Developing Innovation Skills Through Work-integrated Learning

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Abstract- **Innovation skills are an asset for engineering managers as innovation has become a key competitive driver for technology oriented industries. Increasing attention is being placed on designing course offerings that help develop innovation skills and particularly, creating suitable contexts in which innovation can flourish. This study investigates factors influencing the development of innovation skills through work-integrated learning. Moving beyond a single viewpoint to a dyadic perspective involving students and industry supervisors, this qualitative study contributes to a conceptual framework for fostering the development of innovation skills through industry placements. Implications are discussed for engineering and technology managers for developing innovation capacity and skills.**

Keywords- Innovation; Work-integrated Learning; Engineering Management Education

I. INTRODUCTION

The development of innovation skills for engineering managers is a pertinent issue in engineering management education. Innovation has become a strategic issue for engineering managers in allowing firms to position themselves competitively for the future [1, 2]. Many universities have responded to this need to develop engineering leaders capable of advancing innovation by introducing streams pertaining to innovation within engineering programs [3]. A common feature of many engineering programs is the opportunity for students to engage in work-integrated learning (WIL) experiences through industry placements. Involving partnerships among students, employers and universities, WIL is defined as a strategy for combining classroom studies with learning through work experiences that are related to academic goals [4], and is comparable to other experiential learning strategies such as work-based learning [5], experience-based learning [6], and cooperative education [7].

WIL may provide opportunities particularly germane to the development of skills related to the capacity to innovate. That is, it has been suggested that WIL experiences may prepare students for the uncertain and unstructured nature of real-world entrepreneurial and innovative environments [8, 9], while opportunities to find and define problems, to shape the direction of open-ended projects and to engage in guided reflection have also been associated with the development of skills important for innovation [10-12]. However, despite increasing interest in this area, there has been little research on the development of these capacities in the context of WIL, particularly where multiple perspectives and network-based factors are considered. To what extent does the WIL experience enable students to demonstrate and develop their capacities to innovate? What are the individual and relationship factors that influence students' capacity to innovate in a WIL setting?

The purpose of this study is to investigate factors influencing the development of skills related to innovation in a WIL context. This question is explored in a sample of students engaged in industry placements in which contributing to innovation through negotiated project work is an explicit objective. The Australian context is of particular significance as WIL has gained increasing prominence nationally [13]. Research in the area of WIL has predominantly focused on the student perspective and few studies have examined multiple perspectives [14, 15]. This study incorporates both student and employer perspectives in a dyadic approach, thereby offering a more complete picture of skill development and innovation in context. A dyadic approach would serve in reducing disconnects, and in managing expectations and relationships between the two groups.

II. THEORETICAL BACKGROUND

Innovation can be defined as "the process of turning opportunity into new ideas and of putting these into widely used practice" [16, p. 3]. Increasingly, the need to foster the development and implementation of new ideas in a range of fields is of concern to industry and government. The current UK government's stated objectives include the development of innovation skills to result in job and wealth creation and international competitiveness [17]. Consistent with this developing recognition of an innovation-based economy, innovation has gained particular prominence within an emergent stream of engineering management education.

The literature highlights the need for experiential learning to develop skills related to innovation [9]. The importance of work experience has been recognized for its positive impact on students' work readiness and preparation of graduates for innovative careers [18-20]. However, further research is necessary to determine if and how experiences such as WIL prepare students for innovative careers [21]. While much existing WIL research has considered the student perspective [7, 13, 22], few studies incorporate the views and roles of other actors in the process, such as industry supervisors. Understanding the perspectives and requirements of industry is important as education should ultimately "be viewed as a flexible mechanism

through which important knowledge, skills and competencies can be imparted to accommodate specific industry needs" [23, p. 197]. A comprehensive approach to understanding the educational process and outcomes of WIL must consider the experience as a system of dynamic interactions between the individual student, the university, the industry supervisor, the broader workplace environment and the nature of the industry-based project on which the student is expected to work.

In exploring factors influencing the development of innovation skills within WIL, an emerging theory on innovation networks can be applied to offer a useful conceptual framework. Placements involve networks of players and entail innovation processes [15]. They point out that the knowledge transfer between academia and practice has been largely ignored in the literature on student internships. They criticize the literature on internships for its lack of dominant theoretical perspective and its mainly descriptive nature. Consequently, the application of innovation network theory in this study is a direct response to their calls for research on conceptual frameworks to understand underlying innovation processes between actors involved in internships.

Stemming from various streams of literature including those related to inter-organizational relationships [24-26], innovation management [27-29] and networks [30-32], innovation network theory is based on the premise that collaboration between various actors is needed for innovation [33, 34]. Innovation rarely occurs in isolation as networks are required to access specialized skills, to spread risks and costs associated with innovation and to reduce the time taken to reach end markets [35, 36]. An innovation network is defined as a group of organizations which may include university and industry partners who collaborate to achieve shared innovation goals [31, 37]. Within the framework of innovation network theory, innovation is most appropriately studied as it develops through networks of relationships between actors; hence, the dyadic approach is adopted for this research.

A range of factors have been identified as critical to effective innovation networks. One such factor is a sense of trust between actors, which can be defined as "confidence in an exchange partner's reliability and integrity" [38, p. 23]. Trust has featured prominently in the network, inter-organizational and innovation literatures for its importance in relationships for innovation [33, 39, 40]. It has been noted that "collaborative partnerships are generally… hard work. They are difficult to manage and need continuous nurturing to develop trust… yet without this, collaborative projects may be seriously threatened" [41, p. 224]. While research has been conducted on trust in the innovation and relationship context, further research is necessary to examine trust in the context of WIL, including where the focus is on the development of innovation skills.

In addition to trust, commitment is one of the most significant factors operating in effective innovation networks. Commitment can be defined as "a desire to develop a stable relationship, a willingness to make short-term sacrifices to maintain the relationship, and a confidence in the stability of the relationship" [42, p. 19]. The conceptualization of commitment has evolved from research into social exchanges [43, 44] research on marriage [45, 46] and also from research into management contexts [47-49]. While commitment has been highlighted for its importance in networks [38, 50], research has not previously examined the influence of commitment on developing innovation in a WIL context.

Harmony is another factor that has emerged in the literature on innovation networks. Harmony can be defined as the "development of mutual interests among network actors" [33]. Incorporating notions of conflict and cooperation that have been featured in inter-organizational and network research [51], the term harmony also has roots in the new product development literature [52]. It has been used to reflect the synthesis of actors' perspectives in early project stages, the process of 'give and take' among innovation actors, the willingness of actors to raise and address areas of disagreement in a constructive fashion rather than ignore underlying concerns, and the resolution of conflict at the lowest possible points in a cycle of escalation [53]. In an innovation context, the concept of harmony has also been applied to the involvement of industry partners at early stages of innovation so that outcomes align with industry needs, as opposed to a purely academically-driven agenda [33]. Within the WIL context, the impact of harmony on the development of innovation is yet to be explored.

Finally, communication efficiency has been identified as an additional significant factor in effective innovation networks. Communication efficiency can be defined as communication effectiveness given communication costs. They identify effectiveness dimensions such as transparency, credibility, codification or the ability of all parties to understand each other's terminologies and language [54]. Communication costs include the economic costs of communicating between collaborators and potential secrecy issues [33, 54]. In a study by Rounce et al. [41] on a WIL context, language emerged as a significant issue, with confusing terminology and lack of common understanding of terms serving to exclude students from full participation. Further research is necessary to explore not only one dimension of communication efficiency, codification, but others such as transparency, credibility and costs, to determine if they also apply in the development of innovation with a view towards improving processes.

This research develops a conceptual framework for investigating the development of innovation skills in a WIL context. Within this framework, innovation is not considered from a single, individual perspective, but in the context of relationships between actors who operate within networks for innovation in specific environments. Findings are considered in relation to factors associated with effective innovation networks.

III. RESEARCH DESIGN

A comprehensive WIL approach for developing innovation is in its infancy in Australian universities, and little research has addressed the factors at work within industry-based placements that may facilitate the development of students' relevant skills. Consequently, this research is exploratory and a qualitative approach is appropriate to facilitate the exploration of emerging themes and the study of multifaceted and complex processes with a small number of participants [55, 56]. The research design involves the triangulation of data from students' reflective log books completed regularly through the placement and reports from dyads of students and industry supervisors at the completion of the WIL experience.

Data sources for this study included a weekly "process log" or journal completed by each university student at the end of each week during their 12-week WIL placement, which was submitted electronically to their University Coordinator. This log asked students to reflect on their project work for the week with reference to the application of specific skills and knowledge, and influences on their innovative performance. Students' final (written) reflections about the industry placement experience, in which they addressed questions specifically concerned with influences upon their innovative problem solving and project work, were also included as data for the study. At the conclusion of the placement, industry supervisors completed an evaluation report of each student's performance, including comments about the extent to which the student was able to perform innovatively. Journals and reports of the kind examined in this study provide useful data as they draw on the specific wording and language of participants and allows the exploration of individual reflections and perspectives [57]. These mechanisms also give voice to participants so that their responses would not be misinterpreted given that they have made thoughtful written reflections. The multiple sources of data also enabled the exploration of dyadic perspectives on the WIL experience.

This study was conducted within the WIL component of a science and engineering degree undertaken by students at a mid-sized university in Australia from March to July 2010. Each student in the degree completes a full-time industry-based placement of 12 weeks, during which he or she works on a project negotiated with the industry supervisor that is designed to lead to innovation; possibilities may include new product development, software development or technology commercialization. All students and industry supervisors participating in the program were invited to participate in the research, and participants from all 11 employer-student dyads provided data. Industry supervisors were managers from various types of organizations across the private and public sectors.

At the time of this study, the WIL component of the degree was in its early stages of implementation with an initial small group of students. A larger cohort of students will complete the industry placement later this year. Thus, findings from this study will guide the fine-tuning and further development of the curriculum and the design and delivery of the WIL component. However, this study has broader application in light of the growing interest in the development of innovation skills. As governments internationally encourage a focus on innovation in science and engineering degrees, [17, 58, 59], the experiences of this cohort of students as they worked on industry-based projects related to innovation are significant.

All data for this study were analysed qualitatively, guided by theory stemming from the literature. The content of log books and reflective reports from students as well as the evaluation reports from industry supervisors were analysed thematically. Data associated with emerging themes was coded and triangulated with existing literature [60, 61].

Construct validity was addressed through triangulation of multiple sources of information [62]. In addition, industry supervisors belonged to a diverse range of organizations, including firms, government agencies and research organizations, which allowed for different perspectives on a common construct. Considering various perspectives is important in reducing biased opinions [63, 64]. Both investigators analysed all written and interview data [65], which was intended to reduce the potential bias which is commonly cited as a limitation of qualitative research [62].

It is acknowledged that the study reported in this paper explores one placement program in the Australian context. Therefore, its external validity cannot be ensured and findings may not be readily generalizable beyond this study [66]. To ensure generalizability, further research is required, both in Australia and in other contexts.

IV. A CONCEPTUAL FRAMEWORK FOR DEVELOPING INNOVATION SKILLS IN A WIL CONTEXT

A comprehensive WIL Based on triangulation of qualitative data and the integration of relevant streams of literature on innovation networks, a conceptual framework can be derived, as shown in Figure 1.

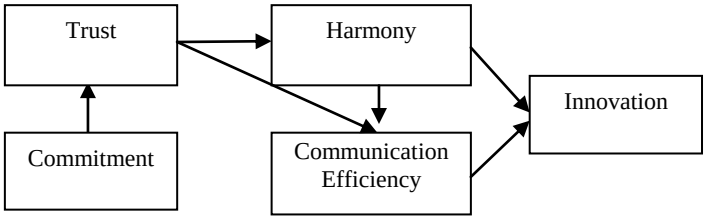

Fig. 1 Conceptual framework for developing innovation skills in a WIL context

A. Commitment

Commitment emerged from the data as an important factor in developing innovation skills. Commitment advances familiarity which leads to trust which is essential for innovation [33]. In final evaluation reports, industry supervisors acknowledged the commitment demonstrated by students in achieving innovation goals. For example, Employer 8 praised Student 8 for his commitment as demonstrated through his active monitoring of deliverables, amending these as circumstances changed and enabling him to achieve deliverables of a high standard.

The qualitative data also confirmed the impact of commitment on trust. While the literature is characterized by contradictory findings as to whether commitment is an antecedent of trust or vice versa, several researchers argue that commitment leads to trust [50, 67]. In this study, students who were not committed were not trusted and were ranked low for innovation by industry supervisors:

Student 9 often seemed to be doing just the minimum to get across the line, without going that extra mile to set his work apart from just acceptable… It is my view that Student 9 needs to apply himself to his tasks with greater dedication. This absence of dedication was reflected in frequent absence and late-coming... His final project specification document was submitted on the last day of his placement... The creative contribution of Student 9 was limited (Employer 9).

B. Trust

Trust emerged as an important factor for both students and industry supervisors. Trust between students and supervisors is vital for innovation given the inherent risks involved in placements, lack of familiarity and the differences in university/industry culture and environment [68]. The qualitative data uncovered contrasting cases of the presence and absence of trust and revealed how it affected relationship dynamics and placement outcomes. In the case of trusting relationships, Student 7 spoke about the presence of trust in his journal in weeks 1 and 4, alluding to its impact on harmony and communication. This connection is consistent with the literature, which suggests that trust impacts on harmony as parties are more likely to place joint goals over short-term self-interests, raise issues (rather than exit) and contribute to solving problems jointly [69-71]. It, therefore, does not involve simply suppressing concerns and being obligated to agree, but also encompasses open and healthy debates addressing fundamental issues [33].

All people who I have collaborated with have made me feel welcome throughout the week and I have great trust in them. Within the project, I have had to collaborate with more than 6 people. All of them had many different opinions about how to approach problems. Making an effort to understand all different opinions and why they think that way is important for myself in discovering the best solutions. (Student 7)

Trust also influences communication. Trusting relationships result in an open flow of information as actors have to place less attention on guarding against opportunistic parties [25, 72]. As one student noted:

I felt trust with colleagues. Not conflicts, but extra clarification was needed this week to make sure that we understand each other's views. (Student 7)

In contrast, data from Dyad 9 demonstrated how both student and industry supervisor had feelings of mistrust and how it impacted on communication. The absence of trust leads to feelings of suspicion among parties [73]. In his journal, Student 9 discussed a level of mistrust in the relationship as reflected in limited access to staff and resources. In turn, his supervisor also echoed sentiments of mistrust in his final report:

He needs to have the ability to offer expert analysis and solutions in a more forthright manner. He has the technical knowledge and he must ensure that his co-workers and managers have the belief that he can work without constant supervision. (Employer 9)

C. Harmony

Both industry supervisors and students emphasized the importance of harmony, a concept that included flexibility, addressing issues constructively rather than ignoring them, and balancing various approaches such as technical and non-technical. This sense of harmony was illustrated in one industry supervisor's comments about a student's approach to work:

Student 8 has been flexible when faced with the competing demands of managers, not losing his central focus … but communicated in a way that educated those managers rather than alienating them. (Employer 8)

Harmony involves give-and-take in the relationships with both parties trying to understand the others' viewpoints and incorporating them in early stages when setting the research agenda [74]. Consequently, it is more likely that these measures may increase communication efficiency. Song and Thieme [53] establish a link between harmony and the information gap, as the latter can be a symptom of a lack of communication efficiency.
The information gap is the difference between ideal and achieved levels of information sharing among participants [53]. Harmony may therefore influence the levelof transparency, credibility and shared understanding in the network, which are key dimensions of communication efficiency [54].

The impact of harmony on communication efficiency was confirmed by the qualitative data from the perspective of both students and industry supervisors. The WIL approach afforded students the opportunity to work with various departments, teams of people and clients, and successful students were able to communicate in an engaging manner using language at an appropriate level of codification. One supervisor noted:

Student 2 got exposure to many different departments including consulting and risk management. He also worked with a strategy and operations consultant in finding statistics in benchmarking corporate services spend in government organizations. (Employer 2)

The student reflected on the outcomes of this broad exposure and opportunity to develop relationships across the network in terms of increased confidence in communication:

I also feel much better equipped to liaise with all manner of project stakeholders, including clients. At the beginning of my placement, picking up the phone and calling a project stakeholder seemed like a daunting task. Now, nearing the end of my placement, calling and engaging stakeholders I have yet to meet is almost a satisfyingly exhilarating feeling. (Student 2)

Interviewees confirmed the impact of harmony on the development of innovation skills. Harmony encompasses both the notions of conflict and cooperation while retaining a more positive connotation for management than mere conflict. A degree of conflict may be required for innovation while at the same time cooperation may be needed for efficiency [75]. Therefore, both cooperation and conflict may be necessary in innovation networks [76]. Student 8 was praised for his ability to connect across disciplinary boundaries and harmoniously apply these perspectives in developing an innovative solution:

Student 8 exhibits a strong technical knowledge of both programming and software design. He was able to identify gaps in the current system and use his expertise to find innovative solutions. (Employer 8)

D. Communication Efficiency

The qualitative data confirmed the importance of communication efficiency for innovation for its role in facilitating understanding between parties, strengthening the level of engagement, dealing with challenges that arise and evaluating achievement of project goals to ensure successful innovation outcomes [68]. The dimensions of communication efficiency include transparency, credibility, codification, secrecy and costs.

There was consensus among industry supervisors and students about the importance of transparency in communication:

One very positive point was our involvement in all other information sharing related projects including formal and informal meetings, small group and large group meetings as well. This is probably the number one important factor in the organization that helped us gain a greater understanding of the problems. (Employer 8)

A transparent flow of information allowed students to take a more informed leadership role in relation to the project and to gain the understanding of the problem required for effective innovation. The negative impact of lack of transparency on innovation performance was identified by both students and industry supervisors. One employer noted:

I think Student 7 found the project difficult because of a lack of information. He could probably be more creative in finding relevant detailed information. (Employer 7)

Similarly, a student reflected that:

Problems encountered during the project were normally in the area of lack of information on particular subjects (Student 1).

Credibility, particularly of information sources and modes of communication was also identified as an important factor in effective project work, and lack of credible information impeded students' capacity to lead and innovate:

Teleconferencing with people from various locations is a challenge. ...Knowing exactly whom one is talking to without specifying names can be a problem. This is further exacerbated when two participants have the same name, which occurred once, and caused plenty of confusion for me. (Student 2)

Codification emerged as an issue particularly in the use of commonly understood language and terminology:

Written communication was also improved with the use of the main business plan document to develop business language. (Student 1)

In working collaboratively on an innovative solution between university and industry actors, the qualitative data confirmed sensitivity to cost issues. Students 1 and 6 expressed a preference for more frequent meetings while their supervisors had other external or overseas meeting obligations, thereby highlighting the issue of communication costs associated with the frequency, duration and mode of communication. Student 7 pointed out the scheduling of meetings with his supervisor as a difficulty in his placement.

One notable occurrence was when Supervisor 7 was away for approximately one month. A meeting was rescheduled nearly a week from when it was originally meant to occur. (Student 7)

Given the multiple organizations involved in the innovation network in the WIL projects, issues of secrecy were also highlighted:

Student 8 is aware of and sensitive to the privacy concerns that bind placement organization 8. He has not acted in any way that undermines the commercial interests of placement organization 8. (Employer 8)

Interviewees confirmed the impact of communication on the development of innovation skills.

Student 3 made the transition to business-based programming very well from his university studies. Given the need for strong communication skills, Student 3 has excelled at the innovation tasks required of him. We are very confident in Student 3's ability and are very happy to employ Student 3 in the role of Software Development Engineer at the completion of his studies. (Employer 3)

E. Innovation

The level of innovation was evaluated by employers based on their ideas presented, work carried out during the placement and actions implemented. Supervisors were asked to provide a mark out of 100% to evaluate the level of innovation in the students' deliverables at the end of the placement period. Figure 2 illustrates the results of innovation evaluation board provided by employers. It shows that employers found the student's work very innovative with employers recommended marks of over 90% for 9 out of the 11 students.

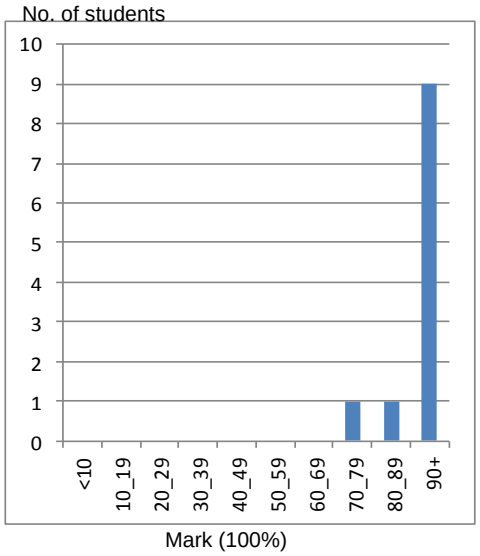

Fig. 2. Innovation evaluation by employers

In addition to employer evaluations, students were required to complete weekly logs in which they rated their level of innovation on a scale ranging from 1 (very non-innovative) to 5 (very innovative) for each of the 12 weeks of placement. Additionally, at the end of the placement industry supervisors were asked to rank and discuss the innovativeness of the student. Figure 3 illustrates the improvement in innovation ratings through the placement.

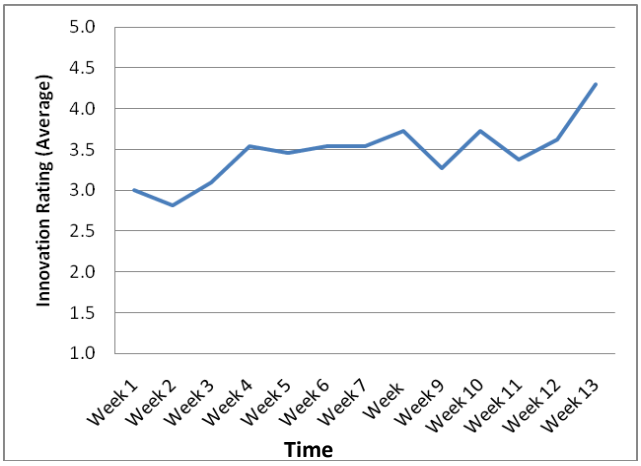

Fig. 3. Improvement in innovation ratings through placement

As shown in Figure 3, at the start of the placement, innovation was rated at 3 out of 5. Students explained in their logbooks that this rating for innovation was due to that stage being spent on induction activities.

Very little of the work I did this week allowed for innovation or creativity. The administrative and inductive type activities are examples of this. (Student 2)

I'm still just digesting all the information that has been given to me from my supervisor. (Student 1)

Some students viewed the process of researching, gathering data and determining requirements as an innovative process. Other students expressed a level of intimidation at the unknown at the start of the placement.

Initially the one thing that I am worried about is the feeling of fear… There is just the unknown factor as well… in the initial meeting where we discussed the details of the project, it was a little intimidating. (Student 4)

There was generally a small decline in the level of innovation which occurred around Week 2. At that point, students began to understand the expectations of the project in the context of the workplace. They were required to submit a project specification by the end of Week 3 to the university so they focused on developing a plan of their work for their placements.

I had to be proactive and ask a lot of questions at the meetings, to get as much information as I could source. I got onto the conceptualization, trying to get my ideas down onto paper, and also in a format that I could present to others. (Student 4)

After students submitted their project plans which served in helping them develop a clear road map for achieving outcomes for their placement, their innovation ratings began to increase.

So far I feel pretty creative because of the thinking process I'm going through turning my ideas into reality after realising my limitations, as well as the technology's limitations, forcing me to use creativity to overcome problems. (Student 3)

Innovation ratings continued to increase steadily until about Week 9 in the placement. With 3 weeks remaining students ascertained their progress and felt that their level of innovation could be better at achieving planned outcomes.

There are still MANY problems. In fixing data, I needed to be creative in the solutions. (Student 10)

I did complete some work but not a lot as I would like to. (Student 4)

After reality checks, students increased their innovation. By the final week of the placement, students were satisfied with their level of innovation and were mainly submitting final deliverables.

We're now only in tidy-up mode. This was planned so it's good to see that come to fruition. Now we just need to re-check what we've done. (Student 8)

The creativity and innovation process is winding down now that I am near the end of the project. Now most time is spent tying up loose ends. (Student 2)

Overall, through the placement, innovation ratings increased as students took ownership for their projects through reflection and the development of leadership skills for innovation. Both industry supervisors and students were satisfied that the WIL approach was useful in achieving desired innovation outcomes:

Student 2 designed and built a new service. These are new offerings leveraging emerging technologies and required innovative and creative thinking to execute…

We will release the offerings Student 2 worked on in the week following the completion of his placement. (Employer 2)

Student 2 reflected on the same project:

My work on the project was innovative in the sense that it added an additional feature that has contributed to create unique set of services. (Student 2)

Student 3 has achieved all project tasks deemed suitable within the time frame to a high level. (Employer 3)

V. CONCLUSIONS

The purpose of this study was to explore factors associated with the development of innovation skills in a WIL context. Employers are placing increased demands for communication and innovation skills on university graduates. The development of these so-called "soft skills" is becoming paramount to universities and industry alike, and work-integrated learning experiences are thought to provide unique opportunities to develop these skills. Unlike other studies in this area, this research considered the views of both industry supervisor and student in examining the factors contributing to the development of such skills as innovation. This approach enabled an investigation of the intricacies associated with educational approaches that move beyond the classroom and present a complex array of issues such as those associated with network dynamics underlying innovation with external parties.

Findings from this study highlighted network factors that should be considered in developing the skills required for

innovation. These include trust, commitment, harmony and communication efficiency, which is consistent with the literature on innovation networks. The findings also lend support to call for an increased focus on "soft skills" such as communication, collaboration and innovation in engineering management education, since these were critical to students' success in industry projects, as judged by their supervisors. The WIL experience explored in this study appeared to enable guided reflection and facilitate the development of skills for innovation, particularly where relevant network factors were addressed. A sense of harmony within innovation networks developed where both students and industry supervisors understood the importance of transparent, credible communication, and where students demonstrated commitment, took ownership of the project, and sought to understand the multiple perspectives, goals and demands that defined the broader context of their innovative work. It is worth noting that the WIL experience investigated in this study was deliberately designed around an open-ended authentic project, negotiated between university and industry stakeholders, in the context of which innovation was a priority. The design of the WIL experience in this way may have been instrumental in allowing scope for the complexity of planning and thinking that is required for the development of capacities and the skills associated with innovation. Thus, the findings reported here might not readily apply to more traditional work experience placements. This project represented an exploratory examination of a WIL experience for a small initial cohort of students.

With growing calls for university programs to become more relevant to the workplace, there is a clear need for further research into understanding and assessing the outcomes of different forms of WIL in relation to the stated objectives and presumed benefits of these program components. In particular, the role of industry-based WIL experiences in developing students' capacities for innovation is worthy of attention for researchers. Findings from this study indicate that a conceptual framework guided by innovation network theory and methods that triangulate data from multiple sources and actors within innovation networks offer worthwhile directions for future research in this field. Research in this area should aim to guide more effective processes for designing and implementing WIL experiences, enhance performance of graduates in areas such as innovation, improved relationships with and outcomes for placement providers, greater knowledge transfer and collaborative innovation.

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