through programs which have mostly replaced the standard "one-size-fits-all" model by embracing a "fit-for-future", multidisciplinary approach to higher education. The application of WIL ecosystems to professional practice domains (such as policing, nursing, and so on) is one such example of this approach, but further research into ecosystems and their broader implication for work-related contexts should prove fruitful.

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