# Leveraging a Diverse Collaboration in Tertiary Education to Develop Graduate Capability for Workplace Innovation

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## Abstract

Recent developments in tertiary education are demonstrating teaching and learning methods to develop students' capability for employee-led Workplace Innovation. In this article, we describe an international collaboration to develop shared learning resources and activities in workplace innovation for adaptation in diverse tertiary education contexts. We are intentionally seeking out additional collaborating institutions that differ in mission, size, location and student demographics, to leverage our team's diversity and encourage innovation.

When shared learning resources and activities are to be used in diverse contexts, some core principles underlying instructional success must also be shared in order to ensure adaptations do not remove key properties. We outline four instructional principles underlying the learning design and illustrate how these principles are applied in our current learning resources.

We then describe some of the ways that these shared resources have been adapted for different tertiary education environments. We also discuss some of the benefits emerging from the collaboration, including the inclusion of new resources targeting specific work domains and the transfer of new teaching and learning ideas across contexts.

We conclude by describing some of the ways we are also collaborating with workplace partners, to ensure that our graduates have the capabilities needed to contribute to workplace innovation practice and to help advance the workplace innovation capability of their own employees.

# Developing Capability for Workplace Innovation in Tertiary Education: An Overview

Employee-led Workplace Innovation engages employees from across an organization in "a participatory process of innovation, leading to empowering workplace practices and continuing learning and reflection" [Totterdill et al 2022]. Employee-led workplace innovation expands an organization's innovation mandate beyond traditional boundaries, e.g., where innovation may previously have been thought of as limited to Research and Development or Information Technology units. The importance of workplace innovation lies on its positive impact on employee's quality of work life and improved performance benefiting the employer [Pot et al 2016].

While teaching and learning for Entrepreneurship capability is an established activity in tertiary education [Bischoff et al 2018], teaching and learning for capability in employee-led Workplace Innovation is a more recent development. Initiatives to develop workplace innovation capability in tertiary education reflect a growing recognition that "innovation and entrepreneurship are not only distinct concepts, but they also play out in postsecondary institutional contexts in different ways" [Swayne et al 2019, p. 738]. Tertiary institutions are beginning to recognize that all students should have opportunities to engage with innovative and entrepreneurial workplace activities [Hamouda 2018; Hero & Lindfors 2019], as a core graduate attribute for the future of work.

## A Diverse Collaboration to Develop Graduate Capability for Workplace Innovation

Our use of "collaborating" follows the distinction frequently made in tertiary education between collaborative learning and cooperative learning: collaborative learning as joint work toward shared outcomes (which may involve working separately on parallel activities) and cooperative learning as working together to develop parallel outcomes in their own projects [adapted from Davidson & Major 2014]. While we have initiated co-operative work to share ideas with some of the other initiatives cited above, our collaborating institutional partners are developing and sharing a body of learning resources and activities designed to be adaptable for a diverse set of institutional contexts (with projects at individual institutions deciding when closer cooperation with other teams would be of value).

There have been other collaborative efforts in tertiary education to develop graduate capability (e.g., FUSION [Blueprint 2022]) and recent collaborations to develop capability in workplace innovation (e.g., FINCODA [Pérez-Peñalver et al 2016]). These collaborations have typically brought together institutions with similar characteristics in terms of mission, program range and student demographics, with the rationale that sharing learning resources and activities would be simpler for similar institutions.

Our collaboration is based on a different rationale, adapted from exemplary practices for innovation projects: the likelihood of breakthrough innovation is higher when the team is more diverse [Garcia Martinez et al 2017]. We have intentionally sought out collaborating institutions that differ in mission, size, location and student demographics. We have also encouraged them to plan for a diverse mix of course unit and program contexts: curricular and co-curricular, short credentials and program concentrations, etc. Finally, we have built shared learning resources and activities which can be used by a diversity of tertiary educators: if capability for workplace innovation is to become an attribute to be achieved by all graduates – in parallel with other Power Skills [Paterson 2019] such as critical thinking, teamwork, etc. – we will need to find ways for a broad range of educators to become involved.

When shared learning resources and activities are to be used in a diverse set of contexts, some common understanding of the core principles is required to ensure that adaptations do not remove the key properties for success (a requirement that we reinforce in one of those shared resources, on Innovation Adaptation, described below). In the next section, we outline the four common principles underlying the learning design of our shared resources and activities, which are intended to allow them to be adapted across tertiary education contexts (and re-purposed for a variety of work domains). We also illustrate how these principles are applied in our current learning resources.

That discussion is followed by a section in which we describe some of the ways that these shared resources have been adapted for different tertiary education environments. We also discuss some of the benefits emerging from the collaboration, including how the design for adaptability has facilitated inclusion of new resources targeting specific work domains or program needs, and the transfer of new teaching and learning ideas across contexts.

Our concluding section relates some of the ways we are also collaborating with workplace partners, to ensure that our graduates have the capabilities needed to advance workplace innovation practice and impact and to help them advance their own capability development for innovation. These vignettes from our work are examples of the multiple opportunities for tertiary education and workplace partners to share research insights, resources and exemplary practices for developing workplace innovation capability.

# Shared Principles Enable Development of Adaptable Learning Resources and Activities

Three academic initiatives have played significant roles in the development of our adaptable instructional design and learning resources to date:

- Some initial ideas were pilot tested within a Faculty of Arts at a regional polytechnic university (dual sector) in Canada [Dastur et al 2019], with collaboration from the Faculty of Design. Further work in this institution was suspended during the pandemic As a result, the rest of this discussion will focus largely on two other institutions who followed up with adaptations and extensions of the resources and activities in that original pilot.

- Building on that initial work, further development in the Faculty of Arts at a major urban research-intensive university in Australia resulted in a new course unit, *Understanding Workplace Innovation* [Nobis et al 2022], and a new work-integrated learning *Innovation Project* course. Enrolment in the first unit has grown from the 2020 pilot offering for 40 students to 360 students in 2023.

- Significant change to an existing course unit on *Creativity and Innovation* in a School of Business at a regional teaching-intensive university in Canada, including replacing half of the previous content with adaptations of the shared learning resources and activities for workplace innovation [Nobis et al 2022].

More information about Learning Outcomes and Student Reflections is available in publications from these three overlapping developments [Dastur et al 2019; Nobis et al 2022; Baregheh & Carey 2022]. The ongoing emergence of employee-led workplace innovation as a graduate capability was highlighted when our collaboration won an award in the 2022 annual Innovation and Entrepreneurship Teaching Excellence competition in Europe [WINCan 2022].

Another Canadian research university recently began collaborating with us on new offerings – launched in 2023 – within their innovative format[1] for preparing students for internship work placements; in parallel, we are in the process of adding more diverse institutions (e.g., technical colleges) and additional formats (e.g., as part of management training programs for Skilled Trades graduates[2]) to further expand our collaboratory. Individual instructors have also begun to adapt specific topics and tasks for their institutional contexts.

In addition to these partnerships to create and share adaptable learning resources and activities, a collaboration with a National Teaching Fellowship project in Australia on The Future

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[1] https://www.artsci.utoronto.ca/faculty-staff/experiential-learning/arts-science-internship-program

[2] E.g., https://tradesecrets.alberta.ca/become-certified/business-competencies-blue-seal/

of the B.A. [Gannaway 2020] contributed to the rationale for interdisciplinary teaching and learning of innovation capability within the context of a Faculty of Humanities, Arts and Social Sciences [Gannaway & Carey 2019, 2022]. This also led directly to our Minimum Viable Prototype course unit and eventual full Implementation in the Faculty of Arts outlined above.

**Shared Principles, Local Adaptation**: four shared principles have provided a framework to encourage multiple adaptations of our resources and activities for diverse contexts:

1. A progression of innovation activities, growing in complexity, diversity and uncertainty
2. Online learning resources with example innovation cases across multiple work domains
3. Innovation activities to develop capability via project tasks, within our own 'workplace for learning' in tertiary education
4. A shared framework for the capability required in workplace innovation, including Skills, Knowledge, Mindsets (e.g., Identity, Self-Efficacy and Motivation) and Experiences.

We next describe each of these shared principles in more detail. This is followed by a section which highlights the adaptations developed for different contexts and shows how those adaptations can lead to new insights applicable elsewhere.

## Principle 1: Workplace Innovation Experiences as a Progression of Learning Activities

All of our collaborating institutions apply a common core instructional design, where students move progressively through a sequence of innovation experiences (see Figure 1) in two stages:

➢ Working through an online learning resource on a particular workplace innovation activity, including a conceptual introduction and multiple example case studies.
➢ Engaging in an applied project to develop, demonstrate and document their understanding, skills and mindsets for workplace innovation.

Figure 1 illustrates the sequence of innovation experiences described and illustrated in the online learning resources, which address progressively more complex innovation challenges involving larger and more diverse project teams. The selected innovation experiences in the sequence have been identified from past workplace innovation research – e.g., [Oeij & Dhondt 2017] for Job Crafting – and from our own ongoing academic-workplace collaborations (described in the concluding section of this article).

**Figure 1: A Progression of Experiences in Workplace**
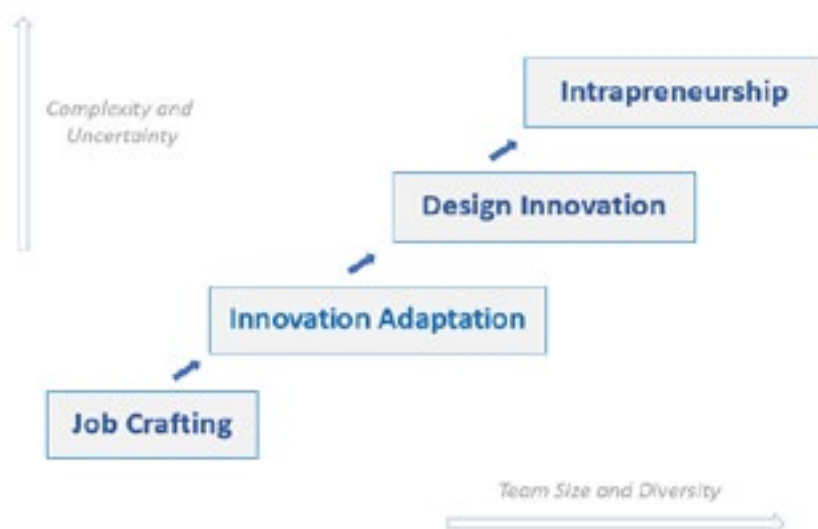


***Job Crafting*** [Berg et al 2008, 2013] has been extensively applied as a way for employees across sectors – Business, Public and Community/Social – to innovatively rethink their workplace activities, aiming to improve both organizational performance and their own quality of work life. Viewed as a simple instance of Workplace Innovation [e.g., Oeij & Dhondt 2017], the social process of Job Crafting typically involves only an employee and a direct manager.

***Innovation Adaptation*** is an analytical and redesign process through which an innovative work practice from a different workplace context is assessed by workplace teams for potential applicability within their own specific workplace context. Workplace teams engaging in Innovation Adaptation – sometimes referred to as Open Innovation [Serrat 2017] – must consider Adherence to the core principles for success of the innovation as well as Adaptation to the specific needs of their new context (a balance also referred to more formally as Fidelity of Implementation [Leko 2015]). The social process involves a local work team, representing those directly affected by the proposed innovative practice, and one or more of their managers.

***Design Innovation:*** For more complex or novel Design Innovation challenges where no known solutions suffice, our shared learning resources outline the process of Design Thinking as a 'social technology' [Liedtka et al 2021] for Design Innovation activities by cross-functional workplace teams to Discover, Define, Develop and Deliver innovative solutions (which can often include a reframing of the original challenge statement).

We should note here that Design Thinking is often the starting point for learners to engage with innovation activities within other tertiary institutions seeking to develop innovation capability across a broad spectrum of students [e.g., Hamouda 2018; Selznick 2019; Hero & Lindfors 2019]. Our decision to provide instead a gentler "on-ramp" to workplace innovation for our learners was driven by the following considerations:

- At our institutions, students across a broad range of program areas could choose the course units to develop innovation capability as an elective option (i.e., they were not a requirement of their program). We needed to engage students whose conceptions of innovation – and of themselves as innovators – could otherwise have been an obstacle to their full engagement. We expand on this concern in the Mindsets discussion below for Principle 4.

- The stepwise progression outlined above also fits well with workplace sectors where economic constraints require integration of the "think outside the box" strengths of Design Innovation and the "don't reinvent the wheel" strengths of Innovation Adaptation (e.g., in the Public sector [Stanhus & Nielsen 2021] and the Voluntary and Community sectors [McMurray et al 2013; Svensson et al 2020]).

- A progressive development of innovation capability supports the strategy of workplaces seeking to engage employees in personalized selection of employee innovation activities (or "routes" [Renkema et al 2021]) suited to their own strengths and developmental trajectories. For example, our approach for using Innovation Adaptation capability as a step toward Design Innovation capability – outlined in the next section – reflects the innovation challenges shared with us by a public sector agency in Canada aiming for "Every Employee" engagement with workplace innovation [Baregheh & Carey 2021].

*Intrapreneurship* (sometimes referred to as internal Corporate Entrepreneurship) is "the process of developing new products, services, and enterprise opportunities within existing organizations" [adapted from Hill 2012]. The social process of Intrapreneurship includes Innovation Adaptation or Design Innovation activities, but is frequently more diverse, complex and uncertain because it can be perceived within the organization as a challenge to existing products and services:

"The journey can be fraught with dangers, including the one that blindsides most intrapreneurs: the danger that comes when your innovation moves from a proof-of-concept stage, to becoming a viable business, product or service within the larger organization. As your carefully selected, nurtured and launched plan gets going – and should you be fortunate to have success – expect politics, battles, war for talent and good old fashioned petty jealousy, to come into play. Understand the dynamics and be ready for them. Know you will need protection and freedom long enough for your innovative virus to spread."

[Skelley 2015, p. 1, describing the adaptation of an innovative service offering into a new corporate environment].

Considering Intrapreneurship as an instance of employee-led Workplace Innovation is a relatively new perspective – but a natural one because of the similarities in the organizational conditions in which they flourish. For example, research on Intrapreneurship emphasizes the same elements of employee engagement often cited as prerequisites for employee-led

Workplace Innovation: "discretional autonomy, a human centred management philosophy (i.e., bottom-up space for voice), a culture that stimulates learning and self-managing behaviour, and thus leadership styles that enable innovative behaviour of employees" [Oeij et al 2021, p. 89-90].

In addition to the considerations listed above for engaging students in a progression of innovation activities, our choice of these particular dimensions and activities as the focus for our shared learning resources was influenced by the feasibility of hands-on activities for learners in our tertiary education environment as outlined below for Principle 3. Other Workplace Innovation activities which could be added to this space include Team Job Crafting [Tims et al 2013], Open Innovation Networks [Bigliardi et al 2021], and Employee Idea Management systems [Mikelsone et al 2022]. There are also other choices of dimensions within which to organize a progressive sequence of activities in an innovation space, e.g., the roles of Discovery-Incubation-Acceleration involved in Strategic Innovation for mature companies [O'Connor et al 2018].

## Principle 2: Online Learning Resources with case stories across work domains

Our online learning resources emphasize the integration of conceptual content with real-world cases to expose learners to the many contextual issues which affect employee-led workplace innovation. Implementing Workplace Innovation successfully is highly dependent on the situation, the context and the history of any given organization. Any presentation of the concepts and principles of employee-led Workplace Innovation must include case stories of exemplary practice in order to be useful to practitioners [Vaas & Žiauberytė-Jakštienė 2017]. In addition, our case stories are intended to support learners in understanding and developing their own capability for workplace innovation.. As illustrated in the next section, we encourage adaptation to specific work domains or higher education programs in part by creation of new cases with which specific types of learners can easily relate.

***Job Crafting learning resources and cases***: Job Crafting is by definition a very personal activity and can involve details of a particular job role. Typical illustration cases are taken from examples where the aspects of the job can be readily understood by learners who may not have performed that role themselves but are likely to be familiar with similar situations (particularly through their own interactions with such employees in their roles as customer or client). Examples include a front-line service worker, a salesperson, and an online customer service representative. There is also a specific case study related to the work of tertiary learning: a workplace learner explaining the use of Self-Directed Learning to improve performance and work quality, which provides a convenient preface to the Project Task outlined for Job Crafting below.

The case stories are also selected to reflect the Job Crafting skills areas described in the Human Resource Management profession and cited by our workplace partners: crafting Job Tasks, Job

Relationships and Job Purpose and Meaning (often referred to in the Human Resources profession as Cognitive Crafting, from the seminal research of Wrzesniewski & Dutton [2001]).

The extensive use of case stories is intended to make it easier to adapt the shared learning resources for learners in specific work domains and contexts. We include one example in the discussion of Principle 3 below: the development of Job Crafting case stories in Accountancy for the School of Business adaptation (in part to address the common perception amongst students that innovative work is not an expectation for Accountants!).

***Innovation Adaptation learning resources and cases***: The concepts of Innovation Adaptation and related methods such as Fidelity of Implementation have been applied extensively in adaptations of workplace innovations in healthcare [Harrison & Grantham 2018], human services and education [Leko 2015]. Application in other domains has emerged more recently [e.g., Laureani & Antony 2021].

For the conceptual content on this topic, we adapted workplace approaches for Innovation Adaptation in the healthcare domain [e.g., Brach et al 2008] into the Four Key Questions format for Design Thinking [Liedtka et al 2018], in order to prepare learners for the project task associated with this activity <u>and</u> for the Design Innovation to follow (as discussed further in the next section). We also provided two generic case stories of the technical and social processes for workplace teams to adapt an innovation into their own contexts.

The first case story for Innovation Adaptation focuses on the Red Box method developed by Adobe Inc. [Morgan 2015] which has since been adapted for use in numerous other workplaces. We used one of those adaptations, the Orange Box adaptation by Mastercard Inc. [Innolead 2016] to demonstrate the practical methods which can be used to determine which core features of the innovation should be preserved and which can be modified to better suit local conditions.

As a practice exercise, learners are asked to compare the two corporate environments to assess which aspects of each context would fit best with their own working styles and strengths. Two aspects of this case provided relevance for the learners: they already were familiar with the products and services of the two companies involved, and the actual innovation was a process to support workplace innovation by employees.

Our shared learning resources also contain a second generic case of Innovation Adaptation set in a tertiary education context [e.g., Reis 2017], which highlights how an innovation adaptation can fail when the core features which led to its original success are 'adapted out'. Since the innovation involves new ways of teaching in a hybrid online and in-class setting, learners can also relate easily to the design choices involved. The case story explores how an innovative teaching method in Science teaching [Mazur 1997] was adapted by a wide range of instructors with varying degrees of fidelity to the core principles which led to its initial success [Dancy et al 2016]. One of the results from this case study was a set of guidelines for documenting the

essentials of an innovative instructional method to increase the chances of success for future adaptors in tertiary education [Khatri et al 2016].

These generic case stories can be easily replaced with other cases of particular relevance in a specific work domain or professional setting, as described in the next section.

**Design Innovation learning resources and case stories:**
The Arts *s*tudents are provided with opportunities to adopt a designers' mindset from the outset and to apply such a mindset to all stages of their learning. For instance, design expert Tim Brown argues that "visual representation helps ... see the relationships between different topics ... (and provides) a more intuitive sense of a whole" [Brown 2009]. In an early exercise on *Illustrate your Learning*, students work in teams to design and illustrate new connections across their learning. The materials of this illustration are found in a selection of terms from across a range of introductions to the concepts of Innovation and Design Thinking itself:

- *Three Spaces of Innovation*: 'Inspiration', 'Ideation' and 'Implementation' as used in [Brown 2009];
- *Four Questions of Design Thinking*: 'What Is?', 'What if?', 'What wows?', 'What works?' as used in [Liedke & Ogilvie 2011]; and
- Five Modes of Design Thinking: 'Empathise', 'Define', 'Ideate', 'Prototype' and 'Test' [d.School 2018].

Across these twelve terms supported by associated readings, student teams design a model that connects the terms conceptually and practically. The *Illustrate your Learning* task produces a range of paper and virtual designs, punctuated with arrows, graphs, SmartArt or interactive links, that identify overlaps and distinguish more nuanced differences in concepts and terms. The task provides the first of several opportunities for students to bring a designer's mindset to think innovatively about the way they receive and process knowledge.

Similarly, the Business unit highlights the importance of User Centered Design and introduces various approaches to Design Thinking as discussed above [Brown & Katz 2009; Liedtka & Ogilvie 2011; d.School 2018]. Various case stories are then presented to showcase application of Design Thinking in diverse contexts, for example a demonstration of social change through design thinking from [Brown & Wyatt 2010]. This module further focuses on empathy and storytelling to humanize design [Lee & Benza 2015]. When students reach this module, they have already started working on their innovation adaptation assignment; consequently, they are invited to view their assignment from the lens of user-centered design and reflect on users to better identify the problem in the context of the Four Questions of Design Thinking [Liedtka & Ogilvie 2011].

**Intrapreneurship learning resources and case stories:** Given the complexity of innovation activities in Intrapreneurship as outlined above, there is no assigned task during the course units which involves students in such complexities. However, the learning resources and case

stories can still be relevant to students within their workplace for learning. For example, in the Monash Arts unit, the first week's online learning resource lesson explores the etymology and meaning of the term before outlining how intrapreneurship operates both within the broader social innovation field – through examples and stories from the League for Intrapreneurs[3] – as well as within the learners' own educational ecosystem through the example of the Monash *BorrowCup*[4] initiative to reduce paper-cup waste on campus. (We explore this learning resource further in the next section, highlighting why it was particularly well-suited to this  Monash Arts context.)

In the School of Business course unit, on the other hand, the shorter time allocated to workplace innovation required a different approach. An introduction to Intrapreneurship and its social aspects appears in the final week's module for students and they are invited to take a Directed Studies or Special Project course if interested in learning more via intrapreneurial experiences in a workplace.

## Principle 3: Project tasks within our own 'workplace for learning'

Hands-on projects are pivotal in our model of developing workplace innovation capability. In order for these to be authentic examples of workplace innovations, students are encouraged to view our higher education learning environment as their 'workplace for learning' in which they can improve both organizational performance (i.e., achievement of institutional learning outcomes) and quality of work life (i.e., the experience of learning and its value to them as students). Over a series of project tasks, they are supported in developing an increasingly complex understanding of the implications and opportunities associated with workplace innovation – beginning with asking meaningful and challenging questions about themselves and their work as learners

**Job Crafting:** Projects for students to engage with Job Crafting in the teaching and learning environment fall under the well-established educational approach of Self-Directed Learning [Robinson & Persky 2020], in which students improve their learning outcomes (the organization's goals) and their learning experiences (i.e., quality of work). For example, in the Monash Arts Context, an online module on Self-Directed Learning as Job Crafting was developed to demonstrate the applicability and value of job crafting to the student experience.

Starting with their own motivations, ambitions and strengths, students begin to recognize the importance of empathy by building a better understanding of their own needs, requirements and pain points. This process is documented in an e-Journal, which not only serves as an e-introduction to other students but allows students an opportunity to gain a deeper understanding of themselves and their 'job' as students. Once this foundation stone is laid, students innovate from the inside out, practicing first-hand the skills of identifying challenges,

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3 https://vimeo.com/leagueofintrapreneurs

4 https://www.youtube.com/watch?v=j1Gl6fJF9TU

and asking what is preventing them from achieving their best results, before proposing innovative solutions.

In the adaptation for a School of Business context, students engaged in a two-part applied assignment, first establishing personal goals in their learning or professional roles followed by a plan to adopt Job Crafting to reach these goals. A subsequent report submitted later in their study term detailed their implementation of Job Crafting and its results. Fulltime students practiced Job Crafting in their student roles to develop better relationships with instructors and peers and to improve study habits (as in the Australian course unit). In parallel, the working learners in the student cohort – half of the class, most of whom were completing Business degrees online – worked with their managers to apply Job Crafting in their professional roles to create a more positive and meaningful experience for them and more value for their employers.

**Innovation Adaptation**: In the Innovation Adaptation project task, students assist in an institutional project addressing a specific educational challenge. For this task students work in teams to examine case-studies of similar problems in other teaching and learning workplaces and probing deeply into how the circumstances and contexts of the innovative solutions arising elsewhere are similar and dissimilar to their own. Whereas the Job Crafting task ensures students think deeply about the importance of developing an understanding of specific worker needs before proposing solutions, the Innovation Adaptation task allows student teams to take time to understand the challenge as perceived by a diverse set of stakeholders.

In the Monash Arts context, students have worked with co-curricular programs in areas such as developing student leadership abilities and fostering connections between domestic and international students. Students are guided to selected readings about successful innovations in such programs in other institutions and asked to evaluate the key factors determining 'if it works there, will it work here'.

Holding students back from proposing innovative solutions too early in the process – asking 'What Wows' before asking 'What Is' and 'What If' [Liedtka et al 2018] – will be a familiar challenge to tertiary educators developing innovation capability. The Innovation Adaptation task purposely does not ask students to propose solutions, but rather to develop capabilities in identifying the potentialities and limitations around understanding a design challenge from multiple viewpoints.

In the Business context, Innovation Adaptation was implemented by evaluating an existing innovation that originated at another institution to the context of their own University. Student teams were able to exercise creativity techniques together with problem solving skills in evaluating the adaptability and fit of the subject innovation at a large urban research University to the context of their own smaller teaching University in a regional city hub.

**Design Innovation**: Across both contexts, students collaboratively explore the key questions approach and implement the first four stages of the design thinking process (empathize, define, ideate, and prototype) to develop and pitch a prototype for their client.

In our progression of tasks, it is not until the **Design Innovation Task** that students apply their capabilities in the practice of ideation. We explore Design Thinking more fully as a 'social technology' [Liedtka et al 2021] that supports collaborative student teams to Discover, Define, Develop and Deliver for internal university clients in response to existing, complex, and unresolved challenges. The Four Key Questions approach to frame Design Thinking [Liedtka et al 2018] – is used to emphasize the progression toward more complex innovation activities, as it was also applied in the Innovation Adaptation resources and activities outlined above.

For example, student teams in the Monash Arts course unit select from institution-level challenges relating to areas such as student leadership, intercultural collaboration and campus sustainability. In these tasks students have the opportunity to test and explore the full range of workplace innovation strategies and apply the capabilities they decide as a team are best suited to the task. A typical output for the Design Innovation task is an 8-minute What If–What Wows 'pitch presentation' to justify investment in prototypes to test What Works, supported by a 1000-word, 'What Is' document outlining the evolution of the problem framing.

In the Business School context, learners worked in teams to apply Design Thinking with an internal university client, to explore new ways to support integration of International Students within the University and civic communities. Despite the time limitations in the unit structure, the resulting client presentations effectively conveyed the potential of the  Design Thinking process and outlined plans for prototypes.

**Intrapreneurship:** Intrapreneurship is the one workplace innovation activity in the progression for which students are exposed in case studies in the learning resources but do not engage in an assigned project task. (However, some of the Innovation Adaptation or Design Innovation projects may relate to intrapreneurial activities of others within our institutions, such as the BorrowCup initiative cited in the section below on Including case stories from local contexts).

## Principle 4: Workplace Innovation Capability as Skills, Knowledge, Mindsets and Experiences

We mentioned above the framing of innovation in student work for learning as addressing both organizational goals (i.e., institutional learning outcomes, in the case of tertiary institutions' workplaces for learning) and the quality of work experience for the learners. However, we have not yet described the targeted institutional learning outcomes in terms of the workplace innovation capability we expect students to develop. A productive collaboration across tertiary education institutions can only be effective if there is some common understanding around outcomes (albeit adaptable to local contexts).

One priority for us was to prepare graduates who would be able to advance innovation in the workplaces of our regional and national employers. We wanted to avoid focusing on personal traits or behaviours [e.g., CBOC 2013; Pérez-Peñalver et al 2016] which can lead to characterization of who is innovative and who is not. Instead, we wanted our learners to appreciate what it would mean to apply the right innovation capability at the right time, as outlined in this anecdote from [Boyes & Shelley 2021]:

Have you ever heard these words before from companies: "To be truly innovative, we must encourage innovation" or "we must...be more creative"...In response we repeatedly hear from employees: "another bloody innovation project" or "here we go again".

Think about this in a sports context: if we wanted to encourage a football team to score more goals, with this approach we would be saying "we need to encourage more goal kicking" or "kick the ball more accurately"...

What we need...instead is..[an innovation] game plan and the <u>right</u> people who are engaged and have the <u>right</u> capabilities and the <u>right</u> mindsets at the <u>right</u> time. [Boyes & Shelley 2021]

Our framework for Workplace Innovation Capability therefore includes four elements:

- situated Skills competencies needed for successful innovation task completion;
- contextual Knowledge that will enable critical reflective about innovation practice – e.g., the "right" elements we have highlighted in the quote above
- personal Mindsets that will enable graduates to proactively act and adapt in diverse workplace situations – current and future;
- the practical Experiences to enable fluent performance by graduates in innovation activities, in their workplaces and in their other roles as community members and global citizens.

(The wording here reflects our adaptation of the distinctions proposed between Job-Ready, Job-Knowledgeable and Job-Capable graduates by [Markauskaite & Patton 2019].)

As with any newly emergent area of expertise, there is only limited research on specifying and assessing capability for employee-led workplace innovation more formally, either within or outside of tertiary education. A relevant comparison point might be the assessment status of Entrepreneurship Education or Design Thinking a decade or more ago. However, there has been past work on assessment of innovative behaviours [e.g., Stange & Helker 2018] and promising recent workplace research on assessing capability in areas such as *Job Crafting* [Bruning & Campion 2022] and *Design Innovation* (both at the end of training [Jaskyte & Liedtka 2022] and when translated into practice [Royalty et al 2021; Edelman et al 2021]).

Educators may have noticed that we have reversed the usual curriculum development process, which would have begun with a specification of desired Learning Outcomes, proceeded to

define the intended Learning Activities, and then designed the needed Learning Environment and Resources to support those activities. We have instead started with the workplace Activities that graduates will be asked to undertake, determine which could be authentically experienced through activities in our teaching and learning environments (framed as workplaces for learning), and then created the necessary infrastructure of learning resources and supports to yield student success.

The progression of tasks described above remains deeply rooted in the premise of our tertiary education institutions as 'workplaces for learning'. Throughout this progression, students can adjust their workplace focus from their individualized and immediate learning environment (Job Crafting) to challenges which may touch on the institution as a whole (Design Innovation). In this process, students can develop skills and knowledge as workplace innovators and as well reframe their mindsets about innovation and about themselves as innovators, by *experiencing* innovation from both user and innovator perspectives.

Our initial assessments of student work in the course units has been based to date largely on the results of their projects, and not on measuring specific Skills or conceptual Knowledge. Our current focus is to ensure that our learners are launched on a trajectory to develop and deploy effective workplace innovation capability, and in the process to engage with workplace partners to firm up appropriate specifications, training and development, and assessment of those capabilities. For example, in the next section we describe our initial pilot test of a self-assessment for  important components of an innovation Mindset, adapted from research with exemplary innovators in Canadian workplaces [Soleas 2020].

This article focuses on our shared Principles and  collaborative adaptations to develop workplace innovation capability across diverse tertiary education contexts. One result of this focus is the absence of 'student voice' examples to provide the students' own views of their Learning Outcomes and the impact of these learning experiences on them. More of the student voice is available in other publications from each of the institutional developments [Dastur et al 2019; Nobis et al 2022; Baregheh & Carey 2022] and the project web pages referenced in the endnotes – including the work by the student team members who have contributed to these developments.

## Collaboration to Foster Adaptations for Local Contexts and Educational Insights

As noted in the previous section, the four Principles were intended to allow a diverse mix of tertiary education institutions to create, share and adapt learning resources and activities. In this section we present some of the distinctive features of the approaches in the two tertiary institutions discussed above, with an emphasis on two aspects:

- how the different contexts led to adaptations which were "faithful" to those principles while simultaneously aligning with the needs, mission and values of their institutions and programs
- how pedagogical insights developed in parallel in those institutions and were also applicable beyond the original context in which they arose.

## Addressing Local Contexts

As noted above, we are intentionally including a diverse group of institutions in our collaboration, in the expectation that local contexts will require different formats for course unit to develop capability for workplace innovation – from which we all can learn. Our first opportunity to fully observe this type of adaptation in action was the School of Business course unit described above, where the following factors had to be considered:

- the opportunity to significantly modify and update an existing course unit on Creativity and Innovation in the Workplace, which imposed constraints not encountered in the Faculty of Arts setting where new course units were created:
  - ➢ the first constraint was the expectation that the new content would fit with the existing university course unit description (the Innovation part of the content predated acknowledgement of the critical role of employee-led workplace innovation). In practice, the existing content description proved to be general enough that no obstacles to revision were encountered.
  - ➢ the second constraint was more challenging: integrating the old (Creativity) and new (Innovation) content so that the students did not experience two topics competing for their attention and assigned work time. This resulted in a complete modification of the Creativity content to include aspects of creativity in the workplace that were not included previously and have received much attention in recent years, such as the role of diversity in problem solving and idea generation.

- A significant proportion of the class was made up of working learners, taking the online course units as part of completing a B.Comm. degree. We have discussed above some of the options this context afforded in terms of student assignments, in particular the desire by the students to carry out Job Crafting in their daily work context – which we were able to easily accommodate. In the longer term, we would like to use such opportunities to leverage student activities in the course unit to advance workplace innovation with their own workforce. (A similar situation prevailed in our initial proof-of-concept pilot at a polytechnic university, where three quarters of the student body worked at least part-time off-campus.)

- The opportunity to complement the generic case stories described in the previous section with case stories related to specific work domains. Since over the half of the Business students in the course were enrolled in the Accountancy specialization – as was the case for the B. Comm. program as a whole – we had an opportunity to test our

hypothesis that a case-based instructional method would facilitate customization through domain-specific case stories.

In enhancing the use of case stories for this context, we recognized that the previous implementations in Faculties of Arts had also faced this issue less directly. In those contexts, we wanted to select a variety of case stories reflecting multiple potential career paths, in keeping with the ethos of a liberal arts program. However, we needed to provide sufficient detail about the work context for the nuances of the case stories to be clear. We now describe in more detail how these two parallel challenges around case stories have been addressed to date.

## Including relevant case stories from local contexts or specific work domains:

As noted above, we included numerous case stories in our learning resources in the expectation that this would facilitate institutional adaptations integrating new case stories to address their local contexts and/or specific work domains targeted by their programs. We describe next two instances of such case story adaptations.

***Integrating a local case story of student intrapreneurship at Monash Arts:*** Along with the generic examples of Intrapreneurship mentioned above from the League for Entrepreneurs, a variety of institution-specific examples of student-led/student-involved intrapreneurship in response to familiar social challenges are presented in the Intrapreneurship lesson using student stories. In particular, the successful BorrowCup initiative to reduce disposable coffee cup waste example provides a tangible and accessible case study that links the concept of intrapreneurship to student-led innovation for sustainability.

Placing this discussion of Intrapreneurship at the beginning of the course unit was a novel approach: that topic had previously appeared toward the end of course units in line with the progression in Figure 1. The resulting student enthusiasm confirmed a pedagogical insight from the lead instructor, that examples of social intrapreneurship in the first week of the course unit would initiate a transformative learning process for B.A. students to develop identity and motivation as innovators (in contrast to a placement).

That same local example re-appeared at other points later in the course unit. In Week 4, where the content focus was on Innovation Places, the Faculty of Arts team had BorrowCup's lead student intrapreneur[5] record a short lecture about the innovation within the context of understanding the University as a laboratory for intrapreneurship. Later, in Week 9, after student teams have been introduced to their own Design Innovation campus challenges, the BorrowCup case study is reintroduced and deconstructed to explore the iterative feedback loops of the embedded Design Thinking stages that student teams can then engage as a team

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5 https://www.monash.edu/engineering/change-makers/simone

for their selected campus Design Innovation challenge. This emphasizes again the progression of innovation activities needed to address more complex, uncertain and impactful challenges, and encourages students to think of their experience in this course unit as launching them on a continuing workplace innovation trajectory.

***Integrating case stories for a specific work domain***: For the School of Business course unit, the large number of Accounting students in the School of Business provided an opportunity to begin contextualizing some of the case studies in the learning resources to a professional domain of work and study. This also responds to recent calls within the Accountancy profession to promote innovation and creativity among accounting students [e.g., Healy & Walsh 2018; De Villiers 2020]

A recent graduate, now employed as an accountant, collaborated with us to develop case stories from her specific workplace  and beyond [Justice et al 2021]. The cases for Job Crafting were incorporated as a feasibility test in the 2022 Business offering; our future plans include more domain-specific cases as optional resources in the course units and more formal testing to assess how this approach impacts learners in those domains.

Our initial positive experience with this adaptation has resulted in efforts to develop additional adaptations for other post-secondary contexts and for specific work domains which are currently in progress (as outlined in the Future Plans section below). Educators with a sound understanding of their desired learning outcomes and of the disciplinary backgrounds and educational ecosystems of their learners are able to select case stories that are relevant to the learning context of the program and the students within it.

Strategic selection of cases allows educators to tell a story about innovation from a particular point of view that is relevant to student experiences in their programs and provides an effective medium for exploring the relationship between theory and practice. This creates a potential role for educators beyond the instructors in a course unit offering: other educators preparing students for work in particular professional or vocational domains could select relevant case stories to be offered as elective resources for students from their disciplines who were enrolled in a workplace innovation course unit. (For example, we have ongoing discussions with educators in Nursing who would like to provide a set of case stories on workplace innovation in Nursing within an interdisciplinary unit offered by Arts or Business.)

## Discovering, Sharing and Adapting New Insights on Teaching and Learning

In seeking an intentional diversity of institutional collaborations, one of our objectives was to foster new insights on teaching and learning for capability in workplace innovation. We describe examples of such new insights coming from different disciplinary perspectives below. This requires first some explanation about the progressive experience to engage instructors from different disciplinary backgrounds in teaching for capability in workplace innovation as a

graduate attribute (in keeping with similar expectations for other generic Power Skills or Employability attributes to be embedded across the curriculum, as noted in our initial Overview section above).

***Tertiary Educators as Master Learners for Innovation Capability***: there are multiple potential roles for tertiary educators in an interdisciplinary program for workplace innovation:

- as instructors assigned to lead or assist in one of the course units described above
- as supervisors, mentors or clients for progressive 'workplace for learning' project tasks
- as creators of case stories of local relevance or to target specific work domains, as described with the cases above
- as contributors of examples about how their disciplinary ways of knowing can provide a distinctive lens on workplace innovation (e.g., [Karanika-Murray & Oeij 2017] for Organizational Psychology or [Ennals 2016] for "practical Philosophy")

In the several institutions in our current and upcoming collaborations, we know of many instructors engaging in innovations in their workplaces for learning. However, few of them have familiarity with the concepts and practices of workplace innovation in other contexts. There are two models under discussion to scale up the capabilities of educators to take on these roles:

- the Master Learner role in a learning community model for teaching and learning. This approach is used in other interdisciplinary teaching settings to help educators to expand their range of experiences and conceptual models (e.g., [Sperry & Hawkinson 2019] who report that "the most significant form of faculty development...occurs within the teaching teams themselves, suggesting that the high-impact practices for students also provide an equally high-impact learning experience for the faculty"

  ➢ We have some experience with an Instructor as Master Learner model of preparation, where an educator with experience teaching in Italian Studies and Global Studies [Stevenson] participated in the Faculty of Arts course units as a direct contact for students and in the process gained familiarity with the content embedded in the online learning resources (derived from subject matter experts).

- We mentioned in the Overview section above that instruction in capability for Workplace Innovation can be seen as in an early stage of maturing along a trajectory similar to Entrepreneurship Education over the last decade or two. This has led to the recent development of a Train the Trainers course to enable "educators of all disciplines...to learn how to teach through entrepreneurship and to encourage their students...to develop an entrepreneurial mindset" [Gedeon 2022]. A similar course for Workplace Innovation Education would be an equally valuable tool in tertiary education.

***Increased Diversity of Teaching and Learning Approaches:*** The inclusion of educators from programs not traditionally associated with the development of innovation capability has also brought new teaching methods and resources into play. For example, the assigned task for Job Crafting in the Faculty of Arts course unit was embedded in an individual Job Crafting e-Portfolio where learners reflected on personal strengths, interests and goals, proposed strategies to improve learning and quality of life within their study pathways or wider work contexts, and proposed learning strategies and an assessment to support their own learning needs and preferences.

The Portfolio was updated throughout the term as students carried out and evaluated the task crafting they implemented within our workplace for learning. This task proved to be a great motivator for early student engagement in creative and diverse products using multiple media, and was followed up by considerable effort being invested later in updates re progress made and lessons learned. The e-Portfolios were also used to guide formation of project teams and as a way to introduce new team members to each other.

The Portfolio teaching approach in the Arts unit reflected the disciplinary background of the lead instructor – Theatre and Performance. One of the new institutions collaborating with us in 2023 intends to adapt this approach in the adaptations of our shared learning resources and activities.

***Developing and adapting new assessment methods:*** The diverse perspectives from teachers in different disciplines can also produce new approaches to student reflection and assessment. In the School of Business adaptation, the instructors introduced a pilot test of a self-reflection instrument on a particular challenging assessment area, Mindsets for innovation.

Past research has established that student's Mindset about the subject matter being studied – and their relationship with it – is directly related to academic success [Yeager et al 2019]. This body of research mainly focuses on first- or second-year students, highlighting the need for further research targeting upper-year students and other contexts [Limeri et al 2020]. As noted above, our definition of capability for workplace innovation included an enabling Mindset toward the topic by learners, including their sense of identity, self-efficacy and motivation as innovators.

In our most recent School of Business course unit, students were invited to complete the Motivation to Innovate (MTI) Instrument [Soleas 2020] during week 1 and then again in week 12 as part of their course activities. MTI is an instrument that was developed and tested via engagement with leading innovators in Canadian workplaces across sectors. (Some details about the items in the Inventory are included in the text box below.)

> **The Motivation To Innovate Inventory** uses as a base the Expectancy-Value-Cost theory for motivation, and elicits perceptions of positive and negative experiences with various facets of workplace innovation [Soleas 2020]. Expectancies focuses on "the confidence an individual has in their ability to succeed in a given task" (Soleas 2020, p. 7). Intrinsic Task Value focuses on the perceived enjoyment of innovation processes in an activity, Attainment Task Value focuses on the sense of gratification as a result of completion of an innovation activity and Utility Task Value focuses on the associated extrinsic rewards (direct or indirect) (Soleas 2020, p. 7). Finally, Cost refers to perceived psychological and contextual costs of innovation and is the one negative factor: promotion of innovation requires higher rates of Expectancies and Task value in face of these Costs (Soleas 2020, p. 7).
>
> The Expectancies and Intrinsic Task Value constructs includes 4 items each; an example of expectancies measure includes "I am skilled at solving problems in novel circumstances" and "I find the process of innovating personally rewarding" is an example of the Intrinsic Task Value. Attainment Task Value includes 5 items such as "Being innovative is important to my identity", whereas Utility Task Value includes 8 items such as "If I am not innovating, I am likely to be less effective". Finally, Costs contains 7 negatively worded items, an example of which is "Trying to innovate places a lot of pressure on me".

As part of the Business course activities, students were invited to voluntarily engage with the Motivation To Innovate instrument. They were invited to complete it in week 1 of the course unit and again in week 12 (the final week of direct instruction) as a self-reflection exercise by which to gain an understanding of their own motivation to innovation before and after the learning experience. During week 1, close to 90% of the students voluntarily completed the instrument and during the final week over 67% of these students participated in the final self-reflection.

For the individuals completing both activities, their initial and final self-reports showed the desired increase for all three Values measures concerning their personal views about the value of innovation for them and for the Expectancies measure about their confidence in their abilities as innovators. In addition, there was a desirable decrease in the Costs construct which reflects a decline in self-reported perceived risk of innovation. For the students who voluntarily

completed both self-reports, this data provided positive evidence about the development of more productive Mindsets about innovation and about themselves as innovators[6].

As noted in our initial Overview section, instruments to specify and assess capabilities for workplace innovation are still very much works-in-progress, both in tertiary education and in workplace settings. In a collaboration with diverse academic partners, we expect that a variety of such tools will be tested based on suitability in particular institutional contexts. The results can then be shared and adapted elsewhere: for example, results from the School of Business MTI pilot have inspired a new Lesson in the final week of the Faculty of Arts course unit to provide a similar self-reflection opportunity for learners using the Motivation To Innovate inventory.

There is also an interesting side story here about interactions between educators in tertiary institutions and their workplace partners. MTI began as an academic research project which involved multiple Canadian companies in identifying exemplary workplace innovators who were then engaged in iterative testing and revision of the instrument. Our use of the MTI in the School of Business course unit was its first application as a self-reflection learning resource. Based on the results of that experiment, we are now working with other companies to deploy the test as a self-reflection resource with possible implications on innovation team composition (e.g., informing individuals about their own Values so that innovation teams can be composed with a balance of  individual dominant values). In the concluding section of this article, we discuss further this theme of a two-way exchange of knowledge and resources between academic and workplace partners seeking to develop workplace innovation capability in their respective contexts.

## Conclusions and Future Work: Collaborating with Workplaces on Innovation Capability

### Conclusions and Future Challenges

The discussion above has shown the potential for a diverse collaboration across tertiary education institutions to advance the development of graduate capability for workplace innovation. The initial collaboration has allowed each institution to build on work done elsewhere to accelerate its own distinctive learning resources and activities, and to gain evidence for the quality of their local advances through their adaptation at other institutions. The intentional institutional diversity of these initial institutions has produced a welcome diversity in teaching approaches which exceeds what the instructors involved have observed in their collaborations with peer institutions. We also described some of the further work now

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6 To further test the impact on student's mindsets, an overall MTI score was calculated through the following formula: (Expectancies + Values) - Costs = Positive Mindset for Innovation. A one-tailed Matched pair T-Test (n=21) on student scores for Positive Motivation for Innovation showed that a statistically significant difference existed between students' scores in the initial and final weeks (P-value =.0000).

underway to add to this diversity with new types of institutions, new formats for student learning and new forms of inter-institutional collaboration.

We know there are challenges we have not yet addressed, including the following issues that are on our near-future list of activities:

- The details of our 'share-and-share-alike' approach to exchange and adaptation of intellectual property amongst collaborators are still a work in progress, i.e., institutional collaboration is via a Memorandum of Understanding (on goals and processes) and not yet a Memorandum of Agreement. Our institutional collaborators in future will have a more diverse set of rules regarding ownership of intellectual property by educators versus their institutions.

- Similarly, the details about sharing learning resources and activities beyond the collaborating instructors, programs and institutions need more clarity. On the one hand, each program or institution has some degree of interest in establishing a leadership position within its circle of peer institutions for developing graduate capability in workplace innovation. On the other hand, we have benefited from external funding whose goal is to advance workplace innovation more broadly in a region or sector – which requires some mechanism for sharing the results of our work beyond the collaborating institutions.

   We have started to test this process by making available two of the modules of the School of Business course unit to other institutions within the sponsoring Canadian province, with restriction on adaptation in keeping with the "Innovation Adaptation with fidelity of implement" approach described above (and in one of those modules!). The details again still require considerable work, and there is now another party involved in those discussions (the organization managing the online repository of shared teaching resources for tertiary education in the region).

Finally, all of our collaborating institutions to date share a common language of instruction. We know from past experiences with sharing learning resources in Canada's two official languages that a simple-minded translation will miss the cultural and contextual differences in the new setting. Since we are already encouraging <u>all</u> institutions to attend to the adaptations required to address contextual and cultural differences, we are hoping that language of instruction will be subsumed within these larger issues. (Institutions in both Canada and Australia are also striving to address the special needs of Indigenous students, which we regard as both a challenge and an opportunity with regard to diversity in ways of knowing.)

**Collaborating with Workplaces to Develop Innovation Capability**
In this concluding section, we want to highlight another promising avenue for our further work: collaboration between workplace partners and tertiary institutions to advance development of capability for workplace innovation in their complementary contexts. Previous co-operative ventures between academic and workplace contexts have produced valuable insights on

specifying and assessing innovative behaviours [Penttilä & Lyytinen 2015] and innovation competencies [Hero et al 2021].

One example of a learning resource resulting from collaboration with workplace partners is the Motivation To Innovate inventory discussed in the previous section. We describe below two more examples from our current work to illustrate the further opportunities for innovation in new frameworks and processes for collaboration with workplace partners to develop learning resources and activities for workplace innovation.

***Extending workplace innovation credentials to fit a tertiary education context:*** One way that we have benefited from collaborating with innovation leaders in our regional workplaces is through building on their criteria for professional credentials in workplace innovation. While developing the initial Monash Arts units, we met with a team which had developed a series of professional credentials for innovation specialists in collaboration with local companies [DeakinCo 2020]. The credentials are awarded based on assessment of a professional practice portfolio.

At the first level in the series, Innovation Practitioner, the portfolio is expected to demonstrate accomplishments such as the following:

- You use experience and research to generate novel approaches to improve existing practices, approaches or methods
- You identify and test new initiatives or breakthrough thinking or practices
- You review and report on operational outcomes from an innovation project

Beyond these elements that employers may request to meet their current workplace needs, in the Arts context we wanted to add some further criteria to indicate readiness for a variety of roles and workplaces, present and future (in keeping with the ethos of a Liberal Arts degree as a preparation for multiple career paths [Gannaway & Carey 2022]. The industry-driven specifications in the professional practice credentials helped us in exploring ways that our B.A. graduates could be prepared to add distinctive value in innovation projects.

We created an initial list of the enhancements to the professional criteria which would reflect the more Reflective Experiences we wanted for our graduates who wanted to pursue career paths as enablers and catalysts for workplace innovation. The expanded list for these graduates to aim for in their innovation activities [Carey & Nobis 2019] included elements such as these:

- You've engaged with workplace innovation in at least two different settings and reflected on the contextual differences affecting the social processes of innovation. (For the Arts unit, one of these settings will be within the academic institution and one will be in an external work-integrated learning context.)

- You've engaged in at least two different workplace innovation activities and/or project roles and reflected on the dynamics of the social processes of workplace innovation.

- You've engaged with at least two different innovation practices for a similar task and reflected on their strengths and weaknesses.

**Applying insights on workplace needs to improve instructional designs in tertiary education:** "How can we build an organizational culture – and supporting infrastructure – to engage every employee with workplace innovation?" This challenge to our team members in Canada arose in a collaboration with corporate and public sector innovation leaders to help inform our learning resources and activities [Carey et al 2018] came from innovation leaders in a public sector organization with dual missions:

- *creating public policies to address a national goal around meeting basic needs in affordable ways; and*
- *providing public services as a key element in implementing those policies.*

The employees in the service units, focused on quality of service and operational efficiency, made up three quarters of the agency's workforce. They tended to regard the organization's workplace innovation aspirations as being directed more to the public policy unit, which was introducing methods such as Open Innovation, Design Thinking and Crowdsourcing that the operational employees found out of sync with their work context and roles.

As part of this collaboration, we had shared with these workplace partners the progressive sequence of Innovation Activities shown in Figure 1 above. We suggested that the employees in the service units could be introduced to workplace innovation through Job Crafting and Innovation Adaptation activities, so that they could see themselves as participants in the same innovation agenda that the policy research and development employees were pursing.

It was from these discussions on a particular workplace challenge that the idea arose to reframe the capability development for Innovation Adaptation to use similar language as that used in Design Innovation, as highlighted above in the discussions on learning resources and project tasks for these activities in our tertiary education environments. In the context of the challenge from workplace leaders, the rationale was to build and communicate an integrated innovation culture across the organization, so that when employees in the service unit heard mention by the policy and research staff of methods such as Design Thinking they would understand elements of that process and how it related to activities in which they were already engaged. The rationale in the tertiary education context was to ensure that students began their Design Innovation activities with a head start on the Skills and Knowledge involved.

In conclusion, we listed above four Principles underlying the collaborative development of shared learning resources and activities for capability in workplace innovation by a diverse set of tertiary education institutions. We then described how this common base allowed two

diverse institutions to share, adapt and extend learning resources and activities for workplace innovation, in ways that reflected their differing contexts.

The work described in this final section, on collaborating with workplaces for two-way diffusion of knowledge, has demonstrated that a diversity of institutional partners amongst our collaborating institutions can also produce innovation in the way we collaborate with workplace partners.

Our current works in progress show a similar diversity in collaborating with workplaces. For example, the academic team from the School of Business course unit outlined earlier are currently involved in a project with workplaces across Canada to adapt research insights on Workplace Innovation for Quality of Work [Frye & Carey 2022] into their local contexts (in co-operation with Workplace Innovation Europe).

In parallel, new collaborating institutions in Canada are also pioneering their own novel approaches to engage with workplace partners:

- work placements for students as Innovation Interns in leading-edge innovation projects
- management training in workplace innovation as part of a Business Competencies credential program for skilled trades working taking on management roles or starting their own businesses.

We believe these developments will create in future an opportunity for us to add a fifth Principle as a goal for each partner tertiary education program or institution in our academic collaboration:

Principle 5: Engage with diverse workplace partners to advance innovation in their workforce.

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