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At the intersection: an Australian model of work-based learning and research

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ABSTRACT

In work-based learning (WBL), autodidactic, informal, nonformal, and formal approaches to learning are viewed not as dichotomous, distinct, or divergent spheres along a continuum but as intersected and clustered spheres. In WBL, prior learning, professional development, advanced standing, and other forms of learning are therefore formally recognised and used to guide future learning; the past merges with the future, informal learning inspires formal learning, work experience and professional practice inform and animate scholarship, and the personal combines with the professional to create a rich and well-considered hybridised learning experience. Using a proto-theoretical model of learning at the postgraduate level, this paper examines the nature of this intersected learning space and provides a real-world example from an Australian postgraduate WBL degree programme to vitalise and concretise the proto-theory. To effectively approach and begin the systematic interrogation of work environments and complex work-related problems, which is a hallmark of WBL, every necessary form of learning must be brought to bear on (or at the least be made available to) practitioners who seek to understand and adapt to the situatedness of rapidly changing work. In so addressing, this paper contributes to the literature on WBL as it has been applied to higher education.

KEYWORDS

Work-based learning; work-based research; higher education; work

Introduction

In the last 30 years, work environments have been identified as fertile settings of learning. As a result, 'learning' has itself taken on new meaning, and its relationship to education and research, for example in medical education (Morris 2019), has evolved in ways unheard of until the late twentieth century. It is to this evolving, and sometimes problematic, view of learning that the present paper is concerned.

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While not traditionally associated with learning, much less formal education, 'work environments' as locations of learning and the practice of 'work' as material for research have gained currency in institutions of higher education, particularly in countries such as United Kingdom, New Zealand, and Australia. 'Work', in this sense, 'can be any form of work or purposive activity that gives rise to learning' (Lester and Costley 2010, 563). Such associations between work environments, work as practice, learning, higher education, and research have been cast as distinct pedagogies, the most common being work-based learning (WBL), workplace learning (WPL), work-integrated learning (WIL), and work-applied management (WAM). Collectively, these have been classified under umbrella terms like 'work-related learning' and 'work-oriented learning' (Fergusson and van der Laan 2021b).

Among the indispensable characteristics of these associations, theories, and practices – which encompass notions of reflective practice, transdisciplinarity, Mode 2 education, co-operative education, learning ecosystems, new forms of collaborative learning, and authentic assessment – have been explored. These associations have been further advanced in the last ten years with the application of new technologies, challenging traditional conceptions of access, inclusivity, and equity, often facilitated by mobile digital devices and recast as work-based mobile learning (WBML).

This author previously investigated two interrelated learning and workplace issues: 1) WBL and research, and 2) their compatibility with different modes of learning in work environments (Fergusson 2022). Five general categories of learning types were identified – reflective learning, empathetic learning, action-oriented learning, scholarly and applied learning, and social and environmental learning – along with 12 specific modes of WBL and research, ranging iteratively from reflective practice and on-the-job observing, making, and tinkering through to higher-level learning, such as researching and experimenting, teaching, training, helping others, and creating sustainable futures. Work-based learning and research have thereby proven useful to working professionals because they provide numerous opportunities to examine work environments and encourage multiple modes through which learning about them can occur.

The foundations of WBL as a transdiscipline – in contrast to the monodisciplinarity of traditional forms of Mode 1 education, the collaborative approaches of interdisciplinarity, and the multidisciplinarity of team problem solving – have also been examined (Fergusson and van der Laan 2021a). In that earlier context, WBL was conceptualised to include not only the cross-disciplinary collaboration of neighbouring fields of study with domains of professional practice but was augmented with other elements of learning, such as action research, advanced practice professionalism (APP), and competency and capability models and frameworks. Mixed

methods approaches to researching the complexity of 'messy' work-related problems and social environments have also been advanced in its name.

Using these transdisciplinary configurations, WBL therefore represents a novel way to not only examine work environments and their problems but may also be an innovative way to look at and learn from work. Such opportunities can potentially lead to greater insight, understanding, resilience, and sustainability (Fergusson, van der Laan, Ormsby, et al. 2020). In light of the COVID-19 pandemic and technological changes to workplace practices and habits, including increased working from home and the impact of digitisation on work, Gerards, de Grip, and Weustink (2020, 1201) ask if novel approaches to learning have evolved into what they call 'new ways of working' while questioning if they affect informal learning at work.

In the present study, the author takes this ongoing analysis of the learning and work paradigm further by considering how WBL and research operate at the intersection of different forms and approaches to learning and by providing a working example from a postgraduate programme in Australia to illustrate how enhanced WBL and research can be achieved. Such analysis is relevant because

scholars have pointed out the problems of a knowledge-transmission paradigm of education rooted in industrialism, such as uniform teaching and learning, teacher-centric methods, standardised assessment, and learning by acquisition [i.e. Mode 1 education]. Higher education intuitions [sic] have [therefore] explored new methods of teaching and learning with the integration of technologies to move away from knowledge transmission to knowledge creation, and to provide [work-based] students with more flexible learning opportunities (Cha and So 2020, 136).

It is not within scope to explain every dimension of WBL as a pedagogy nor distinguish it from other work-related pedagogies, but I have done so elsewhere (Fergusson and van der Laan 2021b). However, in summary, WBL can be described as a pedagogy in which mid-career and senior professionals use their work practice and context as fundamental components of learning by participating in higher education programmes deliberately designed to integrate learning and practice, resulting in a higher degree award (Ball and Manwaring 2010). According to Costley and Lester (2012, 259), WBL therefore 'sits in the university as a transdisciplinary field in its own right, rather than as a mode of learning within a specific area of study'. It is to this transdisciplinary nature of WBL that this paper approaches the topic of learning.

The learning spectrum

Learning at work is considered a key performance indicator (Moore and Klein 2020) and has been associated with positive employee attitudes, organisational commitment, job performance, turnover intention, and

retention (Yoon et al. 2018). In other words, learning can reasonably be treated as a central and indispensable part of a successful work environment and of constructive work engagement. Such a viewpoint is even more important when rapidly changing technologies suggest 'employees must learn quickly, efficiently and continuously – to not miss out on innovations or technological leaps' (Richter, Kortsch, and Kauffeld 2020, 514).

Four generic spheres of learning have been identified: autodidactic learning; informal learning; nonformal learning; and formal learning. Some theorists have proposed these four spheres sit sequentially on a continuum or spectrum of learning, with self-learning at one end and formal, classroom learning at the other (e.g. Jagušt, Botički, and So 2018; Zürcher 2015). This view posits a kind of 'dichotomous positioning' of learning (Berman 2020, 127), and the following four descriptions follow this proposed sequence.

Autodidactic learning

Fisher and Fisher (2007, 515) maintained the term 'autodidacticism' is 'deeply problematic' because of its historical associations with self-taught political activists in the early twentieth century (for example, they cite Jean-Paul Sartre's reference to an autodidact as a 'self-deluded dilettante'). However, De Troyer et al. (2020) more recent definition of autodidacticism as self-regulated learning—i.e. a self-guided and self-regulated learning process motivated by curiosity, personal impulse, and a creative spirit – is more typical. Unlike the self-motivated learner of Sartre's contempt, the autodidact of the twentieth-first century is 'generally seen as someone who has acquired high levels of expertise, usually in a particular field, through self-education. This aspect of high achievement within a field is . . . an important dimension of what an autodidact is' (Fisher and Fisher 2007, 516).

Self-regulated learning is sometimes driven by professional need, such as the need to solve a problem or gain a skill for which no formal training is available or has been acquired, but most often is motivated by the setting of personal achievement goals. Autodidactic learning thus typically occurs independently of organisations, teachers, schools, and classrooms. Examples of autodidactic practice can include self-directed reading and study, asking questions of others, conducting web searches, engaging in hands-on experience, and utilising multiple forms of self-motivated knowledge and skills acquisition.

Famous autodidacts include Leonardo de Vinci, but history, and indeed every field of professional practice, is awash with examples, such as Mary Anning (palaeontology), William Blake (literature), Gustave Eiffel (engineering), Michael Faraday (electrochemistry), David Hume (philosophy and history), Frida Kahlo (visual art), Mary Montagu (medicine), and Nikola Tesla (electrical engineering).

Informal learning

Like autodidacticism, informal learning is self-regulated, but in this case occurs within an organisation while remaining outside the framework of organised training or a set syllabus or curriculum. Lischewski et al. (2020, 3) define informal learning as 'not organized, [with] no set objectives in terms of learning outcomes and . . . not always intentional'. Often referred to as 'learning by experience' or 'real-world learning', informal learning does not lead to any form of certification and is often unintentional but can be seen as supplementary to nonformal or formal learning.

Moore and Klein (2020) have investigated the nature of informal learning, listing examples which include unstructured mentoring, structured critiquing sessions of one's own or others' work with peers or supervisors, reviewing the development or history of task procedures or conditions, coaching by non-specialists, building a community of practice, engagement with workplace simulations, games or podcasts, and official and/or unofficial on-site meetings and troubleshooting sessions extending to participation in seminars and off-site conferences. Despite companies spending most of their training budgets on nonformal and formal learning, Yoon et al. (2018) have pointed out that 70% of learning in the workplace is actually obtained via informal pathways; Jeong et al. (2018) and Cerasoli et al. (2018) put the figure at 70–80%. Eraut's (2010) earlier research on informal learning and work reinforces this conclusion.

Nonformal learning

Like informal learning, nonformal learning takes place outside a formal educational setting but within a structured (i.e. intentional) learning environment (Brown, Dunlop, and Scally 2020). Similarly, nonformal learning does not lead to a formal, accredited qualification but may lead to some form of certification, such as a 'certificate of completion'. However, unlike informal learning, nonformal learning does involve a mediator or authoritative learning guide (e.g. a team leader providing professional development within a company, or a boy scout leader training teenagers in first aid).

According to Lischewski et al. (2020, 3), nonformal learning 'usually takes place at the workplace or in further education and training institutions or in civil society organizations and groups'. Described by De Troyer et al. (2020) as 'semi-formal learning' and as 'semi-structured learning' by Brown, Dunlop, and Scally (2020), nonformal learning is 'a planned, but very adaptable activity set up by an institution or organization. It consists of learning embedded in planned activities that are not explicitly designed as learning but contain an important learning element' (De Troyer et al. 2020, 1).

Formal learning

Formal learning is associated with traditional classrooms and educational institutions; it is intentional and follows pre-planned and structured syllabi and curricula. Formal learning also conforms to the standardised and approved processes of teaching, learning, and assessment, and is thus described as 'a structured way of learning that usually takes place in a classroom environment, outside of the workplace. In addition, formal learning tends to be premised on pedagogical and fixed specifications' (Richter, Kortsch, and Kauffeld 2020, 516). Formal learning is therefore hierarchically structured and typically circumscribed by specific subjects and siloed disciplines, leading to some form of certification, such as a high school diploma, a college undergraduate or postgraduate degree, or other form of recognised (i.e. accredited) qualification.

However, these four spheres of learning are not well suited to placement along a continuum. As Berman (2020, 133) recently pointed out, the notion of a continuum from less formal to more formal learning creates 'false dichotomies'. To better understand these four spheres and their relation to each other in general and to WBL in particular, a clustering of learning types, as shown in the proto-theoretical model of learning presented in Figure 1, is more applicable. Such a view allows for an overlapping and simultaneous interaction of learning types, a key notion advanced in WBL pedagogy. It should, however, be pointed out that this model of clustered learning is significantly different from blended learning in which students participate in both online and face-to-face learning, usually within one or other of the spheres.

Figure 1 shows that WBL and work-related research are located at the intersection of the four learning spheres. In other words, WBL and the research generated by it contain elements and features from each of the four overlapping spheres. Such a view has been expressed by the founders of WBL

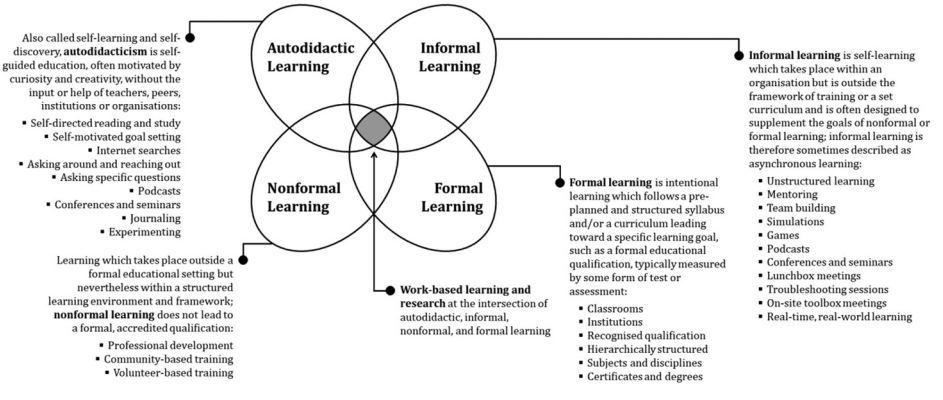

Figure 1. Proto-theoretical model locating WBL and research at the intersection of autodidactic, informal, nonformal, and formal learning.

Stan Lester and Carol Costley (cited by Lester and Crawford–Lee 2022, 787) when they state 'work-based learning . . . can be defined as *all and any learning* that is situated in the workplace or arises directly out of workplace concerns'. Lester and Crawford–Lee (2022, 787) go on to say 'WBL . . . programmes in [higher education] span a broad spectrum of activities, but they are *united by combining practical and theoretical learning* as well as enabling learning at or through work to contribute directly to academic recognition'.

A similar intersection of learning spheres applies to the bridging of prior learning types with planned future learning types in WBL. Thus, founders of WBL have proposed the transdisciplinarity of WBL also clusters learning and

> should provide the starting point and the foundation for the work-based programme through processes such as helping learners to engage in critical reflection, evaluate past learning in relation to future goals, and engage in self-discovery and self-evaluation, particularly in relation to organising ideas and planning future learning. More recently *the distinction between prior and planned learning has begun to be challenged*. (Lester and Costley 2010, 564)

Italics have been used in these (and later) quotations to highlight the key concepts advanced by Lester and his colleagues as they pertain to this study.

This notion of a 'hybrid format' for effective learning (Caldana et al. 2021), which combines and integrates autodidactic, informal, nonformal, and formal learning opportunities by creating 'co-existing contradictions' (Garnett, Abraham, and Abraham 2016), is consistent with that advanced by Caldana et al. (2021) in the context of sustainable development competencies and by Essomba et al. (2022) in the context of education for sustainable development. It is to this intersection of learning spheres that the remaining parts of this paper will now focus.

Work+learning

Figure 2 takes the proto-theoretical model of overlapping learning types and applies it specifically to work and work environments, accompanied with work-based examples of the four spheres of learning.

Work + autodidactic learning

This least formal aspect of learning can be inspired by management or be solely self-motivated in WBL, but for the practitioner to be a 'self-regulating professional' (Jackson 2010) or a 'self-directed learner' (Lester and Costley 2010) it begins with an ability for sustained and critical reflection (Helyer 2015). Due to its centrality, reflective practice is said to help build specialist knowledge and skills, encourage independent research, and promote lifelong and lifewide learning.

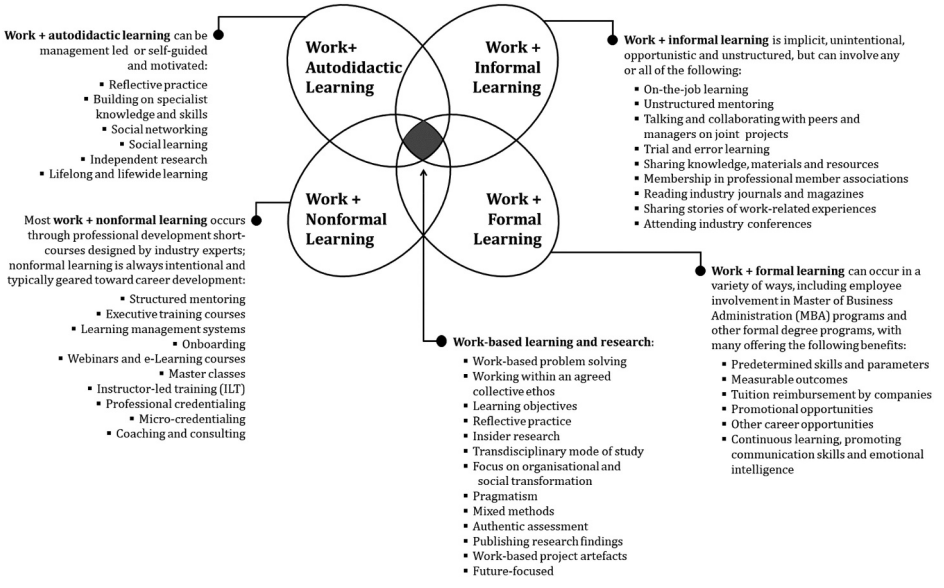

Figure 2. Proto-theoretical model of learning in WBL and its emergence from the intersection of autodidactic, informal, nonformal, and formal learning as practiced in relation to work.

This is what Jackson (2010) meant when he referred to a personal development plan (PDP) of the self-regulating professional, which allows practitioners to 'monitor, build and reflect upon their personal development'. The PDP is 'a structured and supported process undertaken by a learner to reflect upon *their own learning*, performance and/or achievement and to plan for their personal, educational and career development'. However, the development of PDPs, while directed at autodidactic learning, can also be externally imposed, as was the case in the UK example presented by Thompson et al. (2009), and may thus not be truly self-inspired.

Work + informal learning

Moore and Kleins' (2020) analysis of informal learning at work is extensive and informative. Their survey of 385 practitioners to investigate how informal learning is facilitated in work environments found that 'sharing knowledge, materials, and resources emerged as the most common approach' (219). However, other informal approaches, including collaborating with peers and managers on projects of joint interest, learning from trial and error, unstructured mentoring, and so on, each contribute meaningfully to learning in WBL. In the early years of WBL, Lester and Costley (2010, 562) pointed out that 'the great majority of [WBL] *learning is not accredited or otherwise formally recognised*, although arguably much of it has the potential to be'.

Work + nonformal learning

In work contexts, nonformal learning is generally related to professional development (PD), also called 'executive training' in some settings, with emphases placed on training for board readiness, general leadership, team leadership, and negotiating, among other management topics. Professional development may also result in a micro- or professional credential and is common in professional practice domains such as policing, teaching, and nursing (Mlambo, Silén, and McGrath 2021). Nevertheless, other approaches to nonformal learning, such as structured mentoring, coaching, and consulting, are also accepted forms (David and Clutterbuck 2016).

Work + formal learning

The relationship between work and formal education in the last 30 years has mostly been centred on Master of Business Administration (MBA) degree programmes, typically taken part-time. Areas of specialisation in MBAs include accounting, finance, human resources, innovation management, international management, information systems, marketing, manufacturing, health management, and organisational science (Roetzel 2019). But other forms of formal higher education also apply, including business psychology and business-related psychotherapy degree programmes. Advantages of such formal approaches to learning while working include the development of predetermined and measurable knowledge, skills, and parameters, the possibility of tuition fee reimbursement by the employer, and the opportunity to participate in continuous learning leading to promotion and other career advancement opportunities.

Learning at the intersection in WBL

As shown in Figure 2, a significant amount of learning, some of it quite unique, occurs in the intersected space between autodidactic, informal, nonformal, and formal learning. Indeed, several learnings can almost only occur at this intersection. For example, problem solving in work environments requires the integration of: 1) a work-related problem; 2) a willingness and approval from the organisation to understand and tackle the problem; 3) a professional or team of professionals who have the resources and desire to address, and are in fact charged with addressing, the work-related problem; 4) the time to learn about the problem in order to know its boundaries, characteristics, and impacts; and finally 5) a set of methodological research skills (such as mixed methodologies and authentic assessment) to investigate the problem and develop recommendations and ways to successfully engage it. Many of these intersected types of learning,

including the ability for effective insider research and work-based reflective practice, are the hallmarks of WBL and are echoed in the following case example.

An Australian example of work-based learning and research

Because WBL is advocated and practiced within the formal constraints of higher education by researching practitioners (Lester and Crawford–Lee 2022), Figure 2 could have highlighted formal learning to acknowledge this reality. But in so doing, the model might have inadvertently elevated the importance of formal learning and undercut (or at least imply a lesser role for) autodidactic, informal, and nonformal learning in WBL. This would be incorrect: all four clustered spheres of learning are integral to it, as can be seen in the example of the Professional Studies programme at the University of Southern Queensland, a postgraduate research programme engineered on the foundations of WBL pedagogy. The programme and examples from it are presented hereafter not for promotional purposes but expository ones. Without concrete, real-world examples of clustered learning, theories of learning in WBL will likely remain conjectural and prone to confusion.

Professional Studies encourages learning across, and from within, all four spheres of learning. Clustered work-based features of this programme include: 1) focusing on work-based problem solving with an eye to organisational and social transformation while working within an agreed and shared study ethos (Fergusson, van der Laan, and Baker 2019; 2) establishing objectives which guide learning and research; 3) applying and refining the formal application of micro- and macro-reflective cycles to research (Fergusson et al. 2019; Fergusson, van der Laan, Shallies, et al. 2020); positioning the 'scholarly professional' as an insider researcher; 4) thinking in a transdisciplinary way about learning (Fergusson and van der Laan 2021a); 5) applying the rules of Pragmatism, mixed methods research, and authentic assessment (Fergusson et al. 2022); and 6) producing work-based artefacts and publishable findings.

In parallel to working and studying, which lead to an accredited postgraduate degree, the programme is designed to embolden mid- and senior-career professionals to engage in continuous autodidactic learning and self-discovery (through PDPs, reflective practice, self-directed reading and studying, and self-motivated goal setting), informal learning (by talking and collaborating with peers in the workplace, and sharing knowledge), and nonformal learning (such as structured mentoring and professional credentialing through PD).

Multiple transdisciplinary areas of work-based research in Professional Studies occur at the intersection of the four spheres of learning. Current projects include nursing, policing, emergency

services, midwifery and dietetics, education, sustainability and the law, consulting and project management, public relations and new media, sports science and exercise science, workplace health and safety, social services and human welfare, community-led development, culturally and linguistically diverse recruitment, and indigenous studies. While this list may superficially be interpreted as including traditional academic disciplines (e.g. education, sports science, and nursing) and areas of study and professional practice domains (e.g. policing, emergency services, and project management), these areas of research are in fact transdisciplinary and clustered when purposely guided by a WBL and research pedagogy.

Table 1 presents five, high-level examples of these WBL and research projects from the Professional Studies programme, including topic of investigation, name of transdisciplinary areas of study, work-based problem, aim of the study, the method and research design employed by the study, and the type of work-based artefact generated by them.

The transdisciplinary, clustered features of the programme can be seen in its structure, presented graphically in Figure 3. These structural features are explained by the accompanying descriptive elements of one Masters student's learning and research project ('TPM', is an Acting Inspector and strategy and performance officer with, what in this paper I refer to as, a large police service [LPS] in Australia).

Developing a programme of work-based study begins with the practitioner identifying a suitable topic of investigation (feature A, in Figure 3). TPM's topic was: Critical police incidents and organisational learning. Such topics are embedded in a work environment and involve addressing a real-world, work-related problem (i.e. understanding or elucidating a problem but not necessarily seeking a solution to it). TPM's problem statement was:

> A direct relationship between drug use, consumption of alcohol, mental health and violent crime has been identified. Internal police data also indicate a steady and persistent increase in violent confrontations with police, precipitated by drug- and alcohol-fueled violence and/or mental health issues. While every effort is made to de-escalate and peacefully resolve such confrontations, at times they result in police having to use lethal force resulting in the serious injury or death of an assailant.
>
> As these 'critical police incidents' continue to rise, consistent with policy, procedure, legislation and community expectations, there is an increased demand to demonstrate effective and transparent methods of analysing and understanding the actions of officers. Further, there is an increasing demand for the LPS to demonstrate its preparedness for continuous improvement as a contemporary learning organisation.

The topic is then investigated along two streams of learning: (B) a work-based *learning* project situated in the work environment; and (C) a work-based *research* project situated in the formal academic environment of the

Table 1. Examples of Australian work-based learning and research projects.

Topic of Investigation	Transdisciplinary Area of Study	Work-Based Problem	Aim of the Study	Method and Design	Work-Based Artefact
High-risk antenatal women's perceptions of dietitian appointments: A work-based study of fail-to-attend rates in the West Moreton Hospital and Health Service	Midwifery and dietetics	Maternal overweight and obesity, underweight, and previous bariatric surgery prior to pregnancy are high-risk conditions that increase the likelihood of adverse health issues for mother and baby; these conditions cost a health service more than the pregnancy of a mother in the healthy weight range; therefore, controlling gestational weight gain is an important strategy to manage risk during pregnancy	50% of women referred by the antenatal department to a dietitian do not engage with the dietetics department or keep appointments; this study was designed to determine the possible reasons for this disengagement	Mixed methods cross-sectional study of primary quantitative data and semi-structured interviews	Thesis-by-publication and published research paper
A framework agreement on environmental impact assessment (EIA) for the Association of South-East Asian Nations (ASEAN)	Sustainability and the law	Unless a more effective system of environmental and social governance (ESG) can be implemented across ASEAN, the environmental impacts of future infrastructure developments will be catastrophic	Review of commonalities in EIA; identify principles of EIA and emerging issues in ASEAN (including emerging areas of international concerns defined by the Conference of Parties [COP]); develop ASEAN EIA framework	Conceptual study based on work-based data and ASEAN statistics	Thesis-by-publication; published research papers of regional EIA framework; and policy recommendations
Future proofing Queensland Fire and Emergency Services (QFES) through a possible medical first responder capability	Emergency services	Demand for emergency health services in Queensland, Australia is above the national average for service call outs; this level of demand places an increasing strain on first response organisations, such as the Queensland Ambulance Service (QAS)	To determine whether QFES can undertake a medical first responder role thereby contributing positively to better patient outcomes and reduce the emergency response workload of the QAS	Qualitative study of semi-structured interview data derived from senior management and union viewpoints	Policy recommendations in standard thesis

(*Continued*)

Table 1. (Continued).

Topic of Investigation	Transdisciplinary Area of Study	Work-Based Problem	Aim of the Study	Method and Design	Work-Based Artefact
Corporate improvement in project management: A design thinking approach investigating an adaptable model	Consulting and project management	Organisational portfolio, program, and project management (OP3M) is integral to achieving efficient and effective business outcomes; however, OP3M is often overlooked or applied in piecemeal ways; this problem is exacerbated by factors such as non-alignment with business procedures, a lack of expertise in change management, and poorly targeted professional development programs coupled with a lack of effective succession planning and cultural competence	To develop an adaptable OP3M improvement model which addresses these issues and explore components for improvement in OP3M not previously considered or formalised	Mixed methods study of manager opinion, a large-scale quantitative survey of corporate practices, and five international case studies	Existing and future-fit corporate improvement models of OP3M
Managing operational information and intelligence using knowledge management principles: A work-based study at Queensland Police Service (QPS), Australia	Policing	QPS currently uses a networked system to manage, disseminate, store and retrieve operational information and intelligence related to crime in Queensland, however, there are limitations to this system and more advanced forms of organising, accessing and utilising such data have been advanced	The study focuses on developing a more effective way of managing, disseminating, storing, and retrieving operational information and intelligence through the development of an online solution designed using knowledge management principles	Mixed methods design of analytics data coupled with senior QPS officer opinion derived from semi-structured interviews and a time-in-motion study	Technical report

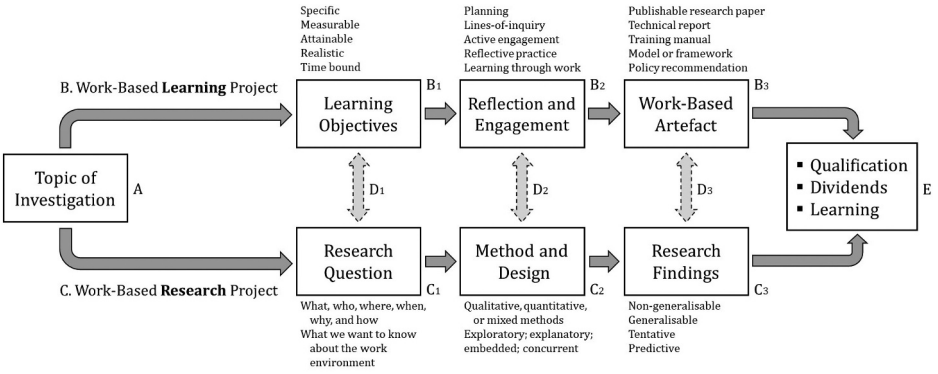

Figure 3. Design of the professional studies postgraduate programme which emerged from the intersection of learning spheres.

University. The work-based learning project has three main phases: (B_1) articulation of learning objectives (LOs), which are always SMART; (B_2) continued reflection and engagement, including planning and developing lines-of-inquiry to fulfil (B_1); and (B_3) generating a work-based artefact relevant to the organisation, such as a technical report or training manual as a consequence of (B_2) (B_3 is built largely on the evidence gained in C_3).

The work-based research project similarly has three phases: (C_1) development of a research question(s); (C_2) identification of an appropriate research method and design to investigate (C_1); and (C_3) presentation of research findings generated as a consequence of (C_2). At least conceptually, if not chronologically, the elements of streams (B) and (C) are run in parallel and inform each other.

Work-based learning project

Based on reflective practice and guided by Kolb's taxonomy of learning, LOs are designed to help the practitioner identify, and then work towards achieving, specific learning goals to be achieved as a result of the programme. In this way, LOs are the core of the practitioner's personalised learning plan and can be identified as a feature in earlier iterations of WBL pedagogy (e.g. Lester and Costley 2010). In TPM's case, LOs (B_1) included: 'To leverage my personal potential and capabilities to drive change within the LPS regarding the knowledge management of critical police incidents'; and 'To conduct rigorous research which combines academic and professional perspectives with a direct alignment to critical police incidents which occurred between 2015 and 2021'.

Reflection on prior learning and LOs and engagement with real-world work experiences (B_2) includes use of the CV Tool, a bespoke iterative

instrument developed by Luke van der Laan for the programme (Fergusson, Allred, and Dux 2018), which encourages the practitioner to reflect inwardly on personal and professional beliefs (i.e. micro-reflection) and outwardly on their practice and the wider organisational, social, and political conditions in which their practice is situated (i.e. macro-reflection).

In the case of TPM, the work-based learning project culminated in the development of a 'conceptual framework' (B_3) based on case data from within the LPS and five coronial investigations of critical police incidents. The conceptual framework had five main levels: 1) mandate and commitment; 2) governance and assurance; 3) policy; 4) process; and 5) management systems, with the State Government's coronial framework used to guide the formation of the new LPS framework for investigating critical police incidents.

Work-based research project

Like LOs, research questions (C_1) are SMART (i.e. specific, measurable, achievable, realistic, and time bound). They provide an answer to the question: 'what does the practitioner want to know about the topic of investigation' (A). TPM posited four RQs to guide his investigation:

RQ 1: How and to what extent will analysing critical police incidents benefit organisational learning within the LPS;

RQ 2: What are the common themes of organisational learning and how do they contribute to an understanding of critical police incidents within the LPS;

RQ 3: What are the barriers and enablers of organisational learning, and how do they contribute to learning from critical police incidents within the LPS; and

RQ 4: As a result of asking and answering RQs 1, 2, and 3, can a conceptual framework explain the relationship between critical police incidents and organisational learning developed to aid the LPS in evidence-based decision-making and achieving continuous improvement?

Research questions are operationalised by the research method and design (C_2) which together indicate how the questions will be answered. Any one of the three methods are used in Professional Studies: qualitative; quantitative; or mixed methods. Any number of research designs have been applied, including: exploratory (QUAL > quan, or qual > QUAN); explanatory (QUAN > qual, or quan > QUAL); embedded (QUAL[quan]QUAL, or QUAN[qual]QUAN); or concurrent (QUAL || QUAN). In the case of TPM's research, a hybrid concurrent > explanatory design was used for

data gathering (quan || qual > QUAL), involving simultaneous quantitative analysis of data sourced from LPS's databases (quan) and qualitative analysis of six LPS critical police incident case studies (qual), followed by a larger scale qualitative examination of five coronial case studies (QUAL) before deduction of the conceptual framework.

Research findings (C_3) from this type of work-based research result in a wide variety of possible deliverables, but most cannot be generalised as they are based on either case studies or specific work environments. These types cannot legitimately be induced to other work environments or professional contexts but may provide opportunities for analytic generalisability. In TPM's case, research findings were tentative and non-generalisable.

Of interest are the parallelisms which occur between streams (B) and (C), denoted by D_1, D_2, D_3. Figure 3 indicates that direct (albeit tacit and informal) parallels exist between each stream: D_1 between LOs (B_1) and RQs (C_1) because both are SMART and because an RQ is the operationalised pathway to fulfilling LOs; D_2 between reflection and engagement (B_2) on the one hand and research method and design on the other (C_2) because both require critical reflection, planning, and implementation; and D_3 between the two 'products' or artefacts generated by each stream of learning, with C_3 informing (and being memorialised by) B_3.

The final intended programme achievement (E) occurs when the two streams of learning re-merge to hopefully produce three outcomes. First and most formal achievement is represented by the 'qualification' of the Professional Studies programme, which conforms to the Australian Qualifications Framework (AQF) certification at Level 9 for Masters and Level 10 for Doctoral postgraduate qualifications.

Unique to the programme is the notion of a 'quadruple dividend' (Fergusson 2022), the second intended programme achievement. Most postgraduate degree programmes focus on delivering one main dividend: the generation of research findings which contribute to the advancement of original disciplinary or practice-based knowledge. Professional Studies is also designed to deliver this standard dividend. However, it also seeks to deliver three other dividends: 1) a benefit to the *practitioner*, in the form of not only a degree qualification but improved standing within the organisation, increased personal and professional knowledge about a topic of importance to the organisation or area of praxis, and the possibility for widening the scope of one's professional practice and sense of professional identity; 2) a benefit to the *organisation*, in the form of data upon which evidence-based decision-making can take place and in the form of a memorialised artefact which can be applied for continuous organisational improvement; and 3) a (hopeful, but nevertheless intentional) contribution to the *future*. These four expected dividends have been summarised as being:

'to oneself; to one's organisation; to original knowledge; and perhaps, most importantly, to a more sustainable human and social future' (Fergusson 2022).

TPM's statement of dividends (with relevant italics added as indicative of learning at the intersection) said:

> The Professional Studies program had a profound effect on my standing as a scholarly professional and *lifelong learner*. The significant contribution of discretionary effort above and beyond normal work hours, over an extended period, *has been recognised* as a commitment to the LPS while completion of the program demonstrated an *ability to solve strategic problems and achieve practical outcomes*. The program further provided academic *competencies and capabilities*, such as critical thinking, research methodology, and academic writing.
>
> The result being an enhanced *professional identity* that continues to develop whereby I am more confident in leading my community of practice, influencing strategic direction, and *enhancing organisational performance*. Further, the research experience and knowledge gained throughout the program buoyed my desire to further proactively tackle *complex work-based problems* knowing I have the tools and critical thinking abilities to achieve successful outcomes.

The third and final possible achievement documented in Figure 3 pertains to encouraging whole person learning, and the practitioner's continued desire for lifelong and lifewide learning. Lifelong learning, and its association to nonformal PD offerings, has been established (e.g. Mlambo, Silén, and McGrath 2021). Moreover, the ongoing work in whole person learning (i.e. a pedagogy that 'celebrates diversity and innately promotes equality and inclusive learning') and lifewide learning (i.e. the 'move to a position where educationalists focus more on "learning how to learn" and moving … beyond the notion of simple "skill development"'), particularly after the COVID-19 pandemic (Cole and Coulson 2022, 87 and 84), are considered critical learning outcomes in WBL and refer explicitly to learning at the intersection of the aforementioned spheres.

At least partial evidence of these achievements can be seen in TPM's statement on the quadruple dividend, for example in his observation that the programme 'had a profound effect on my standing as a scholarly professional and *lifelong learner*'. This is surely what Gibson and Tavlaridis (2018, 5) meant when they said WBL aims at bestowing 'impactful learning experience'.

Conclusion

Three interconnected topics have been considered by this research. First, work environments, and the work conducted within them, have become increasingly interesting to scholars as complex sites of learning and

research. This observation is particularly true as technology has rapidly changed the nature of work, and WBL has over many years shown its relevance by addressing this change. While other forms of work and learning paradigms have been developed, WBL has proven particularly useful (and durable) due to its applicability in multiple domains of professional practice. For example, Lester and Crawford–Lee (2022) list nursing, policing, architecture, and health as noteworthy fields amendable to the principles of WBL, and their research suggests that WBL has proven especially resilient to adverse impacts of the COVID-19 pandemic.

Second, some educational theorists have proposed that different modes of learning sit on a continuum or spectrum, with the least formal approaches on one end and the most formal approaches on the other. For example, Jagušt, Botički, and So (2018, 417) maintain that informal and formal learning sit 'along a spectrum' with non-formal learning emerging somewhere between them. However, other theorists more realistically describe learning as a hybridised activity, for example in the clustered technical, relational, and transformational competencies of work (Rosenberg, Lotz-Sisitka, and Ramsarup 2018). This is certainly how learning has been conceived by the founders of WBL and is how I have conceived learning as it applies to WBL and to the Australian context presented in this study.

Third and finally, the present research provides concrete examples of this type of hybridised, intersected, or clustered learning from the Professional Studies programme. When applying the WBL pedagogy to higher education in Australia, one of the most important characteristics is its transdisciplinarity, which Garnett, Abraham, and Abraham (2016, 309), another leading advocate of WBL, has said is concerned with creating new *integrative knowledge* to address the complex problems of the world. Transdisciplinary knowledge is rooted in the messy problems of real life and is thus primarily emergent, complex, and embodied . . . transdisciplinarity is a *multi-dimensional methodology* based upon an epistemology which sees knowledge as emergent, an ontology that recognises *multiple levels of reality* and an *inclusive logic* which allows for *co-existing contradictions*.

These three interrelated topics – work environments, intersected learning, and real-world transdisciplinary examples – suggest WBL, and the research it engenders, provides the potential for novel but important insights into emergent work-related problems, problems which are always messy but can also be co-produced and sometimes wicked. To effectively approach and begin the systematic interrogation of work environments and complex work-related problems, every necessary form of learning must be brought to bear on (or at the least made available to) practitioners who seek to understand and adapt to the situatedness of rapidly changing work. The four types of learning identified in this study can also be integrated and complementarily provided to enhance learning outcomes for a more sustainable future.

Disclosure statement

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