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Promoting Work-Integrated Learning

New Zealand Association for Cooperative Education

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# New Zealand Association for Cooperative Education 2015 Conference Proceedings

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* Winners of the best Allister McLay Best Paper Award

# Non-Competency Based Work-Integrated Learning Placements: Undergraduate Health Science Students' Perceptions of Benefits and Challenges

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Work Integrated Learning (WIL) through practicum or industry placement is a concept embraced and encouraged by Australian Universities, across many disciplines. The undertaking of WIL offers students the opportunity to explore and expand on theoretical concepts encountered throughout their academic studies in real-life context and application (Garnett, 2012), assisting students in their transition from educational to professional practice informed by experience, engagement and reflection (Billett, 2011). Further, WIL can enhance confidence, increase independence and teamwork skills, and develop personal and professional skills and identity (Hynie, Jensen, Johnny, Wedlock, & Phipps, 2011; Kaliyamoorthy & Sridevi, 2011).

Traditionally Medicine, Nursing, Education, and Law have been representative areas incorporating WIL, however due to employers expecting "work ready" students, the scope for WIL experience is expanding (Garnett, 2012; Billett, 2011). Smith et al. claim that WIL encompasses more than enhancing and developing skills but potentially is a "transformative pedagogy, which entails…personal development and experiential learning" (2009 pg 15). This is of particular relevance to the regulated professions where a perceived identity fits the profession. Professional identity develops with experience; placements provide quality experience opportunities but cannot be controlled (Trede, 2012; Smith, et al., 2009) therefore in professions that are not regulated by competencies or explicit industry skill requirements, and placement opportunities are varied, the experience may or may not transform into learning that enhances future professional practice and identity (Trede, 2012). Transformative learning theory proposes that change will occur where opportunity is provided (Cranton, 2011). However, as questioned by Billett (2011) is that enough to meet needs, expectations and future career aspirations?

Sufficient preparation, suitable supervision and mentoring arrangements are the three most crucial strategies of an effective placement (Patrick et al., 2009). Many students are not fully prepared prior to the placement; unaware of the personal and professional requirements needed to be successful. A student who is not well prepared will have a poorer placement, and place a higher demand on the expert partner and university placement co-ordinator (Chipchase et al., 2012; Parker, 2011). Therefore there is a shared responsibility for preparation and planning between the student and the educational institution (Chipchase et al., 2012) to facilitate readiness. Being fully prepared for placement allows for students to obtain the maximum learning experience and make optimum use of the opportunity to practice and enhance their acquired skills and knowledge (Chipchase et al., 2012).

## CONTEXT

The participants of this study were students who had undertaken a WIL placement as a core topic in the final year of their Health Sciences degree. The cohort of students came from a range of degree majors such as Health Promotion, Health Management and Life Sciences. In this instance the Life Sciences major is undertaken by students aspiring to transfer as postgraduates into Physiotherapy or Occupational Therapy. At the point of the WIL placement however, the student's knowledge and skills were nonspecific to that profession. Providing information and opportunities for students to consider future employability options whilst undertaking a placement enhances the benefit of the learning experience and supports the principles of WIL (Billett, 2011;

Garnett, 2012). The WIL experience is of great relevance to these students, as their generic degree program has no guarantee of acceptance into their desired pathway. Students may struggle to see relevance to future practice (Kift, 2009; Wilson & Fowler, 2005) or in determining their own professional identity (Trede, 2012; Smith, et al., 2009) when undertaking a generic placement.

The WIL opportunity is unique for these students as there are currently no other placement opportunities that this cohort can undertake within their degree. The topic requires 140 hours of placement within a health or community setting where clinical or industry explicit competencies and skills are not required. While agencies range for each placement, and students' working environments will vary, this study indicated that student needs, expectations and desired outcomes were common. This paper reports on research that explored those expectations from the student perspective.

## AIMS AND METHODS

WIL opportunities are provided to students however little is known about whether non-competency based placements can meet their needs, expectations and future career aspirations. Von Treuer, Sturre, Keele, and McLeod (2011) claim that this underreporting of students' expectations weakens WIL evaluations. This study aimed to understand undergraduate Health Sciences students' perceptions of WIL placement expectations prior to, during and after their WIL experience. By listening to 'their story' and personal experiences a greater understanding of the WIL experience seen through the eyes of students' has evolved. This has further enabled the identification and development of resources (practical, personal and/ or theoretical) to prepare future students to ensure a positive WIL experience, regardless of degree major and future professional aspirations.

Fifty-nine students who had completed a Health Sciences WIL placement during 2011-2014 were invited to participate in the study. As many of the invited participants had graduated from the university difficulty arose in contacting them. However, those that responded provided a robust cross-section of the student cohort during that time. Twenty-two students completed a survey using the online tool Survey Monkey©. The online survey collected demographic data that provided background to the students' degree major and prior workplace experience and also used a Likert scale questioning format to elicit data about perceptions of their WIL experience prior to, during and post placement. From this data set 19 agreed to participate in a face-to-face interview. The inclusion of face-to-face interviews in the study encouraged a true reflection of students' experiences through the use of in-depth qualitative research methods through narrative that allowed students to 'tell their story' (Patton, 2002). This assisted in the understanding of the 'lived experience' of these students. Data collected from the survey and transcribed interviews was then analysed thematically to determine the facilitators, benefits and challenges of non-competency based WIL placements.

## RESULTS

Emergent themes consolidated the benefits of offering WIL placement opportunities. Students felt valued in the workplace and took ownership of the work undertaken. They acknowledged outcomes from the placement that could benefit them, regardless of their future profession indicating that in most instances they did feel more prepared for the workforce whatever that may be. Areas identified were: a greater understanding of how workplaces function; the importance of communication; a sense of empathy for some of the population groups encountered within various health and community settings; a better understanding of their future professional options; and in a few cases a change of professional aspirations. Further, students post placement were more inclined to access the University Careers and Employment Liaison Services to explore future employment options.

A range of organisational, interpersonal and individual factors was shown to support a positive WIL placement outcome. At the organisational level students greatly appreciated the opportunity to undertake a placement as supported by participant responses and said "it bridges the gap between theory and practice you can have all the theory in the world but without the opportunity for practice you are up the proverbial creek without a paddle" and "my placement gave me a reason to get out of bed, I was getting bored with other topics".

However, students needed structural and practical support to be prepared prior to placement and reflected on the sources of such support. These included pre-placement information sessions and online resources being available. Understandably when asked how they felt prior to the placement the overwhelming response was "excited but nervous". Many students found the prospect of entering a real-world environment confronting and questioned their ability to fit in, for example, "I didn't know what to expect" and "it was a totally new and confronting experience…I was worried if I had the skills".

While interpersonal resources such as the university and agency supervisors were highly valued prior to and during the placement, for example, "I knew I could go to my supervisor at any time" and "It made my experience a lot nicer knowing to be in an environment where everyone was approachable".

Students accepted that as an individual they also needed to take responsibility in preparing for the placement they saw themselves as a resource and accepted that they needed to be proactive prior to the placement by researching the host organisation and during the placement by developing and maintaining a relationship with not only their immediate agency supervisor but also others within the organisation to ensure a positive and productive outcome. Students gained confidence, skills and knowledge were enhanced and they were able to reflect on how they had contributed to the organisation. Several students also suggested that as a result of their placement they were performing better in others topics being undertaken and past topics finally had context through being able to actually see the theory applied to practice, for example, "it did motivate me to do better in other topics" and "all that stuff we did back in first year it finally makes sense".

## CONCLUSIONS

As supported by this study and current WIL literature there can be no denying that WIL provides an invaluable learning experience for students. What needs to be ensured is that students are prepared for the placement experience at an organisational, interpersonal and individual level. Where clinical and explicit industry competencies and skills are not required and future professional practice or employment opportunities are uncertain, preparation and support needs to span a range of areas to encourage students to think broadly and strategically.

The outcomes of this research are significant, as they will inform future WIL placements in this context. Findings are applicable to the preparation of Health Sciences students prior to undertaking WIL, and also determine what resources are required at an organisational level to support students during and post placement. The results may also be used to counsel students about how to maximise their WIL experiences to prepare for future work readiness and employability. By seeking rich, descriptive information from students who have recently completed a WIL placement, the 'lived experience' has emerged. These students' perceptions and stories can support future development and management of the topic that formed the context of this research; in addition to other topics that offer non-competency based placements for students.

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# Supporting Lecturers of Work-Integrated Learning During their Development of Effective e-Learning Strategies

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This research project was designed to inform and enhance the teaching capabilities of lecturers engaged with the Certificate in Automotive and Mechanical Engineering (CAME). It was anticipated that the project would lead to developments in lecturer resourcefulness and increased familiarity and comfort in using information technology (IT) for work-based applications. In order to consolidate change, a collective team approach proved to be essential. Over a four year period the team developed and delivered course materials through e-technologies. They progressively acquired a level of confidence in their abilities as they attained new knowledge of ways to creatively engage learners. Because of the extensive level of experience with e-Learning, the team had developed ideas for the future of their chosen mode of delivery through the medium of Web 2.0 software and small form tablet technologies, based on the Android operating system.

However, the team's ambition for enhanced delivery through IT was constrained by the staff capabilities and therefore it was recognised that a series of targeted intervention activities would be essential. A significant gap in the project was identified through a survey and it was concluded that staff needed to be equipped with not only IT skills, but online literacy skills, that would better enable them to obtain knowledge and usefully integrate learning materials that all staff and students should then adopt in order to achieve a better balance of work and study (Yang, Catterall, & Davis, 2013).

## AIMS

1. To identify gaps between institutional support mechanisms and existing staff capabilities and ambitions.
2. Negotiate for the adoption of a flexible approach to staff professional development that matches student-centred learning.
3. To create conditions that rapidly respond, encourage and engage vocational lecturers with changing technologies and employer graduate requirements.

## METHODS

The purpose of this Collaborative Action Research (CAR) project was to examine vocational lecturers ability to successfully engage with Android based hardware and develop effective and interactive e-Learning activities that would take advantage of mobile technology. Because of the close working relationship between team members, qualitative methodology was used to gather the findings. Informal conversations around the development of materials were recorded, as well as additional data being collected through the use of surveys that were conducted throughout the project (Bliecher, 2013). In addition, observations of team interaction and frustration during project meetings were chronicled. It is from this data that a series of interventions are recommended.

## IMPLICATIONS AND ISSUES

Despite deciding that the project would be based on the CAR framework, it became evident that the team lacked an understanding of CAR model complexities. The team approached a colleague with the request that they should take leadership of the project. This subsequently involved the leader communicating with institutional experts and feeding back relevant information. With an agreed formalised structure, the project continued with the team regularly meeting to discuss learning and experiences. The CAR model was discussed at length and all members became familiar with its four components of motivation, reflection, action and knowledge (Bliecher, 2013). Considering motivation, the ambitious nature of the project far outweighed staff capabilities and therefore it was recognised that a series of targeted interventions would be essential. A later survey identified that it was evident that the majority of staff started to believe that change could happen despite conversations with some staff who began to realise that previous professional development courses consisted of mainly outdated pedagogy.

There is evidence to suggest that the team became comfortable with the need to remain continuously abreast of new technologies. An accord amongst the team committed them to stay up to date with the changes in the e-Learning landscape and suggest the use of tools to promote constructivist learning (Lvala, 2009). Through professional development of lecturers involved with work-integrated learning may be empowered to look beyond their immediate context and start to explore yet unrealised creativity, which will then positively influence student learning. Lecturers must be given the opportunity to shape and develop new initiatives and should not be singularly driven by institutional agenda (Nelson & Slavit, 2008).

The staff frequently discussed professional development and its value as a medium of acquiring new skills. It was viewed as essential in creating possibilities and promoting changes in learning and teaching practice (Stein, Shephard, & Harris, 2011). In response the team requested directed support from the institution's academic learning department and the initial response was positive. Sessions were organised to develop an understanding of constructivist pedagogies and how the project could positively influence this practice. A further session was arranged to look at the possibilities of app development however, a change in staffing and institutional focus meant that directed sessions would be difficult to arrange. Staff failed to see the relevance of the new institutional e-Learning direction and believed that despite obvious limitations, they had developed their own superior system of learning (Wilson, 2012).

Sufficient time was allocated so that staff could became familiar with the use of the Android tablets. The Collaborative Action Research Team (CART) reflected that an action would be required to make the project and its outcomes more relevant to work-integrated learning. It was therefore concluded that effective integration applications (apps) would be essential (Bliecher, 2013) to bridge the work-integrated learning gap. Each team member was to research and trial various apps of their own choice, with a focus being on an area that related to each staff member's subject knowledge. A key part of this initiative was to reflect on an apps potential in both learning and teaching in the classroom and activities in the workplace. The data gained from this phase of the project was recorded on a Google form which then populated the information in a spreadsheet.

This form was then shared with the whole team so that information recorded would become the focal point of meetings. Each staff member would be responsible for demonstrating the functionality of each app and providing a synopsis of its potential value. This in turn created new knowledge across the team, growing members self-efficacy, and created a link between knowledge and action (Bliecher, 2013). In turn the potential use of these apps became a powerful driver that helped to promote a new sense of direction, value and motivation.

Following these conversations, staff identified 19 apps that ranged from mathematical assistance to on-board vehicle diagnostic (OBD) integration. Exercises were then generated for students to promote the accurate use of online parts catalogues (an essential skill) demonstrating the significant savings in both time and cost.

## CONCLUSION

The journey taken by the team has highlighted some significant shortcomings in their capabilities with the appropriate use of technology. Despite their insistence that they were familiar with concepts of e-Learning and competent at using a range of hardware and software, their knowledge proved to be at a surface level only. In addition, regardless of their willingness to participate in research, team members' lack of experience of research became evident, restricting progress of the project. It was not until a leader was appointed that a structure emerged and the team became truly collaborative action researchers. The rise in self-efficacy promoted independence while increasing belief and commitment to their research. However, the team also started to demonstrate frustration with their institution as it failed to deliver the targeted professional development that they yearned for.

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# Work-Integrated Classrooms: The ICT Development Hub

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Degree level ICT tertiary education has generally been structured similarly to the traditional sciences where specific subjects are taught in isolation within individual papers (e.g., programming 101). Although the value of cooperative work-integrated education has been embraced within New Zealand ICT education, these components are typically reserved for the final semester of study (i.e., once students have developed skills in the classroom, they then apply these skills to an industry-based capstone project). This capstone project approach has historically been the most common form of cooperative ICT education (Ardis & Ford, 1989; Ford, 1994; Steele, Cleland, & Engelbrecht, 2013). Previous research has explored the possibility of increasing the amount of cooperative work-integrated education within an ICT degree (Steele, 2010; Cleland, Steele, & Snell-Siddle, 2011; Steele, Cleland, & Snell-Siddle, 2012). The intention of this previous work was to investigate the possibility of harnessing cooperative education for skill development as opposed to simply end of study skill application. The ambitious initial concept suggested the replacement of a number of second and third year degree papers with industry-based placement papers. This structure would have seen students spending 50% of their study time in industry from the beginning of their second year. Although the intention of the proposed structure was generally well received by lecturers, students, and industry stakeholders, the enthusiasm was balanced out by a number of significant obstacles, such as: students highly valuing the existing second and third year degree papers, industry hesitancy due to the practicality of supporting and training unskilled students, and institutional concerns related to assessment consistency and validity.

As an alternative, a multi-semester work-integrated classroom approach has been suggested as a means for increasing educational value through cooperative education as well as maintaining a controlled, supported, and assessable academic environment for students. Although the implementation as described in this paper is a new initiative, the underlying concept has been documented within computer science education from as early as the 1970's (Horing & Wortman, 1977). Next to capstone projects, the inclusion of a project in a lecture course is the second most common form of providing industry relevant training to students within ICT education (Ardis & Ford, 1989; Ford, 1994; Cleland, 2014). Multiple institutes have adopted year-long 'software development laboratory' approaches where student teams work on large-scale on-going projects, with the premise that inexperienced students work on well-defined areas of an existing application and more experienced students define requirements and architecture of new systems or new features (Sebern, 2002). In further support, research from industry suggests that the way to help prepare ICT students for the realities of their first job is to involve them in a project where: there is a real client; the client requirements change or clients have conflicting priorities; students are made to work in teams; and the team works on an application with a large existing codebase (Begel & Simon, 2008; Coppit, 2006; Dawson, 2000; Dawson, Newsham, & Fernley, 1997; Hogan & Thomas, 2005; Joy, 2005; Cleland, 2014).

## UNIQUE FEATURES

This work-integrated ICT classroom has been dubbed the 'Development Hub' which will consist of a three semester journey where students begin as junior developers half way through their second year of study and progress through to senior developers in their final semester. The project team will contain third year students working as intermediate and senior developers who are in their second and third semesters of the cooperative work-integrated project experience. Junior developers will be mentored by senior developers who will aid them with their orientation into the learning environment. The more sustained nature of this approach will provide ample time for students to become familiar with the tools, technologies, and processes utilised within the

industry and should allow the students to contribute significantly to the software solution being developed. It is worth noting that the junior developer students will be joining existing projects and will be primarily required to orientate themselves within the codebase and perform maintenance tasks. Industry partners will also be involved with the development hub through the provision of professional advice and quality assurance. Lecturers will work alongside both students and industry partners by functioning in a consultancy role. Students completing the development hub journey will have three semesters worth of real-world industry experience to refer to on their CV's. The development hub will exist as a dedicated professional space within the educational institution. Students will undertake collaborative work on significant team-based projects for real-world clients primarily from non-profit and community based organisations.

## DISCUSSION

The introduction of the development hub approach to ICT education builds on previous research by harnessing the benefits of cooperative work-integrated education and by also addressing the obstacles of previously suggested approaches. The development hub satisfies the desires and concerns of education providers, students, and industry partners.

The educational institutes are able to provide a cooperative work-integrated experience for students that allows consistent and valid assessment. As students will be working onsite and have timetabled 'work hours' (which are facilitated by lecturing staff) this creates a structured assessable environment. A student's individual and group contribution and engagement can be easily monitored allowing avenues for individual and group based assessment. An added benefit for lecturing staff is the valuable insights that will be gained into current industry practice through the ongoing interaction with ICT industry partners.

Students are able to develop industry relevant skills through collaboration on real-world projects. The orientation and maintenance role undertaken by junior developer students reflects closely the experience of a junior developer in industry, a function that is very difficult to simulate in a traditional classroom environment (Kajko-Mattson, Forssander, Andersson, & Olsson, 2002; Begel, & Simon, 2008). Likewise, intermediate and senior developer students will gain valuable experience in project collaboration, team communication, team-based development tools, and producing quality assured code; all areas of which are considered underdeveloped skill sets in graduate developers (Begel & Simon, 2008; Brechner, 2003). Through the development hub journey students will also have the opportunity to begin to build relationships with prospective employers making their transition to the workplace more seamless.

Industry partners are able to utilise student ICT expertise and provide an avenue for skill development without the challenge of detailed student support or infrastructure restrictions. Industry partners will likely be a combination of ICT stakeholders and non-ICT stakeholders. Non-ICT stakeholders will provide expert domain knowledge and undertake user acceptance testing (e.g., Radiographers providing medical imaging expert knowledge and testing for an app development project). In return, non-ICT stakeholders receive a quality solution that would otherwise be unfeasible. ICT stakeholder will provide technical expertise and mentoring (e.g., a locally based senior software developer performs code review and suggests improvements to algorithms and design patterns). In return, ICT stakeholders will be able to hire graduates that are more work ready, being productive from day one. The relationships developed during participation with development hub students will also allow ICT stakeholders to gain specific insight into the skills and suitability of potential future employees.

The development hub ultimately facilitates work-integrated education that benefits ICT students, educational institutes and staff, and industry stakeholders.

## IMPLICATIONS

The introduction of the development hub marks a unique milestone in ICT tertiary education delivery in the New Zealand ITP sector. The development hub environment is in strong contrast to the isolated paper approach traditionally seen in degree level ICT education. The new delivery approach aims to bridge the gap between

academia and industry through the provision of real-world projects for real clients within an academically supported framework.

The development hub concept could be easily applied to other institutes within the ITP sector offering degree level ICT education. This type of approach could also be applied to other disciplines and ultimately could be expanded to incorporate multi-disciplinary teams providing for example ICT, business, and design solutions for industry stakeholders. The adoption of this type of learning environment could see a marked increase in cooperative education in New Zealand, as well as strengthening relationships between education providers and industry partners.

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# Engaging with Local Industry as a Student Business Venture

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## CONTEXT

### *The importance of physical fitness*

Studies published over the last 10 years have emphasized the prognostic significance of cardiovascular fitness (Martin et al., 2013; VanHees, Fagard, Thijs, Staessen, & Amery, 1994; Dutcher, Kahn, Grines, & Franklin, 2007; Keteyian et al., 2008; Franklin, Lavie, Squires, & Milani, 2013) for people with diagnosed disease. An exercise capacity of lower than five METs (metabolic equivalent of task) correlates with higher mortality risk whereas nine METs or more generally identifies a cohort with an excellent long-term prognosis, regardless of the underlying extent of Coronary Artery Disease (Franklin et al., 2013).

### *The clinical exercise physiologist*

A clinical exercise physiologist can be defined as an individual who specialises in the delivery of exercise, lifestyle and behavioural modification programmes for the prevention and management of chronic conditions and diseases, and injuries (Exercise and Sport Science Australia, 2010).

### *Registration and accreditation of clinical exercise physiologists*

International trends indicate the importance of a registration and accreditation system for clinical exercise physiologists. Examples include Australia (clinical exercise physiologists), South Africa (biokineticists), Canada (kinesiologists), and America (clinical exercise specialists/physiologists). These countries all have registration and accreditation systems that enable clinical exercise physiologists to be recognised by their respective governments as allied health professionals. Within these countries safe practice and professional accountability are upheld through these professional bodies, which also clearly define the scope of practice for clinical exercise physiologists.

The exercise industry is still largely unregulated in New Zealand and this has led to uncertainty amongst the public regarding the credibility of the profession. One of the biggest challenges in New Zealand for the development of a credible clinical exercise physiology profession is the development of educational programs with work-integrated learning (WIL) curriculums in tertiary institutions in New Zealand.

In recognition of this challenge the Universal College of Learning (UCOL) in Palmerston North developed a post graduate qualification in CEP. This program is now in its third year of delivery and this article aims to reports on developmental barriers encountered and gauge the WIL aspects of the program.

## METHOD

### *Assessing the work-integrated characteristics of the UCOL post graduate curriculum*

The Authentic Assessment Framework (AAF) which is an assessment tool used by Curtin University to gauge the WIL characteristics of curriculums was recently published by Bosco and Ferns (2014). The AAF is divided into six

'cells', each providing descriptors relevant to the degree of authenticity and proximity to the workplace (see Table 1).

The vertical axis relates to the level of authenticity or proximity to real-world-tasks, ranging from activities with nil or low level authenticity to a high degree of authenticity. Whilst the horizontal axis reflects the proximity to the workplace ranging from activities that take place in the traditional class to activities that occur in the workplace. The AAF is used in this publication to evaluate and demonstrate the WIL qualities of the curriculum of the UCOL post graduate diploma in Clinical Exercise Physiology. The curriculum is also evaluated against the CEP registration charter of Exercise and Sport Science Australia (ESSA) which is the benchmark for clinical exercise science in Australasia.

TABLE 1: The Authentic Assessment Framework (abbreviated from Bosco & Ferns, 2014).

| | Highly Authentic Task in educational setting | | Highly Authentic Task in virtual setting | | Highly Authentic Task in workplace |
|---|---|---|---|---|---|
| Level of Authenticity (Nil to High) | **Block 5**<br>Task authentic to professional activity. Case study exercise with marking criteria based upon industry requirements/ demands. | | | **Block 6**<br>Task authentic to professional activity and completed in the workplace. Example: fieldwork, placement, internship or cooperative experience. | |
| | **Block 4**<br>Task authentic to professional activity where student engage with an audience in a contextual setting. Example workshop, presentation or practical. | | | **Block 3**<br>Moderately engaged with industry. Medium level intellectual engagement (applying, analysing or comprehension) in a fieldwork, workplace setting. | |
| | **Block 2**<br>No student engagement. Beginning level intellectual engagement. Example: essay, exam, laboratory test. | | | **Block 1**<br>Task authentic to professional activity. Student passively engages. Example: observational experience, site visit. | |
| | Educational setting | | Virtual setting | | Workplace setting |
| | Proximity to the workplace<br>(Nil to High) | | | | |

*U-Kinetics Clinic*

Due the specific WIL requirements of clinical exercise physiology training, a high quality exercise rehabilitation clinic (which meets specific criteria) was required. No such facility was available in the Manawatu region and UCOL consequently developed its own facility.

*Student's Clinical or Practical Journey*

Students are systematically exposed to increasingly demanding client assessment, program prescription, data processing and client monitoring tasks.

*Program Prescription Process*

Between 1 May 2012 and 31 October 2014, U-kinetics received over 700 referrals for exercise programmes: 500 have started with their 12-week exercise programs. A total of 366 clients (117 Cardiac; 103 Respiratory and 146 diabetic) have completed 12-weeks of exercise. Training programs consist of 10-20 minutes aerobic exercise and

five to eight strength/flexibility exercises. The clients' resistance exercises starts with one set of 10 repetitions with a weight they can lift that many times.

## RESULTS

*Business case*

A primary task in developing a business case was to establish funding pathways with the District Health Board (DHB) and other funding providers as well as referral pathways through specialized health care clinics -such as well-established respiratory, diabetes and cardiac clinics. Eventually the DHB clinics (respiratory and diabetic as well as the head cardiologist) agreed to support the proposed UCOL clinical exercise physiology service.

*U-Kinetics Te Huinga Waiora.*

The development of the U-kinetics clinic was synchronized with the creation of a curriculum that had to go through NZQA. It was essential that the U-Kinetics service met and maintain high medical standards for safety and client intervention. An innovative curriculum, teaching process, student assessment procedures and service delivery system was consequently developed.

*Curriculum*

The benchmark international registration frameworks for clinical exercise physiology are Exercise Science Australia (ESSA), Biokinetics South Africa, and the American College of Sports Medicine (ACSM). The registration frameworks of the above mentioned three clinical exercise physiology professional bodies resolve around WIL (500 hours of exposure to individuals with certain clinical conditions).

The curriculum, teaching and service delivery of the UCOL qualification in CEP are organised around four papers. The first paper runs in the first semester and is mostly a theoretical paper covering pathophysiology of common noncommunicable diseases (NCD). The assessment consists of four case studies that require high quality intellectual engagement such as identifying health conditions through analysing signs and symptoms, medication prescribed and functional data provided in medical referral letters. The marking criteria are based on industry requirements such as identifying conditions, symptoms limits, and making testing and program prescription recommendations. This paper meets all the theoretical requirements of ESSA and can be placed in block five of the AAF (see Table 1).

The second paper is a practical paper that runs over both semesters. This paper assesses and tracks student's practical work in the clinic on a day to day basis as they work with clients. This paper can be placed in block six of the AAF (Table 1).

The last two papers are very similar in design and assessment structure. The first of this two (3rd paper) focuses on student's ability to assess and prescribe programs for patients with chronic conditions. The last paper address musculoskeletal conditions. Overall students are assessed on their ability to make correct testing decisions, their ability to interpret data, to design programs and to communicate and build rapport with people with multiple challenging musculoskeletal, NCD and psycho-social demands. These two papers also meet all the requirements of block six of the AAF (Table 1).

*Student numbers*

The program started in February 2012 and has had four intakes (two intakes per year) of students. By November 2014 a total of 30 students have completed the level 8 post graduate diploma in clinical exercise physiology. Table 2 provides an overview of what happened to these students.

TABLE 2: Employment history of 2012, 2013 and 2014 UCOL Clinical Exercise physiology graduates

| Job descriptor | Number of students | Location |
|---|---|---|
| Physical health educators at the PHO | 4 | Palmerston North |
| Green Prescription | 2 | Auckland |
| Respiratory technician | 2 | Palmerston North |
| | 3 | Wellington |
| CEP (Part time contracts) | 4 | Palmerston North |
| CEP (Interns) | 4 | Palmerston North |
| Private practice/personal trainers | 3 | Palmerston North |
| CEP with ESSA registration | 1 | Australia |
| Cardiac technician | 1 | Wellington |
| Full-time masters student | 4 | AUT |
| Part time lecturing position | 1 | Massey university |
| Lavender Blue | 1 | Palmerston North |
| Ewi health care provider | 1 | Auckland |
| No jobs yet | 8 | - |

*Note: The student numbers does not tally up to 30 as some students are in more than one category (example masters students and an intern).*

*Overall effect of program on patients*

A total of 366 clients (age distribution 15 to 84) completed 12-weeks training by November 2014.

Relatively large numbers of these clients presented with extreme low functional capacity (44.2% lower than five MET), moderate to severe dyspnea and angina during the graded cycle ergometer test (32.9%), abnormal resting blood pressure values (28.1% with SBP > 180mmHg and 13.1% with DBP above 90mmHg) and a peak cycle wattage of lower than 35 Watts (24.1%). Students were consequently confronted with clients with serious health issues and with difficult exercise testing, prescription and training scenarios.

The program had a statistical significant ($p<0.05$) effect on most physiological (resting heart rate, resting blood pressure, exercise blood pressure and $VO_{2peak}$) and psychological variables (SF36 subscales, HADS anxiety and depression and the CES-D depression scale) of the 366 clients who have completed 12-weeks of training. Body weight data was misleading as some clients started the program being in an underweight situation. However some clients lost between 12 and 20 kilograms during the first 12-weeks. The overall results and the fact that the program evidenced a drop-out rate of less than 2% is a remarkable outcome. It indicate that this business venture with students is a successful one in terms of client outcomes and meeting external stakeholder (medical referral network) expectations and student learning objectives.

*Program effect on functional capacity*

At the start of the program 28.3% of the clients had a functional capacity of lower than 4.3 MET. That number was reduced to only 10.5% after 12-weeks. In addition the number of clients with a functional capacity of higher than eight MET increased from 8.7% at the start to 30.6% after 12-weeks. This is a significant finding as a 6.1 year follow-up study on 527 men with cardiovascular disease by VanHees et al. (1994) found that the highest all-cause mortality occurred in the individuals with a functional capacity of lower than 4.4 MET. In contrast, no deaths occurred among patients who averaged 9.2 METs or more.

This is a real positive result considering that the number of individuals that require intensive and consistent supervised medical treatment is growing. If present growth trends are maintained, by 2020, noncommunicable diseases (NCDs) will attribute to seven out of every ten deaths in developing countries, killing 52 million people annually worldwide by 2030 (World Health Organisation, 2014). Programs like this could provide a workforce who will be in high demand in the future. It is therefore essential that training programs preparing such professionals for the workforce are imbedded with strong WIL foundations.

*Client feedback*

Clients describe the program as life-changing and a very positive experience as can be seen in Table 3.

TABLE 3: Client feedback

- U-Kinetics is a well-resourced, friendly facility with well trained, encouraging and positive staff. I loved it. Thank you so much – the staff/students are amazing. Love your personal approach – kind yet firm.
- This programme would encourage anyone with a long term, limiting condition to do more exercise. The supervision is excellent and most helpful. The end results also show how beneficial it is to improve physical well-being.
- I am very enthusiastic about this programme. Can't stop telling people about the program… It has removed my fear of exercise.
- As a quadruple heart bypass patient, this programme took me from being unfit to being fitter than ever. Great programme. Great staff.
- I knew after my heart attack I needed to do some physical exercise. The U-Kinetics program had a significant positive impact on my health and well-being.
- Following heart surgery the program has enable me to be confident of the way forward.
- Coming here has given me self-confidence and I feel more in control of my health.
- I can breathe mush easier and has guarded against chests infections. I'm more positive. Top of the range facilities. Great atmosphere.
- Blood in lower legs now appears to be returning better and the ulcers I have had for two years have all but healed and disappeared while I have been on the programme.
- My time at the U-Kinetics clinic was life-changing for me. I highly recommend this clinic for anybody who wants to do something for their health condition. I have definitely done something for myself!!
- I have a lot more confidence in myself; less scared than before for things that require physical effort.
- Program showed me that I could exercise; less fearful of physical exertion.
- Learning the level of exertion which I can handle without bad repercussions.
- Given me the ability to cope with my situation.

*Feedback from stakeholders (medical community)*

Referring clinics or external stakeholders (e.g., teams at the Diabetes and Endocrinology Service and the Respiratory team) are very satisfied, appreciative and at ease being associated with the U-Kinetics service delivery. They write in a letter of support that they were "pleased to support the nomination of the U-Kinetics Clinical Exercise Physiology Centre for the 2013 Mid-Central Health 'Excellence in Optimising the Health Status of a Priority Population' Award".

## DISCUSSION

The U-Kinetics experience is valuable for students and student feedback is that the opportunity to work with real clients with real health issues in a professional environment is extremely rewarding and educational. Training meets high standards of WIL and is in line with registration frameworks of international benchmark registration bodies in the field of clinical exercise physiology. The programme enhances an in-depth understanding of the pathophysiology of disease and students exit with greater awareness, clinical empathy and confidence with regard to how to work with complex high risk individuals.

This innovative project which involves both a public-public partnerships (UCOL and MidCentral DHB) and a public-private relationship (COL and TBI Health) evidence positive physiological and psychological benefits for clients with advance NCD.

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# Primary Teachers' Experiences of Professional Development in Science by Distance Learning

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In 2007, the revised New Zealand Curriculum was introduced requiring New Zealand Primary schools to compulsorily teach Science (the *Nature of Science* strand) up to Year 10 (Ministry of Education, 2007). In spite of this, a number of international tests such as the Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) indicate that New Zealand schools are not meeting this requirement. Compared with previous test reports, students still do not perform as well as students from other countries (Martin, Mallis, Foy, & Stanko, 2012). The Education Review Office (ERO) Chief Review Officer highlighted in the 2010 *Science in The New Zealand Curriculum* report that there was a lack of teacher confidence and capability in teaching science, and that there were limited opportunities for high quality professional development in science.

The New Zealand government considers that Science, Technology, Engineering and Mathematics (STEM) subjects are linked to the future economic benefit of the nation (Ministry of Business, Innovation and Employment, 2014a). In 2014 the Minister of Education announced funds in the region of a half billion dollars to go towards "raising teaching quality to raise student achievement" (Ministry of Education, 2014a). Also of significance are the recently announced funds to support the objectives outlined in the joint Ministry of Education / Ministry of Business, Innovation and Employment 2014 *Science in Society* strategic plan and the "*A Nation of Curious Minds*" (Ministry of Business, Innovation and Employment, 2014b).

## ISSUE

It could be argued that the investment by the government to "raise teaching quality" will need to have a lasting impact on the science activities children experience in school. Enabling teachers across the country to gain the knowledge, skills and confidence to teach authentic science should contribute to this lasting impact. The 2010 ERO Science report found that best practice in science teaching used authentic contexts and cross-curricula links. The Open Polytechnic developed a Primary Science Teaching programme as a response to these issues with a goal of improving the science knowledge, competence and confidence of primary teachers to teach science. It is delivered online to enable access for those working teachers who are geographically isolated.

The course was designed using the philosophy of making teachers look at the world and 'notice something worth noticing' as amateur scientists. This models the New Zealand Science curriculum where the *Nature of Science* (Ministry of Education, 2007) is the over-arching strand as the mechanism to support acquiring and testing new knowledge about the world.

## METHODOLOGY

The authors carried out an analysis of over 200 samples of work from a total of 165 teachers from around New Zealand enrolled in Primary Science Teaching courses from 2012 to the end of 2014. Both qualitative and quantitative methods were used to explore the demographics of the cohort as well as beliefs and attitudes about science and science teaching.

To stimulate teachers' thoughts about the planning decisions they make in their science teaching, the Teaching Perspectives Inventory tool was used (Pratt & Collins, 2000). This online questionnaire provides an automated analysis with scores indicating how well beliefs about teaching and intentions for learning match the actions taken in the classroom. The five perspectives allow educators to identify the lens or teaching style they tend to use the most when manifesting their intentions for learning. The five perspectives are Transmission, Apprenticeship, Developmental, Nurturing, and Social Reform. The results of the Teaching Perspectives Inventory online tool provided further data for analysis.

## RESULTS AND DISCUSSION

Statistics indicates the New Zealand Primary teaching workforce is typically female and over 40 years of age (Barback, 2013; Ministry of Education, 2012). This is mirrored in the enrolment data of teachers enrolled in the Primary Science Teaching (Table 1).

TABLE 1: Age and Ethnicity demographics of 165 teachers enrolled in the Graduate Certificate of Primary Science Teaching (Curriculum) from 2012 to 2014

| | |
|---|---|
| Male | 17% |
| Female | 83% |
| NZ European | 85% |
| Maori | 7% |
| British/Irish | 8% |
| Under 30 years old | 14% |
| Over 40 years old | 64% |

An analysis of 165 individuals indicated that the reasons teachers wanted to participate in professional development via online learning could be grouped into six categories.

- To gain confidence to do practical work,
- To gain content knowledge,
- School focus on raising profile of science,
- Learn about the Nature of Science strand ,
- Learn about the "5 Capabilities" (Ministry of Education, 2014b), and
- Career progression.

The first compulsory course for these teachers in the curriculum certificate provided a number of opportunities for teachers to comment in forums prior to engaging in an authentic home-based science investigation. Prior to engaging with the course material, a number of themes were evident about existing beliefs and attitudes to science;

- Science only happens in a lab,
- Science is serious, can't be fun or enjoyable,
- Science is not creative,
- Science has nothing to do with numeracy or literacy, needs its own time slot,
- You need a lot of equipment, and
- All science follows a standard Scientific Method based on fair testing.

The teachers' expectations and beliefs appeared to be heavily influenced by their experiences of science at school. Students tended to adhere to a typical secondary school laboratory report template although the course guidance did not include this and had provided alternative formats for submissions.

At the start of the first compulsory course comments tended to align with the following themes;

- Children can't understand science concepts,
- Children can't do research,
- Children need to know content first,
- Anything children discover or notice has been seen before,
- Children cannot contribute anything meaningful to science,
- Children find science hard, and
- Science is for older children.

The extended period of time to do a real-word authentic investigation of genuine interest was for many a revelation about what science actually is and how science teaching could be done effectively.

> *Teacher A:* I think the facts and the doing go together, especially for kids at school. This course is a blessing because I'm now getting to do the practical stuff and see the link between the two. Some 20 odd years later though!
>
> *Teacher B:* This course has already opened up my eyes to thinking about what is important in science; my practice is already changing!

The extended length of time, the practical nature of the tasks, the ability to participate online from any geographical location, and the support of the tutor/mentor, appear to be the key features that increased the likelihood that new skills and attitudes were being retained and applied in the workplace. Evidence that attitudes and beliefs were being challenged was evident in the online forums as teachers shared their findings and talked about the impact their learning would in changing classroom practice. Comments tended to align with the following examples;

> Science is just noticing something in particular that is worth noticing,
>
> Research is more than reading books or going online,
>
> You can't do science without counting, measuring or noticing proportions; maths is the language of science,
>
> There is so much happening in the world!,
>
> Fair tests are just one of the ways scientists investigate, and
>
> Time; I rush my students as I am busy ticking boxes.

With a new understanding of what it means to think and work scientifically, teachers started engaging with the content material to increase and challenge their knowledge. In pre-tests at the start of a five week block of work, teachers demonstrated relatively higher levels of prior knowledge of biology when compared with their prior knowledge of other science disciplines (physics, chemistry and earth science/astronomy). Teachers gained the most knowledge in the chemistry and physics courses during the five week period, but still scored lower in the summative task compared to biology and Earth science.

There is anecdotal evidence that Primary teachers feel the least confident about physics and Earth science / astronomy, and as a consequence these science topics are less likely to be taught in a school that does teach science. Our findings support this observation however comments in forums and messages to the tutor indicate that after completing the chemistry and physics courses, most teachers felt more confident to teach these less familiar concepts as they felt they could learn with their pupils. Gaining some content knowledge had also imparted a new confidence to teach.

> *Teacher C:* I need a range of different activities based on the same context to enable my children to practice their new skills and consolidate their new knowledge in a variety of ways.

Once teachers have gained content knowledge and practical skills in the first four courses, the last courses requires teachers to demonstrate effective science teaching in their classrooms by carrying out a teaching action research project. The teachers that gained the most from this course engaged with the Teaching Perspectives Inventory tool more than once and reflected on what each of the perspectives meant in their context with their students. An analysis of scores and perspectives indicated no one perspective was the 'right' way to teach; each lens or style has advantages at different points of learning as well as being dependent on the beliefs, attitudes and intentions of the teacher.

> *Teacher D:* Knowing one's teaching perspective and what our strengths are is important as they can influence the way we teach.

> *Teacher E:* As a result of the TPI inventory it was highlighted for me that I have certain strengths and perspectives and this can influence how I approach my teaching; yet these perspectives and viewpoints may not always be best for my students.

## CONCLUSION AND IMPLICATIONS

If subjects such as Science and Mathematics are priority subjects, professional development for teachers can be an issue, due to geographical isolation and obtaining time away from the classroom. Traditional professional development opportunities in Science are based on either 'bringing in an expert' or attending one day seminars or workshops. Neither option permits teachers to be supported to ask questions and trial new ideas about their Science teaching over a prolonged period.

The concept of an 'expert' teacher implies that there is one particular way to teach which is challenged by the results of this analysis. We have seen that in-service teachers were able to build up their own expertise and confidence to lead authentic practical science activities and become experts themselves. Rather than a 'one size fits all' approach, by participating in an online professional development opportunity different solutions appropriate to the culture of the school and the wider community were evident.

In summary, this model of distance learning for the professional development for working teachers is effective, and may be applied to other curriculum areas where geographical isolation or class release time may be an issue.

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# The Value of Students Entering Industry-Driven Competitions and Awards

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The Bachelor of Applied Visual Imaging (BAVI) and Diploma in Photographic Imaging are sister programmes at Universal College of Learning (UCOL) in Palmerston North, each incorporating a significant commercial photography focus. The BAVI students doing photography majors share a number of the papers with the Diploma students (UCOL, 2015a).

Two compulsory assignment briefs are set in Year Two of both programs and one in Year three of BAVI in the practical Photography papers, for industry-driven national competitions and awards. These are for the New Zealand Institute of Professional Photography (NZIPP) Iris Print Awards Student Category (NZIPP, 2015) and the Canon Eyecon Awards for Tertiary Students (Canon, 2015a).

Photographic prints for the Iris Awards are submitted for a three-day judging process by a judging panel of professional photographers including international guest judges (NZIPP, 2015). The Canon EYECON awards are also judged by professional photographers (Canon, 2015b). For fourteen years, UCOL students have been invited by NZIPP to help behind the scenes cataloguing and displaying hundreds of submissions.

## UNIQUE FEATURES

Entering these awards has resulted in numerous Gold, Silver and Bronze medals for students over sixteen years. UCOL students have won the New Zealand Student Photographer of the Year Award for the past ten consecutive years (UCOL, 2015b). Within that time, NZIPP offered a Tertiary Institution of the Year Award for the best collective submission from an institution; UCOL students won this every year for the eight years the award existed (UCOL, 2015b). Student work has also been sent overseas to the Australian Professional Photography Awards (AIPP APPA) where it is judged alongside professionals' work (APPA, 2015). In the Canon Eyecon Awards, UCOL students have won first prize each of the six years since its inception (UCOL, 2015b).

Students entering awards, go through the process of studying respective characteristics of professionals' work on many levels and develop a broad range of skills through following a brief to make images with strong communication, high-end technique and presentation, which is a unique work integrated learning experience.

Additionally, the UCOL students helping at the Iris Awards 'rub shoulders' with many of the country's top professionals. A further bonus is that they are invited to attend the annual conference with national and international keynote speakers that takes place over two days after the print awards. UCOL has also been invited to send students to help at the Australian Awards. Some graduates have also gone on to achieve major awards in the professional categories.

## DISCUSSION

Cooperative and work-integrated learning research specifically in the field of photography is sparse. Some work has been conducted in the wider field, often referred to as the 'creative industries' (Flew & Cunningham, 2010). A 2014 Australian study reported on work-integrated strategies designed to enhance the transition of graduates to the creative industries, one major strategy saw students required to network directly with professional practitioners in their field (Daniel & Daniel, 2014). A related study that investigated the skills required for creative industries graduate success highlights career management (i.e., the abilities needed to navigate ones industry), and motivation as important factors (Bridgstock, 2011).

Professional photography awards are seen as the currency of this visual industry, indicating trends, pushing boundaries and showcasing skills. By entering relevant competitions and awards run by key players in the photographic industry and having their work judged by professionals, students are pushed to excel and gain confidence in their abilities. Student success at these awards makes them more employable as they enter the workplace seeking commissions.

Additionally, being involved in helping at the awards where they work alongside professionals, stimulates motivation, inspiring them to develop a vision for pursuing their respective careers in the photographic industry, as well as offering the opportunity to network with photographers in their specialist areas.

## IMPLICATIONS

The photography profession varies significantly from most mainstream professions because practitioners invariably operate as sole traders, although some may employ an assistant who may or may not be required to use a camera. Being a visual profession, each practitioner has their unique vision and way of working even though there may be commonality of output such as magazine articles, etc. With regard to this, work placements arranged in the past were inevitably observation only. Whilst useful, this was also limiting. In addition to this, the UCOL Photography programme is based in Palmerston North – an area with relatively few professional photographers and with whom regular work placement became problematic unless with skilled and motivated students. Internships or work placements were subsequently abandoned. However, our programme is applied and we utilise other approaches to both simulate and give students work related learning experiences.

The study by Daniel and Daniel (2014), states that their "data certainly point(s) to the fact that success relies very much on an individual's capacity to be motivated, networked and knowledgeable about industry realities." They list a range of pre-requisites for career success in the creative industries which are given below grouped into the three key attributes summarised from their data (i.e., Skills, Motivation, and Networking).

Skills, which includes: ongoing development of expertise and skills, develop strong communication skills, engage regularly in reflective practice, acquire and develop business skills, create a niche market and specialise, and development of a portfolio. Motivation, which includes: passion for the art form, initiative, confidence and self-promotion, persistence, and determination and resilience. Networking, which includes: make and maintain contacts, and volunteer or complete work experience.

At UCOL, we have found that students entering industry-driven competitions and awards show a strong tendency to develop these three key attributes and the subsequent pre-requisites listed by Daniel and Daniel from a survey for both graduates and employers.

The production of imagery for the New Zealand Iris Professional Photography Awards extends the students' vision beyond the institution as they know their work will be judged by working professionals. Student success at these awards is a valuable experience which is not only good for their CV's but also gives them credibility at a standard judged by industry members.

As they work on their submissions, their motivation levels are extended as the rewards are significant. This attribute is also in line with research by Bridgstock (2011). The possibility and potential for winning Gold, Silver or Bronze medals stimulates enthusiasm and subsequent creativity. Development of related specific skills becomes enhanced as a result of 'passion-centred learning.' Important characteristics of award-winning images are strong visual communication coupled with technical excellence which are discussed and evaluated in tutorial sessions. This process sees both cognitive and behavioural learning taking place but a significant amount of the learning is intuitive. These in turn develop the further attributes cited by Daniel and Daniel (2014) of persistence and determination. At the awards, success in the student category boosts confidence significantly.

Further educational benefits of working at the awards include having access to top professional imagery. Students unpack, catalogue and handle prints for the judging process with an unparalleled opportunity for close scrutiny. Presence behind the scenes opens a door for meeting and networking directly with attending

professionals that can lead to work experience; some students winning the coveted Student Photographer of the Year have been offered work assisting professional photographers. Attending the professional photography conference with international speakers is hugely inspirational. Collectively, these factors open up a vision for a potential career in photography for students, along with a network of contacts and role models, creating a unique work integrated learning experience. The resulting vision subsequently progresses into developing ideas for a niche market. This may involve a specific stylistic approach to image making or may incorporate a multidisciplinary approach such as integrating imagery with design in the form of brochures and other marketing material.

This may link in with the business paper which is part of the UCOL programme. Students learn how to research target markets and potential clients and prepare a portfolio with this in mind. For the creative practitioner, a portfolio functions as their 'shop-window'.

After graduating, a number of students join the professional associations and attend regular meetings, enlarging their networks, sharing ideas, and seeing their new businesses grow. It is at this point that motivation and resilience will take a lead role in carrying them through as they navigate what is to them, new terrain.

Entering the Canon Eyecon Awards has also been significant because all the winners received as part of their prize, a day's work experience with each of the three judges for the respective year.

Overall for UCOL, the results and benefits of entering awards and competitions, showcases the course as producing high-calibre graduates by the industry and prospective students. For industry, it shows the potential of appropriate training. Canon New Zealand, for example, have now forged a strong association with UCOL in supplying high end video and photographic equipment for the programs. Canon also sponsor professionals to come to UCOL to speak about their business practice which is not only informative but a powerful inspirational tool for our students.

The experience of achieving high levels of success at the awards, helping behind the scenes, attending the conference and networking with professionals have contributed to a healthy symbiotic relationship between the students, UCOL and industry players. The combination of these experiences gives graduating students enhanced skills, vision and a network of potential contacts that collectively create a unique work integrated learning opportunity for our students to help set them up for entry into the photographic industry.

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# The Different Types of Cooperative Education: Identifying Factors to be Included in a Questionnaire

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This forms part of a larger project looking into the factors which are present within cooperative education and the possible effect they have in influencing a student's prospects of gaining their first job. The larger project involves an online survey about the factors identified and an assessment of the percentage of students who obtained work directly as a result of their participation in cooperative education. The various factors are also to be ranked by participants of the survey.

Previous research has shown that 68% of students obtain their first job through personal contact (Lloyd, 2001). One of the ways in which this personal contact could be developed is by the undertaking at least one of the various types of cooperative education.

## AIMS AND METHODS

This paper aims to identify the significant factors within the different types of cooperative education to enable them to be included in an online questionnaire. The types of cooperative education currently identified are: projects, placements, work experience, internships and sections. Although some of these are different names for similar types. The factors identified so far are: length, when within the study, who finds the opportunity, paid or not paid, where the experience takes place.

A literature review was carried out to explore the various terminology used and to see if there were any overlaps. A series of questions was then developed to show the factors connected with each type, and practitioners were interviewed informally to assess the importance of the various combinations. The practitioners were from different disciplines including, art, health and education. This also included the perspective from both participants in cooperative education and supervisors.

## RESULTS

The literature highlighted the necessity of good communication skills within all the stakeholders as well as providing some indication of gaps within the courses (Neyem, Benedetto, & Chacon, 2014). Kopi, Sheard, Naghdy, Chicharo, Edwards, Brookes, and Wilson (2009) in their survey stated that the students remarked that, although they felt their academic courses gave them the technical skills necessary for work, there was not enough emphasis placed on the soft skills. The student's confidence is also enhanced together with their professional skills and sense of professional identity after an internship is undertaken (MacDonald, Cameron, Brimble, Freudenburg, & English, 2014)

In their comparison of work-integrated learning students Hughes, Mylones, and Benckendorff (2013, p. 277) stated

> Responses obtained in this research suggest that integrating WIL into tertiary courses helps to produce work-savvy graduates with a range of transferable skills and informed industry perspectives.

The informal discussion undertaken with colleagues from a variety of disciplines confirmed the opinions found within the literature. The issue of contractual agreement also was discussed as a necessity for all stakeholders to ensure that everyone involved knows what is expected, not only of themselves but everyone else involved. This

prevents scope creep in project work and expectations in a work experience environment. Other factors highlighted were such things as transparency, student fit and good communication. While a lot of these can be discussed they are hard to measure, as some of them depend on the personalities involved and relationships between people.

A good fit between the student and their work placement benefits both the academia and the industry as it helps the student to grow and thus become a useful and competent employee (Parsons, Caylor, & Simmons, 2005).

Over 600 studies have been done during the last 90 years on cooperative education. One thing has been confirmed by all of these studies which is that students undertaking cooperative education:

> The more one works, in cooperative learning groups, the more that person learns, the better he understands what he is learning, the easier it is to remember what he learns, and the better he feels about himself, the class, and his classmates. (Johnson, 1991, p. 8)

The use of questionnaires to collect large amounts of data with a limited number of options is recognised as being very efficient(Lloyd, 2012). These can be used by a number of different modes such as online, in person or by mail. They also allow for distribution over a large geographical area. The advice from Joseph Janes (2001) and Sarah Cook (2005) is to only include questions in a questionnaire which are necessary for your research. This has a direct impact on this current research as the main purpose of this paper is to identify the factors that have the most influence on the success of the various forms of cooperative education.

The knowledge of the person who is answering the questionnaire is also important,(Reeves, 1996) so asking a musician about car maintenance would probably not achieve a great deal for example. The next phase in our research will be to confirm the target population.

The questionnaire development was not as straightforward as expected, as there was a lot of overlap and in some cases cooperative education was undertaken a number of times within the course of study for example, in the case of nurses and teachers who tend to have a progressive system of cooperative placements.. Also different countries used slightly different terminology for similar aspects. This meant that the survey needs to be changed to clarify some points and to allow for multiple incidents of cooperative education within a course of study. Table 1 shows examples of the questions developed:

TABLE 1: Survey question examples

| |
|---|
| Q1: Which of the following do your students participate in? |
| Projects with industry |
| Internships |
| Work placements |
| Work Experience |
| Q2: Who finds the above? |
| Q3: How much staff time is allocated to each project? |
| Q4: Do the students get paid? |
| Q5: How long at any one time do the students spend on these activities? |
| Q6: Where is the work mainly undertaken? |
| Q7: When within the course of study is the activity undertaken? |
| Q8: What proportion of the total course is this activity? |
| Q9: Could you please rank the following factors by your perceived usefulness to the student: |
| Type of Cooperative Education (e.g., listed in Q1) |
| Length of time spent |
| Who finds the activity |
| Where the activity is undertaken |
| Position within the course |
| Q10: Which country do you live in? |

Q11: What discipline do you teach in?

Q12: What percentage of students are offered employment by their project client?

Q13: What percentage of students are offered employment by another similar employer?

Note: Due to the fact that some courses have more than one instance throughout their study questions 1-8 will provide a table where more than one answer may be included.

## CONCLUSIONS

Due to the problems in measuring some of the factors identified such as communication, student fit and transparency these could not be included in the list of factors which were considered for the survey. They are however useful as a basis for discussion points to be used in the follow up interviews where a wealth of material should be able to be collected.

The results from the discussions appear to indicate that different disciplines seem to have different needs in this area. For example teaching and nursing seemed to have cooperative education a number of times throughout their courses tailored to the stage at which the student is, and thus providing a gradual easing into the industry. Whereas IT for example tends to have a major period of cooperative education close to the end of their course. The fact that all IT systems are different, and the learning curve in each is quite high, coupled with the complexity and sensitivity of some systems mean that in order for the industry partner to take part in such a process means that they will expect the student to be of use having invested the time in teaching them the systems.

This research paper has helped in the proposal and design of a larger project which the researchers involved have applied for funding to complete. Even if the funding is not approved a smaller version of the research project using a narrower focus will still be undertaken.

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# The Student Experience of Professional and Community Engagement at Macquarie University: Motives for Learning

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Professional and Community Engagement (PACE) at Macquarie University offers undergraduate students experiential learning opportunities with local, regional and international partners. Through PACE, students work on mutually beneficial projects that both meet the partner's organisational goals and enable students to strengthen graduate capabilities while gaining credit towards their degree and contributing to positive social change. Integral to its purpose is Macquarie University's aim to provide a transformative student experience.

## AIMS

This paper outlines some preliminary findings from the Student Experience of PACE project which investigates the perceived impact of PACE on students' graduate capabilities and career aspirations. The focus of this paper is to explore student motivations for undertaking a PACE unit, as one of the important determinants for the success of experiential learning programs. Attention will be given to assessing the impacts of motivational factors on learning, as well as the effectiveness of different types of PACE activities in this regard. The project adopts a mixed methods approach incorporating interviews, focus groups and a questionnaire survey of students enrolled in PACE units in 2014.

## THEORETICAL PERSPECTIVES

Educational researchers (Deci & Ryan, 2000; Valerand, et al., 1992) have shown that motivation is related to educational outcomes such as learning and performance. Motivation is perceived differently in various professional disciplines, but has been broadly defined as the process that initiates, guides and maintains goal-oriented behaviour and aligns with other constructs such as 'self-efficacy, locus-of-control and student engagement for they all share similar cognitive, affective and behavioural roots' (Nupke, 2012, p. 11). Dweck and Leggett (1988) explored the motivational patterns of behaviour providing a useful perspective on intrinsic and extrinsic behavioural factors of motivation, which are influenced by attitudes and goals. In addition, Valerand et al. (1992) as well as Deci and Ryan (2000) contend the occurrence of amotivational orientations, whereby there is neither intrinsic nor extrinsic motivation, as well as a quantitative dimension to motivation that involves levels or degrees of motivation. The ARCS model (attention, relevance, confidence, satisfaction) developed by Keller (1987), utilises the behavioural constructs of motivation to suggest strategies that enhance learning.

The diversity of motivational factors thus makes inquiry complex but essential in light of Nupke's (2012) suggestion that aligning the goals of students with those of the institution is important for sustaining student motivation. Furthermore, Dweck and Leggett (1988) determined a clear distinction in response patterns where goal framing by students had two orientations: performance and learning, which are influenced by individual values, theories of control and judgement or development goals. Higher Education Institutional goals are in turn being influenced by a global climate that is seeking to develop more responsive and civic-minded students. An emerging 'scholarship of service' is focused on the development of experiential programs such as service learning, internships and cooperative education, which have been shown to be contributing to increased

performance, interest and the development of problem solving skills (Bringle & Hatcher, 1996), as examples of motivational enhancers.

As a strategic intent of Macquarie, PACE is central to its mission of being a university of service and engagement. While research is limited on the role of service learning in institutions globally, evidence suggests an increasing trend towards providing flexible volunteering opportunities for students that align with their motivations and expected or perceived benefits University (Macquarie University, 2014). In particular, students reported that employability, skill development and qualifications, as well as contributing to the community or organisation, were instrumental motivators and benefits of engagement in volunteer programs (Smith et al., 2010).

## METHODS

A mixed methods approach to collecting data includes semi-structured interviews, focus groups and a questionnaire survey of students enrolled in PACE units in the first and second semesters of 2014. At this point in time the focus groups have not been conducted. This data sample includes interviews (N= 22) and surveys (N=237).

The demographic of students completing the survey included: students aged between 20-25 (69%), 26-30 (21%, > 30 (10%); female (70 %). The representation of students was: Arts (30%); Business (23%), Human Science (21 %) and Science (15%). Students completed their PACE unit in third year (42 %) or fourth year (44%), with full-time students (80%) and part-time (20%).

The diversity of PACE experiences ranged from: internship (26%); professional experience with practicum (25%); project based learning (17%); community development project (6%); community/ industry reference panel (5%); volunteering (8%); with smaller percentages in mentoring and community based research.

## RESULTS

In response to the survey question: Does PACE offer any distinct motives for learning?; 78% answered 'yes' and 22% 'no'. Responses from individual student comments collected from the survey correlated to both intrinsic and extrinsic motivators that indicated the importance of real life experience, a pragmatic approach to learning, as well as the opportunity to contribute and make a difference in people's lives. Extrinsic motivators, such as compulsory units, team work, were more prevalent where respondents answered 'no'.

## KEY EMERGING THEMES

Intrinsic motivators:

- reflection and critical thinking: "It made me want to learn more about the complexity of human rights issues/just be a better person";
- practical application of skills: "It did, through highlighting how much faster and deeper my learning can be through practical experience as opposed to more traditional methods of learning; being part of a real scientific research project was great motivation";
- employability: "showed me real world experiences and pathways to employment";
- positive contribution: "to make a real life change to people in the area".

Extrinsic motivators:

- host organisation planning: "our expected work was purely tokenistic; very few opportunities to learn";
- team compositions affected outcomes: "I was highly motivated at the start. My motivation fell when I found out my group was underskilled for a development project and we had to customise a CRM rather than building our own system";
- compulsory units: "It was a required unit".

Despite the challenges and unmet expectations of these extrinsic motivators, this did not necessarily take away from the experience, with students highlighting the benefits of skill development, practical experience and making a difference.

Interviews drew similar responses from students, but provided more detail as to the situational variables that contributed to their motivations and had an influence on PACE activities. The general consensus was that the motivation for doing a PACE unit was the opportunity to apply skills in practice; learn new skills; broaden horizons; improve confidence; and engage in real life experiences that change perspectives; contribute to and make a difference; and establish a link between study and careers. This last point was important to students if they were unsure where their studies would lead. They wanted to gain insights into their liking for their chosen area, and whether or not they were suitable for the job:

> …I don't think I was really very certain of where I was going with my degree. This unit really consolidated what I wanted to do … I had a few different options in mind but I wasn't expecting to be so driven …. That's what I want to do (student no. 0105)

Motivation was clearly relevant to achieving outputs and contributing to society:

> ...this degree that I embarked, I always wanted to see how I could contribute to society... I think as you're going through this degree without any of the PACE program's practical side of it, you feel like - how does this fit into …me contributing to society? But when I did that PACE program, it really linked that in and I felt like, okay, this is how I can contribute… I'm actually making a really big difference (student #103)

PACE activities provided motivation relating to the learning that can be applied in different settings for international students while other students were reciprocally motivated to travel overseas on placement:

> …When [I] return to my country one of the purposes of this program that I came here, is to be in contact and ... know more about how is the work here and bring some new ideas to my country. If I didn't do the PACE unit, I think it is not so good. So [the] PACE unit gave me this option to know more, to see how this works. If this could be applied in other places (student #91)

Importantly motivation changes/grows during the PACE experience:

> … it was a compulsory unit for me …, but one of my motivations though I think as the course started ... I realised what it entailed, … this was a really great experience for me, because it was so different to my whole degree (student #103)

Extrinsic motivators such as adequate planning, good supervision, feeling part of the organisation or community and being acknowledged and valued were additional motivators through the placement activities that resulted in greater benefits to students. According to (Darby, Longmire-Avital, Chenault, & Haglund, 2013), students are motived by their own expectations as well as by those of their hosts. One student was motivated by personal circumstances relevant to the placement that was considered could provide insight and learning.

Some PACE units were compulsory, which raised a number of issues that could decrease motivation, such as reported anxiety and apprehension about what to expect. Students undertaking internships, where close attention was paid to matching skills to activities, were generally more motivated than students who felt their choice of placement opportunities was limited because of a large student cohort that was managed on a preference system. In addition, the length of the activity and the time factor were relevant motivators in some instances. Factors decreasing motivation included communication problems, poor planning and lack of integration between the academic content and experiential component (Darby et al., 2013):

> …when I came to Australia, I thought that I could do some internship or some contact direct with patients because I was in this level in Brazil, that is my country. When I arrived here, the people said no, and I said, oh, what am I doing here? (student no. 0091)

## CONCLUSIONS

This research has aimed to highlight the importance of understanding motivation as a key factor in meeting the expectations and providing benefits for students undertaking experiential programs such as PACE. The complexity of factors, both intrinsic and extrinsic, requires institutions to lead programs that provide the accessibility and flexibility to accommodate this diversity, while still achieving mutually beneficial outcomes for all key stakeholders. While the research has shown that the majority of students are satisfied with the learning outcomes of their PACE experience, other indicators suggest the need for further research and program improvement, especially in the area of expectations and challenges, which are being explored through the larger research project. The aggregated data of the larger research project will provide a more rounded view of the student experience.

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# Employers' Reflections of Work-Integrated Learning Students in the Culinary Sector

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The hospitality industry has seen considerable growth. This broad spectrum of facilities requires a labour force that is skilled and knowledgeable with a variety of personal attributes to maintain a highly competitive industry. Understanding the requirements and expectations of employers would be helpful to students, hospitality, and culinary educators.

## BACKGROUND

Le Cordon Bleu NZ Institute offers a Bachelor of Culinary Arts and Business (BCAB) degree. This applied degree has a strong emphasis on theory and experiential learning. Whilst the programme is in its third year, it is important to assess the progress and success of students in terms of their work preparedness.

The Volume and External Catering course is a component of the BCAB. This course incorporates a compulsory WIL component in the catering sector. Catering for large volumes off-premises has meant authenticity was required for students to experience the true nature of such activities. In order to provide students with an authentic learning experience, a WIL partnership was created with two catering companies in Wellington. In this study the author endeavours to establish what skills and knowledge make a student employable in the culinary sector.

## LITERATURE

The hospitality industry is rapidly changing with growing demands for innovative, healthy, organic food and high service standards (Hu, 2010). These rapid changes have led to a call for more skilled hospitality management professionals.

Harvey (2003) maintains that students often leave tertiary education with little understanding of the workplace environment and their adjustment to working cultures incurs high costs. There seems to be gaps between the skills and knowledge students obtain from tertiary education and what industry employers need (Chivers & Flatten, 1996, Harvey , 2003). In an effort to improve staff retention and productivity, foodservice managers are looking to institutions to provide professionals with appropriate knowledge and skills to meet their requirements.

According to the Tertiary Education Strategy 2014-2019 (Ministry of Education, 2014), there is increasing demand for graduates to compete on the global market but to be successful they will need to keep their knowledge current, be innovative, creative, be critical thinkers and have a professional work ethic. Government is looking to New Zealand tertiary education organisations (TEOs) to improve their effectiveness and encourage TEOs to engage more closely with industry to share knowledge between the two sectors, to ensure that graduate profiles are well matched to industry requirements and that skill shortages are being addressed.

It is important to define what employability means. According to Yorke (2006, p.2.) employability is

> a set of achievements – skills, understandings and personal attributes – that make graduates more likely to gain employment and be successful in their chosen occupations, which benefit themselves, the workforce and the economy.

Harvey (2003) further defines employability and emphasises the importance of critical and reflective skills in enabling and boosting the learner.

A number of skills and attributes have been highlighted in literature as being important for graduate employability (Dacre Pool & Sewell, 2007, Tesone & Ricci, 2012). Employers define employability skills in specific terms such as business and customer awareness, problem solving and communication. Other research categorised employability skills in more general terms for example transferable skills, such as communication that can be applied in different contexts. Core skills relate to the practical abilities required to perform a task such as cooking techniques (Yorke, 2006).

Archer and Davison (2008) maintain that employers believe communication is important but they expressed disappointment in graduates' inabilities to communicate effectively. Archer and Davison's research indicates that employers placed communication skills and teamwork as being more important than any technical skills. They reported that 'social skills' and 'personality type' were considered more essential than graduates' degree qualifications.

Employers want graduates who are responsible, intelligent, can show initiative and apply themselves to the roles they are given. They expect graduates to be reflective, critical and be able to analyse and process information at a higher level to add value to their business and be more effective (Pegg, Waldock, Hendy-Isaac, & Lawson, 2012).

Lowden, Hall, Elliot, and Lewin (2011) also highlighted the necessity for structured work experiences to be provided to students with sufficient number of WIL opportunities built into the curriculum. Exposing students to the industry allows them to further develop current skills and knowledge as well as gain new skills that may be difficult to grasp in the classroom.

## METHODOLOGY

This was a qualitative study using a multi-methods approach to collect data from three different sources to triangulate the findings. The research started with conducting a survey of established catering companies in the Wellington region. The purpose of the study was to engage with the catering industry and acquire some understanding of employer expectations of students, to prepare students for WIL and any future employment. A small sample of catering companies were selected as it was intended to learn about specific expectations for the students who were embarking on WIL with the company. Seven managers from five companies responded.

A questionnaire was sent to the seven managers however four managers responded and completed the questionnaire. In the questionnaire, managers were asked to rate a range of personal attributes, technical skills and abilities in order of importance. They were also asked about their preferences for qualifications and the minimum number of work experience hours per they expected students to have in a three-year degree.

Two of these managers were then selected from two different companies and informal meetings were conducted to discuss the managers' further expectations of students during the WIL. Notes from these meetings were compiled and used as a secondary source of data.

The final source of data was the documents created as a guide for students in order to prepare them for the WIL experience. Managers were asked to provide their expectations and requirements for working at their organisations. Each company highlighted different requirements of the students.

These research methods were selected with the purpose of gaining specific insights into catering business requirements and were used to enlighten rather than provide generalizable findings.

## ANALYSIS

The primary data came from the questionnaire that was analysed for the frequency of responses. This analysis was used to ascertain the common themes that employers considered important and what they considered to be more valuable. The data collected was analysed using a five point rating scale, where 1= not important and 5 = very important. In other questions managers were asked to place skills in order of importance. These were given weighted scores. These scores were converted into percentages in order to compare the frequencies.

In the analysis of the notes and student requirements guide, the information was read several times and coded according to the analysed common themes that appeared in the questionnaires. The codes were then assessed for the frequency of themes. In some cases codes developed from the questionnaire appeared too broad and were broken down further for more detail analysis in the content analysis documents. The codes were included in the final analysis for the frequency of themes.

## FINDINGS

In the final analysis 22 themes emerged from all the data sources. These themes were categorised into three sections namely, technical skills, personal attributes and generic skills. The following provides a list of the initial codes derived from the questionnaires.

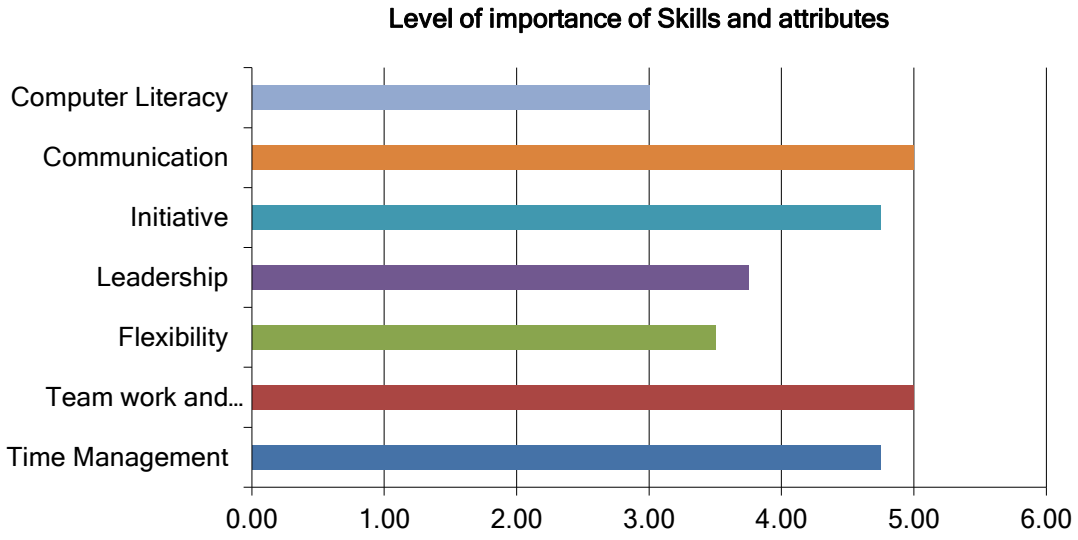


FIGURE 1: Employer perceptions of important skills

In Figure 1, communication (100%) and team work and cooperation (100%) were analysed to be the most important and valuable skills to have. The data for communication was further triangulated in the meeting notes and the requirements guide where communication (12%) was strongly emphasized and showed the highest frequency in the coding analysis (Figure 2). The data correlates with the literature reviewed which has indicated that communication skills are most important for employability.

Teamwork was rated also as one of the most important skills with a 100% rating however it has a lower rating (5.56) in comparison to the other skills and attributes in the content analysis. On closer analysis of the content, teamwork could be linked to cooperation and communication. When reflecting on the literature review these findings correlate with the high demand for this skill evident in other research findings.

Time management was the 3rd highest scoring theme in the questionnaires however on closer investigation (refer Figure 2) it seems that managers were more concerned about student's efficiency (11.39%) time pressures and being organized. It is important to understand that in the catering industry timing of all activities is essential for a successful event and so it is no surprise that this skill is ranked high in importance.

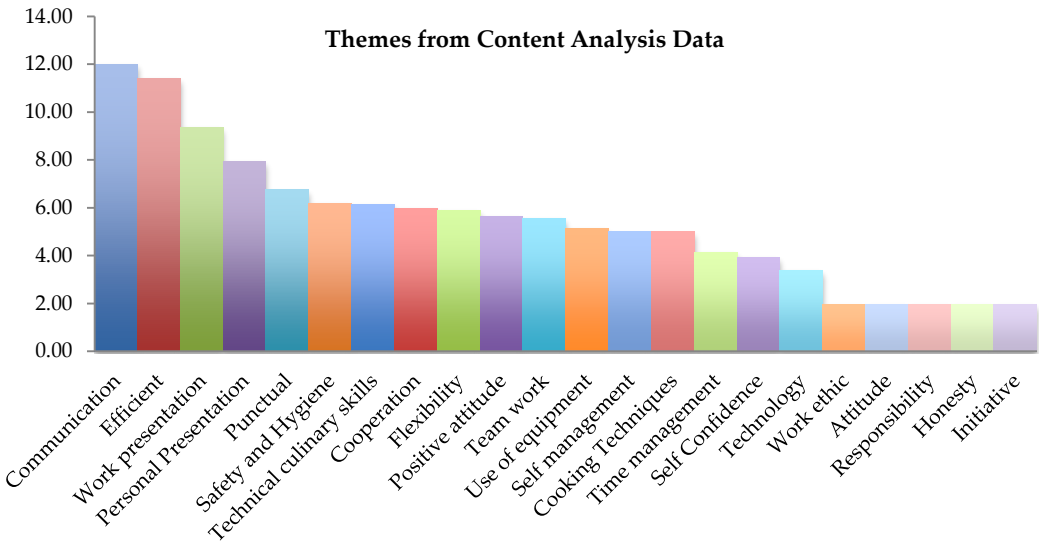


FIGURE 2: Employers expectations of skills and attributes

Having initiative (95%) and a positive attitude (89%) were also indicated as being important attributes in the questionnaires however this evidence does not seem to resonate as strongly in the content analysis. In the content analysis positive attitude (5.63) had an average rating. This is in contrast to what has been seen in previous literature reviews where employers have expressed positive attitude and initiative to be highly valued.

Fifty percent of the respondents indicated that the minimum level qualification they would require would be NCEA Level 3. One respondent also indicated the importance of having other certificates such a First Aid Certificate and a Driver's Licence. A degree was not considered an important criterion.

Managers were expecting students to have a high level of industry experience whilst studying. Fifty percent indicated that students should gain between 120-360 hours of work experience per year. This correlates with other literature, which emphasizes the importance of students gaining structured work experience to prepare them for their future careers.

## CONCLUDING REMARKS

Overall the findings reveal the importance of certain skills as being essential. These skills need to be integrated throughout the curriculum to ensure students practice them within the institution and in the workplace. It is recommended that the number of expected work experience hours for students be addressed further to meet the industries expectations.

Some key concerns to be considered for future research would include:

- Are students gaining sufficient work experience hours?
- Should the work experiences be linked to specific courses or applied across all courses?
- How can transferable skills be integrated across all course?
- How work ready are the students?

It is important to highlight that this study was limited to a very small sample within the catering sector, which means the findings are not generalizable and limited to a specific sector of business. However it is hoped that this research highlights some important points to be considered regarding employability, which can be applied to other sectors.

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# Closer Industry-Student Relationships: Connecting Students to Industry Throughout their Academic Timeline

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The applied Bachelor of Computing Systems at the Eastern Institute of Technology (EIT) requires a compulsory 45 credit industry-based project or internship over one final semester. Initial exploratory experimental changes are being implemented which facilitate students into a cadetship 'buddy' system at or near the beginning of their studies.

Much has been discussed in the cooperative literature and in tertiary sector strategy about a need for closer partnership between university and industry generally (Fleming, 2013). One of the most effective conduits for closer relationships and more effective cooperative models are the students themselves and the cadetship concept can enhance and broaden the traditional cooperative experience.

This paper discusses some recent examples of students communicating, partnering and working for companies in their field of study before their internship or project and during their first 2.5 years of study. This means a three year pathway for students who may enter into a cadetship arrangement within the first year of study with industry partners culminating in their final cooperative experience. The ICT degree pathway and model has been previously discussed and considered by other New Zealand institutes as well (Cleland, Snell-Siddle, & Steele, 2010) and is likely to expand to other tertiary institutes as a point of difference and a logical extension of the successful industry final projects and internships.

## THE BENEFITS OF STUDENT-INDUSTRY PARTNERSHIP

A cadetship student will benefit from having experience with an organisation in the form of meetings, part-time work and specific industry projects embedded into some of their academic assessment work. This will help ease the transition of the student into any full-time cooperative experience at the end of a study programme or degree.

By allowing early industry input into the student's development, it is likely to have a positive effect on their overall tertiary experience due to them having an industry goal, an industry relationship, an eventual assured internship, and a higher likelihood of employment at the end of their degree.

From a marketing perspective, the incentives and industry scholarships that may be available for the higher achieving student direct from secondary school should provide greater motivation for the student as well as benefit the cohort of students that they study alongside. Some research suggests that students enjoy and are more motivated when studying with higher achieving and focussed peers particularly in the area of persistent behaviour (Pascarella, Wolniak, & Pierson, 2003). So the cadetship concept does potentially offer opportunities for institutes and universities to incentivise enrolments from top academic students from secondary schools and those in the workforce already. These students may then exert a positive influence on their overall cohort of students.

## THE RISKS OF A THREE YEAR STUDENT-INDUSTRY PARTNERSHIP

One of the constraints for this early industry connection may be the pressure on the coordinator and associated academics to facilitate the process of matching individual students to specific organisations. This would also typically be done at a time when little is known about the incoming students other than secondary school results and, in some cases, previous work experience. Which leads to another risk that the reliability of students to

respond to this new opportunity, given that the abilities and aptitude of new students are often unknown until after at least one semester of year of study, is more of an unknown compared to senior third year degree students.

One filtering method may be to allow an opt-in choice during the enrolment process so only students keen to join the cadetship will be considered initially. Another risk will be that some students will withdraw or fail during the first two years of a degree, and leave the degree programme, thus rendering the extra effort of arranging the industry connection to be redundant.

The number and availability of willing industry sponsors to commit to a three year pathway or buddy system of regular contact may be lower than the overall number of industry organisations willing to sponsor a third year internship student. Any agreements or industry scholarships may need to continue over a three or four year span during which the company ownership may change or changing profitability may affect their ability to offer students on-going cadetship support.

Finally, a more strategic academic risk could potentially emerge where the student and/or industry partner considers the work experience and partnership more valuable than the academic study and the tertiary institute in in some way disintermediated from the multi-layered process.

## A CASE STUDY

The early buddy system was raised initially at EIT by a local advisory committee member (LAC) member in the school of computing at EIT. So when a high achieving student from a local high school was undecided between enrolling at a university and the institute of technology, the LAC member who co-owned an information technology company was invited to offer a cadetship and an industry scholarship. The company agreed to offer a cadetship to the student after meeting them, and this will include a two year partial fee scholarship (this is in addition to the Year 13 first year full fee scholarship offered by EIT). The cadetship will begin with fortnightly meetings, then a small amount of part-time work, with investigations into weaving academic assessment with industry small projects at the company, and finally leading to an internship with the same company.

### *Scalability*

While proving to be successful so far in these early developments, the scalability of such a cadetship for all applied degree students at EIT may prove to be challenging.

One or two high achieving and motivated students working with supportive companies is manageable. However, an influx of 50 new first year IT degree students (as has occurred in 2015) would be more of a challenge to arrange cadetships for.

However, it may be possible to increase the number of connected students in an organic way informally, much like the internship/project where the student currently makes their own arrangements. In the example of the Australian Government ICT cadetship – this is initiated by the student themselves who are already enrolled at any university and after at least one year of study then may apply to join the governmental cadetship and continue studying part-time while working two days per week (Australian Government, 2015). So instead of the institute or university arranging everything for the student, it may be possible to document and advertise the potential of any similar cadetship arrangement and let the student make arrangements with industry providers, while still providing coordination support when needed. Encouraging students to take ownership of their cooperative education planning and networking towards this aim is part of the preparation by the student for any cooperative experience (Martin & Hughes, 2009) and would also prove important for cadetship preparation.

### *Feedback so far*

Student feedback has been positive so far, with one student choosing to study with the institute instead of taking up a university offer largely because of the cadetship option that was offered. Another student who made these kinds of arrangements in an informal manner themselves over two years leading to their internship pointed out

that they probably would not have been offered such an advanced internship if they had begun their internship without an industry 'buddy' arrangement occurring beforehand.

## DISCUSSION AND CONCLUSIONS

There would appear to be good potential for tertiary institutions to setup cadetships, early connections and industry scholarships leading to more challenging internships and final projects providing a full rich academic/industry coalition over three or four years. The cadetship offering may exert an influence on lecturers who will need to respond to 'cadets' in their classes and allow more industry-driven assessments more suitable for cadets and their industry partners. Early connectivity to industry partners by students is likely to lead to increased successful employment outcomes to graduates, and may provide a useful future line of research for comparing degrees that offer this type of cadetship with degree which only offer on main cooperative experience.

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# Developing Collaborative Learning Technologies in Association with the Creation of Local Indigenous Services Products

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A small research group at Charles Darwin University, working collaboratively with Indigenous colleagues, are developing a social sciences setting in which products for 'local indigenous services economies' might come to life. The imagined products in these economies take the form of delivering services involving Indigenous languages, cultures, or community research. In this endeavour, it is assumed that those organisations that purchase these services delivery products will be government organisations, non-government organisations, businesses, and individual consumers.

Currently in Northern Australia, there is a proliferation of markets in Indigenous services provision. In part this is due to increasing interest in Indigenous cultural experience, art and artefacts. It is also to do with shifts in government policies seeking to devolve responsibilities for services provision to civil society organisations, businesses and NGOs involved in economic activity. We promote research and learning in processes by which new types of workers associated with the projected emergence of so called 'sharing economies' and their products in Northern Australia might emerge.

Examples of services delivery products provided and procured under the trading arrangements of sharing economies are the "ground transportation services" a worker/owner delivers when driving his or her own car as an approved *Uber* driver, or the "hosting services" a worker/owner delivers when renting out accommodation spaces as an approved *Airbnb* provider. We are of the view that the figure of the worker—the services deliverer, in these sorts of economies is radically distinct from the conventional figure of the worker that has come down to us from the twentieth century. Instead of an individuated worker as a detached subject selling labour, the approved *Uber* driver, and the approved *Airbnb* host, are embedded and emplaced.

## CHARACTERISING PRODUCTS OF THE SERVICES DELIVERY SHARING ECONOMY

In this section of the paper we first characterise the services delivery products associated with the workings of the sharing economy in general terms, paying particular heed to the figure of the worker both entangled in them, and generated in them. Then using this general picture we sketch out the idea of an Indigenous language, culture, or community research services product, and consider the particular figure of the Indigenous worker who might come to life in such services products. In the second section of the paper we turn to considering the workings of a suite of collaborative learning technologies by which such workers might come into existence. In doing this we recognise that our provision of services to our collaborating Indigenous learners mimics the services products they might find themselves delivering. We recognise the iterative self-grounding nature of the collective activity we are involved in as researchers and services providers.

The products generated in and traded in a sharing economy are partly resources mobilisation (utilising resources—a car or an accommodation space), partly human bodily action (driving a car, or maintaining a space as clean and tidy), and partly also cognitive activity (navigating a city efficiently, imagining your space as accommodation effectively). To describe these products and discern the figure of the worker at their core, we mobilize the social science analytic of performativity.

As a social sciences analytic concept 'the worker' is conventionally mobilized as a 'high-level' organizing concept; it frames, among other things, the context of learning to be a worker of a specific sort. We are problematizing the concept of 'worker' by refusing to invoke some external concept derived from theories of economies and labour.

Instead we treat the phenomenon of being a worker as emergent from the collective practices in which it clots. To make this shift is to adopt the analytic approach of performativity, to see realities as emergent in collective enactment. Here Callon's work which treats markets, products and consumption as hybrid mixtures of people and things that constitute services from within their own interactions is salient (Callon, Méadel, Rabeharisoa, 2002). In particular, agency, of humans as workers for example, operates in complex ways within the webs of relations that emerge performatively. Taking this approach we can articulate the services products like '*Uber* ground transportation services', as technologically mediated, self-grounding products which bring into being a form of 'workerhood' we characterise as distributed. The agency of the worker—what he or she 'sells' as a form of labour, is embedded as much in telephones, cars, and cities as the worker's familiars, as it is in the workers' driving skills, services delivery demeanour, and navigation capacities. Workers are thoroughly entangled in both hard and soft infrastructure; it is the 'hybrid collectif' that has agency as a services provider (Callon & Law, 1995).

So how might we imagine an Indigenous language, culture, or community research services product? And how to characterise the form of 'workerhood' this product expresses? In doing this we draw attention to an ontological insight that has evaded most non-Indigenous inhabitants of Australia since the 1780's. In Aboriginal thought and culture people and place are ontologically one. Realness is different in Aboriginal ways of knowing. Language, culture, and knowledge mobilised in community research are located as much in place—in the land itself, as it is in Aboriginal populations—the peoples. And Indigenous autochthonous institutions which might be mobilised in language, culture and community research services delivery express that truth. Just as in *Uber* driving and in *Airbnb* hosting, Aboriginal providers of language, culture and community research services, mobilise a form of soft-hard infrastructure, in this case Indigenous people-place.

## A UNIVERSITY BASED EXPERIMENTAL SOCIAL SCIENCES SETTING

Seeking to promote indigenous employment and workforce development within new markets which include indigenous voices and aspirations, we are working to develop a university based experimental setting enabling learning that will equip participants for engaging with the emergent practices associated with the creation of new local indigenous services economies. In doing this collective work, of imagining this novel pedagogical setting we ourselves are inventing a services delivery product of exactly the sort that those who learn with us will regenerate in their local places.

Our ground-up social sciences setting is focussed around five main 'rooms' for research and learning: Local/Indigenous/Services/Marketplaces/Laboratory. Each of these 'rooms' exists as a separate workplace on a laboratory website. The first four operate primarily as repositories for materials contributed by participants including stories, photographs, CV's, testimonials, brochures, academic papers, government reports, maps, travel documents, weblinks and reflections on how these objects may be altered or affected through being hosted on a web platform. We think of these rooms individually and collectively as 'technologies'.

Writing on the emergence of scientific experiment within laboratories in the mid-17th Century, Shapin and Schaeffer identified new sets of material, social and literary technologies as generative of the new objects of knowledge beginning to emerge within scientific practice (1985: 25). Their suggestion was that the making of scientific knowledge was not a process of discovering pre-existing truths or latent capacities, rather it was a performative outcome generated in the interrelation of differing technologies – the materiality of physical equipment and their workings, socialities of institutional etiquette and behavioural norms, and literacies enabling the collective witness and evaluation of events beyond those immediately present.

Also adopting this heuristic, as a way of describing and gaining a handle on collaborative learning practice within our rather different setting, we see the experimental work of this social science laboratory as also implicated within the workings of social, material and literary technologies out of which may emerge new indigenous services products, and those delivering them. Collaborative learning promoted by our experimental social science setting, highlights this involvement and seeks to prioritise means by which the interrelation of differing technologies might be worked in setting of our work, and in distributed enactment of settings of future services delivery.

The work of this experimental social sciences setting may take place partly online, and partly on-country, as collaboration and interaction mediated both by internet connectivity and face-to-face discussion. Working with gathered materials and to elicit new resources, collaboration is around the design of new indigenous services economies fit for purpose within a current era of localist governance and its emphasis on enterprise development. The learning and experimentation taking place in this environment is not restricted to a particular training module, but rather involves the work of proposing, shaping and negotiating forms and involvements of distributed workforces mobilising hard-soft infrastruture and embedding particular figures of 'the worker'.

Added then to these three technologies is also a fourth, 'the working imaginary' emerging within these practices and experimenting with their assembly and interrelation. As an imaginary always in the process of being in construction, the social science category of workforce does not pre-exist but emerges within these distributed negotiations. The context of learning becomes one in which texts, social coordination and material practice feature as participants in process of active creation in which the figure of the worker involved in indigenous services products delivery emerges through and is negotiated within services products design.

Indigenous services products connecting the imaginaries of sharing economies products, and indigenous people-place might be tentatively explored and reached towards within this setting; eliciting materials and stories, work within differing social, material and literary technologies Generating for consideration and exporation the ways in which these technologies surrounding services products delivery of bush tucker trips, Yidaki lessons or cultural competency training might emerge or reperform themselves within services economies and indigenosu people-place.

Seeking ways to find and articulate 'good enough' connections between the mobilisation of new technologies of services products design, and other commitments by service deliverers, the is the task of this final technology; the 'working imaginary'. Generating modest connections between the performance of people-places being done within language, culture and community research as services products, alongside other commitments being juggled and shared by the indigenous workers of these emerging economies.

Within this approach there is no separation between the epistemic work of gaining new knowledge, and the ontological work of crafting new realities, however there is the possibility of differentiation and boundary making in the course of imagining and delivering service products. As collaborative learning and marketplace design occur simultaneously within the practices of the laboratory; and participants generate new knowledge and skills in the course of creating the market possibilities that might support their aspirations ongoignly.

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# Analysis of ICT Capstone Project and Internship Characteristics

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Industry based cooperative education capstone projects and internships are often a core component of ICT and computing degrees throughout the New Zealand tertiary sector, usually existing as the focal point of the final year of study (Steele, 2010; Steele, Cleland, & Engelbrecht, 2013). Previous work examined student reflections of these capstone projects and suggested relationships existed between communication, time management, and achievement (Steele et al., 2013). Subsequently it has been suggested that these cooperative education projects and internships can results in extremely varying experiences for students depending on the ICT focus area and work environment (this could in turn potentially impact communication, time management, and achievement). Of particular interest is the day-to-day working environment that the students are engaged in during their projects or internships and its relationship to the overall outcomes. One extreme sees students functioning as ICT experts working as the ICT lead in some projects, this is in contrast to other students who undertake internships or work within existing ICT teams in an apprenticeship type role. A recent study focused on graduate perceptions of ICT education found working graduates to advocate overwhelmingly for more industry related learning including: industry involvement, workplace learning and business experience, and other real-world activities (Koppi, Edwards, Sheard, Naghdy, & Brookes, 2010). A related report that investigated industry and tertiary education provider's perceptions of work-integrated learning (WIL) determined that a successful WIL experience should provide students with an improved understanding of professional responsibilities within the workplace and should assist with the attainment of generic skills which are strongly valued by industry (Ogunbona, et al, 2013). Other studies have also highlighted the variety of forms that WIL can take within ICT education, ranging from work-experience and internships through to industry-linked projects, however the differences in student experiences were not explored (Pilgrim, 2007). A more closely related study by McLay and Skelton (2007) contrasts ICT projects and internships and highlights many benefits associated with the internship apprenticeship approach (i.e., professionalism, set working hours, communication skills, and master-apprentice mentoring), as well as a number of barriers associated with traditional projects (i.e., limited interaction with project sponsors, lack of professional mentoring, and a lack of structured work environment).

## AIMS

This paper aims to identify and classify the different cooperative education environment characteristics that emerge from different ICT student WIL experiences (e.g., ICT expert through to ICT apprentice). These characteristics are also explored with relation to student levels of academic achievement. The intention of investigating this relationship is to provide insight into the types of ICT cooperative education projects and internships that result in more positive outcomes for students. This information will assist educators in developing academic support strategies to improve the overall experience for future students.

## METHOD

The research sample covered a period of five years (2010 - 2014) of all industry project and internship enrolments (n = 128). These were analysed with specific focus on the characteristics relating to the students role and relationship with the project or internship sponsor and the work environment. The analysis consisted of a detailed review of each project which took into consideration a number of factors including: the type of work, the subject area, the students existing skill set, the host organisation and work environment provided, the project sponsors area of expertise and level of involvement, and if there were any project stakeholders supporting the student. As a result of this analysis, naturally occurring project or internship 'types' were identified.

Subsequently, each of the projects and internships were categorised according to the identified types. These project types were then explored with relation to academic achievement.

## RESULTS AND DISCUSSION

The initial analysis led to the identification of three main categories: student as an expert, student as a subcontractor, and student as an apprentice. The student as an expert category typically consisted of projects where the student was the primary source of ICT expertise, for example, a student developing a dynamic website or database solution for a small business. The student as a subcontractor category typically consisted of projects where the student was supported by other project stakeholders with specific areas of expertise (e.g., ICT, business knowledge, design, etc.). Examples of subcontractor project types include students developing web or mobile applications alongside a graphic designer, students exploring a new area of technology for an ICT team or business, or students involved the analysis of systems where they are assisted by a domain expert. The student as an apprentice category typically consisted of internships and projects where students have an ICT mentor or are integrated into an ICT team, for example, students who upgrade or redevelop existing products where the project sponsor is the original product developer, students who assess wireless coverage of an existing network for the Network Administrator, or students who work as part of a development team on a specific project with senior developers. The results correspond to previous work which had discussed the clear distinction between ICT projects (student as an expert) and internships (student as an apprentice) (McLay & Skelton, 2007), but extends this work through the addition of middle category (student as a subcontractor). Of the 128 projects 67 were classified as student as an expert, 30 were classified as student as a subcontractor, and the remaining 31 were classified as student as an apprentice (see Table 1).

TABLE 1: Project types and related academic achievement information

| Project Type | Count | Overall Average | Fail Count | Average (completed) |
|---|---|---|---|---|
| Student Expert | 67 | 60.05% | 15 | 72.34% |
| Student Subcontractor | 30 | 72.56% | 2 | 77.50% |
| Student Apprentice | 31 | 79.25% | 0 | 79.25% |

When overall academic results were averaged for each of the project types the data suggested that student as an expert projects (60.05%) resulted in a lower levels of achievement than student as a subcontractor projects (72.56%) or student as an apprentice projects (79.25%). It is worth noting that the student as an expert category has the highest rate of failure with 15 of 67 resulting in a failing grade (less than 50%), however of these 15 fails 12 of the students disengaged early in the semester and subsequently did not complete the majority of the assessed components. When early disengagements were excluded from the data the averages for the student expert and subcontractor categories improved, however the overall pattern of achievement remained consistent. The results suggest that students in more supportive cooperative education environments are more likely to have higher levels of academic achievement and are less likely to disengage. In contrast, students who work independently without harnessing stakeholder expertise are more likely to disengage. It is worth noting that causation cannot be established from the data collected in this study, that is, students as an expert projects may result in lower academic achievement due to the project type, or lower achieving students may have a preference towards student as an expert projects. In order to help determine causation future work could examine these results in conjunction with student grade point averages.

Prior to this study all of the projects and internships undertaken were considered relatively equivalent, each with their own benefits and disadvantages. For example, at one end of the spectrum students who functioned as an expert were thought to have more freedom relating to technology selection and standards but less assistance in completing tasks and ensuring adherence to best practice standards. At the other end of the spectrum, students who functioned as an apprentice were thought to have less freedom as they are conforming to an existing work

environment, yet they have the advantage of being able to access much greater assistance and are often provided with expert confirmation when work is completed correctly. Based on the results of this study it has become apparent that there is some discrepancy in the original notion that all projects and internships are equivalent. It is interesting to note that a key difference between the project and internships types is that the subcontractor and apprentice students are usually consistently working within a professional environment, whereas students functioning as an expert often undertake the majority of their work from home.

## CONCLUSIONS

This paper sought out to investigate the different cooperative education environment characteristics that emerge from different ICT student WIL experiences. The analysis of these project characteristics resulted in the identification of three project and internship categories: student as an expert, student as a subcontractor, and student as an apprentice. These categories were further explored with relation to student levels of academic achievement. The study found that the student as an expert projects had lower levels of academic achievement and higher disengagement. In contrast, student as an apprentice projects and internships had higher levels of achievement, with student as a subcontractor projects sitting between the two. Although causation could not be established from the collected data the results are still of interest for those involved with the delivery of ICT capstone projects and internships. Future work will aim to further explore the results of this study with relation to student's grade point averages in order to help determine if a causal relationship exists. In addition, results from this study could be analysed in conjunction with previous work that investigated student project reflections with academic achievement (Steele, et al. 2013).

Based on the findings of this study the researchers believe providing an in-house work environment for students functioning as an expert could help improve outcomes by increasing student accountability, providing a more structured work environment, and facilitating a professional work environment. The intention would be to mitigate the apparent risks associated with students who work in isolation. Ultimately, the findings of this study should prove useful for those involved with the delivery and management of industry based projects and internships and could potentially be used to help improve the education experience of ICT students undertaking cooperative work-integrated projects.

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# Fairness in Organisational Communicative Practices in Cooperative Technical Education

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As Alh, Nwabudike, Chiejile, and Biose (2009) state, technical education (TE) is an important mechanism which can be employed for the development of a nation's economy (p. 734). Technical Education is capable of reversing a poverty trend in a nation, ensuring that learners have the requisite knowledge to fill a resourcing need – in for example: agriculture, industrial, business, paramedical and other occupations. In its co-operative form it also fills a vocational need between scientists/knowledge workers and skilled craftsmen. A rationale for co-operative technical education includes:

- An effective and trained workforce
- It promotes dignity of labour, communication, and information capital as a goal of education
- It equips individuals with appropriate skills for society
- It increases productivity and earning
- It provides training for essential support services
- It refines values and attitudes to work
- It stimulates growth

## FAIRNESS IN THE VOCATIONAL LEARNING RELATIONSHIP

Whether or not an exchange takes place in a working or learning context, the value of a 'psychological contract' in the form of a learning scenario, or an instructional analysis, has inherent worth in education, as in the workplace. Working out the merits of a proposal is itself a constructive act in any workplace context. As such, the 'fairness' of the contract is in part based on a 'right to speak'. Fairness is an important principle in the workplace as it underpins most co-operative activities.

The concept of reciprocity and empathy has evolved to keep people in touch with the needs of others. For most people moral reasoning appears at a young age and develops through to adulthood. As Goltz (2010) suggests, basic to perceptions of fairness is an estimation about the strength of a relationship (p. 167). Furthermore as Liang (2013) observes, people experiencing unfairness are less concerned with a material pay-off than with rejection, identification with a social group is important for self-esteem. Unfairness may persist in areas people perceive of as being fair – women and minority ethnicities may be under-represented, inequalities may persist in terms of rank, salary, and working conditions, for example. Relational contracts evolve over time based on interactions, but transactional contracts are more short-term and outcome-focused based.

Sensitivity to fairness can vary. People who are higher in 'justice orientation', can be more sensitive to justice issues, and are always looking for ways to improve, but those lower in justice orientation are usually less troubled by unfair treatment (Goltz, 2010, p. 172). Trust is essential for any psychological contract. Violations of psychological contract can occur when organisation either knowingly breaks a promise or when employee and organisation have different understandings about what employer wants. For many people, some degree of cognitive dissonance is the norm – whereby individuals become anxious after experiencing inconsistencies such as information and events that are inconsistent with their expectations. As Goltz (2010) states, typical reactions (at least initially) are that people ignore their awareness of the unfairness or they may reinterpret the situation as

being fair (p. 173). The way to mitigate perceptions of unfairness is through controllability of events, and the ability of people to influence events, implicit in these is an exchange of views – a 'right to speak', and range of attitudinal positions is provided in Table 1.

TABLE 1: Range of attitudinal positions for perceptions of fairness/unfairness

| | |
|---|---|
| World is fair | World is unfair and cannot be controlled |
| World seems unfair but is really fair | World is unfair but can seem fair |
| World is fair and if not fair, can be negotiated | World is unfair but can be negotiated to be made fair |

It is thought that people 'construct' their environment through their experiences. The motivation is that people seek 'mastery' over their environment, that is understanding and control of it. But if there is an independence between their behaviour and important environmental rewards, people may experience symptoms of learning difficulties, or even passive behaviours and depression. Thus a reciprocity in the context of workplace learning is a form of empowerment (Kubiak, Siefert, & Boyd, 2004, p. 127).

## APPLICATION OF 'RAWLS ON FAIRNESS' TO THE WORKPLACE CONTEXT

The eminent American philosopher John Rawls (1999) defines social cooperation as a concept of how the basic structure of social institutions should be arranged such that all members of society would accept the distribution of benefits and burdens of co-operation. This further emphasises the tri-partite relationship between the educator, student or trainee, and employer. As such a 'veil of ignorance' in co-operative education might operate by asking the question of educators and employers and students skills they should be taught, if they didn't know ahead of time what vocation they might enter into? For a mobile workforce, for an entrepreneurial workforce and for a predominantly service-industry-based workforce, communication is central. Generic competencies and the ability to transfer knowledge in generic contexts are invaluable in the workplace.

### *The relation of fairness to self-reliance*

As Alonso (2014) states, "[r]eliance is a pervasive phenomenon in our lives. We rely on other people and objects not only when we lack evidence that would ground the corresponding belief. We rely on them also when we possess such evidence and have the corresponding belief" (p. 164). For Alonso, the satisfaction of basic needs and the attainment of a high degree of self-reliance are fundamental factors. Reliance is related to belief, and state which is not reducible to other mental states, desires and intentions (p. 165). Many educational contexts either in the First World or the Third World or in developed and developing societies are about achieving learning in a context of balanced economic growth and/or the elimination of poverty.

As Ransdell, Kent, Gaillard-Kenney, and Long (2011) observe, an internal locus of control (that is fostered in a student through a discursive or negotiated process), relative to self-reliance is better for learning, because it necessitates that it is one's own efforts rather than external factors which determine consequences (p. 932). Self-reliance and high confidence are correlates of an internal locus of control and low-confidence and social reliance are associated with an external locus of control (Ransdell et al., 2011, p. 932). Seligman (2011) outlines four steps for creating self-reliance. These include: Understanding response to trauma (read 'failure') which may include challenged beliefs about selves, others, and the future; secondly, reducing anxiety through techniques for controlling intrusive images and thoughts; thirdly, engaging in constructive self-disclosure (non-bottling-up); fourthly, creating a narrative in which "trauma is seen as a fork in the road that enhances the appreciation of paradox" – including loss and gain, grief and gratitude, vulnerability and strength (p. 104). While educators want to instil positive values, and emphasise the excellent skills and traits of their students, they might also want to teach them coping strategies and resilience in the face of set-backs, and to overcome learning challenges in the course of the work-orientated study. Appreciation of fairness might take such factors into account.

**CASE-STUDY**

In a level 5 Business communication course, students are given the task of making a 5-7 minute oral presentation, either to a live audience or by digital video explaining the 'fit' of the new media or technology in a selected business context. Students who are representing actual business gain permission for use of company names and data. In most situations students are either articulating their speeches in a facilitator context to be assessed, or in a workplace context amongst fellow employees, or in a classroom context amongst fellow students. The 'voice' of the student thus has a multivalent relevance – it can either be applicable to classroom, workplace contexts or a context that is restricted to assessment. The 'results' of this assessment reveal a range of 'voices' and 'contexts'. Some of these contexts are learning based and some are workplace based. There is also an overlap between these contexts. Further still, a context of third space may be articulated whereby the recommendation of the student are extended to either an imaginary or real, 'business' context which advocates the advantages of a new technology in the workplace. Representation may be one-to-one, or one-to-many. Fairness becomes an issue, in terms of the representativeness of the student's voice. A representative space is opened up between the learning, workplace, and promotional business contexts. The identity of the person giving the speech is not necessarily a factor in assessment, but rather the extent to which the speaker fulfils the learning outcomes. Hence it is the psychological social-contract of the learning space within the educational context that provides an open space for negotiation of assessment suitable for business practices. Basic skills are developed in five parts:

1.) Training that is related to the function, processes and cultures of organisations and industries
2.) Training to produce skilful communicators, capable of working formally and informally, using the equipment and tools available to them
3.) Training that will enable marginalised groups (women, unemployed, disabled, elderly) to communicate and participate in skilled activities
4.) Training individuals in activities that satisfy basic communication and organisation needs – inter-cultural, inter-personal, managing conflict, current and emerging technologies
5.) Training members of a community in activities that prepare people for working in groups and with emerging technology

**Example:**

Yasha Radojkovich Business Communication Oral Presentation 2015.
Bachelor of Business, Open Polytechnic.

## CONCLUSION

Values of fairness and self-reliance may be taught as a consequence of the co-operative educational learning process but needn't be the only product of teaching for the workplace, nor indeed a direct consequence of the learning process – they are a part of lifelong learning. As such an important component of education is that it be inherently relational, to life, knowledge, vocation and the learning process, not just 'a sign on a path which points to another sign'. The right to speak in a vocational learning context is an important skill to foster at all levels of engagement.

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# A Review of Trends in Research Methods in Cooperative Education

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In 1997, when Bartkus and Stull analysed the cooperative education (co-op) literature they described it as sketchy, limited, and uncertain, with a focus on best practice. Bartkus, Stull, and Higgs conducted two further assessments of the co-op research, where Bartkus and Higgs (2011) described the literature as being stronger and more developed than when the assessment was conducted in 2004 (Bartkus & Stull, 2004). A significant indication of this development can be observed by the growth in the number, and change in type, of publications in Asia Pacific Journal Cooperative Education (APJCE) (Zegwaard, 2012).

Coll and Chapman (2000) found that the co-op research mostly used numerical methods and Coll and Chapman encouraged the use of different research approaches (a view also expressed by Eames & Cates, 2011), such as mixed methodologies that combing quantitative and qualitative research methods.

When Coll and Kalnins (2009) conducted their review of 141 qualitative research articles in cooperative education from a range of journals, they noted that interpretive (qualitative) research was well-established in the cooperative education literature and a wide range of interpretive co-op research articles were available. Most qualitative studies tended to use interviews as the main data collection tool.

The work in this paper presented here is a preliminary analyses of research articles published in APJCE. The intent was to see if the call by Coll and Chapman (2000) for greater use of qualitative research methods has been fulfilled. The work also reported on some research trends that have developed over recent years.

## METHODS

Articles from 2000 to 2013 published in APJCE were reviewed using document analysis and systematic evaluation approach (Bowen, 2009; Bryman & Bell, 2011). Each article was classified as either research, topical, or best practice. The articles classified as research were then analysed to identify: methodology type or research approach, data collection method, and method of analysis. The terminology used within the research article was used in the analysis, where possible. When the methods were not articulated explicitly in the article, the analysers then determined research approach. Multi-staged data collection approaches were common in research articles, which were recorded during the analyses. In total, 118 research articles were identified and analysed in this research.

## RESULTS

The analyses showed an annual increase in the number of research articles published in the APJCE. Over the same time it was evident that the use of qualitative research approaches and multi staged data collection methods also increased.

### *Growth in number of research articles*

The number of articles published per year in APJCE increased (see also Zegwaard, 2012). To best demonstrate the growth, and change in type of publication, a comparison of Volumes 1-3 (2000-2003) with Volume 14 (2013; the last complete year included in this analysis) was undertaken (see Table 1). These two sample sets are of similar

size (21 and 23 articles, respectively). The two sample sets indicate a significant shift in recent times towards research publications (in 2000-2003, 43% were research articles compared with 74% in 2013). The 2000-2003 sample set also contained predominantly showcase or conceptual type articles.

TABLE 1: Analyses of research approaches used in research articles in 2000-2002 and 2013.

| | 2000-2002 | 2013 |
|---|---|---|
| Total number of articles | 21 | 23 |
| Number (%) of research articles | 9 (43%) | 17 (74%) |
| Number (%) of quantitative | 7 (33%) | 4 (17%) |
| Number (%) of qualitative | 2 (9%) | 7 (30%) |
| Number (%) of mixed methods | 0 (0%) | 5 (22%) |
| Document analysis only | 0 (0%) | 1 (4%) |

*Use of qualitative approaches*

There also was an increase in the number of articles for all (broad) types of research methods (Table 1). From 2000 to 2013, the number of articles using qualitative research methods increased from two (9%) to seven (30%). There was also an increase in articles using mixed methods (however, this expression was not often used by the authors). Mixed methods first became evident in APJCE in 2005 and has subsequently increased.

From 2000 to 2013, 30% did not state the research method; most of which were in the early years and mostly were quantitatively-based research articles. However, in recent years the description of methods has become more detailed and specific. A range of terms was used to describe research methods in qualitative research articles, such as, interpretative qualitative; exploratory qualitative, mixed method qualitative, naturalistic enquiry, case study, collective case study, auto-ethnography, and case study interpretivist-constructivist. Some described the research method as a longitudinal study or a cross-sectional analysis. What was also common was a tendency to (incorrectly) use the terms 'methods' and 'methodology' interchangeably, however, this is not unique to co-op research.

*Methods and research approaches*

Sixty-three percent of articles collected data over several stages (multi-staged data collection). About a quarter had two stages, however, 22% used three stages or more. Multi-staged data collection tended to be pre- and post-intervention evaluations. Some research approaches used data collected from different sources allowing for triangulation, such as interviews, document analysis, evaluations, and academic performance data.

A particularly common mixed method approach involved interview data supported by other data collection, for example, survey data. Open-ended survey questions (which provides qualitative data) was common in surveys. As many as 40% of research articles used either rating scales (e.g., Likert) or rankings. Some articles used focus groups, telephone interviews, participant observations, and action research. A few articles used rather specific terminology to describe the research method, for example, 'unstructured in-depth phenomenological interviews' (Groenewald, 2003) and 'learning curve grids' for student self-describing their depth of experience during work placements (Fleming & Eames, 2005).

Numerical approaches to research tended to rely on frequency counts, percentages, and descriptive statistics (e.g., means, standard deviations or standard error, significance of differences). There were examples of sophisticated statistical analysis techniques, such as, factor analysis, correlation and regressions, Cronbach Alpha tests for internal reliability, and the more comprehensive ANOVA and MANOVA statistical tests.

Qualitative analysis description varied widely, reflective of the wide range of data collections methods available. Commonly used terms in the articles included content analysis, thematic analytical approach, thematic analysis, theme identification, coding with assembling and triangulating, themes identification, and tabulation of results.

## DISCUSSION

The strengthening and maturing of the co-op literature is reflected by the greater research activity and subsequent published research articles over the past 20 years. The preliminary review reported here shows an increase in the number (and proportion) of qualitative research articles published in APJCE, suggesting the call made by Coll and Chapman (2000) has been at least partially answered. Most research articles used mixed methods, combining the strengths of both qualitative and quantitative research approaches.

The process of analysing of the research articles highlighted the difficulty of labelling research as either qualitative or quantitative. Many studies used mixed methods, such as the reliance of quantitative survey instruments supported with qualitative open ended questions or qualitative data collection methods such as interview supported by other forms of quantitative data derived from, for example, surveys or numerical coding of student reports. Interestingly, despite many research articles using mixed methods, very few explicitly described the research approach as mixed methods.

The wide range of combinations of research approaches, including multi-staged research projects, was vast. It demonstrates that researchers are willing to consider multiple research approaches in the attempt to understand the complexity of educational issues at hand. The range of research combinations may also indicate the different disciplinary contexts the researchers were undertaking the research work and perhaps also the range of educational backgrounds of co-op researchers.

It is not surprising that the use of telephone interviews was reported. In the context of co-op, where participants are likely be geographically distributed, the use of telephones (or even online methods such as Skype) presents some obvious advantages. It is likely safe to assume that the use of telephones, or online interactions, as part of the data collection occurs more often than what is reported.

It was interesting to observe that some qualitative research approaches reported in APJCE included some not identified by Coll and Chapman (2000). The use of work performance evaluation, student assessment items, study guides, cross-sectional or longitudinal studies were not mentioned by Coll and Chapman, however, are shown to be effectively used by co-op researchers.

## CONCLUSION

Research approaches reported in research articles published in APJCE has shown a considerable shift over the 13 years towards a greater use of qualitative research methods. An increase in the number of reported research projects using mixed methods is also evident. It was intended that this paper reported on preliminary findings which would shed light on some research methods trends and inform other researchers on the commonality of these approaches. Further review is required to fully understand other trends in the type of use of research methods and also to explore any trends in publishing patterns.

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