Conventional, remote, virtual and simulated work-integrated learning: A meta-analysis of existing practice

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As a result of the COVID-19 pandemic, many organizations offering work-integrated learning (WIL) opportunities were no longer able to support student placements, resulting in many institutions searching for a range of innovative solutions. Many have redesigned their conventional placement-based WIL activities or programs to enable students to meet graduate profile criteria through alternative means such as virtual or simulated WIL experiences. The literature shows there are many models of WIL beyond conventional work placements. Therefore, a meta-analysis was conducted of these WIL models, to provide a complied synthesis of existing practice from within the WIL field specifically focused on two books, the *International Journal of Work-Integrated Learning*, and three national WIL association conference publications. The trends and qualities that emerge from the meta-analysis of existing practice can inform the redevelopment across the different modes of conventional, remote, virtual, and simulated WIL experiences.

Keywords: COVID-19, WIL mode definitions, conventional WIL, remote WIL, simulation WIL

Work-integrated learning (WIL) is increasingly being incorporated into higher education curriculum directly linking higher education curriculum to employability outcomes (Burke et al., 2016, Rowe & Zegwaard, 2017). As WIL expands as a practice, so has the diversity of the WIL practice. In addition, technology has presented opportunity to develop different workplaces, including the virtual workplace. The use of technology has resulted in WIL practice that includes remote virtual WIL, where the workplace is online, and simulated WIL where the activity is a simulation of the real practice. Simulated WIL has been seen as controversial because to meet the definition of WIL, that is to meet the needs of the three stakeholders: industry, students and academia, some practices would not be classified as WIL and instead would simply be a simulation. For the purpose of this paper, where possible, a distinction is made if the simulation included an external partner.

A range of ways defining work-integrated learning (WIL) are available. Three definitions that are widely used are presented to provide a context for the scope of WIL that will be analyzed.

The *International Journal of Work-Integrated Learning* (IJWIL) defines WIL as

> an educational approach that uses relevant work-based experiences to allow students to integrate theory with the meaningful practice of work as an intentional component of the curriculum. Defining elements of this educational approach require that students engage in authentic and meaningful work-related tasks, and must involve three stakeholders: the student, the university, and the workplace/community

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and further clarified that "such practice includes work placements, work-terms, internships, practicum, cooperative education (co-op), fieldwork, work-related projects/competitions, service learning, entrepreneurships, student-led enterprise, applied projects, simulations (including virtual WIL)" (IJWIL, n.d., para. 3)

In *The WIL report: A national scoping study* Patrick et al. (2008) described their approach to understanding WIL by introducing the overarching umbrella concept "work integrated learning (WIL) as a term for a range of approaches and strategies that integrate theory with the practice of work within a purposefully designed curriculum" (p. 9).

Winchester-Seeto et al. (2016, p. 101) added to this by referring to WIL as

> a broad range of experience-based education models and curriculum approaches where students engage with industry and community organizations, for example, service learning, work-based learning, community engagement, cooperative education . . . as well as internships, teacher practicums, clinical placements, engineering sandwich courses, virtual projects, simulations, fieldwork etc. (Rowe et al, 2012)

These broad definitions of WIL make it challenging to provide clarity, which has led to WIL being referred to as a chameleon (Orrell, 2011). More recently in the *Good Practice Report* Sachs et al. (2017) underscore the importance of having a definition that is easily understood by all stakeholders, especially the three main stakeholders. From these broad definitions the connection between work and education, with three main stakeholders is paramount. Zegwaard and Rowe (2019) point out that while placement-based WIL is the dominant approach described in the literature, there is growing practice of a broader range of WIL practice. As a greater diversity of WIL practices are created in WIL programs in response to COVID-19, there will be an opportunity to explore the use of the virtual projects and simulations in WIL.

What is notable is that while WIL may be virtual or simulated, it is not clear whether these terms have been widely accepted or used consistently throughout the literature. In justifying their use of WIL to represent this field of study, Patrick et al. (2008) provide further details about the terminology used within the field. The top three terms identified were practicum used 35 times, professional practice 32 times and internship, workplace learning and work integrated learning 31 times. Within this report, they identified one vignette or virtual practice as an example, the virtual placement project from the Queensland University for Technology, Australia, and refer to the design centre at Swinburne University of Technology, Australia, for the simulated example. Patrick et al. (2008) provide a useful starting point to define virtual and simulated WIL experiences.

As with most definitions in WIL, defining the mode of WIL also proves to be a challenge. The virtual placement project described this mode of WIL as "applying legal knowledge and skills to complete a real world workplace project in a team using online communication technologies to enable students to be virtually, rather than physically present at the workplace" (Patrick et al., 2008, p. 16). In terms of being virtually present, Trede et al. (2017) caution that simply providing online connectedness does not automatically lead to learning and reinforce that expectations regarding technology use needs to be discussed so that a shared understanding may be reached. Virtual WIL is understood to be synonymous with remote WIL, in that access to the workplace is from a distance and could be described as remote access, digital access or access to a digital/virtual workspace. Many industries had to develop new ways of working remotely during COVID-19 lockdown. To avoid confusion between virtual and virtual reality, perhaps a shift to the term *remote* WIL may provide greater clarity.

Then, the defining feature of remote WIL could be: *a WIL experience focused on the student completing authentic, relevant actual tasks for an organization through a remote connection to the workplace/community*. This means the student is physically separated from the workplace/community and located elsewhere such as within an institution or in a home environment.

In contrast "simulating the work environment enables students to experience some aspects of the workplace within an educational framework. Approaches to simulations differ, from some industry involvement, to the development and use of DVDs focusing on work-place interactions, from web-based programs through to well-developed simulated environments" (Patrick et al., 2008, p. 16). According to Gaba (2004), "Simulation is a technique, not a technology, to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion" (p. i2). The distinction does need to be made between virtual and virtual reality: virtual reality in this context is understood as a form of simulated environment. In the WIL literature there are two types of simulation examples, simulations to support WIL and simulations during WIL. In order for simulated WIL to meet the definition of WIL, there must be active engagement between the three stakeholders, however, the proximity of the external stakeholder will likely be low and perhaps limited to mentoring or summative assessment roles.

Therefore, simulated WIL could be defined as: *an immersive WIL experience in a context created to emulate the functions of a workplace with input by the workplace/community, educational institution, and the student.* Without input from an industry/external stakeholder, the learning activity would be a simulation rather than simulated WIL per se.

Simulations are useful for many environments and are often advanced in disciplines where it is not desirable to practice in live contexts, for example, in flight training, health, sciences, and armed forces, resulting in supportive student learning environments with greater control over the range of activities experienced (Chernikova et al., 2020, Naumann et al., 2014, Rasalam & Bandaranaike, 2018). Hopwood (2017) argues that incorporating the high realism of fidelity with imagination into simulation, extends learning beyond mirror like replication, enabling greater learning potential. In order maximize the learning potential, Chernikova et al. (2020) established that the students' level of prior knowledge needs to be considered when structuring effective simulation-based learning.

Simulated environments can be conducted in a broad range of settings from complex purpose-built training facilities such as clinics, restaurants, or even online spaces that are built with the use of second life and virtual reality. The use of these complex environments may range from being a simulated teaching environment through to a space that is used to conduct regular business operations.

Simulations exist on a continuum of complexity, where it may be difficult to determine the transition from the simulation to reality, for example when a purpose built environment is created that sometimes operates in student simulation mode and at other times may function as a conventional or regular workplace. In order for the simulation space to be considered WIL, all three stakeholders must be involved; however, there may also be another dimension to consider; whether the simulation is removed from current operations or if there is real world impact as a result of the student actions, which would speak to the level of authenticity of the task. Simulated WIL could also be used in situations where it is difficult for all students to secure placements. This could be referred to as a halfway house or a safe option. Safety could be to address physical limitations, or reputation of the university with the student level of proficiency – especially in cases where WIL is compulsory and not optional or limited to a certain grade point.

METHOD META-ANALYSIS

Two approaches were taken to find material for this analysis. First the practice-based case study section of the *International Handbook for Cooperative and Work-Integrated Education* (Coll & Zegwaard, 2011) was analyzed to provide a summary of conventional WIL. This text was chosen both for the international focus and for the ability to limit the scope for conventional WIL analysis. More recently *Work-Integrated Learning in the 21st Century* (Bowen & Drysdale, 2017) provided perspectives on program-wide practices, revealing trends in the WIL landscape. Further examples of conventional WIL from other sources were excluded from the analysis. For the purpose of this meta-analysis, conventional, remote virtual and simulated will be referred to as different modes of WIL.

To find examples of remote virtual WIL and simulated WIL, the *International Journal of Work-Integrated Learning* (IJWIL), and the conference proceedings from three associations: Australian Collaborative Education Network (ACEN), New Zealand Association for Cooperative Education (NZACE, now called Work-Integrated Learning New Zealand, WILNZ), and World Association for Cooperative Education (WACE) were used. The journal and proceedings were searched for the use of the terms virtual and simulated, and from there further analyzed to determine if they contained examples of existing practice or a theoretical view of these terms. The sources and the count of articles used for the analysis are presented in Table 1.

The broad definitions of WIL make it challenging to classify WIL activities reported in the literature. Therefore, this analysis mirrors the approach taken by Oliver (2015) and recognizes that the variations classified here are an attempt to portray the salient features "with the rider that further detail would be required to be really sure of the level of work-integrated learning associated with such a task" (Oliver, 2015, p. 62).

Many sources were found to present information about the preparation for WIL using remote or simulated activities with a focus on developing employability skills. These examples were excluded from this analysis, as by classification they did not include all three stakeholders, industry, students, and academia. These articles could provide valuable insights into the development of remote or simulated WIL; however, they did not fit within a tighter definition of WIL.

One way in which to understand WIL activities would be to look at them from the perspective of various typologies. Rowe et al. (2012) presented a typology of WIL drawing distinctions between on and off campus placements. The challenge with on-campus compared to off-campus is that search for remote (virtual) placements is not captured with these terms. Oliver (2015) distinguished WIL activities by identifying them as activities that can sit on a continuum related to task authenticity and location in relation to industry proximity, presented as a four way grid. Kaider et al. (2017) subsequently modified the continuum concept by adding a medium layer, which extends the model (from a grid of four) to a grid of nine gradations. The Kaider et al. (2017) continuum therefore shows low, medium, and high for both task authenticity and industry proximity. To further clarify the relationship with industry they distinguished low proximity or low authenticity as without industry involvement, medium was with industry and high proximity was understood to be within industry. For this paper, the high to medium categories will be analyzed however the low category will be excluded as it is without industry involvement. In the literature, non-placement WIL has been variously referred to as alternative WIL or innovative WIL, in this paper it is referred to it as non-placement WIL. To consider the different modes of WIL, the continuum presented by Kaider et al. (2017) can be used to explore placement and

non-placement examples of WIL that have elements of remote (virtual) or simulated practice *within* and *with* industry.

TABLE 1: The focused range of sources reviewed for published examples of conventional, remote, and simulated WIL.

Source	Date Range	Count
International Handbook for Cooperative and Work-Integrated Education[1]	2011	18
Work-Integrated Learning in the 21st Century[2]	2017	4
IJWIL/APJCE[3]	2000 – 2020	7
NZACE conference proceedings[4]	1999 – 2019	6
ACEN conference proceedings[5]	2010 – 2018	11
WACE conference / research symposium proceedings[6]	2016 – 2019	2
		48

Note:
[1] Coll & Zegwaard, 2011;
[2] Bowen & Drysdale, 2017;
[3] Coll (editor 2000-2009) and Zegwaard (editor 2010 – 2020);
[4] Finch, 2000-2002; Gribble 2003; NZACE 2004-2005; Coll, 2006-2007; Coll & Hoskyn, 2008; Coll & Zegwaard, 2009; Coll, 2010; Zegwaard, 2011-2015; Zegwaard & Hoskyn, 2016-2019
[5] Campbell, 2010-2012; Moore, 2014; Harvey & Rowe, 2016; Smith et al., 2018
[6] WACE 2011-2014; Zegwaard et al., 2016; Zegwaard & Ford, 2018-2019

ANALYSIS OF ACTIVITIES WITHIN AND WITH INDUSTRY BY MODE OF WIL

Kaider et al. (2017) created and refined a detailed mapping of learning activities grouped by suggested timing across the curriculum, which has been further refined in Table 2. Learning activities within host organizations (high authenticity with high proximity) are termed WIL placements with examples of internships, work-based learning, industry-based projects, and service learning to name a few. Activities that were with industry involvement, in the medium category for authenticity or proximity, were described as second or third year WIL, which could be referred to as potential WIL opportunities shown in Table 2. The most relevant examples are high authenticity/ medium proximity that include complex simulations, practice clinics and project-based problem solving. The medium authenticity activities may provide some scope for remote or simulated WIL, however, it is suggested that they would need to be combined with other highly authentic tasks to fit within the IJWIL definition of WIL. Learning activities without industry involvement were considered as introductory WIL, however, this category was excluded from this study because it also does not fit the IJWIL definition.

To provide structure to this meta-analysis, Table 2 will be used. Work placements (high authenticity and high proximity) within host organizations will be presented first, drawing attention to the three modes of WIL; conventional (C), remote (R) or simulated (S). Following this, the focus will shift to activities that are undertaken with industry. These activities range from high to medium authenticity and proximity. The area with the most examples was activities that were high authenticity with medium proximity. Conventional WIL is only in the first section, due to the plethora of literature available, rather the focus is on highlighting published examples of remote or simulated WIL to consolidate knowledge as a backdrop to the current innovation that is taking place. The sections are presented using the relevant activities from Table 2.

TABLE 2: Authentic learning activities in relation to industry proximity adapted from Kaider et al. (2017) restricted to the medium-high authenticity and medium-high proximity only (low category removed).

WIL PLACEMENTS: Activities **within** host organizations
High Authenticity / High Proximity
• Work placements of various types can take place in any year or frequency; for varying lengths of time; and for varying intensities and complexities, and include: • **Internships**, practicums, co-op years, clinical placements, Industry Based Learning (IBL) • **Work Based Learning** (WBL) where students are employed in an organization and specifically fashion their studies around their work, with University authorization, guidance and credentialing • **Industry-based (or community based) projects** undertaken in the workplace for a nominal period of time but not a formal placement. Includes industry supervision or feedback • **Service learning** where students undertake voluntary work in the not-for-profit sector which is formally integrated into their studies
POTENTIAL WIL OPPORTUNITIES: Activities **with** industry Involvement
High Authenticity / Medium Proximity
• **Complex simulated online or face-to-face** workplace environments such as moot courts; extensive role play simulations • **Studios or practice clinics** such as design, business or performing arts studios; health clinics • **Laboratory days** including planning, set-up and experiments plus handling contingencies • **Projects** for organizations, individuals or student teams undertake consulting projects for businesses. Industry-based (or community-based) projects undertaken in the workplace for a nominal period of time but not a formal placement. Includes industry supervision or feedback. Community-based projects for the not-for-profit/community sector. Capstone units that provide for work place projects • **Problem-based learning** with or within organizations – problem solving for clients
Medium Authenticity / High Proximity
• Workplace audits, inspections • Field trips
Medium Proximity / Medium Authenticity
• Q and A with industry • Input or feedback from industry on real case studies, industry projects or presentations • Mentoring by industry of student groups or individuals

Placement Based Learning within Organizations (High Authenticity / High Proximity)

To manage the scope, *conventional* WIL examples are presented from the practice based case study section of *The International Handbook for Cooperative and Work-Integrated Education* (Coll & Zegwaard, 2011). In total 18 chapters provided a diverse understanding of practice across a wide range of disciplines. They provided in depth descriptions of the history of WIL and concluded with case studies of existing practice. It is important to note that the case studies are not necessarily representative of the field, rather together they provide a broad overview of placements from the category of high authenticity / high proximity. In the wider literature, a few examples of remote placements were found that fit in this category and one simulated example has been identified as having high authenticity and high proximity. Table 3 is organized applying the activity type from the Kaider et al. (2017) placement activities presented in the first section of Table 2. In addition to this the mode refers conventional (C), remote (R) or simulated (S) activity. To show simulated activities that may have included all three stakeholders, a plus symbol has been used (S+).

TABLE 3: Examples of high authenticity / high proximity WIL placement activities within host organizations, where C = conventional, R = remote, S = simulated, and S+ = simulated where an external stakeholder was clearly involved.

Type	Citation	Context	Mode	Notes
Clinical placements / practicum / probation				
	de Beer (2011)	Medicine	C	Internships after graduation
	Grealish and Stunder (2011),	Nursing	C	Clinical placement
	L. Cooper (2011)*	Social Work	C	Placement
	Linn (2011)*	Psychology	C	Range of types, clinical work-based & service
	B. Cooper and Taylor (2011),	Teacher Education	C	Practicum
	Campbell and Nystrom (2011)	Police	C/S	Combination of conventional and simulated, with capstone probation
Industry-based learning				
	Todd and Lay (2011),	Engineering	C	placement learning
	Clear et al. (2011),	Information Technology	C	- " -
	Baker et al. (2011)	Hospitality and Tourism	C	- " -
	Bates and Madu (2011)	Criminology	C	- " -
	Hoskyn and Martin (2011)	Business	C	- " -
	Stellar and Porter (2011)	Liberal Arts	C	Career exploration
	Brown and Cooke (2011)*	English as an additional language	C	Contextual language & Culture learning
	Dunn and Tenkate (2011)	Environmental Health	C	80% choose optional WIL
	Thomas and Goc (2011)	Journalism	C	Shortage restricted by GPA
	Zegwaard and Lasslett (2011)	Science	C	
	Truman et al. (2017)	Retail Business Management	S+	On-campus shop
Project-based WIL				
	Fleming and Ferkins (2011)	Sport	C	
	Fleischmann (2015)	website development	R	Not-for-profit project
	Holmes et al. (2012)	Engineering and Multimedia	R	Collaboration with Interactive multimedia
	Reinhard et al. (2007)	Business	R	Virtual training testing
	Reinhard et al. (2012)	Business	R	virtual stop smoking community of practice
	Gummer (2015)	Photography	S+	Entering competition, helping behind the scenes, networking
Work-based learning				
	McCurdy and Barwood (2011)	International agribusiness	C	Farm work focus first to shape education
	Linn (2011)*	Psychology (advanced)	C	Forms an aspect of some degree WIL requirements
Service learning				
	Brown and Cooke (2011)*	English as an additional language	C	Contextual language & Culture learning
	L. Cooper (2011)*	Social Work	C	
	Linn (2011)*	Psychology (advanced)	C	Forms an aspect of some degree WIL requirements

*Note: * example coded to multiple categories*

To extend the analysis from single instance case studies to broader recent trends, four chapters from *Work-Integrated Learning in the 21st Century* (Bowen & Drysdale, 2017) are presented in Table 4 and subsequently discussed to extend the analysis from the examples in Table 3.

TABLE 4: Examples of high authenticity / high proximity WIL program trends where C = conventional and R = remote

Citation	Context	Mode	Notes
Gannaway and Sheppard (2017)	Liberal Arts BA	C	34 BA across Australia transactional v's embedded transformational WIL
Gustafsson and Thång (2017)	Nursing Program & HVE: Health, Computer Sc, Business & Admin	C	Learning context separation Work task progression Cumulative knowledge
Bowen and Pennaforte (2017)	Management Science Communication	C/R	French digital communication Canadian 80% virtual work
Trede et al. (2017)	Initially Health & Education	C/R	Hybrid space intersection of work, learning & technology

Conventional work-integrated learning activities

The conventional mode is well represented across the different types of activity as seen in Table 3. Professions that had accreditation requirements were grouped under the type of clinical placements/practicum and probation for professions with a health focus (de Beer, 2011; L. Cooper, 2011; Grealish & Stunder, 2011; Linn, 2011), education (B. Cooper & Taylor, 2011) and policing (Campbell & Nystrom, 2011). For this type of WIL a strong emphasis was on ensuring professional development within complex environments. Project-based WIL was featured in sport (Fleming & Ferkins, 2011), where projects were used to provide a focused piece of work within which students could apply, connect, and develop their learning.

The industry-based learning examples were noted to have different areas of focus. Activities that were focused on developing skill within the professional context were described as placement learning (Baker et al., 2011; Bates & Madu, 2011; Clear et al., 2011; Hoskyn & Martin, 2011; Todd & Lay, 2011). Bates and Madu (2011, p. 234) captured this in the context of criminology by describing it as developing "mastery and professional autonomy". Liberal Arts and English as an additional language focused on career exploration (Brown & Cooke, 2011; Stellar & Porter, 2011). In the liberal arts it was common for students to be able to identify more than six different careers that they could enter into, showing the breadth of the arts and also some of the challenges for placement coordinators and systems. For English as an additional language the context of the learning was most important (whether that was in a workplace or service-learning environment) so that students could maximize the best fit for their learning. Social work and psychology also had multiple placement types that spanned different categories. Both included service learning (L. Cooper, 2011; Linn, 2011). Advanced psychology student practitioners also conducted work-based learning (Linn, 2011). The purpose of service and industry-based learning was to facilitate a broad range of experiences to then connect with learning.

WIL was also shown through the conventional case studies to be either mandatory or optional depending on the institution. In terms of WIL being optional, Dunn and Tenkate (2011) revealed a high level of environmental health students (80%) choosing to participate in an optional WIL component. In contrast due to a hosting organization shortage, journalism placements were limited to students with a high grade point average (Thomas & Goc, 2011).

Work-based learning in this analysis is understood as the work comes first, and education is shaped around the occupation. Almost in reverse of the previous examples, work-based learning had the educational aspects designed to fit in with work, leading to the student focused on making meaning and connected learning from the education context back to their work environment. The example that falls within this category was international agribusiness (McCurdy & Barwood, 2011) where farmers enhanced their work through education. As remote workspace technologies continue to develop the related work-based learning model may become more prevalent for other careers, particularly in connection with providers of distance education.

Expanding the focus from individual case studies to broader programs of conventional WIL in Table 4, Gannaway and Sheppard (2017) reviewed WIL within the liberal arts, across 34 Australian universities. They found WIL opportunities were limited, often optional, and ad hoc, which could be attributed to the general disconnect between arts and employability, consistent with the findings by Brown and Cooke (2011) and Stellar and Porter (2011). To address these concerns, Gannaway and Sheppard (2017) described transformational model of WIL, an emerging trend of complex activities scaffolded across multiple interdisciplinary core learning opportunities. The importance of interdisciplinary groups was emphasized as a benefit to assist students to cross disciplinary boundaries. Gustafsson and Thång (2017) found in the context of nursing that there were challenges with the transfer of knowledge in problem based learning and in the higher vocational education (HVE) space of health, computer science, business & administration, students experienced a lack of task progression. Thus suggesting that attention needs to be paid to supporting learners in making the link between classroom and workplace learning, by creating "a social space in which theory and practice overlap and integrate with each other" (Gustafsson & Thång, 2017, p. 48) to enhance cumulative knowledge production.

Both Gannaway and Sheppard (2017) and Gustafsson and Thång (2017) found a disconnect between academics and the professional area that students entered for WIL, suggesting the need for transferable learning to be demonstrated across different contexts. In particular Gannaway and Sheppard (2017) noted the transformational potential of WIL scaffolded throughout the students' study program. To extend the call for greater alignment between the university and the changing workplace, there is also the need to address the growing need for digital communication skills.

Remote work-integrated learning activities

From the wider literature, four examples were found that could be classified as remote projects completed at a distance from the organization (Table 3). Fleischmann (2015) presented a website development project that was completed for a not for profit (NFP) organization. To complete this project, students communicated and got feedback from industry about the project concept at the developmental stage. While the activities took place on-campus, the on-campus aspect was understood to be the students remote work environment.

In another case Holmes et al. (2012) described student teams who worked remotely to develop a training manual as their shared output designed to apply the use of interactive multimedia within the manual. Reinhard et al. (2007) also focused on training manuals, in their case the testing of the training

manuals was the project activity. There was strong synergy in the use of remote WIL experience, because the content of the manual was designed for the company to use with their remote workers in an international context. The students' remote environment was a strength in that it mimicked the context for the organization with the remote student team from a different international culture. A more developed use of the remote space for social interactions was put forward by Reinhard et al. (2012) where they created a space for an online stop smoking community of practice. Some of the students' recommendations were consequently put into practice by the organization.

Shifting focus from specific disciplines to program requirements for remote work skills, it is useful to consider Bowen and Pennaforte's (2017) investigation into digital communications and remote work and Trede et al.s' (2017) conceptualization of hybrid learning spaces, spaces that bring together aspects of both remote and conventional WIL in Table 4. Bowen and Pennaforte (2017) found that vocational, students entered technology-based organizations that were gradually evolving to become more digitized. The students instinctively used the internet to find information required to support workplace learning, whereas industry used the technology as a communication platform, showing different approaches to the use of technology. It was further revealed that organizational human resource support had moved from an in person relational approach to become online. Bowen and Pennaforte (2017) also suggested that universities are often lagging in their use of digital platforms to manage WIL, thus weakening the connection between the organization and university. This may not prepare the students for digital work processes. Furthermore, in a different study communication students that were working remotely, initially overestimated the convenience benefits of working from home and reported feelings of isolation when waiting for email replies that would allow them to continue with their work and found it hard to gain a sense of connection to the project team and organizational culture.

Bowen and Pennaforte (2017) and Trede et al. (2017) suggest that further work is required in establishing student protocols for becoming digital professionals confident in the professional use of digital technologies. While Bowen and Pennaforte (2017) focused on general digital technologies for communication and connection purposes, Trede et al. (2017) concentrated on the use of mobile technology for connecting learning and work as a hybrid learning space. Trede et al. (2017) found that instruction on how to use mobile devices in a professional context was required for all stakeholders, and thus developed the mobile technology capability building (MTCB) framework. They found that when confidence grew in the professional use of mobile technology, the concern regarding unprofessional conduct diminished and that instances of encouragement to use mobile devices with reciprocal learning benefits were reported.

Simulated work-integrated learning activities

The emphasis on placements based within organizations excludes most simulations from the category of high proximity (Table 3). Although Campbell and Nystrom (2011) included simulation as an aspect of police training, further detail would be required to determine whether all three stakeholders were included in the simulated aspect.

Truman et al. (2017) potentially provide an example of simulation to address low placement opportunities within the community, whereby an on-campus shop was created to employ students who set up sections within the store to retail their products with governance from a board. This situation is the far extreme of an environment created for learning involving all three stakeholders. It has been classified here as simulated, because the only reason the environment exists is in order for students to

be able to complete an authentic WIL placement. This is in contrast to Kay and Mitchell (2013) who present the concept of students employed in existing areas of the university which they termed students as staff. This example by Kay and Mitchell (2013) could be termed conventional WIL, however only 20% of those students used that experience for WIL.

Gummer (2015) focused on simulating the type of activity professional photographers would engage in – competitions – and shaped WIL around an aspect that contributes to the career of a photographer. This example is understood as simulated, because it created the connection between students and professional photographers using a photography competition as an alternative experience. The students were able to learn how the professional interacts, establish their own professional identity, and gained feedback on how to judge photography. "The experience of achieving high levels of success at the awards, helping behind the scenes, attending the conference and networking with professionals have contributed to a healthy symbiotic relationship between the students, UCOL and industry players" (Gummer, 2015, p. 27). Students did not have access to the photographers working environment, therefore, it is considered a simulation in an alternative workspace.

High Authenticity / Medium Proximity WIL Activities with Industry Involvement

In contrast to WIL located within organizations, the refinement offered by Kaider et al. (2017) of medium proximity and high authenticity yielded the most results. This definition opens the space for remote WIL and simulated WIL activities to be identified as shown in Table 5.

Remote work-integrated learning activities

Ramakrishnan (2010) clearly described a remote capstone project that was supported by industry clients who provided the working data. The students were required to present progress reports, seminars and meeting agendas for industry. They emphasized the usefulness of running this project over two semesters.

Aspects of remote WIL were reported by Irwin et al. (2012) through the use of technology as a foundation for communication with host organizations. The technology was used as a mechanism to establish a real connection between students and industry, to reduce the impact of distance via virtual communication and to also develop a sense of belonging before travelling to placement. Although Second Life was the technology used, it was used to create a space for meeting and not for simulating meetings. While the whole WIL experience is not captured in this activity, it does show the potential for further use of second life.

Simulated work-integrated learning activities

Naumann et al. (2014) describe a vital aspect of simulations is the ability of offer equal opportunities for learning and assessment to all students. They state that "assessing students during a practicum can be highly variable in terms of the opportunities for assessment and the skills of the examiners" (p. 223). Simulations allow for a more equitable assessment environment that does not leave the range of situations assessed to chance (Chernikova et al., 2020, Naumann et al., 2014, Rasalam & Bandaranaike, 2018). This viewpoint continues to be reinforced with further examples from the field of medicine to support the development of soft skills "through these simulated scenarios, the professionalism agenda can be maintained and not left to the varying quality of individual clinical placements" (Rasalam & Bandaranaike, 2018, p. 110).

In contrast to simulations that take place in highly controlled environments, there are also simulations that take place in the field such as the three day humanitarian exercise with progressively advanced tasks (Stibral & Kettle, 2018) and diggers trail where paramedicine students develop "navigation, wilderness response and trauma care skills" (Webb et al., 2014, p. 16). These simulations are partnered with industry to complete these programs.

TABLE 5: Examples of high authenticity / medium proximity WIL activities with industry involvement, where C = conventional, R = remote, S = simulated, and S+ = simulated where an external stakeholder was clearly involved.

Type	Citation	Context	Mode	Notes
Capstone units				
	Ramakrishnan (2010)	Software engineering	R	Data provided, student progress reports, seminars, and meeting agendas to industry
Complex simulated environments				
	Naumann et al. (2014)	Exercise physiology	S+	Purpose built space: Clinic controlled range of situations to be assessed
	Stibral and Kettle (2018)	Humanitarian	S+	In the field: Progressively advanced tasks over three days
	Webb et al. (2014)	Paramedicine	S+	In the field: wilderness 'diggers trail'
	Khan and Brunner, (2010)	Planning	S+	planning office scenario
	Cotter et al. (2019)	Business consulting	S+	Student project office in town
	Woodley and Johnson (2010)	Business and Law	S+	Assessment day centre
Purpose built spaces with clients				
	Pillay (2018)	Hospitality	S	Purpose built space: Restaurants
	Connaughton (2014)	Physio	S	Physio
	Rasalam and Bandaranaike (2018)	Medical	S	Purpose built space: Clinic Soft skills
	Russell and Hannah (2012)	Construction	S	The Practice Firm on wheels on site
	Naylor et al. (2010)	Multiple Campus Operation	S	Consultancy, business venture simulation, in-house innovation challenge
Complex online environment and dual mode				
	Smith et al. (2020)	Construction and Nursing	S	Online: Adapted building for construction (workers) and nursing (clients) fire evacuation simulation
	Irwin et al. (2012)	Nursing	S/R	Second Life to develop sense of belonging with actual community
	Gamble et al. (2012)	Health	S/R	Purpose built space: Clinic actors for advanced scenarios
	Carr et al. (2019, p. 43)	Institution wide	S/R	management experience

Within the business context several creative simulations have been reported. Khan and Brunner, (2010), presented a planning office scenario providing authentic learning tasks for student planners on-campus, ensuring that they "concentrate on coverage of areas or tasks where the gap between theory and practice is most pronounced" (p. 248), and collaborate with industry (such as council planners) to develop simulated tasks. This strategy was important because it also enabled an equitable experience for students who could have difficulty securing industry placements. In another attempt to simulate students' working environment closer to the business area Cotter et al. (2019) set up a student office in town. This simulated the workplace experience and was supported by the local city council and managed by the educational institution. "This creative space not only broke down barriers between staff and students, but it facilitated interactions of students from different schools" (p. 9) leading to collaborations across different aspects of projects. Woodley and Johnson (2010) reported on the positive benefits from the assessment day center that provided a simulation of recruitment processes and tasks that would be necessary to complete within a given role. They found that the "simulations provide students with a chance to behave in ways that are consistent with a real workplace or real processes – such as recruitment processes - but with the psychological safety of a simulation" (p. 547).

There are also simulated built environments on or off campus that serve the dual purpose of being a teaching and professional space. Classic examples from health are quickly understood, however further examples of built environments created for the purpose of simulating reality include; training restaurants, building sites, and business offices. The interpretation of having all three stakeholders involved is a little challenging to define. At what point does a training restaurant, clinic or office space transition into becoming simply a restaurant, clinic or office space? Within these spaces academics may also operate performing a dual role of industry professional and instructor. It may be the presence of paying customers or clients who use the service for real rather than role play could be the defining feature. In Table 5 this was labelled purpose-built spaces with clients.

Training restaurants are understood as complex simulations, where students get to experience the authentic setting within a safe environment (Pillay, 2017). Pillay (2018) describes the importance of clearly defining the roles the students are to perform so that the hierarchy is created to support the management experience. In the simulated Practice Firm environment, Russell and Hannah (2012) present a new way for conducting building consultancy education by locating a construction office on building sites. They created the office to be mobile, so that it could be relocated to different construction sites for other trade student cohorts thereby ensuring that the learning is simulated in a real office in a learning context removed from the classroom. This has resulted in new ways of teaching. The building was created with the support of industry partners with further plans to setup the office for clients in the future.

Naylor et al. (2010) presented a range of simulations that may or may not involve industry. They are captured here due to the high potential to make the three way connection with activities such as manager for a day through to consultancy clinics. To expand on the importance of the management experience Carr et al. (2019, p. 43) assert that "in work simulations, students problem solve, manage conflict, innovate and act, as they encounter challenges, 'on the spot' . . . the focus in work simulations is therefore more on thinking and innovating 'on the spot' and building interpersonal, conflict resolution and problem solving skills under pressure, in particular scenarios." However, to fit the definition of a WIL activity all three stakeholders must be included.

Repurposing gaming environments into a simulated experience across disciplines was reported by Smith et al. (2020) who took an element of an online game – a building – and adapted it to become a

teaching tool for both construction and nursing students. The construction students learned about the building code in a simulated online environment, viewing and interacting with the building online. The nursing students, users of the building, were required to assist with a fire evacuation. Smith et al. (2020) similar to Khan and Brunner (2010), recommend using simulation to focus on key aspects of the course.

Gamble et al. (2012) present a complex range of simulations across different disciplines that include role-plays, paid actors and advanced technology in the form of high fidelity mannequins. In the clinical setting students need to apply their knowledge to treatment. Gamble et al. (2012) are careful to point out that the practice clinic simulations do not replace the need for real experience, however, in some instances this may reduce the number of hours students are required to spend on conventional placements. Gamble et al. (2012) also present a remote aspect with the use of video, where industry record client assessments for students to view. To build this into the development of medical practitioners, students were then required in the practice clinic to complete a simulated exercise in then assessing clients presenting with similar symptoms, thus allowing students to transfer their learning from online to a simulated environment prior to a conventional placement. Aspects of the learning required before practicum can be presented in different ways, including the use of recordings that students may review multiple times.

Less Complex Activities with Industry Involvement

The last two sections within the authentic learning activities with industry involvement in Table 2 are substantially less complex than the previous two sections. These final two sections presented in Table 6 are still useful to map to the literature, as they may show a beginning point for more complex remote or simulated experiences. These experiences facilitate stronger connections with the WIL experience, but do not replace the experience as a whole.

TABLE 6: Examples of less complex activities with industry involvement, where C = conventional, R = remote, S = simulated, and S+ = simulated where an external stakeholder was clearly involved.

Citation	Context	Mode	Notes
Snell and Snell-Siddle (2017)	Information technology	R	Interactive industry presentations, field trips, discussion forums and blogs
Janchai et al. (2019)	Information technology	R	Industry input & mentoring
Snell-Siddle et al. (2019)	Information technology	R	Virtual connections/Q&A industry alumni & students
Stiles-Smith & Kennedy (2016)	Psychology	R	Mentoring and feedback
Gamble et al. (2012)**	Health	S/R	Virtual consult Simulated clinics
Gummer (2015) **	Photography	S+	Mentoring and feedback on photo competition judging
Simpson and Thyer (2016)	Paramedicine	S	A-symmetrical timing, peer teaching
Batholmeus and Pop (2019)	Cross-disciplinary	S	Simulate placement learning skills

*Note: ** in previous tables*

Remote work-integrated learning activities

Snell and Snell-Siddle (2017) created remote connections with industry that included pre-recorded industry presentations and a virtual field trip, to assist students in preparation for their capstone project. Technology has also been used to facilitate collaboration and learning connections between alumni, students and industry in the fields of information technology (Snell-Siddle et al., 2019) and psychology (Stiles-Smith & Kennedy, 2016). Snell and Snell-Siddle (2017) present interaction with industry through presentations, discussion forums and blogs, and more recently through the development hub approach, they expanded the online forum to include closer connection between current students and recent graduates to allow continuous learning to take place (Snell-Siddle et al., 2019). Being mentored by industry or receiving input and feedback on real case studies or industry projects was an important aspect for many of the examples, in particular the focus on mentoring by industry (Janchai et al., 2019; Snell-Siddle et al., 2019; Stiles-Smith & Kennedy, 2016), industry input (Janchai et al., 2019) and the use of industry Q&A on digital platforms (Snell-Siddle et al., 2019).

Simulated work-integrated learning activities

A creative approach to managing a restricted number of placements was explored by Simpson and Thyer (2016) who introduced an a-symmetrical jigsaw approach in response to placements being completed by the same student cohort at different times. "Students each undertake an equivalent, yet different clinical placement in one of three health settings and then return to teach their peers and vicariously learn of their experiences" (p. 18). The activities the students engaged in on placement were highly authentic, it was the students returning from placement to teach their peers that constituted the simulated approach. The simulation enriched the learning for the students yet to go on placement and reinforced the learning for the students who returned.

Batholmeus and Pop (2019) report on a preplacement experience that is in itself a simulated placement. The car manufacturing simulation helps to prepare students for WIL in a two-stage process. First the students attend a two day workshop where the "students go through a theoretical session in which concepts on employability, higher education-industry link, work-breakdown, organizational structure, productivity, cost, quality, SWOT analysis, wastes and housekeeping are explained" (Batholmeus & Pop, 2019, p. 28). Secondly, they complete the simulated activity, and the students are encouraged to apply the concepts from the theoretical session to the simulation. Because the simulation is not related to the actual WIL experience, the tasks – although authentic for car manufacturing and for soft skills – are not authentic for the students' specific qualification.

Discussion of Conventional, Virtual and Simulated Practice by Level of Authenticity and Proximity

An overall summary of conventional, remote, and simulated practice is presented in Table 7. Of the 56 instances analyzed, the highest numbers were found in conventional (23) and simulated (17) WIL with only nine reported as remote. The hybrids showed an additional simulated case with conventional WIL, two examples showed conventional and remote, and four examples included aspects of both remote and simulated. Prior to discussing the overall summary of this meta-analysis, it is important to recognize some limitations. A narrow focus from within the WIL field was applied to this research, in order to provide a foundation from two texts, the international journal of work-integrated learning, and the proceedings from three national association conferences and symposia (see earlier in Table 1). Furthermore, this analysis concentrated on identifying the mode of WIL, not the structure, assessment, or timing of WIL. The Kaider et al. (2017) framework was applied to reveal broad types of practice by

discipline within and also with industry, potentially broadening options for WIL redesign in disciplines severely impacted by COVID-19.

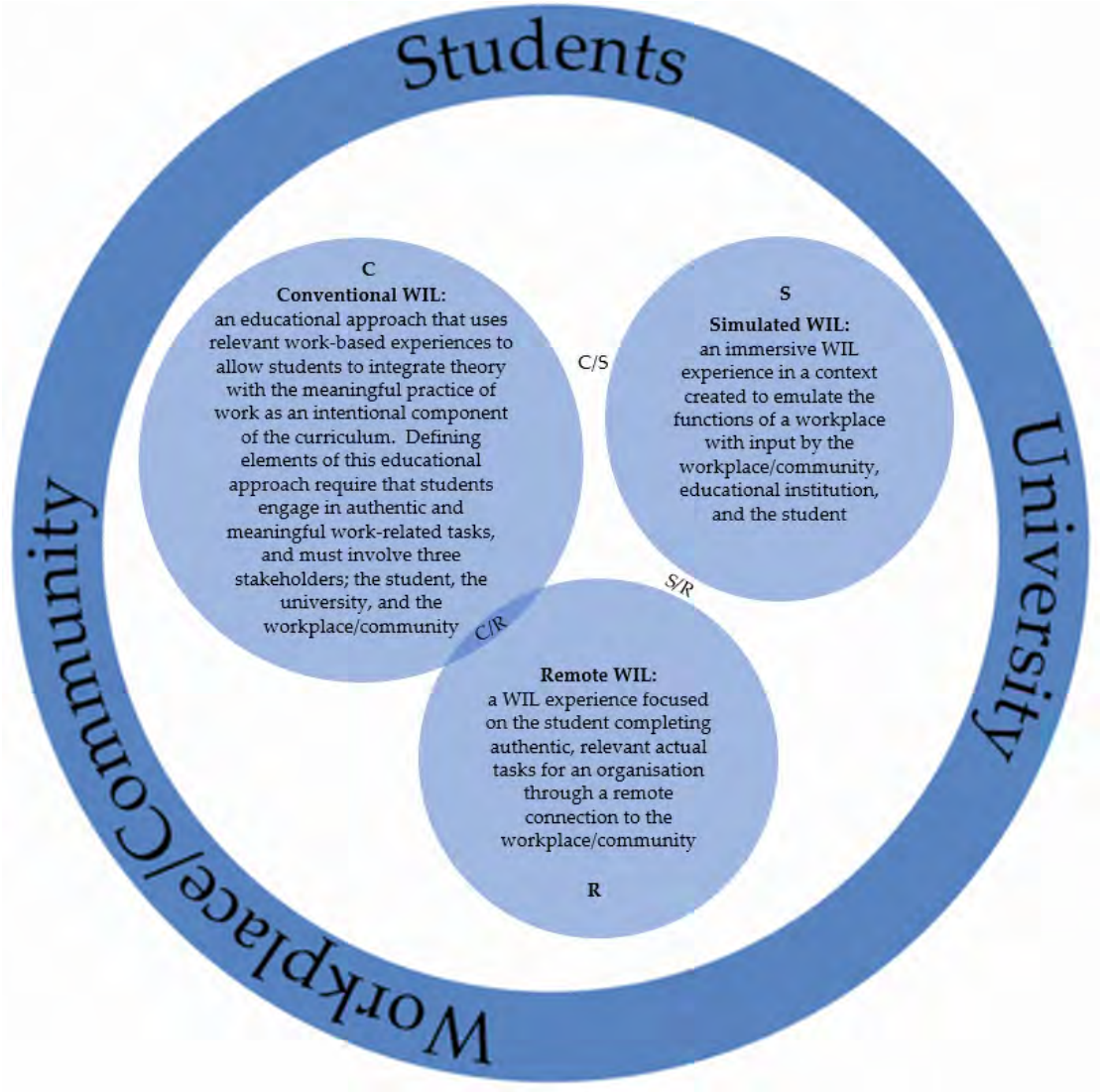
TABLE 7: Summary of WIL practice examples by level of authenticity and proximity where C = conventional, R = remote, S = simulated, and S+ = simulated where an external stakeholder was clearly involved

	C	**C/R**	**C/S**	**R**	**S/R**	**S**	**S+**	**Total by authenticity / proximity**
High Authenticity / High Proximity	23*	2	1	4			2	32*
High Authenticity / Medium Proximity				1	3	6	6	16
Medium Authenticity / Medium-High Proximity				4**	1**	1**	2**	8***
Total by mode	23	2	1	9	4	7	10	56

Note:
* 4 x conventional examples were coded to multiple activities within this level
**1 x example within this level was also coded at a higher level of authenticity/proximity
***In total, 3 x examples were also coded at a higher level of authenticity/proximity

The conventional examples showed a rich depth and range of practices across different types of highly authentic activities within organizations. They revealed that in addition to variations between institutions, there are also variations within institutions and some courses reported multiple approaches. This reinforces the call for a clear definition of WIL that all stakeholders can relate to (Sachs et al., 2017). With this need for clear definitions and to further unpack the detail presented in Table 7, Figure 1 presents the definitions for each mode of WIL established in the introduction. The external circle depicts the three main stakeholders surrounding the different modes of WIL. This visual presentation creates space to consider the meta-analysis along with the combinations that were revealed. The Campbell and Nystrom (2011) example, that potentially had a combination of conventional and simulated, required further detail to classify further and therefore no actual overlap is shown at that point in Figure 1. However, simulated activities may be used to scaffold prior learning for conventional WIL and learning from the conventional mode may also be consolidated through simulation. Similarly, the remote aspects connected with simulations also revealed the potential to consider the relationship between remote and simulated WIL modes shown in Figure 1.

FIGURE 1: Proposed model of WIL mode definitions surrounded by the three main stakeholders, where C = conventional, R = remote, S = simulated, and the potential combinations of C/R, S/R and C/S.



To further build the need for clarity, it is suggested that remote WIL may be a term that is consistently understood by all stakeholders, in contrast to virtual WIL. This is an especially useful distinction to make to reduce confusion in cases that use virtual reality. Remote WIL had the greatest concentration in placements with high authenticity and high proximity (Fleischmann, 2015; Holmes et al., 2012; Reinhard et al., 2007, 2012). This trend may continue now that COVID-19 has required many stakeholders to develop remote work capabilities. There were two distinct approaches to combining conventional and remote WIL practice. Bowen and Pennaforte (2017) reported on the portion of time that students spent working in the different spaces compared to Trede et al. (2017) who supported the development of a hybrid learning space spanning different spaces in multiple ways.

The greatest concentration of simulated WIL (12) was in the category defined as high authenticity, medium proximity. There is potential to consider the advantages provided by simulated WIL. Greater

reporting of the inclusion of stakeholders is needed, and some of the complex simulated environments clearly identified these (Cotter et al., 2019; Khan & Brunner, 2010; Naumann et al., 2014; Stibral & Kettle, 2018; Webb et al., 2014; Woodley & Johnston, 2010). The use of built environments requires further clarification for the boundary between simulated and conventional WIL. Clarification around these boundaries may support further reporting of WIL activities within these spaces with a clear recognition of stakeholders and roles. Simulations have also been featured for showcase or roundtable discussions at conference, in particular presentations that describe ways in which simulations could be scaled to larger audiences (Connaughton, 2014) or pedagogical approaches that encourage the transfer of learning (Hains-Wesson, et al., 2014) would be valuable to have published in full conference proceedings or articles for the wider WIL community. Simpson and Thyer (2016) presented a case for students to teach other students about their WIL experience. Therefore, if part of the premise of WIL is to "integrate theory with the meaningful practice of work as an intentional component of the curriculum" (IJWIL, n.d., para. 3), then having students teach other students what they have learnt from their experience may go some way toward fulfilling or reinforcing that learning.

Overall, the examples of conventional, remote, and simulated WIL may suggest that future examples of WIL could also be in the area of high authenticity, and high proximity for remote WIL, and medium proximity for simulated WIL. Unexpectedly, medium authenticity with high proximity had a low level of use with only two cases captured in this space. Medium authenticity and medium proximity were reported in multiple categories, suggesting that this category could perhaps be used to amplify or prepare for more authentic levels of WIL. Gannaway and Sheppard (2017) suggested scaffolding WIL type activities throughout the curriculum, which could have benefits to programs beyond the liberal arts. This could be a vital tool to help all stakeholders develop their remote professional practice skills.

Remote WIL could therefore be a strength and preferred option for completing some types of WIL, especially when the student context is aligned with the purpose of the project. It is important to consider concerns raised by Hoskyn and Martin (2011) who noted that projects completed outside of the organization may be problematic due to lack of supervision and low exposure to workplace culture. A concern which Bowen and Pennaforte (2017) identified as a current challenge, even with technological advances, in that students found it difficult to establish a sense of connection when using digital technologies for communication. Clearly further work is required in establishing remote WIL which could draw on the mobile technology capability building framework provided by Trede et al. (2017). It may also be timely to consider the ways in which technology can be used in WIL to create a hybrid or blended learning space to connect work, learning, and technology drawing on the foundation by Trede et al. (2017) where the use of technology is extended from mobile technology to the use of broader digital technologies by all three stakeholders in WIL.

Cartmel et al. (2018, p. 26) found that WIL staff want to have strong networks for sharing knowledge "identifying the range of WIL possibilities, including simulations". However, there were concerns about the value of alternative modes. From the student's perspective, Valencia-Forrester (2019) found that university led simulations were seen as more appropriate for an academic career. Therefore, careful thought needs to be given to develop positive associations for simulated WIL. This view may be compounded by the suggestion that remote or simulated modes may be an alternative suitable for low achieving students (Yap, 2010).

CONCLUSION

It is clear that virtual and simulated WIL are terms that are widely used in the literature. This meta-analysis from WIL literature provides curriculum developers with a compiled resource to make research informed changes to curriculum whilst simultaneously addressing current changes in the world of work and education as a result of COVID-19. The synthesis revealed that although previous remote and simulated WIL were predominantly from the disciplines of health, technology and management, there are examples from arts, construction, and hospitality. Of particular note is the potential shown through the use of built workspaces, ranging from digital second life online representations or physical built spaces that may be based on campus, in the community or on wheels so that they may span different contexts and purposes. These spaces could provide rich areas to consider weaving a philosophy of WIL throughout the students' study lifecycle.

Rapid growth in redeveloping the WIL curriculum to accommodate non-placement focused and different modes of WIL, is now underway. To avoid confusion, using the term 'remote' may provide a more straightforward term for all stakeholders to use than the term virtual, which has a tendency to be confused with virtual reality, thus simulations. Reviewing published examples of remote and simulated WIL practice was timely and is intended to assist with the redevelopment of the WIL curriculum during and post COVID-19. In addition, it will be beneficial to consider whether less complex activities could be used as a starting point to add in elements for future transitions to working in a remote way. There may also be greater acceptance of remote WIL placements, including the potential to work more closely with international virtual internship agencies. These internships are generally brokered by external organizations for an additional fee, and as such have been excluded from this analysis.

In simulated environments, activities are constructed to take place for the purpose of the simulated learning experience. The distinguishing feature between a simulated experience and a simulated WIL experience, is that the latter includes input from industry. Many of the simulations were complex and combined multiple activities. Due to the widespread impact of the global pandemic, considering further opportunities to develop interdisciplinary collaborative simulated experiences could be a strategically wise move for practitioners within the WIL community, drawing on the examples from Batholmeus and Pop (2019) and Smith et al. (2020). Rather than providing the whole of the WIL experience in this space, it may be a starting point to lead into other learning activities. It is vital that there is authentic inclusion of industry so that it is WIL, rather than a classroom activity without industry involvement. Perhaps Simpson and Thyer's (2016) creative a-symmetrical simulated approaches to managing a restricted number of placements could be used in other areas where placements are limited.

A few examples showed combinations across modes of WIL using both simulated and remote environments together. Simulated spaces may also cross over into conventional places and, therefore, may exist on a continuum, depending on the activity undertaken, and the audience for the activity/service that is provided. There may be a blurring between these two categories, dependent on the type of customer or demand for the service or simply the timetable for use of a location. It was found that conventional and remote WIL were not always clearly distinct in practice and, at times, the two practices overlapped revealing widespread use of technology in workplaces and learning. Therefore, there may be several ways to redevelop WIL, beyond the introduction of discrete remote and simulated modes, which could include combinations of conventional, remote, and/or simulated WIL, resulting in hybrid or blended WIL spaces.

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