



Designing blended spaces to maximise student learning in work integrated learning programs

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This paper describes a case study at a large metropolitan university in Australia where a range of technology-enabled blended spaces are used for interaction, communication and reflection between the work and university environments to enrich students' learning experiences during their work placement year. Blended space design requirements to maximise the learning experience of students undertaking work integrated learning are identified.

Keywords: Work integrated learning, blended spaces, blended learning

Introduction

Building relationships and maintaining connections are viewed as essential for maximising the benefits that students can gain from their Work Integrated Learning (WIL) experiences. Work Integrated Learning at RMIT University refers to work-based learning that includes co-operative education programs (year long work placements), internships, clinical practice, practicums, industry projects and related professional practices. Work Integrated Learning programs are designed to enable students to apply their academic learning to the workplace, adopt professional practices and develop skills that will equip them for effective work performance. Communicating and relating effectively with a range of people in different circumstances is one of the hallmarks of quality professional practice. For the student on a WIL placement taking the role of employee in the workplace, it means relating to supervisors, peers, customers and others in the organisation. It also means additional communication with the academic advisor, the WIL administrator and student peers on placement in other organisations. The complex communication networks which are required and utilised to maintain these relationships form the focus of the study described in this paper.

A literature review was conducted covering the areas of work integrated learning, blended spaces and blended learning. The findings are grouped into the three distinct learning stages that are believed to impact Work Integrated Learning programs, starting with the preparation of students for work placements, followed by supporting them during their placements, to finally providing opportunities for critical reflection on the placement experience. The literature which deals specifically with blended spaces, while not voluminous, does identify key requirements for creating blended learning environments. Augmenting this literature review are the qualitative findings from information collected from industry supervisors. Taken together, the literature and the qualitative research indicate that it is important to identify the blended space design requirements that will maximise the learning experience of students undertaking Work Integrated Learning.

Literature review

Knowledge transfer practices at various stages of WIL

Preparation for work placements

Preparing students for learning in the workplace is identified by Costley and Armsby (2007) as a requirement of Work Integrated Learning programs. Costley and Armsby (2007) highlight the need to engage students with theories of learning so that they know what the learning is about and can articulate and provide evidence of the learning that occurs (Costley and Armsby, 2007). The principal learning theory for the workplace is identified by Richardson et al. (2009) as aligning with the 'constructive

perspective of knowledge', which emphasises that knowledge is constructed by students, not by a teacher's direct instruction (Biggs, 2003, as cited in Richardson, Henschke, Kaider and Jackling, 2009, p.11). The student-centred learning approach sees students as collaborators in the learning process, while student-directed learning encourages students to take responsibility for their own learning. In support of this approach, McNamara (2008) draws on Delahaye (2005) and Poikela (2004) to describe a work-based learning process in which students assume primary responsibility for devising learning goals and actions for achievement in consultation with the workplace supervisor. Brodie and Irving (2007) present the Work Based Learning (WBL) Model that similarly sees a requirement for student preparation prior to placement, depicting 'the inter-relationship and inter-dependency between understanding learning, critical reflection and the identification and development of capability within a WBL context' (Brodie and Irving, 2007, p.11). Their WBL Model proposes that students' 'engagement with the theories of learning enables students to recognise their capabilities and areas for development, allowing them to evidence their learning through work' (Brodie and Irving, 2007, p.14).

Several studies support the need for preparing students for work placements in order to maximise their learning experience. Cates and LeMaster (2003) describe a university placement program in which students were requested by the university to identify and focus on a single issue or topic throughout their work placement. In the initial meeting between student and supervisor, the student communicated the placement focus. Cates and LeMaster (2003) found that having a focus area for learning provided supervisors with a solid foundation for feedback. Jones et al. (2009), found that the majority of workplace supervisors who they interviewed advocated joint cooperation between the university, the work placement supervisor and the student in determining learning objectives, working from an assumption that there should be flexible goals and objectives for each student placement.

Learning partnerships during placements

Each work placement sits within an organisation where the opportunities for learning are influenced by personal, interpersonal, institutional, social and historical factors (Foley, 2004). How adults learn can be seen to be influenced by a highly complex set of variables. These variables may be loosely grouped across three overlapping dimensions.

The first is the contextual dimension which includes the micro context of the organisation. External political, economical and technological forces drive an organisation's strategies. These strategies in turn drive its internal policy, culture, structure, processes and learning orientation. This learning orientation promotes or discourages a learning culture within the company and influences how managers, supervisors and employees share knowledge. Also, the type of industry of which the organisation is part, influences the nature of the learning required and how learning is perceived (Smith and Sadler-Smith, 2006).

The second dimension is the social dimension which includes internal and external stakeholders, their interactions and relationships. The assumptions, expectations and concerns held by the stakeholders towards learning, impact the design and implementation of learning programs. Good relationships between all parties depends on clear agreements, two-way, open communications; learning and mentoring support for students; advisory support for workplace supervisors; and a recognition of the value of an ongoing relationship between all parties (Lyons, 2007; Gamble et al., 2007; Howe and Patrick, 2007).

The third dimension, the learning dimension brings together the factors regarding the learners and their contexts within the learning program. Learning can be formal, non-formal, informal and incidental (Foley, 2004). However, most workplace learning occurs informally, but consciously through experience, or incidentally and unconsciously (Eraut, Alderton, Cole and Senker, 1998). This means that the measurement of learning and capturing individual learner progress is fraught with complexity. The Dreyfus Model of Skill Acquisition charts the incremental changes of a professional over five levels of proficiency: novice, advanced beginner, competent, proficient and expert (Benner, 1982). Benner (1982) and Smith and Sadler-Smith (2006) found that the learning needs of professionals varies according to their stage of professional development. Novices and advanced beginners require more learning support and scaffolding which decreases as they became more expert.

Most students in a co-op placement are at the novice stage of professional development and require guided instructions, "hand-holding," and recognition and affirmation from supervisors and colleagues. Face-to-face support is optimal but complementary technological support may go a long way in affirming and developing the learner. Students should also be encouraged to be proactive and take responsibility for their own learning and professional development. Reflective practice that forms part of this ongoing development can be encouraged through planned curricula, individual work and learning plans; and regular performance reviews and feedback.

Critical reflection on the placement learning experience

Experiences in work placements provide students with multiple ongoing learning opportunities. Reflection on the workplace experience requires the principle skills of self-awareness, critical analysis, synthesis and evaluation (Duffy, 2009). However, it has been found that many students do not reflect spontaneously on their learning processes (Velzen, as cited in Boom, Paas and Merrienboer, 2007). To facilitate guided reflection, Duffy (2009) suggests the need for competent questioning to trigger critical thinking. This questioning could be delivered during feedback sessions. Chi (1996) and Mory (2003) suggest that 'in educational settings, feedback has proved to be adequate to improve the progress of students' learning and to deepen learning processes' (as cited in Boom et. al., 2007, p.535). During the work placement the feedback may come from a number of sources: the workplace supervisor, workplace peers, academics or student peers. It may be formal or informal. Boom et. al's (2007) study of students at a distance teaching university found external feedback on students' reflections served as a means of increasing the quality of reflective activities and contributing to the development of self-regulated learning. Kriewaldt (2001) similarly concluded that peer feedback, when provided, was effective as a source of external feedback in support of self directed learning.

Technology supported communication between learning stakeholders

McEwan and O'Hara (2009) define blended spaces as shared virtual spaces that connect distributed physical spaces to enable activities that support operations in a specific context. Within a WIL program the concept of virtual spaces refers to the technological mechanisms that are used to facilitate communication between students, academics, workplace supervisors, employees and student peers in a range of work and learning activities. The intersection between workplace learning and university-based learning readily lends itself to being able to be accommodated by technology. Milne (2009) points to the fact that contemporary students easily and actively integrate technology into their lives, and by extension, to their learning. This view is supported by Draper and Hitchcock (2008) whose study of music technology students at an Australian university found that the predominant source of cross-year interactions occurred online. Milne (2009) suggests that significant knowledge is generated through the use of social informal flexible spaces for activities such as group interaction and collaboration. Milne (2009) advocates the pursuit of an improved understanding of learning space design in order to harness the learning benefits of these flexible spaces.

Radcliffe (2002) views the need to provide blended spaces as a response to 'societal changes, competing demands on students' time, and changing expectations of formal institutions' (Radcliff, 2002, p.5). The spatial and temporal dimension on how courses are run provides a useful framework for locating the various technologies that might support blended learning. Figure 1 below illustrates this framework.

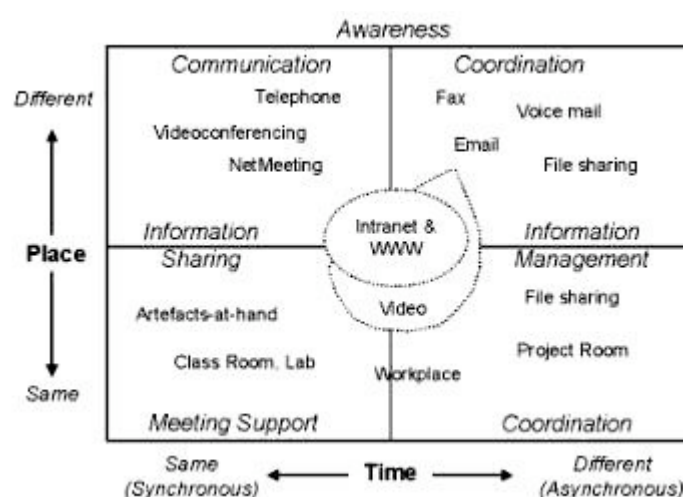


Figure 1: Enabling technologies in a spatial-temporal learning continuum (Radcliffe, 2002)

The employment of technologies to underpin blended learning environments is not merely the result of changing requirements and expectations but also provides for enhanced learning opportunities, when carefully designed. Ginns and Ellis (2007) suggest that while information and communication technologies (ICT) may help develop skills such as 'modern communication and collaboration methods if they are used well, the immediate access they provide to an increasing amount of knowledge, both in the disciplinary and future professional areas of students; and the understanding they engender if they are to

support learning appropriately' (Ginns and Ellis, 2007, p.54), technology typically supports only part of the learning processes in which the students engage. Blended spaces need to not only link the work-based learning environment with the academic-based learning environment on behalf of the students, the workplace supervisors and peers and the academic supervisors and peers, but they must also link the technology with face-to-face interaction. Consequently, blended spaces can be viewed as more than just a blended space; it can also be viewed as blended learning. Milne (2009) in fact, defines blended learning as the combination of traditional and non-traditional face-to-face learning and authentic online learning. He believes that this encourages student engagement and potentially transforms student learning experiences and outcomes. Students' perceptions of blended learning were investigated by So and Brush (2008) who found that emotional support, and communication medium were critical factors associated with student perceptions of collaboration, social presence, and satisfaction in a blended learning environment.

The literature suggests that students whose learning is taking place in the workplace can benefit significantly by technology-supported interaction for the management of multiple relationships which are complicated by geography, people, and time, and can facilitate reflective learning. In support of the learning needs in the preparatory stages of a WIL program, the literature suggests that technology which is controlled by the student provides the autonomy required by the self directed approach to learning, yet also facilitates collaboration as indicated by the student-centred learning approach. The provision of learning support for students during their work placement can readily be enhanced through technological communication. Technological platforms such as e-portfolios wikis and discussion boards can be utilised to support of reflective practices. They can also be used to encourage planned curricula, individual work and learning plans; and regular performance reviews and feedback. In support of the students' critical reflection on their learning, the literature suggests that technology be chosen which facilitates the provision of feedback in a supportive environment. The value lies with the currency that the technology has for today's students; the ease and flexibility of use; its ready availability and access; and its capacity to transcend physical boundaries, providing both autonomy and a medium for collaboration. The blending of these spaces improves the transferability of knowledge and skills between the work environment and the university environment.

Difficulties exist in evaluating the contribution of technology to quality learning; however, the literature provides guidance in determining design features to maximise learning. This has prompted the development and evaluation of a blended learning design for WIL students. Verification of the design would allow for its expanded application.

Methodology

The project-based case study presented from RMIT University is a work in progress. The project is comprised of three phases spanning a 24-month timeline. The phases include: (1) a literature review; (2) data collection from interviews with workplace supervisors and surveys with student; and (2) development of requirements for technology-supported resources to support blended learning spaces.

This paper reports on the alignment of industry supervisor opinion in relation to the technology supported interactions between stakeholders at each stage of the WIL cycle. Twenty-five industry supervisors were interviewed and the information collected was mapped against the activities currently occurring in the Bachelor of Business (Business Information Systems) and the current literature with a view to identifying best practice. Data presented in 2008 Student Experience Surveys (SES) were also scrutinized.

Case study

The focus of the case study is a cohort of students in the Bachelor of Business in Business Information Systems (BBus(BIS) program at RMIT University, a four-year degree that includes a mandatory 12-month industry placement in the third year. This program is commonly termed a cooperative education program, or co-op program, and has been running for approximately 20 years. Although the program has gone through a number of iterations, the experiential learning focus has remained core. Typically there are 100 or so students enrolled in this program at any one time.

The past few years has seen a significant shift in thinking by the School of Business Information Technology (and the University) on the unique learning opportunities offered in a workplace setting. In the past, the co-op program was essentially viewed as a time in which the students were absent from campus, undertaking professionally relevant experience, but with greater maturation as the main outcome. The co-op program is now seen as an integral part of the whole BBus(BIS) curriculum with a number of

academics and administrative personnel involved in its management and delivery rather than the previous “add-on” configuration from which academics were mostly removed. Not only is the curriculum now integrated across the two learning environments, but so too are all the stakeholders. Dedicating increased resources to the program, especially personnel, has seen a marked increase in program effectiveness and student satisfaction. The additional attention that has been given to the pedagogical underpinnings of the program has resulted in increased student engagement and richer learning outcomes. To achieve this, research and thought was paid to how students learn in a workplace environment, what they learn and what facilitation is needed by both academic and workplace supervisor to optimise student learning. Gone are the days where it was assumed that students learn by “osmosis” with little contact required from the University during the students’ placements. The greater integration of stakeholders has concomitantly led to improved student satisfaction and learning.

Throughout the process of improving the delivery of the co-op program it became evident that increased technological resources are required for the effective delivery of the program. An electronic database is a minimum requirement for maintaining student records and learning portals and e-portfolios are required for students to access learning materials, store and showcase their learning activities and communicate with others. The Blackboard Learning Management System (LMS) is RMIT’s core e-learning tool. It provides a variety of online learning resources and communication tools to support students at both course (WIL) and program (BBus[BIS]) levels. These electronic forums became a critical vehicle for communication for various cohorts of users who are widely dispersed both geographically and functionally. These forums, in fact, became blended spaces.

As indicated earlier, work integrated learning as experienced by students undertaking the BBus(BIS) co-op year falls into three distinct, but connected phases: preparatory, placement and the conclusion phases. The technologically-enhanced blended spaces serve as the connectors and one of the forums for blended learning in these three phases.

Preparation for work placements

One of the goals of the BBus(BIS) is to instill in students, graduate attributes, often known as “generic skills” or “employability skills”, which are sought by employers. RMIT in response to employer needs, wants its graduates to be “work ready” and has identified a number of attributes that go hand in hand with this. These attributes include being active and life long learners; environmentally aware and responsive; culturally and socially conscious; global in outlook and competence; and innovative. The lack of graduates who are work ready has become an increasingly grave concern of employers and has led to Australian universities making significant efforts to enhance the graduate outcomes of their students by providing them with opportunities to develop generic employability skills within curricula. Employer-identified employability skills include communication; team work; problem-solving; initiative/enterprise; planning and organisation; self-management; learning; and technology (DEST, 2002). These easily fall under the RMIT’s “work ready” goal.

This year (2009) it has become a mandatory requirement for BBus(BIS) students to attend a co-op preparation program (co-op prep) prior to starting a work placement. The course is designed to aid students to become proactive, self-directed, and reflective. The co-op prep program prepares students for their placements in a number of ways, by: (1) developing self-awareness through a personal skills and abilities audit; (2) helping them build job search skills; (3) inducting them on workplace protocols; (4) facilitating the identification of career goals and strategies to achieve them; and (5) assisting them with identifying the graduate attributes they wish to develop. Alumni and final year students who have gone through a co-op placement year are significantly involved in the face-to-face co-op preparation workshops. A Facebook platform has been introduced to encourage discussions and promote social networking between past, present and future co-op students. This forum serves as a blended space. Another prospect for a blended space is the e-portfolio. Many of the co-op prep activities can be developed, stored and tracked in e-portfolios. These portfolios are an example of an increasingly popular technological instrument, formally introduced by universities, to service both students and teachers. Under the control of the individual student, an e-portfolio may be used as a developmental tool as well as a repository of evidence of activity and learning. The student can determine what can be allowed on their site and who has access. Teachers or workplace supervisors may request the use of student e-portfolios as the vehicle for some of their learning activities and assessments. The tool also has the potential to facilitate “virtual” teamwork between partners at the workplace and the university. Added features of e-portfolios include their portability, easy accessibility, affordability and capacity to accommodate a range of multimedia platforms. For example, an e-portfolio might contain a word document, a video clip, a collection of photos and an audio recording. It can also link to other technologies such as Facebook and

Blackboards. These portfolios have the potential to play an ongoing role throughout the students' placements and post-placement learning. They serve to blend the timeframes of these learning activities as well as the forums.

Learning partnerships during placement

During the co-op year, each student is allocated an academic advisor (or "relationship manager") who visits the student at the start, middle and end of the placement. The co-op site visits are an opportunity for all the stakeholders to discuss expectations, review progress, give feedback and identify any issues or concerns. Co-op site visits are scheduled through emails, phone calls, electronic calendars and spreadsheets. Three data-capture forms are sent to the workplace supervisor prior to each site visit: (1) the Work Placement Agreement; (2) the Mid-Term Student Workplace Performance Review, and (3) the Final Student Workplace Performance Review. These forms are designed to promote awareness of the workplace supervisor's role in the development of the student's employability skills during the placement; to promote feedback to the student on their performance; and to discuss career directions for the student. Co-op site visit forms are completed and emailed after each visit.

The School maintains its own MS Access database and stores data on employers, students, student job applications, and employment details, as well as recording all interactions between the various stakeholders. The current system does not allow students, workplace supervisors or university staff (the data sources) to input co-op data from off-campus locations.

Students are allocated to teams at the start of the co-op placement year. These teams meet monthly during the industry placement to exchange stories and experiences discuss issues and concerns, and offer each other support. This process is intended to encourage scholarly and reflective practice. However, for team members who are located off-shore or who are unable to attend team meetings and online backup has been provided. Each team is allocated an online team space ("Team Talking" space) within the WIL Blackboard to promote ongoing and focused discussions. Students thus have the options of using asynchronous and synchronous forms of communication.

Critical reflection on the work placement learning experience

Throughout the co-op placements students are required to maintain a learning journal on a weekly basis. Students respond to a set of monthly questions that focus on a particular element of work e.g. professional behaviour, organisational communication channels, work performance standards or induction practices. This activity develops their reflective practice. The guided questions steer students' thoughts and feelings in ways that allows for improvements or follow-up actions to occur. The reflections also contribute to the teams' evaluation of the effectiveness of various learning experiences. Anecdotal data collected in this manner, combined with student/academic forum discussions, online teamwork, workplace supervisor performance reviews and academic supervisor reports serve as valuable sources of ongoing incremental feedback to students.

At the conclusion of their work placement students are required to deliver a formal oral presentation at the workplace on their learning and work achievements. The workplace supervisor and academic advisor are present. A final work performance review is also held at this time. Students are given feedback and both the workplace supervisor and the academic advisor jointly negotiate a mark that contributes to students' summative assessments. Students are also required to submit a written report and a learning reflection paper. The work is assessed and feedback given via the course Blackboard.

At the conclusion of their work placement year, each team is required create and deliver a multimedia presentation that highlight the value of co-op in developing their knowledge of the ICT industry; their development as IT professionals; and their own personal development and learning. These presentations are delivered by the practising WIL students to students in the first two years of the program; and showcased on the BBus(BIS) Blackboard and in the School's promotional activities.

Findings and discussion

Students in 2007 and 2008 cited the co-op year as the most valuable part of the BBus(BIS) program. The qualitative comments collected from the Student Experience Survey (SES) attested to the perception by students that the learnings during their co-op outstripped the academic learnings in the classroom. This was primarily due to believing that they have the opportunity to develop both technical and non-technical skills that will be valuable to them in their careers. As good as this program is, there is room for

improvement. Comments from workplace supervisor illustrate ways in which this could be done. One workplace supervisor put it as follows:

Working in the ICT industry is an interesting and enlightening experience where some skills learnt at university can be applied. This can depend on what position the student is given within their place of employment. The skills learnt within the workplace fall into the realm of more political and interpersonal skills, rather than technical skills. This experience is highly beneficial as skills such as this aren't easily attainable through university coursework. The WIL experience is only as good as the student makes it to be, so it is advisable that the student outlines what they want to gain from their industry experience and their goals to their manager early on. That way, tasks may be structured in such a way that will enable the student to benefit greatly from the work they are given. (Respondent #4)

Many employers suggested three-way communications at the start of each work placement:

Prior to starting the placement there should be an initial meeting with the students, employer, and work placement supervisor in which the terms and parameters of the work to be undertaken are established. The work place coordinator needs to be more accessible in cases where the students are not working out or needs extra attention. (Respondent #11)

Another supervisor suggested that a variety of sources be used to give feedback to the students on their progress:

I follow a consultative approach. Firstly I give the students my observations, I describe the feedback from peers, ask the student for their view on how things are going. We discuss strengths and weaknesses and determine where to next. (Respondent #6)

These comments from employers demonstrate how mindful many are in wanting to enhance students' workplace learning experience.

It has become clear that a way to achieve this is by providing students with a range of blended learning spaces in which they can reflect, communicate and learn before, during and at the end of their co-op placements. Prior to the co-op placement, the focus of student learning is around developing job search skills and transitioning from the classroom to the workplace through interactions with previous co-op students and employers. During the co-op placement, the learning focus moves to developing employability skills within the students' work context facilitated by communications and feedback from various sources (peers, supervisor, academics, workmates). At the completion of the co-op placement, the learning focus sees students critically reflecting on their co-op experiences in terms of their professional development. At this juncture practising WIL students can also share their reflections with prospective WIL students through formal presentations.

Each of the blended spaces consists of unique sets of stakeholders, relationships, activities, contexts and resources. Table 1 summarises the complex network of relationships the University seeks to support across disparate locations and timeframes.

Blended spaces, blended learning and blended systems: Implications for practice

The work integrated learning practice in the BBus(BIS) co-op program has demonstrated that technologies enhance face-to-face interactions between the main participants in the program: students and academics; students and workplace supervisors; and academics and workplace supervisors and serve as a connector between the workplace environment and university environment. These connections can be viewed as blended spaces. However, rather than only serving as convenient connectors they can also be seen to serve as a transmitter and developer of knowledge and thus become a vehicle for blended learning. It is considered that this then has the prospect of being taken even a step further to becoming a blended system. A blended system is viewed as a holistic system in which all the functions and instruments are integrated. A blended system is one in which the contextual, social and learning dimensions of co-op placements are fully integrated with the logistical dimensions.

The information systems currently in use for BBus(BIS) co-op placements fall into three categories. The first category covers the administrative functions that include student and employer details and placement

Table 1: Complex network of relationships across multiple contexts, using multiple technologies

	Pre-co-op	During co-op	Conclusion of co-op
People involved	Pre-co-op students (PS), Co-op Student (CS), post co-op students (PCS), alumni (A), teaching academics (TA), employers (E)	Co-op students (CS), workplace supervisors (WS), academic advisors (AA), teaching academics (TA),	Co-op Students (CS), workplace supervisors (WS), academic advisors (AA), teaching academics (TA), Pre-co-op Students (PS)
Relationships	$PS \cap PS, CS, PCS, A, TA, E$ $TA \cap PCS, A, E$	$CS \cap CS, WS, AA, TA$ $TA \cap PCS, A, E$	$S \cap S, WS, AA, PS, TA$ $TA \cap PCS, A, E$
Activities	Engaging in discussions between various stakeholders; delivery of course content; developing job and career planning skills; evidencing learning; tracking student job status; transitioning to the workplace	Receiving and recording feedback on work performance; facilitating discussions across student cohort (team spaces); encouraging individual reflections on learning experiences; building student-workplace supervisor relationships; receiving and giving feedback on assessment	Collecting assessment on students work performance; showcasing individual work achievements (written report and verbal presentation); critical reflections on professional development; formal feedback to student body (team presentation)
Learning transformations	Developing job and career planning skills	Developing employability skills	Developing professional identity
Resources, tools	BBus(BIS) WIL Blackboard (course material, jobs, resources) Student e-portfolio (evidence of learning) Student database Facebook (connecting stakeholders) Emails Phone	WIL Blackboard (team spaces, e-learning journals, course material, assessment feedback) Employment database Facebook Emails Phone	BBus(BIS) WIL Blackboard (showcase team presentations); Course Blackboard (team space, e-learning journals, assessment feedback); Facebook Emails Phone

information. Simple spreadsheets or databases usually serve this function. The second category serves the communication function between the parties. Emails, blogs, Blackboard and e-portfolios are usually used to accommodate this. The third category consists of providing a repository for students for their learning activities. Blackboards and e-portfolios are the vehicles for students to progress their work, reflect on it and showcase and share it with others if so desired or required. These technological tools are effective means to service blended spaces for students, academics and workplace supervisors. However, in many instances they are significantly underutilised. Knowledge about the full functions may be limited, ease and familiarity with using the technology may be lacking, and time for increased demands may not be available. The full integration of traditional face-to-face interactions with complementary technological instruments is also not yet evident. A fully integrated and functional information system designed to manage the contextual, social and learning dimensions of co-op placements does not currently exist in the regular university setting. The requirements to develop partnerships and manage relationships would imply facilities such as those found in customer relationship management systems. The system would also require the ability to capture and organise data arising outside the university in varied industry settings. It would also need to be able to monitor learning in situations where formal assessment is not appropriate. Additionally such a system would be able to align the logistical and operational elements with the other dimensions.

Thus a blended system would require the integration of the separate, disparate systems involved in the management of co-op programs; the development of the learning and reflection activities within co-op programs; and communication among all the participants into a coherent and functioning holistic system. Such a technologically-supported blended system would make provision for the following:

- Synchronous and asynchronous communication across multiple university and work sites with all stakeholders;
- Shared spaces for forum or team discussion and file sharing;
- On-line learning and support resources for all stakeholders;
- Data capture directly from data sources at on-campus and off-campus locations, in a format that allows analysis, reflection and feedback by key stakeholders;
- A system that is responsive to changes and improvements.
- A system that utilises current technology; is easy to use; flexible; readily available and accessible

The development of such a system would require a plan that integrates all the components and resources dedicated to its implementation; scope out the sustainability issues and address the professional development requirements for partners.

Conclusion

Martin in Howe and Patrick (2007) observes that the best co-op placements are those where industry and universities are seen as equal partners involved in the planning of the overall experience and students' professional development. In order to achieve this, and as demonstrated by RMIT University's Bachelor of Business (Business Information Systems) co-operative education program, technological instruments need to be employed. The utilisation of technological instruments such as emails, blogs, discussion forums, team spaces and e-portfolios serve to maximise the learning experience of WIL students, through the provision of learning activities which encourage professional development. As a repository for multiple works and as an aid to communication between parties either one-on-one or as a virtual team, technology enables the blended spaces required to manage multiple geographically dispersed relationships. Some of these technologies provide interactive capabilities that enable real-time work and communication across the traditional boundaries. With judicious use and careful design virtual blended spaces serves a function beyond that of merely being a blended space and move into the realm of blended learning. This blended learning occurs as students transfer skills and knowledge gained at university to the workplace; develop further skills in this environment; and then apply the work experience to their final year of study. In order to optimise blended learning with blended spaces the development of a blended system is encouraged. This blended system would not only apply multiple technologies to context-based learning but would do so in a way that all the dimensions are integrated.

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