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Seeking Industry Perspectives to Enhance Experiential Education in University-Industry Partnerships: Going Beyond Mere Assumptions

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Work-integrated learning through industry-based placements characterizes a degree program launched by an Australian University (Deakin) in 2000: the Bachelor of Business Information Technology (Hons) [BBIT]. In this program, industry mentors are the nexus between the world of the university and the world of industry. However, in setting up and running such programs, tertiary educators tend to make fundamental assumptions about the level of commitment and understanding of these industry mentors, about how they will be selected and the skills they will be able to demonstrate and impart. A shared vision of what constitutes a satisfying placement cannot be taken for granted. These tacit assumptions underpin key elements of the BBIT program, such as the preparation of students for their placements, the Handbook that is provided for industry partners and the site visits made by academics. Research was undertaken in 2003/4 to test these assumptions, and to determine whether the support infrastructure the University places around the industry placements is optimal. In-depth interviews were held with 10 experienced industry sponsors/mentors and one member of the relevant professional body. Reflecting on the rich data generated, this paper seeks to provide some insight into whether assumptions regarding industry mentors and also what constitutes a satisfying placement, are supported. This leads to a consideration of implications for tertiary educators who are directing such segments of degree programs. The paper advocates research to take us beyond assumptions, claiming that the articulation of industry perspectives is instructive for all those involved: industry sponsors/mentors, tertiary educators, students and the industry more broadly, as students are prepared more effectively for their professional roles. (Asia-Pacific Journal of Cooperative Education, 2006, 7(2), 1-9).

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Academic educators of the twenty-first century are facing unprecedented demands to prepare professionals for what is commonly referred to as the 'knowledge society'. It is also a 'learning society' because new knowledge and new ideas occur almost every moment (Cheng, 2004). In attempting to meet these demands, universities need to recognize the value of practical working knowledge developed in workplace settings, and promote the value of academic forms of knowledge making to the practical concerns of everyday learning. One of Deakin University's flagship degrees, the Bachelor of Business Information Technology [BBIT] presents a contemporary case of a well designed professional curriculum in the field of information technology that situates workplace learning as a central element in the education of students about to enter the workforce.

In work-integrated learning programs, such as the BBIT, industry mentors are often the nexus between the world of the university and the world of industry. However, in setting up and running such programs, tertiary educators tend to make fundamental assumptions about the level of commitment and understanding of these industry mentors, about how they will be selected and the skills they will be able to demonstrate and impart.

In this paper, we report research undertaken in 2003-4 to test these assumptions within the BBIT program, and to determine whether the support infrastructure the University places around the industry placements is optimal.

In the first part of this paper, background to the BBIT program is presented. The next section then introduces the three assumptions that it is argued BBIT educators (and arguably tertiary educators in general) tend to make about the level of commitment and understanding of industry mentors, about how they will be selected and the skills they will be able to demonstrate and impart. Next is an outline of the approach taken to the collection and analysis of data to test those assumptions; the results

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collected following this approach follow. While exemplars of mentor activity are reported, concerns also emerge. Some possible tertiary educator responses to these concerns are therefore canvassed, along with relevant contributions from the extant literature. Finally, the major conclusions of the study, and some possible future research directions, are reported.

Background to the Study

The then Bachelor of Information Technology [BIT] Hons Program was launched by Deakin University in 2000, with its first student cohort graduating in 2003. The BIT, now renamed the Bachelor of Business Information Technology [BBIT] as part of its University re-accreditation in 2004, is a joint offering between the University's School of Information Systems, Faculty of Business and Law, and School of Information Technology, Faculty of Science and Technology.

The program aims to develop a range of technical, conceptual, analytical, inter-personal and leadership skills of relevance to contemporary thinking and practice in the Information Technology [IT] industry. The program is organized into three major components: academic coursework units relating to various Information Systems [IS] and IT topics; two major industry-based learning [IBL] placements; and an Honors' year consisting of further research-based coursework and an applied research project.

Graduate students' perceptions of various aspects of the BBIT program, including the value attributed to the IBL component of the educational experience, were reported by Holt, Mackay and Smith (2004). Also reported by Holt et al. (2004) were the views of University academic teachers making various contributions to the BBIT program ranging across teaching coursework units, supervising Honor's research, providing academic mentoring during IBL placements, and overall program coordination and liaison with the profession and industry. The study of the BBIT educational experience uses case study research methodology elaborated in Holt et al. (2004) and draws upon ethnographic methods (Hammersley, 1990; Hammersley & Atkinson, 1983).

Within industry, perspectives on the role, work and contributions of industry mentors in the IBL experience are given prominence. In conceptualizing this study, the research team used a brainstorming approach and supporting software [Mind-Manager] to map out a framework showing the various stakeholders, perspectives and issues of importance in focusing this stage of the research around the Industry-Based Learning placement. The map so created identified eight key areas important to understanding the IBL dimension of the BBIT program:

1. Theoretical underpinnings relating to various bodies of knowledge of workplace, organizational, professional, environmental and authentic/experiential learning of relevance to developing understanding of the IBL experience from the point of view of industry mentors
2. The views of industry mentors on what constitutes a good mentor, good IBL student, good student, and views about desired entry-level graduate capacities, early career development, trends in IS/IT over the next five years and how these developments might be considered by University IS/IT educators in future program enhancements
3. Views of University academic staff directly involved in providing educational support for the IBL placements and coordinating the establishment of productive relationships with industry
4. University academic teaching staff members' views on what constitutes a good BBIT student
5. BBIT students' views on what constitutes a good IBL placement
6. University senior executive views on the value of professional courses with major components of work-integrated learning in relation to institutional teaching and learning goals, directions and desired development of graduate attributes
7. The IT profession's view of the value of work-integrated learning developments in IT courses, and
8. International perspectives on work-integrated-learning in contributing to excellence in professional education in the higher education sector.

This paper focuses on the perspectives of the IT profession and industry on the value particularly of IBL in order to complete a consideration of the trinity of stakeholders' perspectives involved in the program. The work reported in this paper therefore concentrates in particular on areas 1, 2 and 7 above.

The Assumptions Underpinning the Study

The study reported in this paper is built upon a series of interviews conducted with industry mentors (see 'Data Collection' below) that were designed to test key assumptions that it is argued are held tacitly by academics and students and which underpin IBL components within the BBIT degree program. These assumptions were drawn from prior interviews with University academics involved in the BBIT, as well as with students. Student journals of the placement experience were also used to inform the framing of these assumptions. Details of those interviews and the journal analysis will be the subject of future publications.

For the present purposes, it is sufficient to note that these sources suggested that in setting up and running such programs, BBIT educators (and arguably tertiary educators in general) tend to make fundamental assumptions about the level of commitment and understanding of industry mentors, about how they will be selected and the skills they will be able to demonstrate and impart. Further, it is taken for granted that there is a shared vision of what constitutes a satisfying placement.

These observations might be characterized in terms of the following three assumptions:

- Assumption 1: Industry mentors will be committed to the notion of experiential/integrated learning, understand its salient characteristics and how, and for whom, it value-adds
- Assumption 2: Industry mentors will be carefully selected on the basis of a shared understanding of the skills required and have the capacity to demonstrate these skills

TABLE 1
Participant profiles (Prof#: relevant professional body representative; Ind#: industry sponsor/mentor)

ID	Industry Sector	Interviewee Position/Role	Years involved with the program	Student placements on site
Prof 1	IT Professional Body	Professional Association	Not applicable	Not applicable
Ind 1	Financial services	Senior ITR Security Specialist/Industry Mentor	3	6
Ind 2	Bio-medical Instrumentation	Senior Manager/Industry Mentor	1	2
Ind 3	Computer Hardware/Software Provider	Senior Manager/Industry Mentor	3	6
Ind 4	Computer Hardware/Software Provider	Senior Manager/Industry Mentor	4	8
Ind 5	Retail	Application and Development Support/Industry Mentor	3	6
Ind 6	Business Solutions Provider	Field Service Management/Industry Mentor	3	6
Ind 7	Local Government	IT Manager/Industry Mentor	2	3
Ind 8	Software Developer	Senior Manager/Industry Mentor	4	7
Ind 9	Health	Executive Director IT - Manager IT Operations/ Industry Mentor	3	4
Ind 10	Tertiary Education IT Services	IT Services Manager/Industry Mentor	3	6

- Assumption 3: Industry mentors will have a vision of what constitutes a meaningful/satisfying placement, their role in achieving this and have the capacity to structure and implement it.

Data Collection

Ten in-depth interviews were conducted with experienced industry sponsors/mentors, and one with a member of a relevant professional body. A brief profile of those eleven key respondents is presented in Table 1, including the ID (identity) used to identify subsequent extracts from interview transcripts, the industry sectors involved, the position(s) held by the interviewees, and the years the organization has been involved with the program and numbers of students taken in placement during that period.

As shown, participants have been drawn from a wide range of IT industry contexts, with the numbers of students mentored ranging from two to seven over periods of involvement ranging from one to four years. Respondents typically hold what might be termed middle to senior level management positions. The member of the relevant professional body (Prof 1) has responsibilities and experience related in particular to the conduct of programs incorporating industry based learning within the IT industry, and, as such, has observed closely, over an extended period of time, the conduct of such placements.

Interviews were semi-structured, addressing in turn issues highlighted in the map described briefly above, including:

- Motivations for involvement in the program
- IS/IT trends and developments and their representation in the program
- Expectations and capabilities of entry level graduates
- Approaches of young/inexperienced IT professionals to career development
- Characteristics of an effective industry mentor in the context of the BBIT program
- Components of an effective industry placement
- Characteristics of an effective IBL student in the context of the BBIT program, and
- Observations on the placement experience and its relationship to academic experience.

Transcripts of the interviews were subjected to content analysis (Neuman, 2000), with responses grouped according to insights gained into the three assumptions made by tertiary educators, as introduced above, concerning the level of commitment and understanding of industry mentors, how they were selected and the skills they have been able to demonstrate and impart.

These assumptions are addressed in turn, illustrated by selected extracts from the interview transcripts, in the following section.

Data Analysis and Research Findings

Assumption 1: Industry mentors will be committed to the notion of experiential/integrated learning, understand its salient characteristics and how, and for whom, it value-adds.

The notion of motivation and commitment to the program was explored with participants. Five clear motivations emerged, three of which have been classified as "pragmatic" motivations (i.e., the program was seen as value-added - providing additional tangible or intangible benefits- to the organization either in the sense of raising corporate profile (an intangible benefit), or providing two different forms of Return On Investment [ROI] - tangible benefits or cost savings that might offset the cost to the industry of the scholarship that was provided), whilst two related to value-adding to the educational growth of the student.

Pragmatic motivations include:

- Corporate Citizenship. Industry has a responsibility to the society in which it exists, which can be met, in part, by the support of tertiary education. This emerged in both the sense of acceptance of a societal responsibility:

  "We have … I guess a firm belief that we should be putting something back into society, into the community and we felt that in supporting this program through Deakin was one of the ways that we could put something back into the community." (Ind 6)

and in the sense of being seen as a responsible corporate citizen:

  "I think, for example, from a company point of view, we were trying to be involved in the society and not only just doing business with Australia. As a foreign company we invest money in here, not having the intention of just withdrawing profit from Australia. We also want to re-invest what we earn in the company and also we invest in the society." (Ind 3)

- Providing ROI to the Sponsor through the Industry Placement Work and/or Research Project. The two industry placements and/or the honors year project are seen as providing a valued return on the scholarship investment. This emerged in the sense that the student during placement released staff from work that might otherwise be a distraction to tenured staff and/or actually delivered products of commercial value:

  "I was keen for it to continue because we do get good value out of the people who join us." (Ind 5)

  "Not only are they getting industry-based placement, industry-based learning, but in doing so I have some expectations of some output from them … I didn't want her walking out the door and going to the next placement without us having a … data base application. The expectation was that that was going to be finished." (Ind 7)

- Providing ROI to the Sponsor Through Access to Graduates as Potential Future Employees. Involvement in the program provides an avenue for the future recruitment of relevantly qualified graduates. This emerged in several contexts, but most specifically in terms of 'case studies' of students who had moved from industry based student employment to on-going casual or full-time employment:

  "We've employed one of the students, who was our first placement, [the student] is now an employee and he was employed about three months ago. He was doing some casual work for us, but now he's got a full time role in the organization … So I've almost developed a casual pool out of these elite students which is quite beneficial." (Ind 7)

Motivations related to value-adding to the educational growth of the student include:

- Building Links Between Industry and Tertiary Education That May Have Wider Benefits. Involvement in the program provides an opportunity for industry to build relevant links with tertiary education institutions:

  "It is also a good opportunity for myself to understand and to know what's happening, for example, in the educational environment and also the IT industry that is reflected by the universities in terms of their programs, in terms of the way they teach students and find out which way is more effective." (Ind 3)

  "Well, in the small snapshot that I've been able to view and be part of [of Deakin's BBIT program], you're out there talking to industry in the right way. So you've set up people who have the ability to go and talk to industry. You assure industry that there is someone on-campus who will listen to them whenever there's an issue or a problem and resolve it." (Prof 1)

- Producing Graduates of the Right Type. The program design, which blends academic programs with industry-relevant experience, produces the type of graduates that industry needs.

  "We feel that the program was very well suited to producing the type of people that we as a company like to see in the IT industry. People who have a good grounding in an academic capacity and also have experience in industry so that's why we support this particular program." (Ind 6)

In summary, whilst the interviewees noted the educational value added by placements, to the growth of relevant educational programs facilitated by industry-tertiary education links, and the production of graduates attuned to industry needs, it must be noted that these were not the sole, or indeed the immediate reasons stated for commitment to the program by the majority of interviewees. Those designing programs with substantial industry placement components would do well to be aware of the pragmatic reasons cited above for involvement. In particular, whilst there is recognition of the way in which such programs value-add for the student, there is strong recognition of the very tangible values that accrue to the participating industries themselves.

Further, it should noted that, whilst the above selection of extracts might give the impression that interviewees were able to clearly articulate motivations for involvement in the program, some struggled to articulate the salient characteristics of experiential/integrated learning and how, and for whom, it value-adds. Given that such understandings are fundamental to such programs, those designing such programs should give thought to the role they should play in exploring the wider motivations of experiential learning with industry sponsors.

Assumption 2: Industry mentors will be carefully selected on the basis of a shared understanding of the skills required and have the capacity to demonstrate these skills.

The notion of skills required of industry mentors was explored with the interviewees, and in the course of addressing these matters anecdotal information was collected concerning perceptions of capacity to demonstrate these skills. Analysis of the interview transcripts highlighted some seven skill areas, with various perceptions of the degree to which these skills are held by industry mentors. These areas might be classified as process-oriented (supporting the transition to IBL), content-oriented (provision of technical advice, business-process advice, and building generic skills), futures-oriented (provision of career advice and serving as a role model), and personal-support (pastoral care of the student including involvement in the social life of the organization). These are addressed in turn.

Process-oriented skills include:

- Support of the Student's Transition to the Organization. Industry mentors should have skills and knowledge to facilitate the transition of the student into the IBL placement. This issue was raised by many of the interviewees, almost exclusively in the context of confusions about the transition process:

  "Often I don't think companies … and I know in our particular case in a couple of examples, … there hasn't been enough internal communication about the person who's coming in, and as a result when the person arrives, it's like: 'Oh, okay so how do we fit you in here right now?' … So I think there's two things. One is the organization that is going to take the placement needs to be organized in advance and understand what roles that they could provide the incumbent." (Ind 8)

There is evidence, however, of industry mentors learning from past failures in this area:

> "The last placement, [the student's] placement, we really mapped out her blocks of time. Now they changed while she was here, because as I say the business pressures change, but we really sat down and said: 'Okay what is this person going to be involved in?' " (Ind 7)

Content-oriented skills include:

- Provision of Technical Advice. Industry mentors should have skills and knowledge to provide support/advice on relevant technologies. A strategy often used by mentors is to not provide immediate answers to technical questions, but instead to point students to areas where they might self-educate in the relevant technology:

  "So I like the concept of 'This is your problem'. To solve this problem I think you perhaps should explore this avenue and in [doing] that, you may have to talk to these people. Go and do that. If you're still having a drama then come back to me and then we'll explore the possible solutions." (Ind 7)

- Provision of Business Process Advice. Industry mentors have a responsibility to provide support/advice on the business processes in the organization in which the student is placed. This typically takes the form of facilitating the student's need to meet/interact with others within the organization, to increase their understanding of organizational roles and expertise:

  "I would say that although we are official mentors the whole development group are mentors as well in some way. We made sure we placed the student around experienced staff and really pointed them towards experienced staff to work with." (Ind 10)

- Building Generic Skills. Industry mentors have a responsibility to facilitate the development of the student's generic skills, including problem solving and the understanding of organizational culture and behavior. Mentors expressed confidence in their abilities to meet this responsibility:

  "A good student is lateral, by that I mean that they can abstract. Often, you know when I remember my days at university it's 'Here's the problem, here are the tools – solve it'. In real life if there's a problem, you're not sure what the tools are, you're not sure of the constraints that you're working in and you need to first define your domain that you're working in before you can actually go on and attack the problem." (Ind 8)

  "The personal attributes that we want them to display and we need to coach them in … that we listen to them, but we also give them some direction on what we expect in terms of their culture and performance attributes." (Ind 7)

Futures-oriented skills include:

- Provision of Career Advice. Industry mentors have a responsibility to assist the student in forming views on their future career. A number of interviewees discussed this. Noteworthy is the observation of one mentor that a responsibility exists to introduce realism into a student's career expectations:

  "They've probably been set up with an expectation which is fairly high level, that they will leave University and walk straight into a senior management IT position quite frequently. We've lowered those expectations with them, and got them to realize that in most large organizations there was going to be a stepping stone procedure that they would have to go through to rise through the ranks." (Ind 10)

- Serving as a Role Model. One interviewee took the notion of providing future direction further, seeing the possibility that the mentor might, in some sense, be a role model:

  "I guess the student we had; there was a lot of similarities with that person to myself. We had similar backgrounds." (Ind 1)

Finally, the provision of personal support includes:

> Pastoral Care and Social Involvement. A number of interviewees stressed their responsibility to support the student's personal growth and involvement in the social life of the organization:
>
> "Certainly a sense of self esteem and confidence. It can be pretty daunting to come into an organization. Some organizations feel cold or they're welcoming, and it really depends on the organization and sometimes you just have to have confidence in yourself that you're doing the right thing, you know believe in yourself." (Ind 8),

In summary, industry mentors have been able to articulate some seven areas of responsibility. Of concern, however, is evidence that in some cases the selection of industry mentors is driven by pragmatic issues such as staff availability, rather than as an outcome of a considered selection process operating on the basis of a shared understanding of the skills required and ensuring that mentors have the capacity to demonstrate these skills:

> "It probably fell on to me ... the mentoring program, because the area of work which they were dealing with was out of my control and then the IT manager didn't have I suppose as much of a technical [role]. … I wasn't officially elected as a mentor, but sort of became the mentor." (Ind 9)

Given that it is during the student's transition to the workplace that the mentor is selected or assigned, tertiary educators administrating these programs may do well to provide enhanced support to industry mentors in this area.

Assumption 3: Industry mentors will have a vision of what constitutes a meaningful/satisfying placement, their role in achieving this and have the capacity to structure and implement it.

To test this third assumption, industry mentors were asked explicitly to describe the features they felt essential to a 'meaningful/satisfying' placement. In answering this question, each mentor shared anecdotes from their experience, reflecting upon their role and capacity to deliver these features.

Whilst many sponsors highlighted various features, some eight emerged as core, as follows:

- Purposeful Work. Work completed should be important to industry rather than a concocted 'student learning' or 'time-filler' activity. It was widely held that work that was not meaningful to industry would be recognized as such by the students, who would then devalue the experience:

  "We see this as a two-way relationship, so, you know, we want someone who's coming in, who's not just, you know, sitting down and spend the next twelve weeks or how many weeks in just doing their time. We want someone who's going to come in and critically access our environment and look to ways where they can add value." (Ind 9)

- Focused Work. A meaningful placement should provide a focused experience for the student – allowing the student to 'own' the work carried out. Two mentors in particular stressed the need to provide a coherent central task, that the students might 'own':

  "For me the pleasing aspects are when you can give somebody a task you know perhaps they've struggled with, but then they've come and presented the solution to you and it's tested and it works." (Ind 5)

  "Giving them ownership of a project. Gives them time to study the project I think and the nature of the assignment, and that there's a two way exchange here." (Ind 9)

- Variety. A meaningful placement should allow the student to experience a wide variety of technology/business related activities. This may at first sound at odds with the notion of 'focused work'. The mentors interviewed, however, did not see it as incompatible. Rather, they saw that, whilst working in a focused project area, the student should have the opportunity to experience a wide variety of related activities:

  "We're in the process now of writing up what we're going to do for the next student and I've got about six projects on the go, and they will have a breadth of involvement from what you're probably talking about, low-level help desk type responding calls to actually being involved in probably one of our knowledge management projects that's about to go on." (Ind 7)

- Learning (Technical Training). A meaningful placement should allow the student to exercise/enhance technical abilities. This was probably the most widely cited aspect – with sponsors particularly respecting students who embraced the opportunity to build technical skills, often through processes of personal exploration:

  "On the very good side I think the thing that most surprised me was we had one IBL placement who spent a lot of time in their own time outside of work actually researching issues and looking things up on the Internet and working using their own tools at home to not only complete tasks but to increase their knowledge and to provide input into things." (Ind 5)

- Learning (Business Process). A meaningful placement should allow the student to develop their understandings of organizational behavior and business practice. This was not widely explicitly cited by mentors, although it underpinned, for example, the emphasis given by some to the importance of providing variety in the work, and the need to build generic skills:

  "Exposure to business probably is an important one, … a lot of it's contingent on the employer and the employer's understanding of the program, and the employer's willingness to act as a mentor …there's a risk there you'll get these kids and they'll sit in the IT department and they won't be exposed to you know, to the business. They won't understand the context which they work in." (Ind 9)

- Learning (Generic Skills). A meaningful placement should allow the student to build/develop their generic skills – sometimes called "soft skills" by the industry mentors:

> "But the communication and I guess initiation of that person's role is one aspect but the actual progress of that person is where the soft skills come in. It's being able to get them to be at a level of confidence." (Ind 8)

- Risk-taking. A meaningful placement should allow the student to explore tasks, and possibly take risks. This factor was explicitly raised by three of the interviewees, in the following general terms:

> "Yeah, I don't mind them taking a risk within, you know, the boundaries of what they're working in. I think with that risk though, comes the responsibility that I don't mind them taking the risk but if the risk turns pear shaped, they're going to be involved in the clean up as well, and that's part of the learning process." (Ind 7)

- Enhanced Employability. A meaningful placement should enhance the employability of the student following graduation. The interviewees shared during the interviews a well established, pragmatic view, that, underpinning the IBL placement from the student's perspective, was a need to enhance their employment prospects – indeed possibly to establish their credentials as future employees of the sponsor industry:

> "If I'm in a role where I'm interviewing someone and I have someone who has done industry placements and I know they would have derived a certain amount of industry experience and work ethic and all the other things out of that experience. From an employer's view I'll value that reasonably highly because they've already demonstrated some of the skills and aptitudes you might be looking for." (Ind 5)

In reflecting upon each of the above features there is a sometimes tacit assertion that the industry mentors feel empowered to deliver these opportunities to the students placed with them. It is important to recognize, however, that each of those interviewed were experienced mentors (see Table 1), and coming with that experience was an ability to respond to changing circumstances in an opportunistic way, to construct satisfying student placement experiences:

> "For the month of July, we think they'll do that for the first two weeks in August, we think they'll do that. That's got to be a benefit for the student. That's got to make a good placement, they've got some in surety of where their heading, but it's like my business plan, if I don't do my business plan every year, we just roll along and stumble from crisis to crisis. You've got to do planning. That makes a good placement." (Ind 7)

It is by no means clear, however, that inexperienced mentors would have the capacity to achieve such a coherent placement plan in the dynamic environment that characterizes today's IT industry. Further, it is by no means clear that all mentors possess the personal characteristics to be empathetic to the student's situation:

> "As you [the interviewer] were speaking I was actually reflecting into the past when I believe we haven't been a good mentor … it boils down to a point where I think we weren't sensitive enough to understand what the student was experiencing at a point in time and it hasn't been fulfilling for them." (Ind 6)

Discussion and Implications for Tertiary Educators directing IBL Course Components

Promoting reflection is seen as pivotal in the process of professional education (Boud & Walker, 2002). The University requires BBIT students to keep a learning journal and write an end-of-placement report on the work placement experience. Moreover, an end-of-placement presentation is required involving the industry mentor and academic supervisor. All of these strategies are used to encourage students to reflect on their work experiences in relation to their academic studies. We were additionally interested in analyzing the interviews with industry mentors with a view to ascertaining to what extent encouraging reflection was seen by them as an overt part of their role. In their day-to-day interactions with the BBIT students did the industry mentors deliberately or, indeed, unintentionally foster reflection in order to help students learn to solve work-related problems and more generally in learning to make sense of their work experiences in the context of their academic studies past and planned, and in learning about future possible career opportunities? To what extent did mentors see themselves as educators of and about learning productively in the workplace both in terms of supporting BBIT student learning and learning about their role as mentor in this process? As noted by Bova (1987, p. 124): "Mentors act as teachers a great deal of the time imparting to their protégés a feel for their job, a knowledge of the skills needed for success, and also guidance regarding future trends in the field."

Boud and Walker (2002) note a number of problems encountered in the apparent process of supporting reflective learning, one of which is that reflection might occur but without learning:

> "It is important to frame reflective activities within the learning context in which they are taking place. Without some direction, reflection can become diffuse and disparate so that conclusions or outcomes may not emerge. Without a focus on conceptual frameworks, learning outcomes and implications, reflection for learners can become self-referential, inward looking and uncritical." (p. 93)

What were the self-perceived skills of the industry mentors in enabling productive reflective learning on and in the work undertaken by the BBIT students? The evidence suggests the problematic nature of this capacity amongst the mentors and one suggestive of further support from the University (see below).

On a broader scale, partnerships in professional education between universities and industry require the integration of two self-reinforcing learning organizations to maximize educational opportunity and benefit for the learners (see Boud & Solomon, 2001; Symes & McIntyre, 2000). One is the academic learning organization, the University, the other is the workplace learning organization, the companies operating in the IT industry. In order to function as an effective inter-organizational learning organization for students' learning both must exhibit the characteristics of a genuine learning organization, which begs the question as to how one defines what a learning

organization really is. Marsick and Watkins (1999) reflect on this definitional issue:

> "We originally defined the learning organization as one that is characterized by continuous learning for continuous improvement, and by the capacity to transform itself … This definition captures a principle, but in and of itself, is not operational. What does it look like when learning becomes an intentional part of the business strategy? People are aligned around a common vision. They sense and interpret their changing environment. They generate new knowledge which they use, in turn, to create innovative products and services to meet customer needs. We have identified seven action imperatives that characterize companies traveling toward this goal." (p. 10)

Marsick and Watkins (1999) identify these action imperatives as: provision of strategic leadership; connecting the organization to its environment; empowering people towards a collective vision; creating systems to capture and share learning; encouraging collaboration and team learning; promoting inquiry and dialogue; and creating continuous learning opportunities. Four of these action imperatives of direct relevance to our study are defined by Marsick and Watkins (1999, p. 50) as follows:

> Create continuous Learning Opportunities: Learning is designed into the work so that people can learn on the job; opportunities are provided for ongoing education and growth.
>
> Promote Inquiry and Dialogue: People gain productive reasoning skills to express their views, and the capacity to listen and inquire into the views of others; the culture supports questioning, feedback and experimentation.
>
> Encourage Collaboration and Team Learning: Work is designed to use groups to access different modes of thinking; groups are expected to learn together and work together; collaboration is valued by the culture and rewarded.
>
> Establish Systems to Capture and Share Learning: Both high and low technology systems to share learning are created and integrated with work; access is provided and systems maintained.

The fact that companies are prepared to sponsor Deakin BBIT students undertaking work placements is prima facie evidence of their commitment to taking action supportive of the notion of the learning organization.

Whilst the results above have highlighted a number of exemplar industry mentor behaviors, some concerns have emerged. These are summarized below, grouped according to the assumption that is brought into question, together with possible tertiary educator responses. Specifically:

Arising from Assumption 1: Whilst the industry mentors have expressed commitment to the notion of experiential/integrated learning, there is some evidence that some struggle to understand its salient characteristics and how, and for whom, it value-adds. Whilst a substantial IBL Handbook is currently provided to industry mentors, thought might be given to a targeted seminar program for sponsors, addressing in particular IBL characteristics, informed by case studies drawn from placement experiences across the years of operation of the BBIT.

Arising from Assumption 2: There is evidence that in some cases the selection of industry mentors is driven by pragmatic issues such as staff availability rather than as an outcome of a considered selection process operating on the basis of a shared understanding of the skills required and ensuring that mentors have the capacity to demonstrate these skills. This suggests that tertiary educators may need to be increasingly proactive in supporting the preparation for placement, in particular the selection and briefing of mentors, possibly through a process of site visits prior to the commencement of a placement.

Arising from Assumption 3: There are instances where industry mentors struggle to articulate a vision of what constitutes a meaningful/satisfying placement, their role in achieving this and to demonstrate the capacity to structure and implement it. Whilst the IBL Handbook provides information on student placement assessment strategies, what may be required are examples of best practice, and tools for mentors to assess the opportunities they are placing before students against models of best placement practice.

Conclusions

Research has been undertaken to test three assumptions that tertiary educators tend to make when designing and operating the industry-based components of tertiary education programs, about the level of commitment and understanding of industry mentors, about how they will be selected and the skills they will be able to demonstrate and impart.

In the course of the research a number of exemplar industry mentor behaviors have been uncovered.

Specifically:

- A number of the industry mentors interviewed have been able to articulate motivations for industry involvement in the educational process, three of which have been classified as 'pragmatic' motivations (i.e., the program was seen as value-added to the organization either in the sense of raising corporate profile, or providing two different forms of tangible Return On Investment [ROI]) and two related to value-adding to the educational growth of the student
- Industry mentors have been able to express some seven 'skills' required of the mentor, including process-oriented skills (supporting the transition to IBL), content-oriented skills (provision of technical advice, business-process advice, and building generic skills), futures-oriented skills (provision of career advice and serving as a role model), and personal-support skills (pastoral care of the student including involvement in the social life of the organization), and
- Finally, mentors have reported some eight features of a meaningful/satisfying placement, including purposeful work, focused work, variety, learning (technical training, business processes and generic skills), risk taking and enhanced employability.

Despite such exemplar standards being uncovered, some

concerns have emerged. Specifically, there is some evidence that:

- Some struggle to understand the salient characteristics of experiential/integrated learning and how, and for whom, it value-adds
- In some cases the selection of industry mentors is driven by pragmatic issues such as staff availability rather than as an outcome of a considered, informed selection process, and
- There are instances where industry mentors struggle to articulate a vision of what constitutes a meaningful/satisfying placement, their role in achieving this and to demonstrate the capacity to structure and implement it.

Some actions to address these concerns have been canvassed (see above).

In his presentation at the 14th WACE World Conference, Pratt (2005) contended that:

- More research needs to be conducted, not only to study existing practice, but to suggest new practice, and
- More people, practitioners, scholars, employers, administrators, policy-makers, foundations and governments need to review what research has been conducted and its implications for both practice and for further research.

The work described here provides a rich basis for future research. Bringing together the results reported herein based upon industry mentor interviews, with data collected by the present researchers from students, analysis of student journals, tertiary educators and senior university managers, is to be presented in a future publication. Beyond this, a rich stream of future research, exploring a selection of the strategies introduced in the penultimate section of this paper, may well prove fruitful. Moreover, its process of connecting the industry and the academy models may well provide a useful approach to informing research and also to applying that research and exploring its implications for both sectors.

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