



## Research Report

# Keeping Up With the Play: Practicum, Partnership and Practice

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This paper reports an inquiry into a Sport Management Program at Massey University. It provides program evaluation based on feedback from sport organizations and graduates related to their experiences of the Sport Management Practicum, a for credit double semester paper, normally undertaken in the third or fourth year of study or as part of a compulsory requirement of both undergraduate and post graduate Sport Management majors at Massey University, New Zealand. The research investigated the impact on the practicum organizations, and whether the practicum helped graduates in their current position. An open-ended questionnaire was sent to all 2004 organizational supervisors (n=25). A separate questionnaire consisting of open and closed questions was sent to all Sport Management and Coaching graduates between 2000 and 2003 (n=160). The responses were transcribed and then coded using the qualitative data analysis package HyperRESEARCH. Triangulation of the data findings provided further insight into the value of the Sport Management Practicum, benefits to the industry and transfer of learning to the work place. The findings suggest that graduates and practicum organizations valued the linking of theory to practice through the sport Management Practicum and regarded it as professional preparation for careers in the sport industry. The importance of managing both student and organizational expectations was also highlighted. The graduates and supervisors concurred on the key needs of practicum students, which were to be enthusiastic, organized, show initiative and make the most of their practicum opportunity. One implication from this research is that it is important to see work-integrated learning as part of a whole course of study involving the placement organizations, rather than as a stand-alone component. (Asia-Pacific Journal of Cooperative Education, 2005, 6(2), 17 - 25).

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Boyatzis and McLeod (2001) argue that the educational bottom line for colleges and universities, with respect to management education, was to develop the whole person. Similarly, it has been suggested that management education can benefit from adopting an experiential approach enabling students to put into practice the theoretical concepts learned in the class room (Mailick & Stumpf, 1998; Mumford, 1991; Romme, 2003; Ruben, 1999; van Baalen & Moratis, 2001; Wankel & DeFillippi, 2002). In the field of management education, experiential learning has taken place for a number of years, and may include, in addition to outdoor activities, cooperative education, the analysis of case studies, role-playing, taking part in business simulations or management games (Hussey & Lowe, 1990; Mailick & Stumpf, 1998; McRae & Baldwin, 2005; Mumford, 1991; Romme, 2003; Ruben, 1999).

Despite the use of experiential learning in management education, it is still predominantly classroom based and focuses on learning the theoretical concepts associated with key management skills such as teambuilding, conflict resolution, strategy, planning, leadership and personal development (Boyatzis & McLeod, 2001; Whetten &

Cameron, 2002; Worrall & Cooper, 2001). This situation has led to management training being deemed too theoretical with the skills learned not transferable to the workplace on return from training (Flor, 1991; Reed & Anthony, 1992).

### Experiential Learning

Dewey's (1938) work provides a foundation for current theoretical learning models and educational practices (van Gyn & Grove-White, 2005). Just having an experience does not necessarily mean learning will have occurred (Boud, Keogh, & Walker, 1985; Dewey, 1938; Roberts, 2002). Experiential learning promotes deep learning, as opposed to surface or strategic learning (Entwistle, 1996), and transfer of learning (Macaulay, 2000), with reflection being the crucial factor in facilitating this process (Dewey, 1933). Research by Moon (2000) and Seibert and Daudelin (1999) focuses on the importance of reflection in learning and professional development, reinforcing Schön's notion of the 'reflective practitioner' (Schön, 1983), which is particularly applicable to cooperative education (Coll & Eames, 2005).

Kolb's (1984) model is most commonly used as a basis for discussion of the experiential learning process in

cooperative education (Eames & Cates, 2005). In Kolb's (1984) experiential learning model, reflection is seen as the second stage in the cycle followed by conceptualization and then action. He characterizes learning as "a process whereby knowledge is created through the transformation of experience" (Kolb, 1984, p. 38). Roberts (2002) argued that reflection is the means through which experience and theory are transformed into knowledge. Boud, Cohen and Walker's (1993) model for promoting learning from experience highlights the points emphasized by Roberts (2002) (Figure 1). During the event, being aware, noticing what is happening, and intervening to bring about change are all parts of the process of reflection. Following the event, returning to the experience (metaphorically), and focusing on feelings and emotions can enhance (or inhibit) further reflection and learning (Boud & Knights, 1996). The model also illustrates the process of cooperative education discussed in this research, in which the relationships between preparation, experience and reflective processes are highlighted.

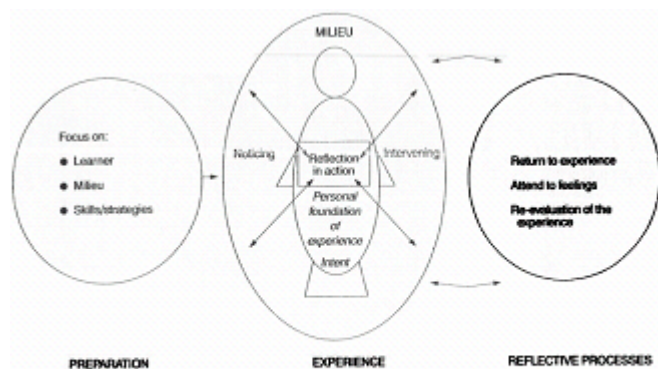


FIGURE 1  
Model for promoting learning from experience (Boud, Cohen & Walker, 1993, p. 7).

### Personal Development

The importance of personal development in the area of management education is increasingly being recognized (Hager, 1999; Leberman, 1999; Reynolds, 1998; Whitaker, 1997). Hager (1999, p. 72) states that "learning from experience is fundamental to individual personal growth and development", and that "in a rapidly changing world successful and competitive enterprises require workers who have certain broad generic skills". Leberman (1999) concluded that personal development was crucial to the work of case managers working for the Accident Compensation Corporation in New Zealand. The findings from her research suggested that the development of self-confidence during the training of these managers enabled them to transfer their learning from the classroom to the workplace. Managers require not only job-specific skills, but also finely tuned interpersonal skills for dealing with a range of situations encountered on a daily basis (Leberman, 1999). Management education must therefore assist in preparing managers for the challenging work environments they are likely to encounter as professionals working within often complex and changing organizations (Reed &

Anthony, 1992; Reynolds, 1998). These points are clearly summarized by Whitaker (1997, p. 21) who stated that "managers and organizations will need to accept that professional development will have to place personal goals alongside professional ones to help in the creation of a more integrated and holistic self-concept".

### Sport Management

The area of sport management is part of management education and over the last ten years has seen the professionalization of sport and leisure services throughout New Zealand and other parts of the world. The contemporary demands on sport and leisure managers require the development of specialized management knowledge and skills (Trenberth & Collins, 1999). A special feature, run over two issues of the Journal of Physical Education, Recreation and Dance, focused on adding rigor to sport management internships (Cuneen, 2004; Kelley, 2004; Moorman, 2004; Peretto Stratta, 2004; Verner, 2004; Williams, 2004; Young & Baker, 2004). The articles highlight key issues applicable to cooperative education in general, including justifying the educational value of linking theory to practice (Young & Baker, 2004); criteria for selecting appropriate organizations to place students in (Verner, 2004); standards and practices for maintaining consistency between student placements (Kelley, 2004); legal issues to consider (Moorman, 2004); students expectations of work-based experiences (Peretto Stratta, 2004) and organizational expectations and concerns of providing internships (Williams, 2004). However, none of the articles discussed the role of the internship from multiple perspectives involving graduate experiences of the internship and its value in terms of professional preparation, organizational perspectives and current student issues, which is the focus of this paper. This current research, set in a New Zealand University context, focuses on the professional preparation benefits of the sport management practicum from graduate and supervisory organization perspectives.

There has been a proliferation of tertiary level sport and leisure programs in New Zealand since the early 1990s (Grant & Stothart, 2001). Many of these programs offer work-based or cooperative experiences as part of their programs, which in the New Zealand context tend to be called practicum or work placements. The development in New Zealand of tertiary curricula and cooperative education programs in sport studies is recent compared to the United States and the United Kingdom, for example. Despite the number of cooperative programs offered in the area of sport management, little has been published specifically on the topic of graduate or organization feedback in the academic literature, particularly in the Asia-Pacific region (Ferkins & Fleming, 2005). Ferkins's (2002) empirically based study presented the views of the New Zealand sport industry when offering work-based placements to sport studies students. Her findings suggest that most organizations value the input of new ideas provided by the students, and identified that ensuring the student matched the organization was crucial for a successful experience for everyone concerned. New

Zealand research with graduates majoring in sport management between 1994 and 1999 by Leberman and Martin (2004a), suggested that the sport management practicum was an important part of their Business Studies degree in terms of preparing them for work in the sport industry.

### Context of the Inquiry

This paper presents the findings from graduate feedback on undergraduate and postgraduate courses majoring in Sport Management at Massey University. Undergraduate major requirements include sport management, event and facility management, outdoor recreation management, sport marketing, sport sociology, sport psychology and leadership, as well as a sport management practicum (see Figure 2). Postgraduate requirements also include these topics.

In particular, this paper focuses on feedback by graduates and organizational supervisors on the practicum experience. The practicum is a compulsory full year paper, where students are based at a sport organization and work on a specified project for a minimum of 180 hours. A learning contract is agreed upon by the student, the supervisor within the organization and the lecturer responsible for co-ordinating the practicum at the University. This contract provides the detailed overview of the practicum, including expectations, responsibilities and assessment. Student objectives specifically are:

- To understand the structural, organizational and operational aspects of a sport organization
- To plan, implement, and evaluate independent projects that benefit the organization
- To formulate goals and measurable objectives to be accomplished, and
- To understand the relationship between theory and sport management practice necessary for managerial or supervisory positions.

The practicum provides an opportunity to apply theoretical knowledge gained in academic studies to the 'real world' and to prepare the student for a career in the sport industry by providing an opportunity to develop relevant professional skills. Parkhouse (2001) argued that practica and internships provided discrete educational experiences, which enhance the transfer of learning (Macaulay, 2000). The practicum also provides an opportunity for the student's reflection on management learning, as a result of their sport organization experience (Reynolds, 1998). This reflection is undertaken by setting objectives, maintaining a reflective log book throughout the practicum experience and then formally evaluating the experience in terms of personal and professional learning in a final report.

The specific objectives for the supervising organization are:

- To establish a cooperative working relationship with the University
- To participate in the preparation of future sport and leisure management professionals

- To increase awareness of new and innovative ideas in the sport and leisure management field, and
- To develop and/or create new programs or projects.

Students can study internally (on campus) or extramurally. This latter group of students adds an extra challenge in terms of cooperative education, as they can be based any where in the world. From a University perspective it is vital that good relationships are developed with supervising organizations via telecommunications extramurally and reliance is placed upon strong support structures with the respective supervisors in these sport organizations. This situation is highlighted by Ferkins and Fleming (2005) in relation to 'out of town' students in Australia.

### Methodology

A questionnaire consisting of 17 questions was sent to all Sport Management graduates between 2000 and 2003 (n=160). The questions were both open and closed in nature, including both demographic questions as well as questions about current and previous employment since graduating, useful aspects of their course, the practicum, and relevance of the course to their current position. Similar questioning had been used in previous research by the authors (Leberman & Martin, 2004). Eames and Cates (2005) indicate that although most studies in cooperative education have been quantitative, future research should focus on the use of qualitative inquiry. They suggest that qualitative research facilitates a deeper understanding of learning in the workplace, and provides insight into what the experience means to students - aspects which are difficult to highlight with quantitative research. Merriam (1998) argued that the transferability of qualitative findings (Guba & Lincoln, 1994) is enhanced by the detailed description of the context, method and research findings. For the purposes of this paper only the open questions relating to the student's practicum will be discussed.

1. What did you learn from your practicum experience?
2. How has the practicum helped you in your current position?
3. What insights would you share with a sport management student who is pursuing a practicum placement?

A different questionnaire consisting of 17 questions was also sent to all supervisors of 2004 students at their practicum organizations. The questions were also both open and closed in nature, including both demographic questions as well as questions about their involvement and experiences of supervising the practicum. For the purposes of this paper only the open questions relating to the following questions will be discussed.

1. How does your organization benefit from the sport management practicum?
2. How do you see the practicum experiences benefiting students in gaining future employment positions?

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Year 1	Introductory Accounting	Fundamentals of Finance	Introduction to Organizations & Management	Principles of Marketing	Introduction to Business Law	Introductory Business Statistics	Principles of Macro-economics	Introduction to Business Communication
Year 2	Contemporary Management	Sport Business	Outdoor Recreation Management	Sport in the Social Context	Elective 100 or 200 level paper	Elective 200 or 300 level paper	Elective 200 or 300 level paper	Non-BBS Elective 100, 200 or 300 level paper
Year 3	Sport Facility & Event Management	Sport Management Practicum		Sport Psychology & Leadership for Managers & Coaches	Elective 100 or 200 level paper	Elective 100 or 200 level paper	Business Elective e.g. Sport Marketing	Non-BBS Elective 100, 200 or 300 level paper

Notes:

Year 1 papers are compulsory; Year 2 and Year 3 papers other than electives, represent papers for the major.

FIGURE 2

The sport management program at Massey University.

3. What insights would you share with a sport management student who is pursuing a practicum placement?
4. What are the key skills/competencies required for working in the sport industry?

The following comments are representative of the views expressed in this present study specifically about the value of the practicum experience and working with the organization's staff.

All the responses were transcribed and then coded using the qualitative data analysis package HyperRESEARCH (Dupuis, 1994). HyperRESEARCH enables text to be coded and retrieved, allowing the generation of descriptive statistics in terms of numbers, as indicated (in words and in brackets) in the next section of this paper. The process involved both researchers initially separately coding the data, then reviewing the codes generated before agreeing on the final list of codes and then grouping these into themes. The codes used emerged from the data.

### Research Findings

Thirty eight graduate responses were received (24% response rate), 20 from male graduates and 18 from female graduates. Seventeen organization responses were received (68%). The low graduate response rate is not surprising given that some students had graduated four years previously and may have changed address from the one held by the University and used for mailing the questionnaire. Interpretation of the data and the possibility of transferability (Guba & Lincoln, 1994) from one setting to another should be cautioned due to this low response rate.

#### Benefits of the Practicum Experience: Graduate Views

Seventeen graduates indicated that the practicum had been the most useful part of the course of study, as indicated by the following typical responses:

I found the practical classes and sessions most relevant as it was hands on theory and practice as opposed to learning things but not being taught how and when to use them and use them with confidence.

The practicum is probably one of the best aspects of the course, with it providing students the opportunity to apply some theories as well as confronting them with the practical realities that their future employment will bring. A great deal, it was probably one of the most enjoyable and worthwhile parts of my study at Massey.

The practicum paper was the most useful for me as it gave hands on experience in an organization. This was very beneficial when I started working in the sport management industry.

Loved the practicum paper, was so worthwhile and gave a real insight into the working world of sports administration and made great contacts.

Although the practicum was the most rewarding aspect of my study I felt that all sports papers were relevant as together they provide a comprehensive grounding in the sports management industry.

I was given an enormous amount of control over my own work and freedom to implement aspects of management, marketing and media relations as I saw fit, which let me show my creativity... I had a great relationship with my supervisor which made the experience all the better and he was keen to pass on any knowledge he could.

I have gained valuable experience and felt comfortable exploring new management ideas and systems... I received support in the form of my mentor - great to have someone to bounce ideas off, who encouraged and guided me.

It gives students the chance to put into practice some of the things learnt in the classroom. Being given the chance to undertake a real-life project with a sports organization is a very valuable learning tool and means of progression into the industry.

Working with [supervisor] who was really great in letting me take part, guided me through tasks and let me feel like I was making a big help...The whole organization was really supportive of me and helped me with tasks I was unsure about or worried about.

Seventeen of the graduates in the current study indicated that they had benefited from business skills applied in their practicum and nine students specifically identified event management skills.

#### Benefits of the Practicum Experience: Organization Views

Fifteen of the supervising organizations also indicated benefits of the practicum by being able to delegate work and projects, but also in maintaining standards, enthusiasm and new ideas, as highlighted by the following responses:

Staff don't want to be shown up...lift in work standards... Enthusiasm, a lending hand, eagerness to learn, fresh ideas.

Exchange of ideas with some fresh and often innovative thinking from the student. The supervision process allows frequent assessment and evaluation of my own programs.

See [the student] grow in confidence and derive pleasure from organizing something. She became really involved in the process and knew that what she was doing was for the benefit of others.

### **Relevance of Practicum to Current Position: Graduate Views**

The graduates indicated that they had gained a range of skills as a result of the practicum experience, in particular general skills (7) networking (6) and increased confidence (5):

Skills developed - applicable to a lot of situations. Quite a key element of a practicum paper.

Although not currently working in the industry it has helped me in my current management role. Although the practicum is geared towards sports there are a number of overlapping features that apply across all industries.

Certainly gave me a great grounding in analyzing situation and obtaining a number of key contacts which I have used working.

The practicum gave me a lot of confidence in dealing with people - being answerable to 'higher powers'.

### **Relevance of Practicum to Current Position: Organization Views**

The organizational relevance of the practicum was mentioned by 12 of the supervisors, as the opportunity to provide real experiences, which may lead to future employment.

We have employed the student. Definite advantage of employment seeing the strengths of the individual.

I am sure that the quality of work he produced would be beneficial when viewing study results in a work CV.

Supervised experience in the business environment. A huge benefit to a young person. Gives them confidence to move ahead.

Can closely observe and implement practical working programs; hands on organizational experience; ability to brainstorm, synthesize, implement and evaluate a complete program while under experienced supervision.

### **Insights for Future Practicum Students: Graduate Views**

Eleven of the graduates indicated that when undertaking the practicum there was a need to research the organization and have clear expectations established with the supervisor.

Talk to previous students (if possible) about their practicum experience. Go for organizations that value your contribution and give a good practicum experience. Ask what they got out of their experience and what could have been done to improve it.

Talk to a few organizations and see what they have to

offer. Once you decide who you are going to do your practicum with, sit down with them and talk through your expectations and what you want from the experience.

Be proactive and don't be afraid to go and talk with the organization about what they are doing and trying to achieve. Clear the rest of your workload so as you can focus solely on the practicum when it comes to crunch time. No matter how planned you are things always pop up that will require time - make sure you have plenty available.

Make sure you work hard - clarify the role you are meant to be fulfilling with the organization before you start.

Be clear with your mentor about what your background/existing experience is and what your objectives are, i.e. to learn or to play an active role.

In addition, the graduates in this current study indicated that the practicum student needed to be proactive and totally involved (18) with the organization and to be well organized (11).

Do more preparation so that [you] can undertake tasks with ease i.e. make [your] own event checklist and then add to it as more things crop up. Enjoy yourself, although it may be stressful leading up to the event and on the day, all your hard work will be rewarded with happy smiling people! Do as much as you can, take on as many roles as possible so that you get more insight into the organization and the way things work and why?

Plan, plan, plan! Then do it and do it well. You've got to make it different and just use all your initiative! Work hard! Choose carefully what event you want to do. Ensure it covers all the elements in the process and gives you as much learning possibilities as possible. Enjoy it! It is a great experience and gives you so much prep for life after Uni!

Choose something you are interested in as much as possible. There is a lot of work involved and skills to learn, so being excited about the project is important.

### **Insights for Future Practicum Students: Organization Views**

The supervising organizations concurred with the graduates views. They indicated that practicum students needed to be enthusiastic (13), make the most of their practicum opportunity (10), organized (9), and show initiative (8). Good business (13) and communication (10) skills were also identified as important. These points are illustrated by the following typical supervisor's responses:

Passion for industry with clear personal and business vision.

Strong organizational capacity. Ability and desire to develop systems that clearly allow for all contingency coverage.

Be prepared to experiment with new and old ideas to see what combination suits the situation the best.

You should be thinking about how you can 'add benefit' to the organization. Leave a mark/make an impression. You will never know where it could lead.

Practicum is a good intro to people in the industry. Having good people and relationship building skills is a huge asset in the industry so choosing a project with people contact is an advantage. People skills - people are the base of the industry.

## Discussion

The findings of this research have highlighted the importance of the three elements, preparation, experience and reflection, advocated by Boud, Cohen and Walker's (1993) model for promoting learning from experience. The preparation in terms of the generic business skills learned as part of the degree and the initial setting up of the cooperative experience, were mentioned by the graduates. The value of preparation was also noted by the supervising organizations, particularly in terms of having good business and communication skills. On a personal level, both graduates and organizations indicated that students needed to be enthusiastic, well organized and show initiative.

Graduates indicated that the cooperative experience, in this case, the sport management practicum was the most useful part of the course of study. Many respondents of McGlothlin's (2003) study on the internship experiences of occupational safety and health graduates in North America also commented that the internship was the most valuable and important part of their degree as it provided the opportunity to put theory into practice. These current responses support the findings of Leberman and Martin's (2004) previous research on the sport management program at Massey. The graduates also indicated the importance of workers having certain broad generic skills in a rapidly changing world of successful and competitive enterprises as highlighted by Hager (1999). The examples the sport management graduates provided of transfer of learning support the research findings of McGlothlin (2003), which suggested that graduates rated learning from experience, interaction with management, confidence in technical skills and career-related experience as most important in terms of their internship experience.

The value of the experience was also emphasized by the organizations. The responses from the supervising sport organizations support Ferkins's (2002) New Zealand based findings that most organizations value the involvement and input of new ideas provided by the students. These current findings highlight the importance of selecting appropriate organizations to place students (Verner, 2004), and reinforce the view that internships or co-operative education experiences are important in linking of theory and practice

and providing professional preparation for careers in the sport industry (Ammon, 2000; Chouinard, 1993; Parkhouse, 2001; Pitts, 2001; Southall, Nagel, LeGrande, & Han, 2003). These findings also emphasize the importance of managing student (Peretto Stratta, 2004) and organizational expectations (Williams, 2004). In addition, there is a need for students to take responsibility when selecting their internship and clearly establishing their roles and learning outcomes (McGlothlin, (2003). Ferkins (2002) highlighted the importance of matching student and organizational expectations. The development of the learning contract is an important way that the sport management practicum formalizes student and organization expectations by establishing initial project objectives, which relate to areas of both personal and professional development.

The reflective processes which facilitate the learning from cooperative education are incorporated in the sport management practicum as discussed above. Based on the authors' previous research we suggest that an extension of this reflection has been the research itself (Leberman & Martin, 2004b). The very nature of the questions asked of graduates and organizations encouraged a reflective return to the experience in order for participants to respond to the questions. The authors have argued elsewhere that structured reflection post experiences can enhance the transfer of learning (Leberman & Martin, 2004b).

## Conclusions and Implications

The findings of the research suggest that the Sport Management Practicum was of value to graduates and supervising organizations, with the business and communication skills also being important. The graduates and supervisors concurred on the key needs of practicum students, which were to be enthusiastic, organized, show initiative and make the most of their practicum opportunity. Current students are advised to complement the sport management and coaching major with a second area in business, such as marketing or human resource management, to increase their chances of gaining employment in the industry following graduation. The research also highlights the value of educating the whole person through cooperative education particularly in the area of management education. Managers by the very nature of their employment operate in an ever changing environment, which requires graduates to be able to have had opportunities for both personal and professional development during their course of study.

The main implication for cooperative education programs from this research is the importance of seeing work-integrated learning as part of the whole course of study involving the placement organizations, rather than as a stand-alone component. However, most of the research in the sport management area has focused on the internship itself rather than on the context within which it is situated. Further research in this area, as well as graduate and organizational feedback would assist in designing academic courses which maximize the use of co-operative education in terms of the theory to practice link and relevant professional preparation for students in their chosen career.

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# Preparing Student Industry Projects: Instilling the Art of Communication

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## Abstract

Students in their third year of the Bachelor of Information Technology (BIT) degree at Whitireia Community Polytechnic (WCP) are required to carry out a 420-hour 'real world' industry project. This project can often prove intimidating and confusing, not only as a technical challenge, but also because students are beyond the 'safe' environment provided by the polytechnic. Many students lack an understanding of organizational behavior and codes of conduct and are often unsure how to deal with their new industry colleagues. At WCP we have developed a second-year second-semester communications paper which has as its focus the teaching of systems thinking and research methodologies and the works of a number of communication theorists ranging from Sherif and Festinger through to Burke and McLuhan. The primary purpose behind this course is not to assist students to write more clearly or construct better sentences but rather to prepare the student to think, reflect and understand the world of communication they are about to enter. While the degree is primarily devised of technical courses devoted to the use of application and design principles, the communications paper is designed to take students out of their technical comfort zone and expose them to the often new world of communication theories. Industry based projects are challenging to the student not only from the technical aspect of the project but also from the aspect of intra and interpersonal communication. Students with high technical abilities may fail a project if their scope of knowledge learnt does not include an understanding of the way individuals and organizations think and act. Graduates of the BIT degree will work in a world that has a transitory view of their technical ability. Employers appreciate the technical knowledge that is relevant for a particular organization, but the value placed on a person who can communicate can be priceless. This paper will highlight the challenges faced by students and reflect on the benefits of the communication course in preparing them for their capstone projects with industry partners.

## Introduction

The placement of students in industry for a portion of their education is not new. It is an important way of providing experiential learning for students to develop and practice the skills they will need in industry. It is also a useful method of forging links between educational institutions and the industries they serve. The Tertiary Education Commission (TEC) has, as part of their remit, a requirement to future-proof the New Zealand tertiary system. This has resulted in future-focused strategies. They state that "Increasingly, providers and Industry Training Organizations (ITOs) will need to work with their external stakeholders to develop joint strategies that look ahead and focus on developing the skilled people New Zealand will require in the future, not just on the skills needed for today" (TEC, 2002, p. 19).

Student industry placements are a future-focused strategy. Many placements are in large global organizations that have a history of internship. New Zealand has very few large global corporate organizations and its business environment is mainly made up of small to medium enterprises that may not have the capacity or the structure to take on student placements. Simulated environments may be used as substitutes but these simulated environments may lack the opportunities of work-based placements. Instead many Information Technology courses require final year students to complete a capstone course, usually a directed industry project of some form. "Most computing curricula have a special course, usually taken during part of the final year that is considered a 'capstone' course. This course is required of all students and is supposed to provide a culminating and integrative educational experience" (Clear, Goldweber, Young, Leidig & Scott, 2001, p. 93).

At WCP students in their third year of the Bachelor of Information Technology (BIT) degree are required to work in teams to carry out a 420-hour 'real world' industry project. The project allows

students to apply the knowledge and skills they have learnt in the field of computing to produce a real product for a real client. It also requires the student to put into practice their skills in written, verbal and interpersonal communication, teamwork, problem solving, and critical thinking: “Skills found to be important to IT employers hiring entry level computing professionals” (Beasley, 2003, p. 123). For students, some of the more difficult aspects of the project are related to communication; communication with clients and end-users, communication within the project team and adaptation to a different organizational culture. To assist them in these areas we have developed a second-year communications course to prepare the student to think about and understand the world of communication they are about to enter.

### **The Purpose**

So just how does a course in communication help? Davenport and Prusak (1998, p. 19) state that “knowledge transfer involves two actions: transmission (sending or presenting knowledge to a potential recipient) and absorption by that person or group. Inter-group and inter-project communication, is the key to a successful project”. Simmons, Germans and Ruijters (2002, p. 44) state: “Team learning also means having and creating good communication between team members. Mostly, small multi-functional, autonomous teams function in such a way that people learn from each other, taking over and learning each other’s jobs flexibly”. This method of working is extremely common in the IT environment.

The intent of the communication course is to introduce students to research and give a greater understanding of the process and value of communication through the study of a number of communication theories. Regardless of the role students find themselves in, it is an undeniable fact that that role will require communication. The opportunity for a student to gain employment in the backroom of an organization, programming away in isolation, is far removed from the realities of the modern industry. They will be part of a team, often for a defined period of time, before being moved to another team. They will become an interchangeable part of an organization and their skills will be utilized and maximized to the best advantage of that organization. While at this point readers may be reminded of Orwell’s 1984, this is not our intent; the IT industry is not quite that oppressive. It does require, however, that a student learns to communicate well in a wide variety of situations, that a student can research information in an industry that experiences rapid change, and can negotiate their value in order to remain in employment.

The IT industry has over recent years matured into a more stable and viable career industry for many graduates. Gone are the excessively high paid jobs that were prevalent in the early years of the industry and during the millennium bug crises. Organizations are now seeking an intelligent workforce that is able to learn new skills quickly and is able to communicate knowledge to others. The age of the learning organization is here.

Capstone courses are proving to be useful preparation for this new age. After three years of final year projects at WCP it appears that we have been successful in utilizing imitation environment and work placement techniques to achieve high success rates, with approximately 80% of graduates gaining employment within the first three months of graduation. We are growing a strong client organization base and are increasing the complexity of projects every year. Part of this success, we believe, can be attributed to our second year communications course.

### **The Communication Course**

The communication course is a 20 credit, semester based course that runs in the second semester and again in the summer school program to accommodate students who are entering the third year of the degree through a pathway from a completed two-year Diploma in ICT. The timing of the course is crucial as the students are introduced to research and communication theory before they enter the third-year first-semester Project Management course, in which they are expected to work effectively

in teams, and then graduate to the third-year second-semester industry project. It follows on from a first year communication course introducing the students to writing and presentation skills, interpersonal communication skills and basic communication theory.

The course begins with an introduction to quantitative and qualitative research. It is in this portion of the paper that students become aware that to conduct research means more than just using Google or Altavista. The course then progresses through to an introduction of communication starting with the basic Shannon and Weaver model and expanding into systems theory and the various traditions under which communication is studied.

The challenge is to engage the minds of students who have come to study IT, not communication. At this stage the students have not realized that IT and communication are closely related. We explain it to the students in this way: "If you cannot communicate your intent when designing or developing a piece of software, how do you expect your customers to use it?" Cooper (1999, p. 11), the 'father of visual basic' states that "the obnoxious behavior and obscure interaction that software-based products exhibit is institutionalizing what I call 'software apartheid', where otherwise normal people are forbidden from entering the job market and participating in society ...". He goes on to note that "By purposefully designing our software-based products to be more human and forgiving, we can automatically make them more inclusive, more class and color-blind". Surely then to become more 'human and forgiving', one must have an understanding of humanity's greatest gift, the ability to communicate and reason.

The assignments for the course are designed to challenge the student, both in giving each student a difficult topic to research and the equally difficult task of reporting back that research in a form that can understood by their peers.

Stowers and Barker (2003) suggest six strategies for teaching and evaluation. While these strategies were created for business communication classes the strategies work equally well for the communication course. The strategies are:

- Goals - Linking the assignments to the overall learning outcomes of both the course and the degree.
- Invest time early – Students are given the reasoning behind the course from the outset of the course.
- Make assignment expectations clear – Students are left in no doubt about what is expected and the amount of effort that is required on their part. This can be a challenge for students who have come through the pathway of a completed two-year diploma as the manner of learning is often more piece-meal.
- Establish connections – The students must establish the connection of the assignment with the overall goals of the course.
- Tailor to audience – The assignments should address a specific audience.
- Evaluation – The feedback must be of use to the student.

The assignments for the communication course incorporate these strategies. In the first assignment each student draws the name of a communication theorist out of a hat. Their task is to research and write a 4000-word report on the theorist(s), their theory, and how it relates to IT. There is usually little problem with the theorist chosen as, generally, all of the theorists are unknown to the IT students. The student is not left completely without a starting point as all theorists used are referred to in the course text *A First Look at Communication Theory* by Griffin. This text was chosen for several reasons; it is readable, it is supported by the author's own website and comes with interviews with many of the theorists on a CD-ROM, a media type much liked by IT students. The theorists chosen have produced theories in the areas of interpersonal communication, group and organizational communication, and cultural and gender communication. The purpose of studying the theories is to encourage students to think more deeply about communication and how it relates to the IT industry. In their report, students may disagree with the theory but are then required to critique it in an organized framework, as well as suggest alternatives. Students who agree with their assigned theory are required to explain why they agree and give examples from their own life experience.

The second assignment requires students to give a 20-minute presentation on the assigned theorist(s) and theory. Often the information found through university web sites and peer-reviewed journal articles is couched in language totally unfamiliar to the student. Academics are as protective of their industry as IT experts are of theirs. The task of the presentation, therefore, is not to recite back to their peers a series of words and phrases that mean nothing to the audience, but rather to present to their peers their understanding of the theory in their own words. This is one of the best methods we have found to promote understanding of the theory and the point of view of the theorist. To a large extent it is irrelevant whether the student has understood or totally misunderstood the theorist, provided the effort is made to research and cite correctly. A misunderstanding becomes a useful tool as this then forms a basis for discussion, evaluation and learning in the class.

An aspect of the communications course is the development of a better understanding of ethical issues. It is difficult for students to discuss such theories as 'standpoint theory', which focuses on the standpoint of women and other groups on the margins of society, without the debate raising both moral and ethical issues. This particular theory is not limited to female students. Often the debate is better when a male student has been assigned such a theory.

The third assignment involves the students working in small groups to apply communication theories to a case study involving an IT issue. The students are required to work effectively as a team to research the issue, apply relevant communication theories to the issue and to produce a written report and group oral presentation. The case studies presented involve issues of organizational communication and culture, and are designed to help students improve their teamwork skills and gain a better understanding of the environments in which they will be working during their industry projects.

We stated in the abstract that the purpose behind this course is not primarily to assist students to write more clearly or construct better sentences but rather to prepare the student to think about, reflect on, and understand the world of communication. However, the ability to write concisely and clearly is of increasing importance in a world that has become increasingly embroiled in litigation. Although we have not reached the levels of concern evident in the USA, the need to be clear and concise is important.

Many students come to higher education with an attitude that all information is contained within 30-second sound-bites and that these snippets of information are all that need to be recited when presenting information to others. While such a style may be suitable for an advertisement spot, it fails to impress upon the student the value of communication. It is important for students to also understand what they are writing and why. Our communication course requires the students to present their research reports and oral presentations to a high standard and reinforces writing and presentation skills learnt in their first year. These skills will also be needed to produce the documentation and presentation required for the capstone project.

Like many courses in the New Zealand education environment the numbers of international students are high. There have been many articles published on the difficulties and challenges of international students. While the challenges of English as a second language (ESL) issues are similar to many other courses, the issue of the material in the course makes little difference to either an international student or a domestic student. The first leveling point is that the theorists and theories covered in the course are likely to be alien to both groups due to the newness of the subject and the academic nature of the writing. Both groups of students may need assistance and support to initially understand the basic propositions of their theory. The second leveling point is that the majority of the theorists are from a USA context. This in itself proves interesting because not only is the United States context often alien to the New Zealand mindset, it is certainly alien to a large number of international students who come from an Asian or Eastern culture. Indeed, this proves to be a source of much debate on the validity of certain theories that have a particular Western view of the East. This is not to say that international students do not present challenges on the communication course. Basic ESL skills need to be addressed in order that capable students are accepted on the course earlier rather than later.

## The Outcome

Students emerge from the communication course with a better understanding of why communication is important. Until this time many of their courses of study have been technically based and 'chunked' into areas of expertise; database, programming, and so on. The courses in the third year expand to include issues of communicative design, structure, and methodologies. With an introduction into the vast arena of communication students appear to better understand the concepts discussed. The students enter their industry projects equipped with a broader range of communication skills and a deeper understanding of the communication issues than one first year paper in communication can provide. Many of the challenges that students face in the capstone projects are communication related. Students must apply their understanding of communication theory to understand and work within organizational cultures, to deal effectively with clients and to interact successfully as a team. Students involved in project work often comment on the benefits knowledge of communication brings in the 'real world', often in ways they had not appreciated before. Carver (cited in O'Hara, 2001) states that there are few more important educational goals than making students realize and appreciate the extent to which the topics they study are relevant to their lives.

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# **Transporting the Workplace into the Classroom: A Case Study at the Eastern Institute of Technology**

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## **Abstract**

The value of developing meaningful industry relationships must never be underestimated by tertiary institutes wishing to provide their students with the best learning experience possible. These relationships can benefit all parties concerned; opening educational, business, and employment opportunities. In 2002, the Eastern Institute of Technology (EIT) decided to build a purpose built information technology suite and upgrade its existing internal network infrastructure. As a result of the subsequent tendering process Allied Telesyn was identified as the preferred provider of networking hardware. Opportunities to develop meaningful relationships beyond the hardware purchase and support were investigated and included building naming rights, student sponsorship, industry course delivery, and graduate employment opportunities. This paper traces the ongoing relationships and explores how opportunities to build meaningful industry connections can be established within the existing programmes that a tertiary institute offers. The paper backgrounds Allied Telesyn and the services they offer and traces the steps taken to establish a new course within an existing degree structure base around industry content. The paper details the experience (positives, negatives, and problems encountered) of delivering this course for the first time and the placement of a student into employment via their 3<sup>rd</sup> year capstone project as a direct result of this initiative. The student concerned was the only graduate in the country to gain employment in a much sought after and highly competitive environment. We believe that such relationships are essential for any institute that intends to offer relevant tertiary qualifications that are geared towards meeting the needs of perspective employers.

## **Introduction**

The place of real-world experience in educational setting has been well documented (Velenchik, 1995). In 2002 an opportunity arose for the Eastern Institute of Technology (EIT) to establish a relationship with Allied Telesyn Research (ATR), a leading communications equipment developer and supplier.

This paper outlines the ongoing relationships between EIT and ATR, and the subsequent development of a third year data communications course which incorporated significant components of ATR's industry based training courses. The paper also describes the work undertaken as part of a capstone project (directed project) by a course graduate, which led to fulltime employment at ATR.

The paper commences by providing pedagogical evidence in support of 'real world' experiences in the tertiary educational sector. It describes the evolving relationship between EIT and ATR, and the circumstances that led to the development of a third year course within the Bachelor of Computing Systems degree. The paper then discusses the activities undertaken by a final semester student who undertook a software development project for ATR. The work done within the project led to fulltime employment for the student at ATR.

## **In Support of 'Real World' Experiences**

When ATR offered to provide switches and routers, and access to their industry based training materials, academic staff at EIT saw the opportunity to integrate "real-world" training materials into their traditional academic programme. The use of Allied Telesyn's materials and the ability to use modern switches and routers, enabled what was previously a mainly theory component of the BCS programme to include industry specific practical training.

The value of learning activities that focus on “real-world” events and interactions have been recognized by educators for some time. Over the last two decades, educational institutes have been busy incorporating industry-based training and project-based learning materials into their programmes, to give students a taste of what they are likely to encounter when they take up employment.

Pedagogical support for the integration of “real-world” activities into traditional academic courses can be found in the theories of constructivism and constructionism.

Papert (1993) describes constructionism as both a theory of learning and a strategy for education. Papert built on the "Constructivist" theories of Jean Piaget (1990), which suggested that knowledge is actively constructed in the mind of the learner rather than simply transmitted from teacher to student. Learners are more likely to create ideas than get ideas. Constructionism also suggests that new ideas are most likely to be created when learners are actively engaged in building some type of external artifact that they can reflect upon and share with others.

Constructionism is similar to constructivism in that it supports the idea that the learner is an active builder of knowledge. However, constructionism emphasises the particular constructions of external objects that are shared by learners. Although learners can construct and present knowledge or meanings without producing external products, the processes of construction is more evident when learners produce through social interaction with others and share representations of their understanding and thoughts.

Supporters of constructionism adhere to two fundamental principles. The first is that the best-learned lessons are ones in which students discover for themselves through their own struggles, and the second is that the most useful kinds of understanding and judgment cannot be taught but must be learned through practical experience (Volpe, 2000).

Velenchik (1995), a supporter of constructionism, highlights issues addressed by the use of “real world” case studies. Case studies motivate students to learn by providing a platform where tools are needed to solve problems. Students then start looking for the tools rather than expecting to have them delivered. Case studies also encourage students to apply the theory, placing a focus on analysis and evaluation, enabling students the opportunity to identify limitations of theory.

The emphasis that case studies and industry placements place on analysis and evaluation helps students move up the cognitive skills ladder from the low level skills of comprehension to the higher level skills of analysis and evaluation. The case study method provides a stimulating environment within which to develop the cognitive skills in learners.

### **Introducing Allied Telesyn**

The emphasis that both the EIT Charter and the Tertiary Education Commission Strategy have placed on industry relationships and collaboration, illustrate the importance of tertiary institutes (EIT) and industry (ATR) working together.

ATR is based in Christchurch and is the leading research and development arm for Allied Telesyn International. ATR is responsible for developing the company's most advanced and innovative networking products. In 2002, ATR won a contract to provide a replacement backbone network at EIT. When the contract was signed, the two organisations decided to investigate if it was possible for both parties to gain from additional non-contractual relationships.

The integration of ATR training materials into EIT degree courses was seen as a mechanism which had benefits for both parties. EIT would be able to offer a course that was sanctioned by industry and would be seen by students as being relevant providing improved employment prospects. ATR agreed to provide a class set of layer three switches and provided access to their course training materials.

In 2004, this relationship was further extended, when a third year final semester student was offered the opportunity to complete their capstone project at ATR. This was an important milestone in the ongoing relationship between EIT and ATR



### **The Third Year Course**

When ATR offered to provide switches and routers for a software laboratory and access to their industry based training materials, EIT began looking for ways to use the provided resources within their existing programmes. It soon became evident that there was significant overlap between what was covered in two degree-level Data Communications and Networking courses and the areas covered by the ATR materials. It was fortunate for EIT that the investigation coincided with an EIT wide review of all degree courses, conducted because the institute had decided to adopt a standard structure of 15 credit courses for all degree programmes.

The content for the two Data Communications and Networking courses was rearranged with the year one course aiming to provide the students with a knowledge of the concepts of data communications and networks and the year two course aiming to use the concepts of the year one course to provide students with skills in planning, installing and using data communication facilities. While the resulting two EIT courses covered much of the content of the Allied Telesyn training courses, there were sufficient materials requiring skills at the higher levels of the Bloom's Taxonomy model (Bloom et al, 1964) in the Allied Telesyn training courses, which had not been covered, to develop a meaningful third year Data Communications and Networking paper.

Modified prescriptions were prepared for the two existing courses and a new prescription was prepared for the third year course. The prescriptions were reviewed by industry, the degree monitor, students and other tertiary institutes and passed to academic board for approval. Once the courses were approved, a decision was made to offer the third year course as a summer school using block mode delivery. The course was oversubscribed and local industry expressed a desire to have their employees participate.

Prior to the course being delivered, Allied Telesyn ran a training course for EIT academic staff and EIT Computer Services staff. The course provided valuable experience for EIT staff, and enabled the staff who would be involved in delivering to participate using the case study approach adopted by Allied Telesyn. This move helped strengthen the growing relationship between EIT and Allied Telesyn.

### **Capstone Project**

The culmination of the Bachelor of Computing Systems at EIT, as for most applied Information System degrees, is a final year project which is viewed as the "capstone" of the degree. The project can be taken only in the final semester of study and it integrates a student's knowledge, skills and understanding of IT into the analysis, definition, development and implementation of a business organisation's computing activity (Bridgeman, 2003; Mann and Smith, 2004).

The project provides students with the opportunity to research, select, integrate, and apply a range of techniques and technology in the solution of a complete realistic problem. According to Dobbstein and Taylor, (2004); and Taylor (2002), co-operative education typically occurs when a learner is placed into the actual working environment by a higher education institution - in this case developing the project for industry while studying towards the degree.

During the early part of 2004, ATR approached EIT with three "nice to have projects" that they had on their wish list and wondered whether any of our Data Communications three students would be interested in doing them for their capstone projects. All three projects were out of the scope of many the students; however the "Cisco to Allied Telesyn script converter" was taken on board by the top student from the Data Communications three course.

In brief the project was to "build an application that would convert Cisco networking commands into Allied Telesyn's native language". As this project had never been undertaken by ATR before, the student was supplied with the necessary resources and given technical support from ATR and then "dropped in the deep end". The project was out of the normal scope of many of the other capstone projects that were undertaken at EIT, so an open minded approach was adopted from the institute's point of view when it came to supervising and marking the final output.

The normal systems development process was followed throughout the project. During the programming stages of the project the student had to incorporate many years of previous programming and scripting experience to enable a successful output. Numerous visits were made to the Allied Telesyn after sales technical support centre in Lower Hutt, throughout the life of the project. With the final 45 minute presentation of the working product made to ATR management and senior technical staff at ATR headquarters in Christchurch.

Following the presentation, which demonstrated the application to satisfy the original project brief, an offer of temporary employment was made on the spot, which has subsequently turned into permanent fulltime employment with ATR.

## **Experiences**

### **The Third Year Data Communications and Networking Course**

When students had completed the third year course, which was based heavily on the ATR industry courses, they were asked to rate their feelings about various aspects of the course against a five point Liechhardt scale, where a score of five indicated that they strongly agreed and a one indicated they strongly disagreed.

When asked if the course had extended their current knowledge and skills, all students agreed that it had to some extent. When asked if they believed the learning materials were helpful and well presented, all students agreed that they were. This indication of support for the materials was pleasing since the majority of materials used were provided by ATR. When given the opportunity to comment on the quality of materials, three students expressed concern that the materials appeared to be out of date, and that significant sections of the materials provided appeared to be repetitive. When asked if the course was easy to follow, 90% of students indicated that it was. However, several students indicated that the shortened delivery timeframe gave little time to consolidate and cement ideas.

When asked about support for the block mode method (two week block course) of delivery, 70% of students indicated that it was a good idea, but when it came to agreeing that all 700 level courses should be offered using block mode delivery support fell to just over 40%. Comments made by students about the block mode delivery indicated that the time frame was too short and that block mode delivery would only be suitable for courses which had a high practical content. Others suggested that it was good to be able to concentrate on a single subject, compared to the traditional situation where students have to juggle the learning of up to four subjects concurrently. One student commented that they appreciated the focused approach and another suggested that it made learning easier.

All students indicated that they appreciated the opportunity to participate in a course which had strong ties industry and they expressed support for aligning degree courses with equivalent industry courses. Even though the number of students participating in the course was limited to half the normal practical class size, two students indicated that every student should have individual access to multiple switches, and that more powerful and sophisticated switches should be available.

When the course was delivered at EIT it was decided to share the teaching responsibility among three lecturers, as a way of reducing staff work loads and providing some form of variation for students. All three staff noted that students appeared to be well motivated and that they applied themselves to their work consistently. Many students stayed after formal class times to practice the skills that had been taught and the level of student interest appeared higher than that shown in the more traditional data communications courses.

### **The Capstone Project**

Since a capstone project of this nature was a first for both EIT, there was a fair amount of uncertainty as to how both the student and EIT would work towards a successful outcome. The initial project brief to the student had limited information and this required the student to be proactive and initiate a

dialogue with ATR. With the student working remotely from ATR, numerous visits and meetings were pre arranged with ATR providing financial support to the student to visit their premises.

After defining the scope the student, rarely required support from either EIT or ATR, until the project neared completion. As a result, the issue of geographic isolation from ATR was not too much of an issue. As the project scope lacked specific detail it allowed the student to adopt a flexible approach. This resulted in the student developing his own scripting language and allowed him to develop an application which did not have too many specific requirements. While many students may have found the lack of direction a little hard to adapt to, the student undertaking the project flourished in the free flowing development environment that was provided.

Following the completion of the project, came the opportunity to present the output to senior management at ATR. This was a great achievement for both EIT and the student. From EIT's perspective it was satisfying to be able to offer ATR some return for their initial sponsorship and support. From the student's perspective it meant they were able to take an opportunity with both hands and present the work to a potential employer. The ATR management team was so impressed with the finished product and the caliber of the project presentation that they made an offer of employment.

Overall the student enjoyed the flexibility given in the project brief and was at times challenged with meeting the desired outcome. Working remotely proved to be no real issue as previously thought and the previous experience that the student brought to the project in this area was a real plus and helped with a successful outcome where many students would have not got to.

## Conclusions

The experiment with block mode delivery and the incorporation of industry specific content into a degree course was seen as a successful exercise and worthy of further investigation.

To allow students more time to consolidate the materials covered during the course, it was agreed that students would benefit more if the two week delivery period was separated into two blocks with time given between for students to conduct research and practice the skills learnt. Since the course was a summer school offering, the first week could be delivered in early December following the completion of semester two, and the second week could be delivered in mid January.

The experiences gained while the student completed the "capstone" project, have made staff supervising projects at EIT aware of the need for flexibility when managing and evaluating project outputs. The technical nature of the project and the lack of a specific project brief, which could have been viewed as potential pitfalls, provided opportunities for a student to excel and produce quality outputs that impressed the industry partners.

The relationship between EIT and ATR has proven to be beneficial for EIT and it has increased the profile of Allied Telesyn among the tertiary information technology teaching environment. EIT now has a number of students who have practical experience working with Allied Telesyn products, and the two organizations are investigating further opportunities for students to undertake their industry project placements working alongside ATR staff. The success of the first student, in completing his "capstone" project and his subsequent offer of employment has helped strengthen the ties even further. Since the appointment of the student, ATR have offered a scholarship for the best data communications and networking students for 2005. The scholarship includes financial assistance with fees for the year and an opportunity for paid holiday employment in Christchurch.

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# **Student Experiences of University-Based Cooperative Education: Do They Eat in the Lunchroom?**

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## **Abstract**

Cooperative education experiences are integral to many university programs in sport and recreation. At Auckland University of Technology (AUT) there are numerous opportunities for students to undertake their placements 'on-campus' within the Division of Sport and Recreation. Sociocultural views of learning suggest that students learn through participation in the activities of the workplace and social interaction with work 'colleagues'. The aim of this study was to examine the experiences of students undertaking their placement with the academic department within which they were enrolled. Focus group interviews with students and academic staff were used to explore the impact of the staff/student relationship and social interaction on student learning. The findings suggest that effective learning requires supportive relationships with supervisors and colleagues. The 'on-campus' students felt that more social interaction would have made them feel part of the team and generate a sense of belonging. In contrast, socialization, during work or out of hours, allowed the 'off-campus' students to learn more about the workplace culture. Cooperative education aims to help students understand the real world context. If the career direction for students is further education and research, then a placement on-campus at AUT within the Sports Performance Centre or within the Research Institute is appropriate and begins the process of enculturation into this community of practice.

## **Introduction**

Industry placements or cooperative education experiences are integral to many tertiary programmes in a wide range of discipline areas. This strategy of applied learning has been practised for almost a century (Sovilla & Varity, 2004). Students are placed into real world contexts where they may have the opportunities to take on responsibilities, develop relationships with colleagues and supervisors and to work as a member of the team (Howard & England-Kennedy, 2001). The benefits of these experiences for student learning have been well documented. Research has highlighted academic benefits such as applying theory into practice (Van Gyn et al., 1997) and improving motivation to learn (Burchell, Hodges & Rainsbury, 2000; Weisz, 2000). Students also gain personal benefits such as enhanced self confidence and increased initiative (Coll & Chapman, 2000; Parks, 2003; Weisz, 2000). Cooperative education programs have been shown to help develop positive work values, attitudes and beliefs, (Hayward & Horvath, 2000) and to build relationships (Fleming & Eames, 2004). The socio-cultural views of learning suggest that, "learning can be seen as a social process within a culturally determined community of practice" (Eames & Cates, 2004, p. 43). Students therefore may learn not only through participation in the activities of the workplace but also through social interaction.

The aim of this study was to examine the experiences of students undertaking their cooperative education placement with the academic department at AUT within which they were enrolled. The experiences of students undertaking their cooperative placement within the university were compared with students placed with external organizations. The impact of the staff-student relationship and social interaction on student learning was explored. The study also examined potential ethical issues from the student and staff perspective.

## **Context of the Study**

Most cooperative education students gain work experience with organizations external to the university or tertiary institution in which they are studying. However, at Auckland University

of Technology (AUT) there are opportunities for student placement within the Division of Sport and Recreation where students are undertaking their Bachelor of Sport and Recreation (BSR) degrees. Due to the nature of the staff-student relationship opportunities for social interaction may be limited when students undertake their experience within their own university environment.

The BSR degree is a three-year program designed to prepare students for careers in the areas of sports science, sports management, coaching, physical activity, physical education or outdoor recreation. During their final year the BSR students complete 600 hours of placement experience, where work and learning are integrated through the development of partnerships between the university, the student and a sport or recreation organization.

Cooperative education papers (Cooperative 1 and Cooperative 2) are structured such that the student spends the equivalent of two days per week during the two semesters of the academic year within one organization. Industry placements include national or regional sports organizations, community recreation and fitness centers, outdoor recreation operators, schools (physical education departments or sports departments), and regional sports trusts. Placements within AUT include the Sports Performance Centre (SPC, a sports science consultancy service), the Research Institute, located within the Division, and assisting the Sport and Recreation Coordinator to provide on-campus sport and recreation services. The students are supported in their learning experience by an industry supervisor, and an academic supervisor from the university.

## **Methodology**

A qualitative approach was used for the study. Four focus groups were used to collect the data. Focus groups were considered the best alternative because, (a) the researchers could interact directly with respondents, and (b) respondents could react to and elaborate upon the responses of other group members.

The first two focus groups were conducted with Bachelor of Sport and Recreation students who had just successfully completed their cooperative education requirements. One focus group (N=8) consisted of 'on-campus' students who had undertaken their placement within the Division of Sport and Recreation. A second focus group (N=7) was conducted with 'off-campus' students. These students had completed their placement with an external organization. Focus groups with both student types explored the following: the learning experience during the placement, the relationship with industry supervisors and other staff of the organization including the extent of social interaction with staff, the students' views on employment prospects, and any other emergent issues and concerns.

A second set of focus groups was conducted with staff from the Division of Sport and Recreation. One focus group was conducted with academic staff involved with cooperative education students as industry supervisors. As industry supervisors, the staff were responsible for directly facilitating and managing the workplace experience for the student. A further focus group was conducted with other academic and administrative staff from the division. The focus groups with the staff explored the following: the role of students within the Division, the relationships with students as 'colleagues', and issues and concerns created by students being located within the Division.

Focus group interviews were recorded and transcribed verbatim. Transcripts were content analyzed to determine emergent themes. Two researchers were involved in coding the focus group data. 'Check coding', a technique whereby the same data is coded independently by two researchers and then compared for consistency was utilised to enhance reliability. Ethical approval for the study was gained from the AUT Ethics Committee. Pseudonyms are used throughout this paper.

## **Research Findings**

Cooperative education aims to provide opportunities for students to learn in the context of the environment in which their skills and knowledge will be used (Eakins, 2000). Students in traditional cooperative placements are required to develop relationships with colleagues and supervisors, take on responsibilities and work as members of teams. The findings will be discussed using the following

themes: the on-campus learning experience, socialization within the workplace, workplace interpersonal relationships, and career clarification and employment.

### The On-campus Learning Experience

Learning emerges from and builds on the experience. The focus groups provided an insight into the difference in the experiences, from the student perspective, between the on-campus and students undertaking a 'traditional' placement with an organization external to the University.

'On-campus' students spoke of the high expectations held by their industry supervisors regarding their performance. Carol felt that "there were really high expectations as to what my project was going to be ... it was expected to be to a standard that was publishable". Jane said, "they knew who we are and what we are capable of, that would hopefully work to our advantage".

These students also acknowledged that they were aware of these expectations before the commencement their placement. The staff felt that for students who are academically focussed, an on-campus cooperative could be a positive experience. This is confirmed by the comment from John (on-campus student), "you are here to learn and it is not so much a job role, it's an educational experience". Such comments reinforce the notion that the effectiveness of the cooperative education experience is optimised when there is congruence between the expectations held by the student and industry (Coll & Eames, 2000; Fleming & Ferkins, 2005).

The focus groups also revealed that the placement was not consistent for the on-campus students. The students based in the Sports Performance Centre spoke enthusiastically of their contact with the athletes, teams and coaches 'in the real world'. The students in the Research Institute felt that they had a more academic focus than many other students, and were often involved in pure 'academic research' rather than what could be termed 'industry projects'.

Jane commented: "The academic stuff was great – but as far as practical it just seemed like we weren't needed". Alison felt that, "I didn't really have one thing that they gave me responsibility to do. I never felt that I had one thing that was mine". However, she "didn't regret it because the amount of knowledge here is amazing and there are always people you can ask". For a quality learning experience students need challenging tasks for which they can take responsibility and see that they are contributing to the organisation. The work needs to seem legitimate and real and provide opportunity for growth, (Atchison & Gotlieb, 2004).

The off-campus students felt that the experience within an organization external to the University had provided an insight in to the 'real world'. However, when the 'off-campus' students were asked to comment on their perceptions of the on-campus placement, they had the following impressions:

They didn't get a shot at the real world unless their career was in research, then that would be excellent. (Ross)

You learn so much, who is out there, what is out there and what everyone does. When you talk to students in here they've just got no idea, they are still in the confines of AUT. (Louise)

They have access to awesome academics but have no exposure to the industry. They possibly come away with a less diverse range of skills, they weren't getting a wide range of roles. (Karen)

I don't know how stimulating it would be, that small community syndrome, you come to uni, you have a lecture with one person, then you see your industry supervisor, who is in the same place, and then your academic supervisor who is in the same place and you do your work activities, with people who are in the same place. (Christine)

### Socialization Within the Workplace

Socialization provides opportunities for learning about the culture of the workplace. The interviews highlighted that the on-campus students felt that the opportunities for social interaction with their work colleagues were limited: “There was no staffroom. No ‘hi’ meet everyone” (Jane).

This is in contrast to most of the off-campus students who utilized the staffroom or had lunch with workplace colleagues. Karen however felt, “that at the start it was quite intimidating, but as time goes by it becomes more familiar and accepting”. This suggests that with increased socialization she was becoming part of the workplace community.

Informal gatherings can be used to help generate a sense of belonging. Mary, an on-campus student, commented that if they had been able to go to the lunchroom it would have made her feel “...more part of the team, [the academic staff] are human too and they do eat sandwiches”. Alison also didn’t really feel part of the organization, “we were just the co-op students”. However several on-campus students noted that, “many lecturers just ate their lunch in front of the computer anyway as they were so busy”. The emergent concern in this regard is that the informal social interaction is not occurring within the everyday workplace environment, and students may therefore be missing a significant opportunity to understand the workplace culture.

The amount and type of social interaction varied for off-campus students and depended on the organization. One student didn’t socialize at all, whereas all others interviewed described varying degrees of social contact, both during working hours, and out of hours. Karen commented that socialization enabled her to, “get to know people on a very personal level and it is of benefit because you get along, but you still apply yourself in a professional way”. Ross felt that “you get to see a whole new side of people, what they are like, and then when you are at work it gives you reasons for the way they work”.

Informal social gatherings helped students to learn more. Karen comments:

I guess you are a lot more relaxed and you learnt a lot more about the company because you were in the situation where you were just talking about it ... when you are in the social environment everyone is quite open.

The staff interviewed had mixed reactions regarding whether students should eat in the staff room, responses ranged from a definite, “no they shouldn’t”, (Carla), to “... co-op students should shadow everything you do” (Barry). Anna remarked “if the co-op students were in the lunchroom then you would need to modify what you say”. However in any work place situation there are times when conversations in the lunchroom need to be modified depending on who is present.

Concern was voiced by the academic staff regarding the ability of on-campus students to hear the “organizational chatter that goes on” (Barry). Students may hear conversations about other students and staff who they may be involved with in a different context. All staff felt that it was inappropriate for students to attend staff meetings despite their belief that it was important for external students to do so. This is clearly a limiting factor for integrating the cooperative students into the culture of the workplace in both formal and informal settings. In contrast off-campus students were often encouraged to attend such meetings.

### Workplace Interpersonal Relationships

The most significant relationship that develops within the cooperative education placement experience is between the student and supervisor. Effectiveness of supervision was a key theme that emerged from all focus groups. Time and availability of the industry supervisor was an important focus with both negative and positive comments from the students. The support and guidance of supervisors was also highlighted as being important for student learning: “Mine was really good because she was always there but she always pushed me to use my initiative and try and solve problems for myself” (Ruth).

In the on-campus placement it is possible for the industry supervisor also to be the lecturer of the student in another paper. This created the following impressions from the on-campus students:



I felt obliged to have a very high standard of work when I was in his classes ... there was more pressure to perform in his classes because I was his co-op student. (John)

You have to work to a really high standard because he is watching what you are doing. (Jane)

An academic staff member raised the following related issue:

Potentially a power relationship can develop when a student is enrolled in a paper that is lead by an industry supervisor and their coop is not working well. Would a student be able to complain? Could they complain to their academic supervisor who was a colleague of the industry supervisor? Students often look at lecturers as people who have got power and from the student perspective they don't want to upset them. If their industry supervisor is lecturing them in a paper then they may feel intimidated. If a lecturer asks them to go above and beyond, then for a student to say no could be difficult. (Anna)

From the perspective of a staff member (Gill), the realities of the "real world context" are, "that there are potential conflicts and things don't always work". However, in the on-campus placement the student may not develop the skills necessary to address conflict because of the power imbalance. This whole learning experience then may be worked through differently when compared to the off-campus situation.

Examination of the themes related to relationships also highlights other ethical issues that were of concern. The on-campus students felt that off-campus students perceived that they were getting good marks because they were with the SPC and that they were getting inside information about exams and assessments. On-campus students recited comments from classmates such as:

You are one of them – that's why you are getting good marks. (John)

Don't worry about that- you'll be fine because Graham is marking it ... He's taken the lecture but he will give you another two hour lecture in his office. (Jane)

Issues of security in the photocopy and printing room were of concern to most staff. The staff were concerned that students would have access to student grades or assessment information. A system to ensure that the students were not put in the position where their integrity could be compromised was suggested.

### Career Clarification and Employment Opportunities

Career pathways in sport are not well defined and therefore the placement provides a vital stepping-stone for career planning (Ferkins & Fleming, 2004). Some academic staff felt that on-campus students did not have the exposure to the wider industry, were not out there establishing networks, and that the University did not have opportunities to create employment for them on graduation. However, it was acknowledged, by both students and staff, that there are limited numbers of sport science organizations and placement opportunities for students other than the SPC at AUT. In support of her on-campus placement, Carol said:

This has been the best opportunity I could take up. I have learnt so much that there is no way anybody in industry would have been able to cover so many aspects. In terms of long term development I hope to come back and further my education, [maybe a] masters, but at the moment I think my employment options are limited from doing my co-op here, but it is just a stepping stone for the long term.

The on-campus students felt that the experience had prepared them to go on to further education. However in terms of employment prospects Jane commented:

I'd like to think that people would look at this and know this was a valuable experience and that my knowledge is good but I perhaps would have had more opportunities if I had been working in an external organization. I don't feel I got a lot of practical knowledge but I don't know whether that makes me totally unemployable.

Overall students who have undertaken cooperative education programs have been shown to have a competitive advantage in employment over non-co-op graduates (Hayward & Howarth, 2000; Ricks & Van Gyn, 1997). In addition students that have had structured work experience have developed, "desirable work values, attitudes and beliefs that make them valuable employees" (Hayward & Howarth, 2000, p. 6).

## Conclusions

According to Atchison and Gotlieb (2004): "Learning is a social activity and cooperative education should provide a social context in which and from which students can learn" (p. 265). Effective student learning requires supportive relationships with supervisors and colleagues. However in the on-campus cooperative education placement experience there are limiting factors because of the nature of the relationship between student and academics that can minimize the opportunities for socialization.

Cooperative education aims to help students understand aspects of the real world by exposure to authentic work that is related to their career aims (Coll & Eames, 2004). If the career direction for the student is further education, such as a masters degree, then a placement on-campus at AUT within the sports performance centre or within the research institute is appropriate, and may begin the process of enculturation into this particular community of practice.

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# **How Has the Internet Affected the Way We Communicate Within This New Era? Can We Use This to Our Advantage?**

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## **Abstract**

This paper reports on ongoing research aimed at investigating the interaction between Internet-based communication and career management. This includes knowledge management in a virtual environment and career management in the Internet environment. I aim to combine the students' need for good career information with the technology used in multiplayer interactive 3D gaming environments, which the Internet generation find so engaging supplemented by artificial intelligent 'bots' or other tools and methods available. This is the initial investigation into the current scene with regard to the tools available. It looks at some of the effects which the Internet has on the way we communicate over distance and how the changes in these may be used to improve the way we attract prospective students, and ensure they achieve the types of career which they aspire to. The prospective employers could also use some of these methods to widen their pool of recruits by allowing them to gain a more complete picture of their skills. Currently the differences between courses and their usefulness within employment are based on advertising and personal knowledge often presented in a traditional way for example text and images. The modern environment requires these methods to be updated to attract the new generation of Internet savvy players in order to become more effective.

## **Background**

The onset of the popularity of the Internet has permutated through every aspect of our lives as such places as government agencies, banks and the like make full use of it. This enables people to get answers for straightforward questions immediately, and allows them to get any relevant paperwork Millar-Jacobs (2003). Currently though many people use the Internet solely for the purpose of browsing and observing with a few who actively interact (Millan, Patterson & Constanzo, 2000; Topjobs UK, 2003), the modern tools available mean that this does not necessarily have to be the case.

### **History of the Internet**

In 1962 a 'Galactic Network' was proposed by JCR Licklider, who was the first head of computer research for the Defense Advanced Research Agency (DARPA) this idea developed into 'ARPANET' which is acknowledged as the precursor to the Internet as we know it and was implemented in 1971-72. It was originally a 'host-to-host' network where you had to know where each computer was and how it communicated in order to connect. A standard communication protocol was developed in the early to mid 1980s which dispensed with the need to know how a computer communicated and allowed the World Wide Web to emerge. As user interfaces became more intuitive and communication between computers became easier, more people wanted to use the service which in turn led to the adoption of a Domain Naming System (DNS) to allow a wider community to access this new tool.(Leiner et al., 2003)

The Internet today is viewed as an indispensable research tool used by all levels of education as well as for social contact and entertainment. With the ongoing development of technology it is no longer limited to a stationary computer, but may be accessed using a Personal Digital Assistant (PDA) define or phone.

## Social Trends

Scheiderman acknowledges the need to understand the physical, intellectual and practical differences between the various users (Shneiderman & Plaisant, 2004). This is highlighted by Gunn and Brummett (2004) when they discuss the melding and refocusing of cultures. Due to the global character of the Internet people have easier access to cultures other than their own; there is a view that new interpretations of the word culture are emerging which include popular and global.

McDowell poses the following question:

The declining cost of telecommunications and computer technology, new uses of computer-communication services by business and social groups, and the combined uses of broadcasting, computing, and communications services have allowed the development of social uses of communication that have distinctive spatial configurations. Do these computer-communication or network “communities” differ significantly from communities based on geographic proximity, shared values, or shared languages and conversations? (McDowell, 1997, p. 136)

According to Cappella (2002), just as genes contribute to evolution within the animal kingdom, memes contribute to social evolution. Humans are the only species who have the ability to imitate, and we make very good use of this ability: “Successful memes are precisely those replicated and retained as guides to future behavior” (p. 237).

New uses for the Internet have changed our social habits; children now play games in the privacy of their own home using the Internet instead of going outside to play, meetings take place in cyberspace and friendships are forged, sometimes over great distances.

There are not many areas where training is required which do not include the use of the Internet in some form or another, the way in which the Internet is used is changing at a rapid pace. These changes could be very useful in the work placement environment allowing placements further away from the training establishment, thus expanding the possible options. Communication may take on a number of forms varying from instantaneous chat to the exchange of documents.

## Communication

Work by Rheingold (2003) in the area of smart mobs, or the use of technology in social networks, emphasizes the trends towards using new technology for communication especially within the younger generation who make up a large part of our students. This group appears to respond well to the presentation of information in this modern interactive form. Consider how many young people you know who communicate using text messaging or chat rooms. New terminology has evolved, words such as cyberspace and to ‘google’ something as well as to ‘surf the net’.

Both society and technology are changing and their interrelationship leads to drastic evolution in the way technology is used to communicate. Csikszentmihalyi (1993) discusses types of personality and the ways society evolves by using memes which impact on this development. As members of the educational fraternity we need to be aware of these changes and adapt our presentation styles to make the best use of the tools and methods available.

One of the first applications written for this new environment was one which allowed messages to be passed over the network, the first mail program, now this method of maintaining contact with other people is more common than letters.

## Interfaces

The need for encompassing a huge range of academic disciplines when designing user interfaces is emphasized by Rogers, Sharp and Preece (2002) along with some of the problems encountered when attempting to combine this variety of disciplines due to the variability of focus each discipline has. However, if these problems are viewed as challenges, they could in effect enhance the final product and combine to give a useful and pleasant experience when interacting with the technology. This ties in with Shneiderman and Plaisant’s (2004) ideas: “Effective interfaces generate positive feelings of success, competence, mastery and clarity in the user community” (p. 10).

IT professionals have to be aware of the wishes of the people who are going to use the tools we create, as failure to investigate the wishes of the target users often lead to disappointment with the tools developed failing to meet the users expectations even after intensive training in the tool (Sahoo, 2005).

### Media

The Internet is often used by the media as an alternative tool to disseminate news or opinions along with print, television and radio. This allows interested parties to keep in touch in real time. Not all media coverage on the Internet may be accurate as there is no requirement for verification. Militant groups sometimes use the Internet as a vehicle for propaganda to promote their cause, or as a tool for blackmail, examples of this have been well publicized within Iraq recently.

Everland (2003) attempted to define certain attributes within media. The idea is that each media type is scored on a mixture of these attributes and can point to suitability of a particular mode of presentation.

During WWI and WWII news took weeks to filter through to the general public, and it was usually produced in print, or maybe the radio. Current wars are shown graphically using video footage nightly on the news, or screened as they happen on dedicated television channels and Internet sites. This means that the general public is far more aware and involved in these events, the commentary often influences their point of view, and media bias often contribute to public opinion. Governments are aware of this, and in some cases use it to their advantage.

Along with these changes comes the other use of media, that of advertising, this is used on some sites as a means of revenue similar to television advertising. Unsolicited emails are often compared to leaflets distributed to out letter boxes.

## Career Management

### Employee

Career management currently depends on individual knowledge, or the results of psychological testing similar to those outlined by Anastasi and Urbina (1997). When someone initially applies for a job, they usually fill in an application form, or send in a CV. This indicates to the prospective employer the skill of the applicant in each of these tasks, neither of which may be the most crucial skill necessary to do the job. What is required is alternative ways to allow applicants who may not be particularly skilled in these areas to get past the first screening by providing different ways of communicating, for example, speech or something which relies on interaction. The young people with whom we are most concerned tend to avoid static form filling in favor of the more 'exciting' game type interfaces which can be mimicked by such tools as 3D worlds. There is proof according to Csikszentmihalyi in his work on flow that as a species, humans are happier when they are completely absorbed in something. Csikszentmihalyi (1997) Modern technology using multiple stimuli means that this is more achievable for a greater number of people.

The familiarity with the Internet exhibited by students particularly within IT leads to a natural progression to using this medium to search for jobs. Topjobs (2003) state that 26% of all graduates prefer to look online, whereas Online Recruitment (2003) says 94% of respondents to their survey of graduates felt that Internet job sites were useful while others also used the Internet to search corporate sites for both job opportunities and details on firms. Miller (2000) cites a report from the Association of Graduate Recruiter (AGR) stating that nine out of 10 college leavers surf the net for their first job. This indicates that more employers are using the net to attract prospective employees. Although there are a number of web recruitment sites currently available they do not use the newer tools and technologies available such as 3D worlds even though some are starting to use some of the more interactive tools such as chat.

Prospective students could be better informed of the courses on offer, over a wider geographical area, hence giving them more choices. The development of online learning and virtual

classrooms allow a student to study at a distance at all levels, videos, voice, chat and 3D worlds add reality and can accommodate the various learning styles. This will allow a student the economy of living in their own locality possibly with family without having to compromise their choice of career, or the ability to gain the necessary qualifications to pursue that career.

### Employers

Employers are no longer restricted to the prospective employees within their local geographical area. The Internet allows their search to widen to other districts and countries. The options for selecting suitable employees are varied, often prospective employees spend hours, maybe even days sitting tests and interacting with current employees. Phone interviews used to be the main option for distant applicants to allow the two sides to discuss crucial aspects of the job, another alternative is video conferencing so that each side could see the other. Technology has progressed to the point where a combination of the tools available could enhance this experience by the use of voice, video and online interaction.

Smith (2000) reports that one employer which she interviewed indicated that in their opinion IT employees need to possess not only the general IT skills which are currently required for the job, but the ability to acquire the wider higher level skill essential to cope with the convergence of information and communication technologies. This indicates that the ability to evolve is important especially within the IT industry, although a lot of other industries are using new technology which is constantly changing.

### Conclusion

The Internet has drastically changed the way we communicate, whether this is a positive or negative change is dependant on the view and experiences of the individual. Together with other technological media such as television, telephone and the radio it has meant access to an enormous amount of up to date information. The information provided may not always be accurate, which means that to use the Internet effectively the sites must be chosen with care.

The use of the Internet could enable students to complete any work placement closer to home, thus minimizing cost for them and enabling them to follow careers, and enroll in courses which were previously an unviable proposition.

The onset of online databases for journals and books make searching for data easier and faster, and gives a wider range of options. A search engine is often used instead of a librarian to select the appropriate texts, which are then downloaded, making citing easier. The skills necessary to use these tools are taught in schools together with the manual methods of searching a library.

The technology has enabled people to socialize in private using chat rooms, text messaging and the telephone; this removes the need for face to face contact, so the face you present to the digital world could be totally different from reality. This often proves to be a problem as in chat rooms where stalkers hide, and on-line dating, but could also remove some of the hurdles which come from insecurity, or where there is some form of disability.

In his book Rheingold (2003) discusses how the modern generation use text messaging to arrange meetings, thus allowing a change of venue or plan at any time, as the participants are always in touch. Mobile phones now have the ability to 'surf the net' take photographs and movies.

The Internet has also enabled the spread of propaganda and viruses, neither of which are particularly useful, but as with most beneficial inventions, there is an alternative, destructive side. If we are going to use this medium, then we have to filter out the propaganda and protect against the viruses.

Although the Internet is used productively in the area of career management, with some sites including some of the more modern tools such as chat and video conferencing, I still feel that it is possible to reach a wider audience if some of the visual and audio tools which are currently under development were incorporated. These would need to be used appropriately, and could give both

sides of the employee/employer connection a better understanding of the requirements and availability of careers.

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# **‘Co-op Lite’: An International Industry Experience Course for Electronic Commerce**

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## **Abstract**

Cooperative education has a well recognized track record in providing students with an industry based anchor to the academic studies they take during their university study. However, the costs of administering a co-op program are usually significantly above the costs per student for a typical lecture style taught course, which often results in required financial subsidy from other sources (student or school) and constraint on numbers. This paper describes one approach to designing ‘co-op lite’ industry experience courses which can provide both academic rigor, substantial academic learning opportunities and ease of scalability, together with a relatively low administrative overhead which makes it more feasible under normal course funding criteria. The Bachelor of Electronic Commerce (BECOM) is a 20 course, three year degree introduced at the Waikato Management School in 2000. The degree comprises a required core of 12 courses, which are a mix of management and computer science, and one of which is the industry experience course which is the subject of this paper. The remainder of the 20 courses comprise a six course major in one of eight subject areas, and two option courses. The aim of the degree is to produce graduates who are at least technically literate and confident in the technologies used to support electronic commerce, at least literate in the basics of business and management subject areas, but also skilled and project experienced in the area of their major subject concentration. About 450 students are enrolled in the degree in 2005. The Industry Experience course in the BECOM was designed to both provide a rich co-op field work experience for students, and add to their academic knowledge, without requiring additional funding for co-op administration. To do this, the course is taught on-line, and *without* coordinators who find jobs, match students to jobs, and visit students and employers in the field. One of the key components is a web based discussion board (DiscussionWeb) for required weekly journal comments and interaction, which facilitates interaction among students in assigned small groups of approximately 10. Other electronically submitted components of assessment are a 3000 word report, and a self-assessment on performance in the host organization, which is backed up by supervisor comments if possible. Students are responsible for arranging their own work placements, and are supported in this with a variety of on-line materials (such as preparing CV), as well as lists and contact details of prospective placements located by a telemarketer hired for three months to find possible positions. However, many students locate excellent positions through their own efforts, including many in overseas countries, often being their home countries. The paper describes in more detail the processes used to administer the academic and placement sides of this course.

## **Literature Review**

Cooperative education (co-op) at university level has a hundred year history of linking experiential field learning to academic programs (Sovilla & Varty, 2004). There are several learning theories that can be used to understand the acknowledged success of co-op education (Eames & Cates, 2004), but with the variety of different administrative implementations of co-op program, it is difficult to establish exactly what the key components in learning may be. Hodges, Smith and Jones (2004) provide comment on the issues of assessment of the workplace learning component of coop, and discuss a learning outcomes approach as a way forward. A framework for workplace learning is developed by Zegwaard, Coll and Hodges (2003) which puts forward three models which may be appropriate for different circumstances. Further on the issue of assessment, Coll, Taylor & Grainger (2002) comment on things that can be learned about workplace performance assessment from the teaching profession.

On the administration side, there is a common model of student work experience placements being coordinated and administered by field coordinators, who establish relationships with employers, and is involved in the processes of selection of employer by student and student by employer. This role usually involves field visits to the employer’s location, interaction with the student and supervisor

at the site, and assisting with the assessment of the student's performance in the placement. However, this model may be undergoing change (Hall, 1999) as new models of business and communications technologies become established. The impact of email and other electronic communication technologies on communication between student and mentor (Hayward, DiMarco, Kranz, & Evans, 2001), student and coordinator, and student and academic supervisor is still unfolding, but the potential for significant change is clear. Taylor (2001) comments on the impacts that information technology may have on administration of co-op programs. Technology may also be helpful in preparing students for the field work placement (McRae, 1999). Canale and Duwart (1999) suggest that the Internet can provide infrastructure to support reflective learning.

### **The Economic Difficulty with Co-op in New Zealand**

It is not easy to establish and grow co-op programs in New Zealand. There is not as high a level of public and business awareness of co-op as there is in Canada and the USA, where many universities have prominent co-op programs across a range of faculties, and co-op has percolated down to broad acceptance even at the high school level. In New Zealand, Government funding of university tertiary students depends on the subject area, and in the management area is just over \$6000 per equivalent full time student (EFTS), or approximately \$1000 per student per course based on average course loads. Funding for courses in science is about double this. Perhaps less than half of the funding actually finds its way to the departments administering co-op programs, as the university central administration and faculties each take their cuts. This is usually not enough to support the traditional staff infrastructure needed for co-op courses.

The number of students that can be serviced by a single full time co-op coordinator is often small – perhaps as few as 10-15 students per semester or as high as 40-50. Costs associated with the support of a coordinator are also significant – travel, vehicle, accommodation while traveling, and so on. Therefore there often needs to be a top-up of funding above normal EFTS course revenue to make a co-op function possible, either through additional student resource fees, or funding subsidies from faculties using co-op to support overall degree programs.

In our interaction with prospective employers, the benefits to employers may often not be clear to them either. While some employers rightly see participation in co-op program work placements as a low risk way to find future graduate permanent employees, others may see a significant effort in participating in the usual activities such as job description writing, traveling to the university to interview candidates, and the time required to train a student before they are on the verge of becoming a productive employee, and then they leave to go back to university. Many do it out of loyalty to their local university and supporting the benefits of education, rather than as a cost justified business decision.

So, we have a situation where it may be difficult to persuade senior academic administrators that co-op courses are desirable, will help boost student numbers, and the extra costs needed to run them are justified over other investment options. At the same time, the lower awareness of the benefits of co-op makes it more time consuming to recruit and maintain employers who will take co-op students, decreasing the number of employers and students that a co-op coordinator can effectively service.

### **A Different Way of Looking at Co-op**

Proponents of co-op programs are enthusiastic supporters of the concept, usually seeing first hand evidence of the life-changing experiences that often result from the placement. However, they may view the benefits of co-op as inseparable from the processes and infrastructure that they have experienced first hand in their co-op experiences, either as a former student, academic faculty member, or business person recruited into the role of coordinator.

It may be worthwhile to take a step backwards and ask the question “where is the value created in a co-op experience?” While this is difficult to establish across a range of approaches to coop, one might

postulate some of the highest value adding components such as:

- Student skill building
- Student perceptions about courses still to take and job opportunities
- Student academic learning (often not emphasized in co-op placements), and
- Student international experience.

That same person might speculate on the lowest value adding components, such as:

- Administration of the program
- Employer visits by coordinators, and
- Matching of job to student.

This raises the issue of how much value does the “coordinator” function provide - the link between employer, student and university. Certainly, it is a major portion of the cost in running a co-op program. In an ideal world, the role is highly desirable, providing many service and communication channel benefits to all parties. However, in a less than ideal world, where budgets are tight, we may need to examine whether we can achieve many of the benefits without the role of a coordinator.

So, if we can put our efforts and resources, both people and money, into achieving the high value outcomes, while giving up some of the low value, high cost components of running co-op programs, we might be able to encourage more co-op activities within the constraints of ordinary course EFTS funding.

### **The BECom “Co-op Lite” at Waikato**

The three year Bachelor of Electronic Commerce degree was introduced at the University of Waikato in 2000. Because of the applied nature of the degree, and the need to instill in graduates the knowledge and skills in demand by prospective employers, it was decided to incorporate an industry experience co-op type course into the core 12 courses of the degree, and have this course run in the summer between students’ second and third years of study. The number of students who have taken the course so far appears in the table below.

Year of Course	Students
2000/1	7
2001/2	27
2002/3	67
2003/4	97
2004/5	131

The environment and objectives of the course include:

- Link student’s university learning to real world employer requirements
- Subsidy or top up funding for co-op function not feasible
- Build a co-op experience course within the constraints of normal course funding, and
- Operate the course with a minimum administrative infrastructure.

The ‘co-op lite’ course is aimed at providing an industry experience with an organization involved with electronic commerce systems and processes. Students locate and seek agreement with an external organization involved in electronic commerce activities, with the goal of entering into a mentoring relationship with a member of its staff. Once on the job, they then carry out duties assigned by the mentor, and learn about the workings of the organization by watching the mentor at

work. It is entirely field based. Contact with the academic supervisor of the course and participation in the course activities are through electronic communication, so that the location of the work experience host organization can be anywhere in the world.

The course duration is a contiguous 13 week period beginning in mid November. During this thirteen week period, a minimum of four weeks fulltime, or 150 contact hours if part-time, must be spent on location with the organization which has agreed to host the student, although longer periods on-site with the host organization are desirable if possible

One of the major differences in this course from traditional co-op courses is that there has been a shift in the primary job finding responsibility, from co-op program administration and coordinators, to the student. This makes the job finding process more like a true job search process, and opens up the possibilities of jobs in other countries. Because there is no formal contact between employers and the university, there is probably less time spent by employers on recruiting process, such as trips to campus for interviews, and writing of evaluation reports. However, this also has the downside of making the links between university and employer weaker.

### **The Academic Component of the 'Co-op Lite' Course**

The course counts as an ordinary academic course weight toward the 20 course requirement of the BECom degree. To be able to take the course, students must have successfully completed 2 years of the 3 year degree. While there is assessment on the completion of learning activities, responsibility for the execution of learning processes is devolved to the student. This can be seen as a transition between the structured, curricula- and assessment-driven university courses in their degree, and the life long learning for which they will have to take responsibility if their careers are to flourish.

Self chosen research topics are a key component of the academic part of the course. Three research topics are chosen by the student as area they want to learn more about, perhaps as an extension to a course they have already taken. Each topic must be supported by a named book purchase, to provide structure and outcomes for the learning. The topics are often focused on technical knowledge and skills not covered in normal taught courses, such as PHP or Dreamweaver, but can also be more general business or management topics. Examples such as the following are given to enrolling students to help them formulate their research topics and select a supporting book.

A student in the finance major is interested in security of Internet B2B transactions. She looks on Amazon, and finds 'Building SET Applications for Secure Transactions' by Mark S. Merkow. This book does not cover all the protocols she wants to learn about, but it is a start, and she decides to buy the book and supplement it with articles from banking journals.

The second component of the academic part of the course is a weekly discussion requirement through a web discussion board. Students are assigned membership in an electronic group of approximately ten, and must contribute one 200 word posting, and one or more response postings each week. The desired within-group interaction has a critical mass with the required weekly contributions, and often takes on a life of its own as additional threads of discussion are spawned. The desired interaction includes discussion of software, systems, and processes in use in the workplace, sharing of experiences in work environments, raising of the awareness of skills in demand by employers, and development of a supportive group/team learning environment, even though participants may be spread around the world.

The third academic assessment component is the final 3000 word report, which has a fairly tightly specified structured outline for report sections, with a specified word count allowed for each. The report also has a section for the student to reflect and comment on their work experience.

The final piece of assessment is a short self evaluation on the student's performance in the workplace. Students are encouraged to seek feedback on their supervisor or mentor on their performance, and incorporate and paraphrase that into their self evaluation, but the onus is on the student to critically assess their performance, and reflect on their future career, with questions such as

“what skills/experience and knowledge would you need as a full time employee in this organization?”. This approach is quite different from the normal co-op process of employers evaluating students, and it is superior in several ways. It removes variability in evaluations, such as generous supervisor, poor student; or good student, but poor environment or over critical supervisor.

### **How the ‘Co-op Lite’ Course Runs**

The course runs for 13 weeks, from mid November to mid February. As students are responsible for finding their own jobs, they are encouraged early on to start the process of searching for an industry experience host company, as illustrated in the following extract from the course outline.

**May-July:** decision to take course, preliminary look at course requirements, preliminary checking out of possible work experience sites

**June-August:** enrolment in course

**June-September:** preparation of CV, collect job leads from website, develop own leads, target a list of prospective sites, make phone/email/letter contact with prospective firms

**September-October:** confirm employer of choice, submit details of organization form to course coordinator, submit learning agreement to course coordinator and have agreement signed

**Mid November:** first weekly submission required on DiscussionWeb

The ‘co-op lite’ approach shifts from the administrators of the course having the responsibility to provide a suitable placement, to the student having that responsibility. However, job leads are provided to students through the mechanism of a telemarketing person, hired for a three month period to find suitable companies and positions. The jobs found are posted on the course website, which is restricted to course enrollees. The telemarketing person is selected for tenacity, as there are usually many callbacks and follow-ups required to extract a job description and a willingness to consider applicants from prospective employers. Email rather than site visits is used by the telemarketer to send out information on course to employers, and getting back job descriptions from them. The telemarketing process uses a structured approach, starting from lists of employers from previous years, supplemented by leads suggested by employment ads in newspapers, and expanded to other firms in the same industries where interest has been high.

### **Conclusions**

With increasing pressure on budgets, the traditional role of coordinator in co-op programs may be under threat. If co-op programs can only be run using the coordinator model, then some institutions may find it beyond their interest or ability to fund co-op programs, thus depriving students with a well proven learning environment to consolidate and extend the knowledge acquired in the classroom. The ‘co-op lite’ approach has allowed the running of a co-op program for Bachelor of Electronic Commerce students at the University of Waikato with much reduced costs, and seems to be successful. By eliminating the traditional coordinator role, and partially replacing it with Internet technology supported communication between student and course coordinator, the costs have been greatly reduced, financially facilitating the integration of this form of co-op into the degree. Whether this approach can be ported to other environments without loss of value generating workplace experience is yet to be determined.

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# **Teaching the Theory and Practice of Captive Wild Animal Husbandry: A Coalescence of Pedagogical Approaches**

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## **Abstract**

Unitec New Zealand has, over an 8 year period, developed, redeveloped and delivered a programme committed to providing an education not only for those wishing to embark on a career journey as a zoo-keeping professional but also as continuing education for those that have been working within the industry for some time. The program has proven to be a success in terms of industry acceptance, student satisfaction and the practicalities of delivery. The key to this success has, in the main, centred on a well structured, integrated work experience practicum taught by and within zoo facilities, that also affords the work experience provider with 'home-taught' workers for the period of study. This paper reviews some of the issues encountered and overcome in designing and delivering a vocational qualification to a naive industry, and highlights some teaching/learning approaches that are utilized in a distance delivery program. As such, the paper will ask the most important questions that were posed along the way, and present the decisions that were made at the program's inception and during its delivery in answer to those questions.

## **Background**

The art of zoo keeping is the combination and integration of hands-on experience, practical and lateral thinking, anecdotal evidence and instinct. The science of zoo keeping is the utilisation of findings and conclusions of rigorous and informed investigation integrated with logical, fact driven processing. In the modern zoo, the zoo keeping professional must be capable of assimilating all of these traits to provide the best for their charges, the facility, the visiting public, and more broadly, the species, society and the local and global environment. And all within an industry in which there are no practical absolutes, the variables are numerous, the scientific record is sparse, and even ethics and philosophies are by no means standardised across institutions.

Despite the recent media popularity of the inner workings of zoos and similar establishments, and the associated focus on those working closest with their charges, the zookeeper position has commanded only a modest (at best) professional standing since the inception of such a recognized role nearly four millennia ago. Indeed, although one can now read at some length about how such issues as zoo design, philosophies on animal use, zoo *raison d'être*, and principle characters have shaped zoo development (e.g., Baratay & Hardouin-Fugier, 2002; Cherfas 1984; Croke 1997; Hancocks, 2001; Livingstone, 2000; Mullan & Marvin, 1999; Tudge 1992), there is little in the historical record, ancient and modern, that provides testimony and tribute to those entrusted with the care of captive wild animals. More recently, aristocrats, politicians, scientists, naturalists, media personalities and zoo owners/directors have been well documented as having contributed to forging a more acceptable relationship between humanity and the natural world. Notwithstanding such endeavours, the lot of the hands-on zookeeper has been a low key one and, as such, has commanded little investigation into career qualifications, pathways, progression and standardization.

In New Zealand, an apparent lack of consistency in regard to knowledge base, skill competency and responsibility within the zoo keeping profession was recognized. Such variation may have dramatic effects on animal husbandry minimum standards /best practice, success with respect to zoo aims and objectives, wider ranging conservation efforts and, ultimately, society's acceptance of the zoo industry. With this in mind, Auckland Zoo and Unitec New Zealand (a tertiary education provider) collaborated and prepared to develop a national standard entry level qualification that could,

in the first instance, be used to set a standard for those already working in the New Zealand zoo industry, but more immediately within Auckland Zoo itself.

### **What Needs To Go In the Curriculum and Who Decides?**

Part of knowing what should be in a vocational qualification is knowing precisely what the industry needs in terms of academic level, depth and range of knowledge, and expected skill levels. In this case, a number of facts highlight the difficulties with such a decision.

Firstly, and possibly most importantly, there is no globally accepted definition of what a zoo keeper actually is. This is in part due to and complicated by the following secondary considerations:

- There are almost 10,000 animal species in zoos worldwide that are recorded regularly on international databases (International Species Information System website, retrieved 2005)
- Zoo formats (e.g. open range park, safari type, city zoo, specialist animal group, aquarium, sanctuary, reserve) vary, with an equal number of variations of zoo environments (geographical location) and ideologies (culture)
- There are a huge range of resource capabilities within the zoo facility community
- As a result of the above, there is an extensive assortment of facility aims/objectives
- No hard and fast husbandry rules exist, thus providing for very wide, grey demarcation lines for minimum standards and best practice
- Relatively few historical facts have been recorded pertaining to the profession of zoo keeping. Knowing where one has come from is essential to knowing where one needs to go
- The nature of the industry inevitably creates a complex spectrum of ethical beliefs and philosophies, and
- This is a rapidly changing world.

In addition, reconciling the requirements of the industry with the qualification's structure, processes and resources is often an arduous task since it is rare to find zoo professionals with intimate knowledge of academic inner workings. Equally, few academics with relevant backgrounds in qualification development would have a profound knowledge of ground level zoo keeping. However, this program's development was established using an industry leader from Auckland Zoo with relevant experience of academia abroad, and two academics with extensive industry experience at a hands-on level.

It was thus decided that the entry level zoo keeper in New Zealand requires four main areas of proficiency: Understanding the underlying theory, application of the theory to practice, working within an appropriate ethical framework and developing on-going transferable skills. It is not the remit of this paper to relate qualification content in any detail; however, understanding what is required of a profession clearly correlates to not only the specific content, but also the precise nature of its delivery. It was realized at an early stage that integrated within the learning experience must be a vehicle by which teaching, practice and assessment on the practical skills of zoo keeping can take place. Thus, a large component of work experience, 320 hours, was formally incorporated into a one year part-time qualification. As the program progressed and developed, this work experience became credit bearing within two courses of the program, and therefore, the work experience became structured and defined.

### **How Can the Program be Delivered to a Wider Audience?**

The expectation was that eventually, this qualification would be used to: a) up-skill currently employed zoo keepers across the country, and b) be an entry level qualification for those wishing to gain employment within the zoo industry. However, given the facts that Auckland Zoo could only provide a small number of work experience placements initially and that the other New Zealand zoos



were distributed across the length and breadth of the country, a distance delivery format was the only option if this was going to be successful at creating a standard.

To provide for this, certain mechanisms had to be in place:

- A system for delivering a large quantity of underlying theory
- An ability to teach more complex conceptual information
- An environment and system that allows for 'real' student based learning and assessment and yet is logistically viable
- A forum for open discussion and co-operative learning
- A provision for tutorials if required
- A method of providing practice and assessing practical components, and
- A scheme by which students could acquire their 320 hours work experience

These are all achieved using an array of teaching/assessment tools.

#### Block Courses

All students attend three compulsory three-day block courses which are spread strategically throughout the year. Each block course is repeated in Auckland and Wellington, and students decide which of the two delivery sites suits them best. Apart from a small number of specialist topics taught by local vets and vet nurses, the same tutors deliver lectures and provide assessments at both sites to ensure consistency. Block courses consist of lectures, formative and summative assessments, discussion and debate, group work, on-site practical teaching and any tutorials that are required.

#### Online Web Based Learning

This provides a facility to deliver further materials as new information becomes available; can be used as a forum for longer duration debate via discussion boards; develops communication skills; provides easy contact between tutors and students, and between students; and provides the students with the illusion of being part of a class – something bigger.

#### Printed Material

Although soon to be replaced by interactive DVD, the present mode of delivering large quantities of information is via printed material. These are presented as course specific manuals within color coded files. The manuals are formatted for easy reading but also provide questions which require further research, provoke the student to further thought or discussion, and challenge the students to test their own knowledge and understanding of the material.

#### Directed Assignments and Assessments

The nature of the distance delivery means that direct contact time with students by tutors is small in comparison to in-situ delivered programs. However, this is compensated for by using well designed assignments. These require students to learn essential transferable skills in order to access the information required, and then show an appropriate level of understanding or evaluation in the presentation of the answers. Other modes of assessment used are exams (minimally), projects, practical assessment, peer assessment, on-going work-based assessment using log books, and summative on-site oral and practical assessments. Such a diversity of assessments ensures that an appropriate range of skills are tested during the program.

### On-site Structured Work Experience

This proved to be the most difficult area of development and created a raft of challenges in its own right. As such, the questions have been individually posed below. Regardless of the initial problems in set-up, the work experience becomes both the defining forum for integrating all that has been learnt (that is, a place for students to see the ‘what’, ‘how’ and ‘why’ actually working in real time and space), and also a spring board for further research and interest.

#### **In Light of the Above, How Can Such a Wide and Variable Topic be Taught Successfully?**

It was clear that teaching students everything there is to know about all captive animal species whilst providing for all zoo types, environments and logistical capabilities across a complex array of ethical and philosophical contexts, within a fast changing world, was not an option. To this end, a different view was taken (figure 1). In essence and put rather simplistically: Provide the students with all the underlying information, general principles, basic skills and fixed factual data. Next, instill a culture within the student and the industry to allow the student to evaluate and question what is taught. The zoos then provide a platform for the student to observe or carry out the applications within the everyday workings of a respectable zoo. Finally, the students are empowered to make decisions about how to achieve best practice utilizing all they have learnt within the parameters of the facility at hand. This final strategy also proves directly useful to the zoos providing the work experience since they may be working with outdated techniques, information or principles.

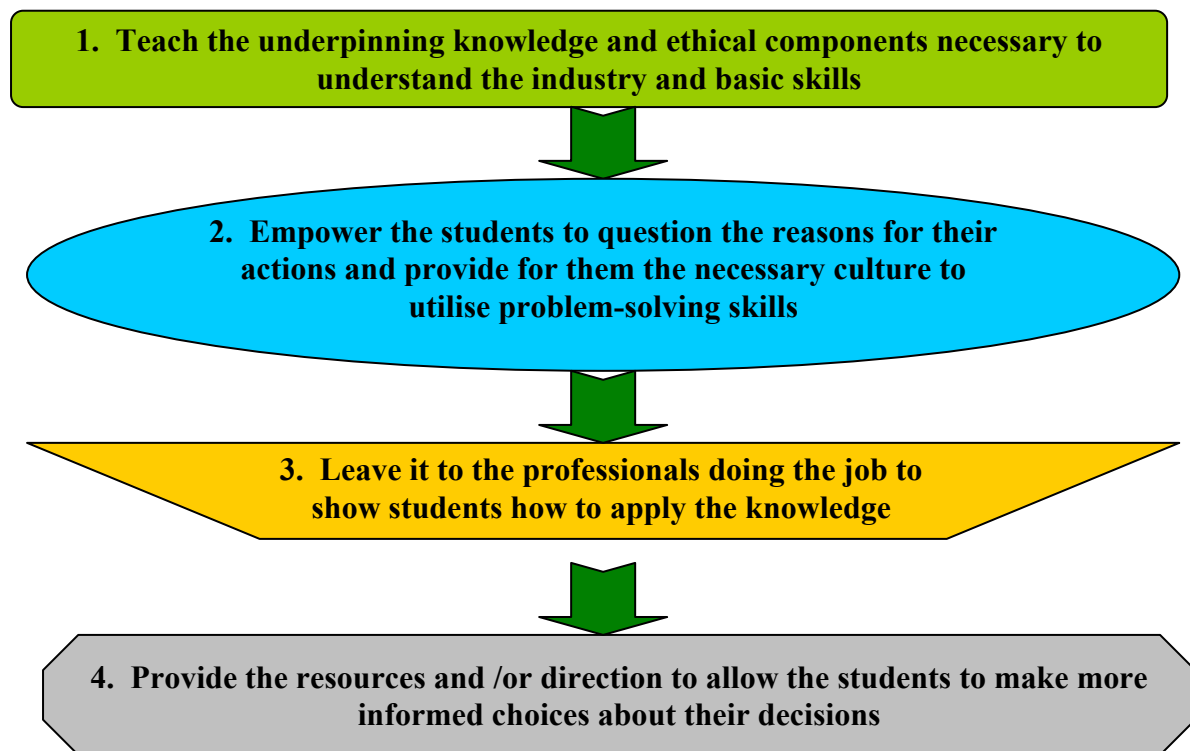


FIGURE 1  
Teaching and learning scheme

### **How is Consistency and Standard Measured across a Number of Facilities?**

This was a question asked by both the academic community and prospective students. In the first place, only facilities with a work ethic and acceptable standards of welfare are allowed to deliver the on-site work experience required of this program. This standard is assessed by independent individuals working or having worked within facilities that have internationally recognized standards. This process will become far more rigorous and defensible once the regionally driven zoo accreditation scheme comes into force. Second, most students are taught by a number of zoo professionals during their study year and not by one dedicated tutor. It has been shown that any inconsistencies in teaching standards are more or less negated by the number of different on-site tutors. Third Unitec program tutors and coordinators constantly review feedback from students and, in turn, provide feedback to the work experience facilities. This often has the effect of correcting problems almost immediately. Indeed, some of the zoos have created their own feedback systems in order to better cater for the students. Lastly; all summative on-site assessments are carried out by a senior member of the zoo staff at the facility of work experience in association with one of the Unitec assessors. Standardization of assessment can thus be assured across facilities since only two Unitec assessors are involved in testing all students across all facilities.

### **Isn't This Going to Cost Time and Money with Little Return for the Zoos?**

The very large work experience component of this program ensures that students become a very useful, energetic, motivated working asset to their facilities. In addition, because the work experience is credit bearing, the facilities are paid an hourly fee for each student that is on the program (predetermined and capped to the requirements of the course). However, these are only the direct advantages; the captive wild animal industry as a whole also benefits from this scheme. These are outlined below.

### **What are the Benefits of Using Industry to Deliver Such a Large Component of the Qualification?**

Feedback evaluations and monitoring processes have been integral to this program from its inception and have provided information detailing the benefits and costs to all stakeholders. It is clear that despite some issues common to academia regardless of program, industry and delivery mode, the most pertinent benefits commonly quoted are as follows:

- The program provides a reservoir of suitably experienced and qualified prospective employees
- Most zoos know the candidates for their jobs. Indeed, most students and facilities view the work experience as a 320 hour on-site interview for possible future employment
- The programme is seen by students as particularly relevant to their career goals
- The association between Unitec and the zoos provides a springboard for further relationships between facilities e.g. research, sponsorship, professional development
- Given the large work experience component, students are well aware of what the job entails and thus their own suitability to the industry
- Experience within the industry itself provides for the osmotic learning of many transferable life skills
- There is, by association, promotion of tertiary education to other workers within the industry that do not possess qualifications
- The partnerships with the zoo facilities create a large public relations base for the tertiary institution, and
- ALL parties benefit; a **WIN WIN WIN** scenario.

## Conclusions

Despite the difficulties there is now a transparent, industry specific approach to qualifications in the captive wild animal field. This has, in effect, created a standard nationwide - skills and knowledge are quantifiable against a benchmark of competence and as such, employers may expect a certain level of skill and understanding from their qualified employees. It is clear that the industry itself will, to a certain extent, have direct input into the on-going development of the qualification. Reviews inherently involve the facilities from which students gain their experience and where levels of competence are set.

Students are taught to be flexible, critical and analytical in their work, thus preventing the stagnation of philosophies, techniques and knowledge base, and so allowing the students to be responsive to the needs of the industry. Indeed this is what the industry asks of its employees now; the qualification draws attention to this specific industry's requirements and promotes the recipients as highly proficient, well educated professionals possessing a vast array of transferable life skills, capable of integrating with, supporting, contributing to and propelling the captive wild animal industry forward. Not semi-skilled labourers but highly skilled zoo keeping professionals.

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# **‘Best Practice at the IT-Enabled Factory: Tracking an Exemplar Project Student**

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## **Abstract**

This Paper tracks and illustrates a "Best Practice" industry project by a mature IT Bachelor of Computing Systems student who was involved in a physical control process at a Fellmongery and skin processing facility. The project was multi-dimensional with the student involved in purchasing and implementing equipment, modifying business processes, as well as designing and implementing a Tracking Database for the Operations Manager. This paper draws from features of this exemplar project and sets some success factors for quality industry-based student projects. Further discussion centers on how the student was also involved in onsite management and advice for the company. Academic staff from the IT teaching section were taken on a tour of the entire plant, and were given technical and managerial commentary by the student. The conclusion summarizes evidence that increasingly, degree students are operating at a significantly higher level in industry involvement. They provide a richness of previous experience, as well as a greater awareness of organizational realities. Indicative findings also show how the feedback loop from industry based students can benefit academic staff by visiting sites, meeting industry players and learning technologies used by current industries. Finally, this paper argues that an exemplar industry based project can provide incentive and modeling for other students involved with real-world projects.

## **Introduction**

The single semester ITFP7.290 project is the final piece of work that a Bachelor of Computing Systems student completes at the Eastern Institute of Technology. This final project of 45 credits (equivalent to 3 degree papers) has been designed to encourage students to draw knowledge and skills from a range of information technology papers and bring them together on an industry based project with a concrete measurable outcome. These IT projects differ from general workplace learning in that a specific output stemming from 5 months work is expected rather than a series of tasks performed over a time span in a work placement. In fact many of these projects are designed and built while the student is away from the company site. As Bridgeman (2003) outlines for the typical New Zealand Institute of Technology and Polytechnic IT degree project “the student needs to follow a process that requires them to demonstrate sufficient skills, competencies and process to complete their IT project; plus demonstrate an ability to manage the relationships between these technical and academic processes and outputs”.

The project showcased in this paper involved a mature EIT student, Kevin Wilkie, who created a database system for Tomoana Pelt Processors as well as providing onsite advice during the project life-cycle.

## **Background of the Company**

Tomoana Pelt Processors Ltd is one of the largest fellmongery operations in New Zealand. They deal in the processing for export of Ovine (Sheep and Lamb) skins, Bovine (Bobby Calf) skins, Cervine (Deer) skins, Goat (Capri) Skins and wool to major world markets.

Tomoana Pelt Processors Ltd has many overseas clients; however 60% of their production is sold to China, the remaining 40% sold to such countries as Turkey, Italy, France, Belgium, Japan, and India. Tomoana Pelt Processors Ltd has an annual turnover of NZ\$40 million and at the peak of their season employs 140 staff. They process in excess of 3.5 million skins per year and have recently completed a major expansion to further increase processing capacity.

## **The Fellmongery Project**

Tomoana Pelt Processors Ltd previously used Excel spreadsheets to record production information, such as supplier, species, grades, MAF certificates, orders and staff resources. This method did not enforce any business rules, or logic for the users and this spreadsheet based system was mainly a manual recording system. Tomoana Pelt Processors Ltd recognised the need to operate smarter and more efficiently, hence the desire to establish a bridgehead where their business starts. The database allowed the input of accurate information about the raw materials going into the system as skins from the suppliers arrived.

### **System Solution**

The product to be developed by the student was called the Bin Tracking System. It consolidated the requirements of Tomoana Pelt Processors Ltd by combining the new management system with a database application specifically designed for the task required. The Bin Tracking System comprised of a database, an application program and associated interfaces to label printers and barcode scanners. These components were demonstrated to Tomoana Pelt Processors Ltd as the project progressed. Users were trained and operating manuals supplied by the student. The new Bin Tracking System needed to have the data resident in the existing system input into the database ready for operation.

### **The Student's Role**

The student's role, Kevin Wilkie, was multidimensional for several reasons. Firstly, he was closely involved in the physical process of the Fellmongery. He had been involved in providing electrical services to the plant previous to the project. Secondly, he was in close liaison with several plant managers, the operations manager as well as the general manager, so he had a managerial awareness of wider issues. Thirdly, he was close to the data and existing IT systems at Tomoana Pelt Processors, which gave him an insight into the deficiencies of the existing system as well as a good "feel" for the data and information involved.

Throughout the project Kevin was onsite, watching real world activity, evaluating existing spreadsheets and reports and talking to personnel throughout the business. These features, we believe, are key characteristics of a high quality industry project. Although many times being onsite is not compulsory for an industry project, it does lead to better results.

## **Insights for Quality Industry Projects**

### **What Sets This IT Project Apart from the Average Capstone Project?**

Firstly, the student spent considerable time at the site, although this was not a compulsory requirement. Rather than focusing on a narrow collection of data and artefacts used for building a database, the student immersed themselves in the context in an ethnographic approach which helped him consider wider issues at the plant than simply how to build a database. Discussion with several layers of management and staff helped as well as hands on experience with the physical factory process. This type of ethnographical research can be useful as a specific approach to the interpretation of a culture, helping with data collection and analysis of the culture under study. Information systems researchers are becoming more accepting of the need to adopt techniques which consider the historical and contextual aspects of information systems (Sayer & Harvey, 1997).

Another success factor was the autonomy given to the student so that he could order equipment (e.g. a thermal printer and plastic labels) and set this up in conjunction with the database system. Allowing the project or workplace student some freedom to use resources for their project can free the student from the restraints of the workplace environment. The increased responsibilities undertaken by the student may have been due to his maturity. Given that over 65% of EIT's degree

students are over the age of 25 (this is probably similar across NZ ITP's) we need to take this into account when defining workplace assignments.

Finally, another success factor was the willingness and ability of the student to experiment with live data and test the database system prior to use and generally 'get a feel' for the use of real data. This meant the cutover to the new system was smooth and successful. Basically, the student took responsibility for all aspects of the projects success from beginning to end.

Mann and Smith (2004) acknowledge the challenge in capstone projects is the relationship between process and product. They also cite a number of exemplar projects where good process has been used to produce a product of excellence, and in this example of the Tomoana Database we can see evidence of both. Some students produce an excellent IT "product" e.g. website, database but their documentation of process does not achieve the same level. Other students produce an acceptable product but produce a well documented process. Only a minority of students achieve both an excellent "product" and high quality documentation.

### The Supervising Institution Benefits

There are appreciable benefits to supervising staff and the teaching institution involved in student projects when a good professional relationship has been built up by the student. In this case, liaison with supervising staff and a willingness to show EIT staff around the plant, meet key personnel and showcase the IT solution within the context of an operational plant provided some real benefits to the supervising institute. The student was able to provide a wide range of evidence of work completed including understanding of factory processes, managerial oversight and software running on company computers. Where this occurs, supervising lecturers get to meet some key industry personnel and industry players appreciate interest displayed from teaching organizations. This illustrates a valuable feature of projects where staff are able to meet industry people, walk through their premises and show an interest in their operation. Benefits from these meetings include; opportunities for guest speakers to be invited to classes, another project to be offered by the sponsor site again, and general goodwill built up between a particular industry site and the tertiary institute.

There is already a generally good satisfaction rate amongst industry hosts of IT projects across most ITP's as Sutcliffe and Kuypers (2000) indicate in their own survey. However, tertiary organisations utilising industry projects for liaison should increase this satisfaction rate with higher quality projects.

### Conclusions

As a result of examining this exemplar student project, there are some key questions project supervisors and potential students could ask to help predict success where specific outputs are sought from students involved in industry-based projects:

Firstly, does the potential industry project allow the student to spend some time on-site, perhaps even working for some time within the company? It would appear that the more open the access is then the more likely it is that the student will achieve a holistic view of their project within the context of the wider organization. Conversely, if the student can only gain limited access to a contact within an organization and has a more theoretical idea of the company's processes then success will be more limited. This may be difficult to achieve in businesses with a more virtual product/service.

Secondly, what work experience or life experience does a student have before undertaking an industry project? One of the success measures from the showcased project appears to be the maturity factor, and in this case the previous experience as an electrical contractor at the site helped with an appreciation of physical processes and managerial overview. How can this success factor be fulfilled for a younger student who has entered a degree program direct from school? This previous experience may also be a critical factor as the student needs to balance academic and industry requirements (Albertyn, 2002). Are there ways that we can provide some workplace experience, either at the site or elsewhere, for younger students before they encounter the full industry based project?

Thirdly, will the student take full responsibility for the industry based project from start to finish? This may not always be in the student's control, but may be a key indicator of commitment for successful completion. Supervising organizations may be able to check the conditions of engagement at the industry sponsors workplace before the student starts a project to ensure that reasonable autonomy is given to the student.

In conclusion, I believe this exemplar student project at 3<sup>rd</sup> year level on an IT degree program highlighted some success factors that may be useful for consideration by tertiary organizations who are supervising project based workplace learning.

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# **How Integrated Learning and the Quality of Degree Teaching and Learning Can Help to Achieve Degree Outcomes**

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## **Abstract**

The purpose of this study was to find out how integrated learning, in the context of cooperative education, and the quality of degree teaching and learning can help to achieve degree outcomes. A total of eight bachelors' degrees were selected from a regional Institute of Technology. All final year students (3<sup>rd</sup> year) were asked to rate their perception on a questionnaire from 'agreed' (5) to 'don't know' (1) on 11 characteristics and outcomes of a bachelor's degree. These characteristics and outcomes were extrapolated from the definition of a bachelor's degree, agreed to by tertiary institutions and the NZ Qualifications Authority. A total of 82 responses, representing 47 percent of all final year students, were received. Weighted and total average means of each degree and each statement were calculated. The findings of the study showed three degrees and six out of 11 characteristics and outcomes were scored above the total average mean. The results of the study suggested that integrated learning in the context of co-op education and improvement in the quality of teaching and learning can help to achieve the definition of a bachelor's degree. The focus is on degree improvement based on what students perceive as important to them.

## **Introduction**

A degree qualification is a powerful incentive for learning because of the doors it opens. A degree designation(s) at the end of someone's name usually evokes an aura of achievement. It stands for something (Smithers, 1997). Often degree qualifications obtained from certain institutions are looked upon more favorably than from others. In a report commissioned by Universities UK and the Standing Conference of Principals found that employers no longer rely on degree results as they believe them to be inflated and instead increasingly choose graduates according to which university they attended rather than how well they did in final exams (The Independent, 2004). Obtaining a degree from certain institutions, therefore, is both prestigious and rewarding because of the reputation and fame of such an institution.

A degree qualification has its own attributes and outcomes. It is defined variously depending on the focus of the degree. For example, NZQA defines an undergraduate degree as "a systematic and coherent introduction to the knowledge, ideas, principles, concepts, chief research methods and problem-solving techniques of a recognized subject" (NZQA, 2000, p. 15). It further expands on the characteristics and outcomes of such a degree. Collectively, they demonstrate that the definition of a degree is holistic, coherent and inclusive of all models and approaches to learning. In this context, concepts of integrated learning and co-operative education are inherent as many degrees include projects and research assignments that connect learning to workplaces.

Often student feedback on various aspects of degree study is used to measure several performance outcomes. Many institutions profile their degree qualifications differently as they do for their graduates. For example, the University of Otago surveys its degree students on a range of subjects, including the course outcomes, information technology, facilities and support systems. Their survey is based on Course Experience Questionnaire (CEQ), an Australian model used by all tertiary institutions' profiles as one way of measuring whether the students have achieved the minimum set of outcomes. Similarly, the polytechnic sector and many more individual institutions and other groups carry out annual graduate destination surveys. However, there is no one such study that matches what is espoused as degree characteristics and outcomes and what students achieve as part of their study. While opinion surveys provide useful information on a host of variables, they do

not match with the agreed definition of a bachelor's degree. In this study integrated learning in the context of co-operative education and the quality of degree teaching and learning were used to suggest how degree outcomes could be achieved from what students perceive as important in their degree study.

### **Methodology**

This study was conducted at a regional Institute of Technology in New Zealand. The Eastern Institute of Technology at Hawke's Bay offers 10 undergraduate degrees and three postgraduate qualifications. For the purposes of this study eight undergraduate degrees were selected on the basis their delivery history. Program leaders from these degrees agreed to participate when approached about it earlier. A questionnaire was developed by extrapolating the characteristics and outcomes of a bachelor's degree, as defined by NZQA. The questionnaire included 11 statements for respondents to rate on a 5-point scale ranging from 'agreed' (5) to 'don't know' (1).

The degree program provided me with the opportunity:

1. to gain knowledge and skills in my major subject of study
2. to use problem solving techniques in my degree study
3. to gain research skills to solve problems
4. to acquire, understand and assess information from a range of sources
5. to engage in self-directed learning
6. for critical thinking
7. for intellectual independence
8. for analytical rigor
9. for the development of communication skills
10. for collaborative skills, and
11. to gain entry into postgraduate study.

In addition, students were provided with the opportunity to comment on anything else that they were expecting to gain from their study. Statistical information on gender, age group and ethnicity was collated to highlight any trends observed in the responses.

The questionnaire was administered by program leaders in the month of November, with the exception of one program where the forms were mailed to students. A self-addressed envelop was provided for the return of these questionnaires.

### **Analysis**

A total of 82 responses, representing 47 per cent of total final year students in 8 selected degrees, were received from the survey. The collated responses from participants were summarized by each degree and then for each item. The last item in the questionnaire that asked students to comment on any other expectation from the study was eliminated from the study because very few comments were received. Table 1 summarizes the weighted and total average means of each degree and outcomes as follows:

### **Findings**

Of the total of 82 students, 44% were males and 56% were females. Of these, 84% of them were in full time study and almost half of them were over the age of 28 years. The ethnicity of students

TABLE 1  
Summary of weighted and total average means by degrees and outcomes (n=82)

Degree	Weighted mean on each degree and outcomes											Total Weighted Mean
<i>Bachelor of:</i>	1	2	3	4	5	6	7	8	9	10	11	
Computing Systems	50.0	50.0	75.0	45.0	65.0	55.0	60.0	25.0	65.0	60.0	15.0	51.3
Business Studies	85.0	65.0	85.0	85.0	75.0	85.0	70.0	55.0	75.0	80.0	65.0	75.0
Recreation & Sport	90.0	45.0	55.0	25.0	55.0	30.0	45.0	25.0	30.0	25.0	15.0	40.0
Nursing	80.0	55.0	85.0	95.0	90.0	75.0	45.0	45.0	55.0	80.0	70.0	70.4
Wine Science	100	71.4	64.2	64.2	42.8	14.2	-7.1	42.8	21.4	50.0	42.8	46.0
Viticulture	81.2	62.5	87.5	87.5	37.5	56.2	81.2	50.0	18.7	-12.5	12.5	51.1
Māori	100	92.8	92.8	92.8	92.8	85.7	64.2	71.4	71.4	64.2	78.8	82.4
Visual Arts & Design	25.0	50.0	62.5	47.5	72.5	62.5	52.5	40.0	32.5	17.5	30.0	44.7
Total Average Mean	76.4	61.4	75.8	67.7	66.3	57.9	51.3	44.2	46.1	45.5	41.0	57.6

NOTES:

Calculation of means was obtained by transforming responses on the 5-1 into a scale ranging from -±100 to 0. On this scale, the value of each number is represented as follows: 5 = +100; 4 = +50; 3 = -100; 4 = -50; and 1 = 0. This was done to improve the strength of responses and to avoid the ‘averaging’ effect of a conventional scale. For example, on the given scale of 5 to 1, the weighted mean for 10 students is calculated as below:

	Agree		disagree		don't know
Standard Scale	5	4	3	2	1
Responses received	3	2	1	2	2
Weighted Scale	+100	+50	-100	-50	0
Weighted mean	$(3 \times 100) + (2 \times 50) + (1 \times -100) + (2 \times -50) + (2 \times 0) / \text{total responses} = 20.$				

indicated that over 60% were Europeans, 20% were others and the rest (15%) were Māori. The findings of this study needed to be treated carefully as the numbers of respondents in some degrees were small to make any generalizations. The findings of the study showed that the definition of a bachelor's degree was not reflected in five out of eight degrees. Table 1 above indicated that only three degrees exceeded above the total average mean. These included the Bachelor of Māori Studies, Bachelor of Business Studies and Bachelor of Nursing. Conversely, the Bachelor of Recreation and Sport and Bachelor of Visual Arts and Design scored poorly out of the remaining five degrees.

Of the total of 11 outcomes, only in five degrees these were scored below the total average mean. The outcome on the opportunity to gain entry into postgraduate study scored the lowest overall total average mean. However, this was not supported by the same three degrees, whose weighted means were above the total average mean. Similarly, the outcome on the opportunity to gain knowledge and skills in my major degree study was scored the lowest by students of the Bachelor of Visual Arts and Design. Likewise, students from the Bachelor of Viticulture and Bachelor of Wine Science achieved negative weighted means on two outcomes on 'collaborative skills' and 'intellectual independence'.

In summary, the results of the study showed that the definition of a degree was partly met by various degrees offered at EIT. More effort in the development and delivery of the degree by encompassing the concept of integrated learning and improvement in the quality of teaching and learning were seen as means of achieving degree outcomes.

## Discussion

The concept of integrated learning is well-documented in literature (Braid, 2000; Shapiro, 2003). Integrated learning is seen as a set of highly integrated learning and assessment experiences designed to help students develop clearly defined outcomes (Shapiro, 2003). It is the sum total of experiences embedded in the outcomes of the degree that makes the whole. Such experiences are sub-sets of cooperative education as Hodges (2005) in defining cooperative education suggested that it is inclusive of integrated learning and is a part of any structured educational program. This definition takes a non-reductionist approach to learning, emphasizing the holistic view of degree study. The object is in not on how individual courses are designed and delivered but how they contribute to achieve the whole. Often the tradition of degree study is manifested in accumulation of knowledge and academic work at the expense of coherency in degree outcomes. Individual courses are more important than the whole. As such, individual lecturers are more concerned about the success of their own courses in the belief they contribute to a coherent program, befitting the definition of a degree. The common fault is they don't because learning outcomes expressed in individual courses are discreet and stand alone. They are independent and fail to connect all courses towards the holistic definition of a degree. Some may argue that each characteristic and outcome is an important thread to the whole and it can not be taught as per se. For example, 'intellectual independence' can not just be taught but developed through engaging in learning opportunities that inculcate this. Similarly, there are other outcomes that are transparent in the definition but hidden in the delivery of individual courses. Co-operative education is seen as one way of achieving the holistic definition of a degree. Boyer's thesis (1990) is not to focus on teaching in isolation, but on teaching as a part of the larger whole of academic work, implying there is an overlap between outcomes of courses and the overall definition of a degree. Only then the possibility of achieving the holistic definition of a degree is possible. In this study only three degrees met the definition of a bachelor's degree, suggesting that there is room for integrating course outcomes and degree outcomes in a planned way.

Teaching and learning is receiving greater attention in the tertiary sector now than perhaps ever before. The STEPS document (2005) lists four priority areas towards improving excellence, relevance, access and capability in education. On excellence it wants to promote effective teaching through the proposed National Centre for Tertiary Teaching Excellence. In the context of degree teaching, improvement in the quality of teaching and learning can help to achieve the outcomes of the degree definition. The results of this study showed that several characteristics and outcomes of a

degree were scored below the total average mean. One of the reasons attributed to this, and linked to cooperative education, was the ability of lecturers to emphasize all aspects of the degree definition in their teaching. Excellence in teaching and learning at a degree level, as expected, depends on the experience and enthusiasm of lecturers who make up the team. In such a situation, the ability of the team to critically reflect and share their experiences is imperative as Shulman (1993, p. 6) puts it as “communities of conversation, communities of evaluation, communities in which we gather with others in our invisible colleges to exchange our findings, our methods, and our excuses”. Within this context, individual perception and experiences of individual lecturers contributes to the understanding of the concept of teaching and learning. Trowler and Cooper (2002) and Healey (2000) suggest that theoretical understandings of lecturers’ approaches to teaching and learning tend to lie in one of the three domains of individualistic concept of learning, the disciplinary approach and the notion of reflective practitioner. They concluded that some of the factors like motivation, staff development, approaches to learning, and institutional support are necessary to foster excellence in teaching and learning. This opens the scope for more professional development and training that can help to improve the link between the quality of teaching and learning in achieving the outcomes of a degree. C-operative education, as a means to connect learning to education and work, is one way of bringing together of lecturers, courses and the outcomes as communities to achieve the definition of a degree.

### Conclusions

Student feedback is a powerful means of measuring degree outcomes. In this study, they demonstrated what they perceived as important degree outcomes. It further illustrated that components of cooperative education like integrating course outcomes and delivery in a holistic manner and improving the quality of teaching and learning can help to achieve various characteristics and outcomes of a bachelor’s degree. However, there are challenges to it and, therefore, an appropriate balance between the theoretical and disciplinary-based knowledge and the practical know-how desired by the degree definition needs to be safeguarded and promoted in undergraduate degree study.

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