CONFERENCE PROCEEDINGS SINO / NZ TVET EDUCATIONAL RESEARCH FORUM – TIANJIN, P.R. CHINA

New Zealand Papers

Overview

The New Zealand and Chinese Ministries of Education have signed a strategic educational partnership to strengthen the links between the two countries. They have agreed to host an annual symposium, showcasing best practice in the delivery of vocational teaching. This publication provides the papers presented by New Zealand authors to the second Sino / NZ TVET Educational Forum held in Tianjin, P.R. China in November 2014

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Introduction and Welcome

On behalf of Education New Zealand and the Sino-NZ Technical Vocational Education and Training (TVET) symposium I am pleased to present the proceeding papers from the 2014 symposium held at Tianjin, P.R. China in November 2014.

In 2013, the New Zealand and Chinese Ministries of Education signed a strategic educational partnership to strengthen the links between the two countries. Both countries agreed to host an annual symposium, showcasing best practice in the delivery of vocational teaching. The symposium demonstrates a shared a commitment to ensuring TVET practices in both countries are informed by extensive research.

Vocational education and training focuses on the application and transfer of knowledge. The depth, breadth and scope of these New Zealand proceeding papers demonstrate how research has been used to inform teaching and learning. They illustrate how the vocational sector of our educational provision provides a fertile area for in-depth evaluation and how that acquired knowledge is used to improve practice.

We encourage readers to reflect on their own practises and think of contributing a paper to next year's conference to be held in New Zealand.

Mark Flowers

ON BEHALF OF THE SINO / NZ TVET EDUCATIONAL RESEARCH FORUM

Content

Linking theory and practice: applying the principles of adult learning theory in the classroom

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Preparing effective early career educators for the challenges of the twenty-first century tertiary environment requires professional development tools that deliver practical and useful guides. *Goalposts* is a newly developed resource which aims to distil the complex theories and practices that underpin the pedagogy of tertiary and higher education teaching and learning. The resource is arranged as a series of ten one-page summaries of commonly agreed principles, supported by a glossary and examples of practical implementation. *Goalposts* was developed with funding from Ako Aotearoa, New Zealand's National Centre for Tertiary Teaching and Learning Excellence, and is free to download from the website, meaning that educators anywhere, anytime, can access and adapt the content to suit any educational setting. This presentation and paper will explain how using *Goalposts* will help new teachers and those who support them to design effective learning activities underpinned by theory; offer a resource for reflecting on and developing practice; and provide a starting point for further reading and study about learning and teaching.

Keywords: adult learning theory; student-centered; new teachers

Introduction: Our modern vocational education landscape

Increasingly in the twenty-first century, institutes of higher education are peopled by teachers who run the gamut of career academics to those recruited for their expansive research, commercial, industry and technical expertise – regardless of teaching experience. Organizations add financial imperatives, such as casualization and contracting of sessional educators alongside massification of delivery (Irvine, Code, & Richards, 2013) and a changing student body brings its own challenges. We have students from highly diverse backgrounds incorporating first-in-family, second chance and other non-traditional learner groups (Stanley, Fraser, & Spiller, 2011). In New Zealand, and likely all around the world, such characteristics are particularly evident in polytechnic/community college and vocational education environments.

Then too, these issues are compounded by the lack of a formal qualification, accreditation or registration framework for tertiary education professionals. Although primary and secondary teachers in our compulsory sector must complete three year programs in educational theory and practice, tertiary teachers have no such legal requirement, the only constraints being an organization's policies and procedures. It is increasingly common therefore, for our classrooms, lecture theatres and training workshops to be addressed by newly recruited educators who may have a wealth of subject-matter expertise, but little or no background in lesson planning, classroom management, or other pedagogical knowledge (Cercone, 2008).

Teaching in vocational and technical training programs is therefore, arguably more demanding today than ever before. Credibility requires instructors who know what they are talking about, and have first-hand knowledge of the workplace beyond an academic setting; yet the training providers must value quality teaching. Pressure to fill vacancies in a profession with high staff turnover can mean teachers are dropped in at the deep end, with as many as 40 per cent, say Lodge, Bosanquet, and Mathews (2012), appearing in front of their first class with no front-end training or a more gentle introduction to the role.

Small wonder then that teaching has a reputation as one of the more stressful professions: 41 per cent of teachers report high levels of occupational stress compared with 31 per cent of people in nursing, 29 per cent in managerial jobs and 27 per cent in professional and support management occupations (Milburn, 2011). In a recent Australian study (Richardson & Watt, as cited in Milburn, 2011) it was found that between 25 and 40 per cent of teachers leave the profession within five years of starting, and a burnout inventory applied to early-career teachers in a longitudinal study identified that even people who had been teaching for two years had highly elevated levels of emotional exhaustion. If we add to the impact of this negative experience for the individuals, by considering that the cost of replacing a worker is three times their annual salary, clearly it is in the best interests of education providers at all levels, to protect their investment in talent recruitment and training.

Many providers address this issue through internal professional development programs for their educators, such as inductions, workshops, and certificate/degree programs. However, for the new teacher, such a menu may still have significant gaps. Inductions, for example, are often not available to staff before they actually start teaching.

Also, in many organizations, inductions concentrate more on institutional culture and requirements, such as vision and mission statements, and technology than they do on how to talk to a class. Professional development workshops and seminars are also problematic because they are scheduled throughout the year when frontline delivery staff may not be able to get release time to attend (Baume, Knight, Tait & Yorke, 2005). And clearly, studying for education qualifications is a longer-term commitment to a teaching career.

It was into this gap – this need for a just-in-time, focused and accessible guide for new vocational teachers in their first few weeks on the job – that the *Signposts* and *Goalposts* resources described in this paper were born.

Adult learning theory

Supporting early career teachers means first and foremost, helping them to understand and engage with students. There is a growing body of evidence in the literature that student success is increased when educators have some exposure to, and awareness of, the pedagogy of teaching and learning (Mane & Snelling, 2011; Prebble, Hargreaves, Leach, Naidoo, Suddaby, & Zepke, 2004). These authors state that part of being an effective facilitator of learning means recognizing students' learning needs and preferences in order to design more meaningful learning experiences for them. If this does not occur, says Viskovic (2006), new tertiary teachers appear to rely mainly on tacit experiential knowledge, that is, the way they were taught themselves, and do not have a strong theory-based understanding of their own teaching.

Adult learning theory, also known as andragogy, is a field of study which began in Europe in the 1950s, and gained momentum with the work of American practitioner and theorist Malcolm S. Knowles in the 1960s, '70s and '80s. Knowles defined andragogy as the art and science of helping adults learn. The distinction, he said, was in the particular needs and characteristics of adults which differ from those of children. Adults learn differently from the way children do: firstly because their personality structure is now almost fully formed, and accompanied by a range of behaviors and practices they have acquired along the way; and secondly, because of the impact of previous learning and life experiences, as well as their current needs, interests and expectations (Knowles, Holton, & Swanson, 2005). It is also important to acknowledge that many adult learners have extensive family and work responsibilities. External issues such as transport, finance, health, social and recreational roles, and relationships can affect the learning process. There are biological factors associated with maturing into adulthood, and ingrained attitudes about teaching delivery and the use of technology. Adult learners have complex and multi-faceted lives (Cercone, 2008).

Such a position is far from unanimous however, and many writers today would argue that there a clear division between categories for child, youth and adult learners: "Most descriptions of how adults experience learning are rendered by researchers' pens, not learners themselves" says Brookfield (1995). Brookfield, Cercone (2008) and others have discussed whether, in fact, there should even be something called 'adult learning theory'. They say that variables such as culture, ethnicity, personality, gender, religious and political ethos – as well as life experiences – may be more important to learning than chronological age. An individual's response to these factors occurs across the lifespan, they argue, and is not necessarily a defining aspect of adulthood. Knowles himself came to acknowledge that andragogy may be less of a theory of adult learning (or teaching) than a set of assumptions about adult learners in general (Honeyfield & Fraser, 2013). Repositioned in this way, the principles of how our post-primary and secondary students learn remain as valid as ever for new career vocational educators to connect with.

So how does anyone learn? Driscoll (2000) defines learning as "a persisting change in human performance or performance potential…[which] must come about as a result of the learner's experience and interaction with the world" (p. 11). He notes that this definition encompasses many of the ideas from different schools of thought, such as behaviourism, cognitivism and constructivism, which share a central tenet that "learning occurs inside a person" (p.2). Learning theories are concerned, he says, with the actual process of learning, rather than the value of what is being learned. Siemens (2004) then poses the question of whether, in an age of rapid growth in knowledge, we can still elevate knowledge that is learned through personal experience as our benchmark for optimal learning. He notes that "action is often needed without personal learning – that is, we need to act by

drawing information outside of our primary knowledge" (p. 3). Now, he says, we need to move learning theories into a digital age, to synthesize and recognise patterns and connections, in an approach he terms "connectivism".

This new concept of connectivism has close ties, says its originator Siemens (2004) with Chaos theory, a science which recognises the connection of everything to everything. Siemens cites Gleick's description of the Butterfly Effect: "the notion that a butterfly stirring the air today in Peking can transform storm systems next month in New York" (Gleick, 1987, as cited in Siemens, 2004, p. 3). In essence, this is about the breakdown of predictability, so that by extension, learning as a process is not entirely under the control of the individual. The teaching role in this new approach to learning theory is about facilitating opportunities for students to connect specialized information sets, where the connections that enable them to learn are more important than any single pool of knowledge (Siemens, 2004, p. 4).

Developing resources to fill the gap: A six year journey

In New Zealand, improving the quality of teaching has become a high priority, both on an institutional and a national level. In 2007, New Zealand's Ministry of Education established Ako Aotearoa, The National Centre for Tertiary Teaching and Learning Excellence as a specialist body to fund research related to teaching and learning. A Creative Commons publishing platform and a national register of educational research facilitates the sharing of ideas and learnings across the breadth of the sector (http://akoaotearoa.ac.nz/). An apt name indeed: "Aotearoa" is the Māori word for New Zealand: literally "land of the long white cloud", and the concept of "ako" means both to teach and to learn, with an emphasis on reciprocity and shared learning experiences.

The *Signposts* and *Goalposts* resource development projects described in this paper received three funding grants from Ako Aotearoa: first in 2008 to conduct a needs analysis for novice teachers, review existing options and develop the *Signposts* resource; second, one year later, to conduct a national evaluation of the resource, assessing its usefulness and current applications, and identifying strategies for its expansion and improvement; and third, in 2012 to develop a follow-on resource, *Goalposts*, to provide an introduction to the theories and principles underpinning adult learning and education. Each phase has been subject to rigorous peer-review as well as field pilots with the target audience of new teachers, and with staff developers and academic advisors whose role it is to support, mentor and sponsor teaching capability.

In addition to "quality", a central tenet of Ako Aotearoa's vision, and of our own pledge as a recipient of their support, is collaboration. Accordingly, the project was conceived from its very beginning as an inter-institutional collaborative process, conducted with deliberation and forethought, as "genuine partnerships, characterized by respectful and critical dialogue" (Gewirtz, Shapiro, Maguire, Mahony & Cribb, 2009, p. 567) to make outcomes meaningful and productive for all participants. Drawing on a national association of staff developers, we began our partnership with eight team members from three institutions, but by the evaluation phase of the project, other colleagues had expressed an interest in participating, and the project team expanded to include staff development representatives of five Institutes of Technology and Polytechnics (ITPs). Over the six years, further changes occurred with retirement, job loss and role change, so that the new team assembled to write and review *Goalposts* in 2013 had just three original members among its 13 contributors, but our spread now encompassed eight organizations, with universities and private Training Education providers (PTEs) represented alongside ITPs – so that these resources are truly a good representation of current thinking across the sector about effective teacher attributes.

The research process and the first resource: *Signposts*

The original project began when a group of staff developers first mooted the idea of an inter-institutional resource which would assist new tertiary teachers in their first one – two months in their role. Sharing good practice from their own institutions, the team agreed that beginning staff needed a great deal of support and information provided in simple, usable 'chunks'. Two separate literature reviews were conducted – one on new tertiary teacher professional development options and the other on inter-institutional collaboration. A methodology of action research enquiry was decided upon, since we wanted to be able to monitor, scrutinize and adjust our collaboration as the project was underway. The action research process is usually described as a cycle which allows practitioners to test ideas and concepts as they provide opportunity for feedback through the four phases of planning, acting, observing and reflecting (Ellis, Armstrong, & Ground-water Smith, 2010). A useful and frequently cited description of this approach is offered by Kemmis and McTaggart (1988), who explain that:

> Action research is a form of collective self-reflective inquiry undertaken by participants in social situations in order to improve the rationality and justice of their own social or educational practices, as well as their understanding of these practices and the situations in which these practices are carried out (p. 5).

Alongside the literature reviews, a number of professional discussions were held within the team itself, and also with our wider community of practice, examining learning and teaching, the context of tertiary education, student profiles, teaching roles, teacher and student centred perspectives, and the attributes and skills of good teachers. Eventually we decided a format for the *Signposts* resource of 10 one-page topics with tips and techniques, covering:

- Planning to teach
- How to get going with your class
- Engaging your students in their learning
- Classroom management
- Delivering the goods
- The language of assessment
- Reflecting on teaching
- Knowing about and responding to difference
- Being professional
- Literacy integration

Figure 1: ***Signposts (http://akoaotearoa.ac.nz/)***

Each of the one-page guides is deliberately practical or applied: aiming to distil and summarise important concepts, demystify the language, and provide meaningful links and context. Following pilots, feedback and revision to make sure we were meeting this target, *Signposts* was published on the Ako Aotearoa website in 2008 for national –and international - use across the tertiary sector. Feedback from the site's administrator indicated that this resource was the most downloaded document of any on the site in the first three years after the launch. Informal feedback from staff developer colleagues suggested that the resource was filling the need for immediate teaching and learning tools experienced by staff new to an education environment.

The national evaluation of *Signposts*

The next phase of our research journey, supported by a second funding round, was a collaborative national evaluation of *Signposts* to determine its usefulness and current applications, and identify strategies for its expansion and improvement. At this still early stage in the life of Ako Aotearoa, few of the new resources available through their website had been subject to any formal evaluation process. Therefore, an added benefit of this project would be to provide a methodology which could be of interest to other teams involved in teaching and learning resource evaluation. Accordingly, an e-evaluation tool was developed and promoted through staff developer networks and communities of practice.

Feedback from staff developers, academic advisors and human resource staff through this online survey was positive; new teachers were using the resource and finding it to be useful. Several institutions were providing links to the resource on their website and building it into their induction packs and in-house training programmes for teaching staff. Others reported uses such as: a conversation starter with a buddy or mentor; a set reading for tertiary teaching courses; a discussion topic for online communities of practice; excerpts included as helpful tips in internal newsletters, with a link to the full resource; and as part of an internal "effective teaching practice" book with examples from within the organization.

We also received a number of suggestions for improving accessibility and currency; many of these were incorporated in the current second edition.

Goalposts

Some years after the launch of *Signposts* and its proven utilisation, discussions at various regional, national and provider fora identified a need for an equivalent resource, providing a platform for introducing teaching and learning theory, and showing how this could be incorporated in classroom and workshop delivery. Most higher

education professionals readily accept that teaching requires deliberate interventions to make sure that students achieve the best possible outcomes, but what exactly should these interventions should look like, and what is the basis for decision-making about this? That's where teaching theories, models and frameworks come in.

Goalposts was commissioned by Ako Aotearoa as a companion to *Signposts*, linking theory and practice. Where the earlier resource outlines learning and teaching strategies, *Goalposts* provides an overview of some of the key principles and theories of adult learning. Again, the concept was to provide a resource which is easily accessible through Ako Aotearoa's website, and which is self-explanatory and unintimidating.

Distilling the large and ever-increasing literature down to the 10 one-page primers we planned to adopt to keep our presentation consistent was quite a lengthy process. Ideas about learning are continually evolving and changing, and further, many of the commentators in the field have developed their own taxonomies. For example, Knowles, Holton III, & Swanson (2005) list six principles; Ambrose, Bridges, Lovett, DoPietro and Norman (2010), seven; Calloway (2009), eight; and Cercone (2008), thirteen. Then, as well as principles, there are concepts, models and philosophies related to adult learning. It is a vast field!

Following an extensive literature review, recurring themes and central concepts were identified and organised into the following ten topic groupings:

- Principle #1 Prior knowledge and experience
- Principle #2 Importance of culture and the NZ context
- Principle #3 Respectful partnerships and relationships
- Principle #4 Autonomous and independent
- Principle #5 Goals and motivation
- Principle #6 Relevant and practical
- Principle #7 Learning styles and ways of thinking
- Principle #8 Critical reflection
- Principle #9 Environment for learning
- Principle #10 Change and transformative learning

Figure 2: ***Goalposts (http://akoaotearoa.ac.nz/)***

Our first draft of the 10 one-page guides, along with a Glossary of terms and an Appendix of examples for practical application, was sent out for consultation within our professional community of staff developers, and we received very detailed feedback and suggestions from 10 colleagues from a range of institutions, both national and international. This stakeholder group is the body most able to assist and direct new teachers, and therefore are the key conduit for dissemination of the resource. Representative comments were:

> *What a great resource this is, especially in the minefield of 'theories' (when a significant number of new teachers here at XXX do not see why they have to even consider understanding this as it relates to and informs their practice!)*
>
> *Cath, this is going to be such a useful book!! I want to make it a set text in XXX here—I'm a very new teacher in it, and it isn't mine, but believe this book will just be exactly what lots of us bursting into education from other disciplines need.*
>
> *I loved the summaries on learning and think they have been superbly done. The inclusion of all the theories was a great strength, well done!!!!*

Once a series of revisions to incorporate useful suggestions from this review group was made, the resource was piloted with 10 new tertiary teachers from four different tertiary organisations as representatives of our target readership. Their feedback was consistently positive; representative comments included:

> *If I'd had this from Day One, it would have given me a better idea of where to head. Suits me because I'm a self-learner, I like to go over things in my own time*

Looks good. Like the format, the contents. Glossary very good to have

Examples at the end are the most interesting for me and all new teachers probably. As new teachers we all want to make it exciting, but have no idea how.

The final version of *Goalposts* was accepted by the Ako Aotearoa review panel and published on the website in late 2013. As with *Signposts* and all other Ako Aotearoa resources, the Creative Commons publishing model means that users are free to download, adapt, customize and "tweak" any of the pages and build upon this work non-commercially, as long as they "credit the author/s and license … new creations under the identical terms" (http://akoaotearoa.ac.nz/download/ng/file/group-1387/signposts---staff-developers-guide.pdf). For example, colleagues have added pages to cover specific technologies, activities, or techniques, and others have adapted the resource to the ethos of their organisation, for example a Bible College.

Using the resources in workshops

The two resources designed for early career tertiary teacher, *Signposts* and *Goalposts*, are part of the professional development programme currently offered by Ako Aotearoa as *Teaching Tips 1 and 2*. The intention is to help new teachers build confidence, and to become more reflective practitioners as they develop personal approaches based on their experiences and linking evidence from research literature.

Workshop planning and outline

The author of this paper, Cath Fraser, and a colleague Judith Honeyfield were contracted as project co-leaders to develop and deliver the half-day workshops across New Zealand, and we decided to share the venues equally between ourselves. In our planning we aimed to be as interactive as possible, and to make sure that we were role-modelling the ten principles of adult learning theory ourselves, as well as introducing these concepts to workshop participants. We try to make sure the half-day session is fast-paced and filled with variety as we move from video to activity, to reflection and feedback. Key to the workshop is the opportunity for participants to discuss how these strategies could be implemented into their own teaching programmes.

Our room is set up around tables of 4 to 8, wherever possible, and when wall space permits, we hang a series of *Teaching Adults* posters (another Ako Aotearoa funded resource). This set of 11 motivational posters is designed to support adults to learn, either online or in tertiary classrooms (Figure 3). Once we have greeted all arrivals and exchanged names, we begin by demonstrating an ice breaker technique using post-it notes and requiring participants to mix and mingle. We make sure to "de-brief" each activity, with source acknowledgements (in this case, a UK educator Phil Race: phil-race.co.uk) and a discussion about alternative ways the techniques can be used.

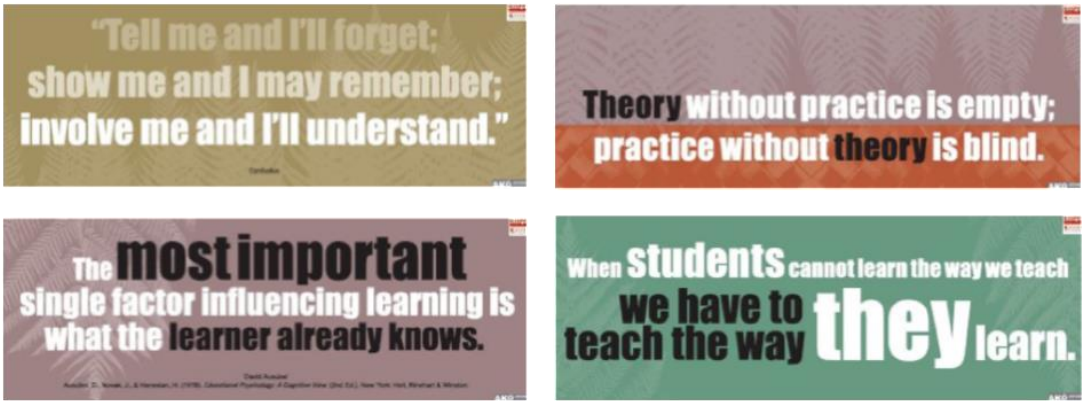

Figure 3: Examples of the *Teaching Adults* posters (https://akoaotearoa.ac.nz)

Next, we show a quick YouTube video clip "Adult learning in three minutes" by Alan Caddell (http://rryoutube.com) as a humorous summary of why we need to move away from lecture style, teacher-centred delivery: students fall asleep! Instead, the video introduces some key ideas about adult learning theory: students already know a lot about the subject, group work is an effective means to support the social aspect of learning, and learning needs to be active. Asking participants to note these key ideas in groups while they are

watching and to briefly discuss afterwards allows interaction and relationship-building, while focussing their attention on the topic area, as these principles from the video are picked up on and expanded in the first few pages of *Goalposts*. After participants have shared key points with the wider class, we again debrief the activity, pointing out the abundance of free teaching material on the Internet, as well as that ideal use of videos in class is brief and accompanied by a task, so that learning remains active.

At this point we introduce the *Goalposts* resource: its layout and content; each participant has a copy and can flick through quickly. Asking the participants to go around the room numbering off from 1 to 10 gives us the opportunity to create new groupings as we assign each number a *Goalposts* topic page. We ask participants to work in their new groups to read their page, as well as the examples of teaching applications in the Appendix; they need to note key interest areas and relate the topic to their own context – do they have any new examples? The facilitator has meanwhile posted 10 sheets of blank paper around the room with only the title of one of the topic principles on each. As we encourage the groups, topic by topic, to share their discussion we ask them, and anyone else, to note new examples of applications on post-it notes and add these to the appropriate poster. We tell all our workshops that we aim to add new ideas to the online resource in future editions, so that the pool of practical teaching tips continues to grow. This activity takes about half the workshop time, and again is a good example of learners working cooperatively on a task to build their own understanding, where the facilitator's role is only to coordinate and "chair" the activity, ensuring all voices are heard and all contributions respected.

At this point we are likely to have a quick refreshment break, allowing participants to relax and refocus. When we come back we ask participants to choose a new seat at a different table, so that they are now in a third group. Now we show another video, this time of a novice teacher, from our own organisation who has generously allowed us to record a segment of his class time working with a foundation and bridging programme (Levels 1-3 in the New Zealand educational system). The task for the participants is to conduct a "pmi" analysis, looking at the positives, minutes and interesting points of his teaching delivery. This is discussed in groups with the instruction to find two points for each category, which they then write in the appropriate column on the whiteboard. We discuss these points as a class, pointing out that there are no "rights" or "wrongs" here, but just different ideas about classroom and student management. There is a lot to notice, including but not limited to use of whiteboard, repetition, clear instructions, links to students' own interests and backgrounds, late arrivals, relationship building, individual, pair, group and class work, use of language and gestures, use of space…

Another video features a 2013 national Tertiary Teaching Excellence Award recipient, teaching in a large lecture theatre, but still able to personalise delivery. This very experienced teacher uses humour as an integral part of his teaching programme to develop a strong rapport with his students, and create a positive learning environment. We then discuss the learning journey for teachers, and the role that peer observations can play as a free professional development mechanism open to teams and institutions, by considering the lessons we have learnt from analysing two recorded excerpts in the workshop.

The more formal part of the workshops concludes with another short video of students being interviewed, where they identify teaching practices that best support their learning – a nice way to reflect on what we had gathered and shared during the workshop.

Finally we finish off with a competitive and energetic memory game with half the class pitted against the other half trying to accumulate points (achieved through naming aspects covered in the workshop and explaining the associated theory or concept). The winning team gets a prize – where possible a set of the posters described above, or perhaps a bag of sweets. We finish by quickly debriefing this activity as an effective and fun revision tool to reinforce learning which can also be used in a range of contexts and at different learning points. Then participants complete a brief, anonymous evaluation form, posted it in a box as they leave the room.
Finishing with a game creates a great positive note to go out on, and most who attend seem to have enjoyed themselves, with representative general comments including:

> *Really best workshop ever. A great range of activities and very useful ideas. Many thanks!*
>
> *The game at the end, although it got quite competitive, was awesome and a fun way to recap at end of the day*

Examples of teachers implementing adult learning theory in vocational training programs

Figure 5: Electrotechnology students making posters

Figure 6: Recreating a circuit

Mike Scott, a 2014 national Tertiary Teaching Excellence Award recipient from Bay of Plenty Polytechnic, is a great advocate of the "flipped classroom" model (see *Goalposts* Principle #6) where the traditional class-work / homework elements of course design are swapped, using technology to provide online repositories of learning resources such as readings, podcasts and videos. Students view these at home prior to the in-class session which is devoted to practical exercises, projects, or discussions (Berrett, 2012). In figures 5 and 6, students are using class time to recreate the ideas and explanations they have viewed before coming to class.

Figures 7-9: Hairdressing students entering regional and national competitions

Figures 7-9: A local PTE, Hair to Train, finds that encouraging students to enter industry competitions is a great strategy for making learning relevant and practical (*Goalposts* Principle #6) as well as for giving students goals and motivation (*Goalposts* Principle #5). Such strategies promote student persistence and program completion, ensuring course content which is applicable to the real-world roles and responsibilities which learners value (Knowles et al., 2005). Entering competitions also increases graduate employability, showcasing achievements to industry representatives.

Figure 10: Travel and Tourism students map-making

Figure 11: Culture squares – showing (not Telling) students' heritage and values

Figures 10 and 11 show two activities which allow students to work in groups and individually to acknowledge cultural diversity and prior learning experiences, based on independent research and followed up with presentations to the class about how these connect with current study. These ideas link with *Goalposts* Principles #1 Prior knowledge and experience, #2 Importance of culture and #4 Autonomous and independent. (The "Culture Squares" activity is described in more detail in Waterson and Fraser (2013)).

Figure 12: On-site automotive workshop

Figure 13: On-site house build

Many vocational and technology training providers have on-site workshops, such as Bay of Plenty Polytechnic's "Bay Auto" workshop (Figure 12) where students work on the organization's fleet vehicles, as well as offering feature services such as battery and transmission tests for staff and students at a minimal charge. In Figure 13, carpentry students are working on the year-long house build, where each class builds a three-bedroom house which is fully inspected and compliant with all industry requirements and regulations, and which are later sold to members of the public to recover costs: we even have a waiting list! Practical training allows for on-the-job skills development and assessment which is meaningful and meets younger and vocational learner preferences for applied rather than text-based learning (*Goalposts* Principle #7; Sternberg, 2012). Incorporating activities like this, and allowing students to document the processes in ePortfolios which can be later shared with future employers is a good example of creating a positive and authentic environment for learning (*Goalposts* Principle #9). A full explanation can be viewed in an Ako Aotearoa Good Practice Publication video *Nailing it with technology: Using ePortfolios to evidence carpentry students' practical learning* (Keys, Fraser & Abbott, 2014).

Evaluating the workshops and resources

In line with Ako Aotearoa's tight focus on learner benefit, all workshops are evaluated at the time, with participants' comments collated by the attending Regional Hub manager and then forwarded to the workshop facilitators. Participants are also surveyed about any changes to teaching practice 6 months on from their workshop attendance.

Over one hundred tertiary teachers attended the *Teaching Tips 2* workshops during the first semester, 2014. Gratifyingly, 100% of participants rated the dissemination workshop "very high quality" or "high quality" while 94% rated the content as "very valuable" or "valuable"; only 6% rated below this.

One of the best outcomes from the workshops has been the way our participants leave with heaps of new ideas to try out. Participants mentioned planning more multiple delivery activities, like pre-lecture YouTube videos and more breaks, and inviting in guest speakers who could share success stories of their own learning and career pathways. A recurring theme was that of student engagement and participants' forward planning included an increased focus on prior learning, learning how to learn activities, more responsibility for active learning, presentations and group collaboration, effective feedback, and improving questioning techniques. One representative comment was:

> *More student focus and less of me, small chunks of knowledge...*

There were also intentions about changing the learning environment: participants mentioned using music, pace, trying new things (variety, humour, icebreakers, thinking activities and quizzes). A couple of meaningful comments were

> *My delivery, slowing down and not trying to put so much into students' heads – the video made me realise this*

> *Ensure hands on in all sessions some way*

Self-development intention was evident in ideas like observing others, sharing their own practice, improving introduction sessions with students, reflecting on personal practice, using more motivational techniques, and continuing to try new things.

Conclusion

"Teaching is one of the few professions where beginners are put into the deep end, almost thoughtlessly" says Milburn (2011, p. 2), and despite best efforts by providers to create professional training opportunities for new teachers straight from industry, these experiences persist. The *Signposts* and *Goalposts* resources have been created to fill this gap in the short term, and to provide a tool for continued development and reflection about teaching practice. The ten one-page summaries of key principles are intended to introduce the theoretical models and different schools of thought about how best to support adult learners – and why. We hope, of course, that users will continue to pursue their reading and pedagogic inquiry well past these simple, starter resources.

Shulman (2000) suggests that the scholarship of teaching is communal in the sense of professional obligation to pass on what we have learnt as individuals. In facilitating the dissemination workshops we have had a highly effective opportunity to see the work come to life – be interpreted and reinterpreted - which has assisted our reflection on the ongoing improvement of this resource for new tertiary teachers. We look forward to many more of these professional exchanges.

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Food For Thought: Project Based Learning

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This presentation uses the metaphor of food preparation to illustrate and reflect on six phases of Project Based Learning.

'Na to rourou, na taku rourou ka ora ai te iwi.' With your food basket and my food basket the people with thrive. (Maori whakatauki/proverb)

The presentation serves as a taster to this approach to learning. The learner is fed knowledge, made hungry to learn more, encouraged to cook up their own ideas, experiment with new ingredients, and finally exposed to a unique east/west fusion of educational tastes.

Presenter 1, Richard Finn, tackles this learning technique from the Western perspective and creates the almost-unheard-of-in-the-East classic New Zealand lettuce and Marmite sandwich; while Presenter 2, Mary-Jane Duffy, demonstrates the technique via a favourite Chinese dish: dim sum.

'Divide an orange--it tastes just as good.' (Chinese proverb)

East/West perspectives to Project Based Learning are examined as Presenter 1 & Presenter 2 move to fuse their separate tastes into a future New Zealand/Chinese recipe for success.

Key words: Project-based learning, active learning, 21st century skill

Introduction

Twenty-first century education has turned towards teaching models that position the students at the centre of the learning process. Active learning, practice-led learning and project-based learning are teaching models that developed out of a constructivist theory of knowledge, but also fit best with current understanding of learner needs for the future.

The benefits of student-centered learning are now well documented but will be summarized in this paper. In short, with student-centered learning, higher levels of motivation and engagement lead along a pathway to mastery as well as student retention and success.

This presentation focuses on project-based learning (PBL). PBL provides learners the opportunity to investigate and problem-solve real world problems and to produce real world outcomes – events, products, performances, artefacts to name just a few. It develops skills that are essential in the 21st century – conceptualization, planning, collaboration, team work, problem solving, reflection and evaluation – providing learners with the experience of seeing a project through from gestation to fruition.

> PBL integrates knowing and doing. Students learn knowledge and elements of the core curriculum, but also apply what they know to solve authentic problems and produce results that matter. (Markham, 2011, p. 2.)

Project-based learning is a model relatively new in classrooms in New Zealand and in China. International research shows that there is resistance to implementing PBL in the classroom for diverse reasons – that teachers need support and help (Hickey, 2014, p. 9). Or teachers that don't see the benefits of PBL But there is also a

baffling array of literature on the subject with the potential to alienate and confuse teachers. This presentation outlines the model in an enlightening and entertaining way. It aims to demystify PBL and demonstrates that in its simplest form, it is no more complicated than an everyday project – that of considering and preparing lunch. It also shows that PBL serves up nicely on the international table.

As the proverbs in the abstract above suggest, problems and research questions have the potential for greater meaning and success if they are solved collaboratively (Markham, 2011). This presentation assumes that projects are carried out in small teams – that food preparation is community-based.

Constructivist Theory

Constructivist theory is the idea that learners construct knowledge based on what they already know. They add knowledge to their existing knowledge base. It was developed by Jean Piaget (1896-1980).

> Piaget's ideas form a basis for cognitive constructivism (Windschitl 2002). These views are supported by Bruner's (1961) theory of discovery learning, which maintains that individuals know best what they discover for themselves. According to Bruner, the act of discovery supports increased intellectual ability as cognitive structures are rearranged to account for new learning. (Scott, p.191.)

From a teaching perspective, teachers facilitate this process — they act as signposts rather than megaphones.

This presentation bases itself on constructivist theory by proposing that PBL can be demonstrated, unpacked and explored using the daily activity of food preparation; that teachers can built on their own knowledge of this process to make sense of the teaching model—and ultimately to test and use it in their own classrooms.

Demystifying Project Based Learning

J.W.Thompson (2000, p. 1) describes project-based learning as 'a model that organizes learning around projects'. In its simplest form, PBL can be broken down into six phases:

- concept and feasibility
- planning and design
- preproduction
- production or implementation
- presentation
- termination

Research shows that PBL is not widely adopted in New Zealand and Chinese contexts. It is difficult to find research on PBL in New Zealand, and for the purposes of this paper, it is assumed that the experiences in other parts of the world are reflected in the New Zealand context (Hickey, 2014). In China there is a body of research about PBL. This focuses mainly around the change in teaching conceptions and methodologies which have taken place in the last ten years. From both these sources of research, it is clear that for teachers there are still a number of barriers to PBL – and amongst these is the need 'to review the act of "teaching" and the foundation of legitimacy on which it relies: "knowledge" (Zhu & Fan, p.52).

> There are clear disparities between teachers' "ideal conceptions of education" and the "practical conceptions of education" displayed in classroom teaching practices… Many factors contribute to these disparities. We have no intention of challenging the existing arrangement of the school education system: however, if we are to passively accept that we cannot change the existing education system, the only thing we can change is the classroom teaching situation, which is under the teacher's control. (Zhiyong and Xiaohui, p.54)

Other experience showed that active-learning models aren't the 'fix-all' solution, that classroom activities had to be designed carefully, and that the key to all of this was a student-centered approach based on what

individual students needed.

> Teachers consciously changed the traditional situation of the teacher-dominated classroom, used more classroom time for interaction between teacher and students or group activities, and created opportunities for students to actively participate in different types of educational activities. However, our observation on the case study of teachers' classroom teaching also exposed some problematic issues, such as group activity tasks that lacked challenge and participation suitability and inequality in the participation opportunities for student with different academic performances. (Decheng, Fujian & Jun, p.69)

The food preparation metaphor outlined in this presentation provides a simple, entertaining and humorous way to demonstrate, understand and apply the principles and phases of PBL.

Six phases of project-based learning

Concept and feasibility
The first phase of this PBL model involves a research question, a problem to investigate and solve (Larmer & Mergendoller, 2010). Using the food metaphor, this quest is a solution to the question: what to have for lunch? The underlining subtext of this question is that lunch will be easy to prepare, and healthy. What would such a conceptual lunch look like and is it feasible? We propose to answer this question from a Chinese perspective and a New Zealand one. In New Zealand, the answer to this question is the idea of a sandwich. Is a healthy sandwich feasible – affordable, doable, the right product for the time frame? In China the question is answered with dim sums.

For the learner, a real world problem or research question is essential. This must be something that matters to learners, and something that they are determined to set about researching and solving. The solution to this problem will be the outcome of the project. In the process of identifying and solving this problem, learners acquire the skills required to complete each phase of the project. In this first phase, skills to develop the research question and research methods are required – to ascertain the feasibility of the idea, and to develop its concept (Larmer & Mergendoller, 2010). Critical awareness and thinking are introduced in this phase as they will assist learners in their decision-making processes.

Planning and design
The second phase in this PBL model is planning and design. Bell (2010) identifies this as a crucial phase for learners. The development of a blueprint plan for the project will enable them to stay focused and on-task. This is also the stage at which social learning becomes important (Markham, 2011) – relationship building, empathy, collaboration, and communication. Everyone involved in the project team must understand the project in the same way and be working towards the same goal. Roles within the team must be discussed, developed and allocated. The flow of the project including timing and milestones must be understood and agreed (Bell, 2010).

In the preparation of lunch, research from phase one has established that the sandwich and the dim sum are excellent options. Thinking and planning must now work towards what the sandwich and the dim sum will consist of, and how their production will be achieved. This will involve researching recipes and ingredients, as well as understanding and managing timeframes and constraints.

During this phase of the project, learners are introduced to time management skills and the importance of setting realistic goals. They also learn about collaboration, planning, team work, and identify skills required to design the product. This phase includes more research as learners move toward understanding the requirements of their design.

Preproduction
In this phase all of the materials and tools identified in the planning process are gathered and tested. This is the rehearsal for the moment of production. Potential problems are identified and solved, materials are tried and rethought, and the correct tools are confirmed. Communication and organizational skills become important at this point to make sure that everything that needs to happen for production happens. The robustness (or weakness) of the planning process comes into view.

For the food production, the recipe is confirmed, ingredients are sourced, and the correct tools are identified and tested.

During this phase, learners get to find out if their planning process is working, and make any tweaks to the design or the concept. The importance of a high functioning team with good lines of communication becomes apparent.

Production
The fourth phase of the project is production. This is the moment when everything comes together – planning, research, team work. The materials – designs, tools, resources – as gathered at the preproduction phase, as identified at the planning phase, as inspired by the feasibility and concept phase are put in use.

For the sandwich and the dumplings, this is the production stage – the sandwich and dim sum are assembled and cooked (in the case of the dim sum).

Learners now get the chance to see the outcome of their planning and design. This is the moment to observe the success of the process, to think about how everything is working.

Presentation
In the learning environment, research points towards the necessity for learners to present their project, that this is an essential part of the process (Larmer & Mergendoller). The product should be presented to its audience, a real audience. One of the strengths of the PBL model is that it is about real life, and real life solutions to research questions. A real audience reinforces this authenticity

For our food metaphor, this is the moment when lunch is served, when the food is on the plate and the audience/community is gathered around the table to eat. As the guests eat, the recipes are discussed and the source of the organic lettuce, and the freshness of the prawns.

For learners, having to present the outcome of their project – as book launch, exhibition, reading, demonstration, game, poster – additional skills are required – communication and presentation skills, as well as more teamwork.

Terminal
The sixth and final phase of PBL is the terminal phase. This is where the project ends but it is also the point at which evaluation and reflection are essential. Critiquing, evaluating and reflecting skills come to the fore. These fall easily out of the experience of a real project. And this is one of the most essential phases of the process. Reflections about the process, project and the product reinforce the learning. Feedback from the team, the teacher and the audience are essential. What went well? What went badly? What are the areas of improvement? How could the design be improved? Were goals realistic? Did the timeframe work? The answers to these questions underpin the learning for future projects.

Figure 1: Ashland Elementary Charter School's summary of PBL concepts.

For the Marmite sandwich and dim sums, this is the moment of truth. How does the food taste? How could it taste better, have been cooked better, presented better? How well did the team work? What would happen if we looked at an East/West fusion? What would that look like?

It is essential that learners develop reflective and evaluative thinking. Within the context of their own project, this is easy to observe and reflect on. This is where they make sense of the things they have learned and integrate them with existing knowledge for future projects.

The Benefits of Project Based Learning and the future

PBL asks the question: what do you need to know in order to do? (Markham, p.5).

> PBL allows students to tackle real-world issues. Through PBL, they strengthen their critical thinking and verbal and written communication skills, as well as learn the appropriate use of technology in the classroom and workplace. As students work through their PBL projects, they must collaborate with their peers, teachers and workplace professionals. Inquiry-based learning increases the rigor and relevance of the concepts, and differentiation of instruction will occur naturally in the classroom. The students will not only rise to the challenge and take ownership of their projects, but they will also drive the classroom instruction (Hickey, p.9.).

Contemporary life is full of projects – at work and at home. Knowledge is constructed by undertaking projects from the complex to the simple.

> Nearly all of us… can appreciate that education is emerging as a knowledge-building journey informed by collaboration and a rich digital environment. (Markham, p.4).

This presentation doesn't have a digital environment and not every project based in the classroom will. However it is difficult to imagine a project without a single digital feature in the 21st century and technology must be regarded as a tool within the PBL toolkit (Markham, 2011).

Collaboration is implicit in this presentation – specifically between the presenters – and it is be one of the important outcomes of PBL. Collaboration is also turning out to be one of the characteristics of 21st century education, working and living. Whereas the twentieth century education model produced the isolated genius who developed important knowledge, in the twenty first century, innovations and the development of knowledge are more likely to occur with collaborative intelligence; that with collaborative intelligence, innovations will occur. PBL has a huge role to play in teaching the collaborative skills needed for this (Markham, 2011).

Conclusion

The answer to a question asked on a daily basis - what's for lunch? – sparked this collaborative presentation. Using the metaphor situated in this presentation, it demonstrates that PBL can be taught cross-culturally despite differences in diet and approaches to food preparation. It provides a simple and fun model for teachers and learners alike.

Furthermore PBL offers the possibility of cross-pollination. Returning to our food metaphor,
how does the Kiwi classic – the Marmite sandwich work with an Asian twist? How can the Chinese dim sum be given a Kiwi twist? What do they have to teach each other? The smell of paua dim sum simmering in a pot fills the room…but what will be added to that sandwich?

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Competenz eLearning: convenient and effective learning for apprentices

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eLearning, also known as online learning, aims to deliver training in a digital environment where learners are able to access courses anytime, anywhere at their convenience. This paper described a Competenz developed eLearning system that addressed existing issues with paper based learning, and provides benefits to our increasingly computer savvy learner group. To better serve our internal and external stakeholders who are also new to eLearning, we adopted an agile development approach to ensure we meet their ever changing requirements. Our organic team comprises of specialists in design, instructional design, assessment writing and software development, who are able to take ownership of individual projects and work directly with stakeholders. Each team function has its underpinning principles and operational theories behind their processes, which the paper will cover in detail, along with data and recommendations for future training organizations seeking to pursue eLearning as a tailored solution to their learners.

Keywords: eLearning, apprentices, innovation, curriculum development, digital literacy, assessments

1.0 Introduction

Competenz is a multi-sector Industry Training Organisation (ITO). ITOs primary functions are to design and manage technical and business qualifications to ensure the New Zealand workforce is highly skilled. Every year, Competenz works with over 3,500 businesses in 37 industries, helping over 20,000 learners develop their skills on the job. ITOs also arrange training for learners, assigning them to an employer for on-job training and night class or correspondence for academic knowledge required to achieve their qualification. A qualification comprises of components called Unit Standards (US), which individually requires the learner to achieve a

certain knowledge or skillset whether on-job or off-job.

Traditional methods of night class and correspondence are heavily paper based and rigid in terms of schedule and location. For example, learners are required to travel to institutions after work to study towards their off-job US. These sorts of arrangements lack flexibility for the learner and are significant time wastage for course administration staff. Traditional textbooks are also cumbersome and text heavy, which is often difficult to digest by learners, especially those with lower literacy or numeracy capabilities. On top of that, paper based assessments take a long time to be delivered between parties and do not provide real-time transparency. With the above issues in mind, Competenz embarked on a long term investment into eLearning in 2011. The vision was to address our sectors' needs and more importantly introduce a better learning experience for every learner.

Technology, globalization and new knowledge on education has changed approaches to learning worldwide and most literature have revolved around physical technology, such as the tools to deliver learning (Educause, 2010). However, it has been widely recognized that specialized delivery technologies such as eLearning are merely time-saving vehicles of training but does not impact learner achievement (Anderson, 2011). There are significant learning benefits from embedding audiovisual and computer media into courses compared to traditional text and diagrams, but at the same time, these benefits do not correlate with the medium but the instructional strategies when designing the material (Clark, 2001). We have learned that while eLearning allows learners to save time and flexibility of access, our content must also follow sound instructional design principles (Cole, 2000). We also realized the commitment and resources required to make it work, as according to Rossett (2002), eLearning has its promises but must be done right – this means the material must be designed properly, with the learner in focus, and adequate support be provided. Educause (2010) goes a step further by suggesting that human learning behavior and psychology are increasingly important to ensure that the learning experience goes beyond the "electronic" in eLearning, but also make it stand for exciting, energetic, engaging and extended.

Competenz aimed to achieve this by building its eLearning teams around experts in the core areas of design, instructional design (ID), assessment, and solutions support. The design team focused on understanding our end users, creating multimedia content, and enhancing user interface and experience (UI/UX). The ID team scopes and prioritizes business requirements for online material, then builds the material for learner consumption via a series of chunking, wire framing and storyboarding processes. The assessment team is experts in the New Zealand Qualifications Framework (NZQF) who understands the expectations, demand and evidence that each US requires from a learner, and then breaks it down into online assessments in collaboration with industry approved subject matter experts (SMEs). The solutions support team is responsible for the eLearning system roadmap, regression testing, bug fixing and day-to-day reporting, documentation and user support. Overall, the team structure is very flat and organic to allow for more effective cross-team development and collaboration. This also allows the eLearning teams to be agile towards its ever evolving stakeholder requirements, and develop a culture that embraces change. The later sections of this paper will go into more detail about the processes and operational theories behind every team.

Each individual team's overall process follows an agile development cycle that involves: scoping out requirements, iterations and feedback from peer review and/or subject matter experts (SMEs), fixing issues and improve on content, and then deployed to stakeholders. Later sections of this paper will describe each team's processes in detail and actions involved relating to the agile cycle.

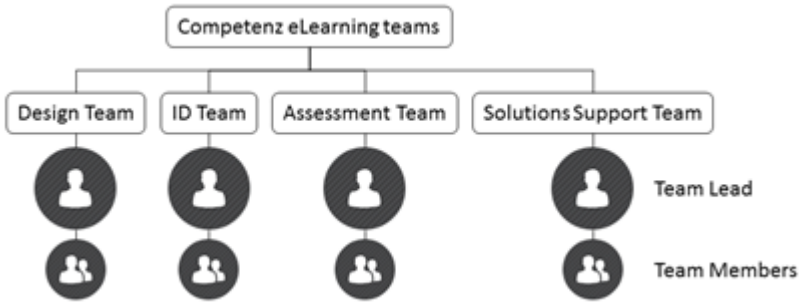

Figure 1: Organisational Chart for Competenz eLearning teams

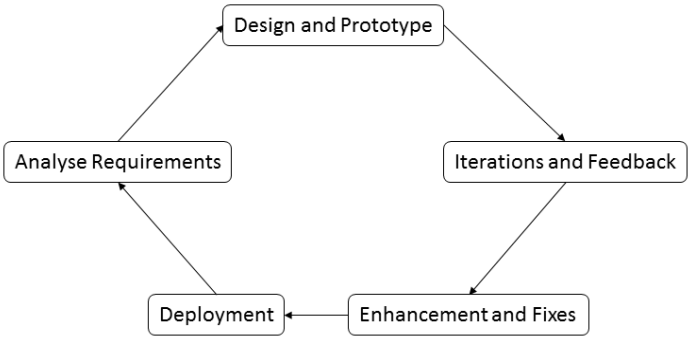

Figure 2: Agile Development Cycle

2.0 eLearning Platform Overview

The Competenz eLearning platform was custom built to integrate learner progress data with the company's existing customer relationship management database (CRM) which ultimately is delivered to the government's online data collection service called Industry Training Register (ITR). Whenever a learner completes an US on our eLearning platform, the data is automatically synchronised to the CRM which reports to the ITR for funding purposes, thus it is crucial that the platforms are tailored to communicate seamlessly with integrity. From initial research, none of the off-the-shelf products could offer this level of integration.

To prevent inconsistencies in data, the eLearning platform sees all data from the CRM as its 'source of truth'. This means that most details about learners, US, assessors, employers, and so on are based on what's provided from the CRM, and cannot be overridden by the eLearning platform. The eLearning platform is however responsible for the online courses that the learners progress through and any data relating in that respect is sent back to the CRM.

There are two individual sub-platforms that make up the overall eLearning platform – the Learning Management System (LMS) and Asset Management System (AMS). The LMS consists of the front-end portals that end users log into and experience the eLearning. Meanwhile the AMS is the back-end development area where all materials are created, uploaded and managed. The AMS also contains many tools such as: user management, learner setup, site activity log, media library and quality assurance. Effectively the LMS pulls the necessary content from the AMS to present to the end user.

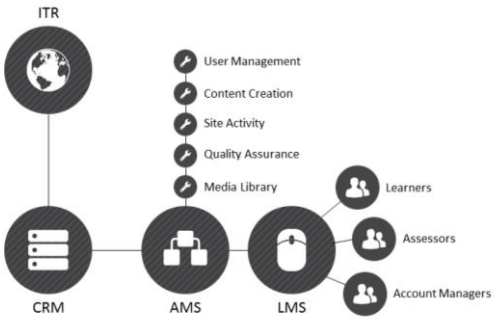

Figure 3: Platform Mapping Overview

2.1 Development, Bug Fixing and Regression

The eLearning roadmap contains a list of features to build and existing bugs to prioritize for fixing. As with all software, every inclusion of new code may accidentally break something else. In order to deploy ongoing new features without unexpectedly affecting end users, three instances of AMS/LMS has been set up on the cloud server – test, training and production. New software builds containing features and bug fixes are first deployed onto test server, and once all changes are confirmed working, that build is pushed to training server. The training server is where full regression will be performed, therefore all functionalities will be tested, even those that are supposedly unaffected by the changes. If the build passes regression, all users (who will only use the production

server) will be notified of system maintenance for a software release.

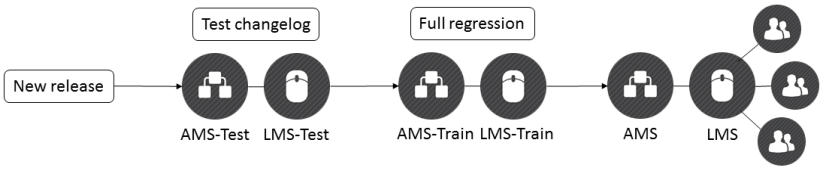

Figure 4: New Software Release Cycle

2.2 eLearning User Interface

The eLearning user portal is shown in the image below (Figure 5), where each numerical marker on the image represents a user feature.

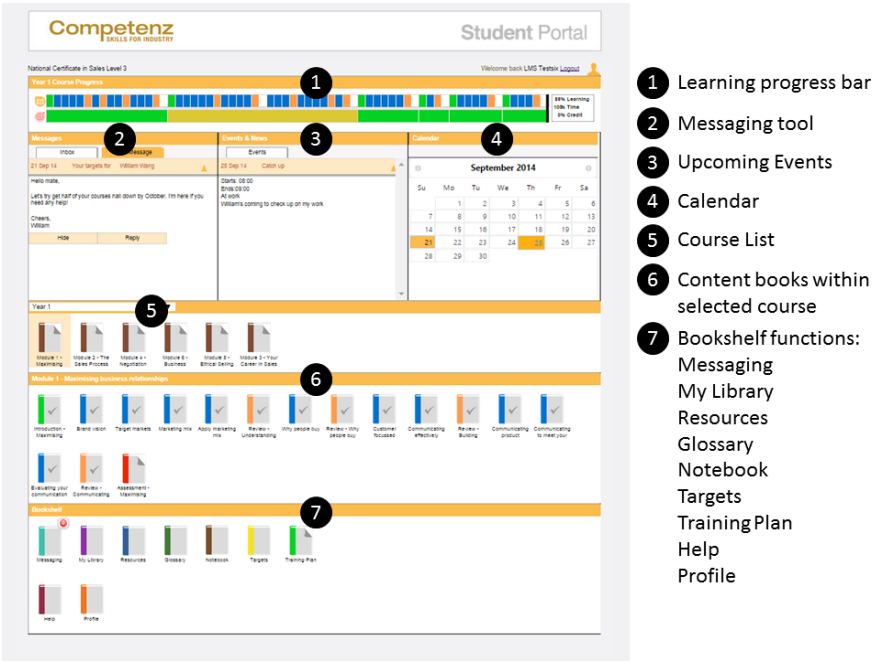

Figure 5: LMS Student Portal Interface

The learning progress bar (1) displays the number of courses on the bottom row (variable length based on how many learning books it consists) and the number of learning books completed in relation to those courses on the top row. On the right hand side there is a high level overview percentage of: total learning completed, time passed for that year of study (365 days) and credits achieved (credits are awarded when a US is achieved and accumulates towards the total required to gain a formal qualification.)

The messaging tool (2) is a quick way to read any messages and compose new messages to an assessor or account manager. The upcoming events area (3) displays any appointments in the near future as set up in the calendar tool (4). To add an event, the learner simply clicks on a date and fills out a few details.

The course list (5) displays all eLearning courses to be completed for that active year. Clicking on a course will display all its content books below (6). Content books are color coded to represent different types of learning: green is an ‘introduction book’ that describes the course, blue is a ‘learning book’ with learning materials, orange is a ‘review book’ to recap all the learning books before it, and red is an assessment book where the student’s knowledge will be tested. Completing each book will give it a ‘tick’ icon, and completing all assessments in a course will award the learner the US and credits that the course covers. For example, ‘Maths and Mechanics’ course covers US21905 and US21908, which are worth four and two credits respectively.

Other functionalities reside in the bookshelf (7). The Messaging book is a more feature packed view of the messaging tool (2); My Library book allows learners to upload evidence of their work such as drawings or photos; Resources book contains extra learning references to support learning; Glossary book display all the key words in every course, their meaning and pronunciation; Notebook book allows the learner to type in their own notes while studying; Targets book shows all the targets assigned to the learner by their ITO account manager; Training Plan shows all the US and their respective eLearning course mapping (if any) for the entire qualification; Help book contains all the user guides about the portal and finally Profile book allows the learner to change password and email address.

2.3 eLearning Material

When a content book within a course is selected (Figure 5), the learner is directed to the first learning content page in that content book. An example of learning content is shown in the image below (Figure 6); each numerical marker on the image represents a user feature, described below.

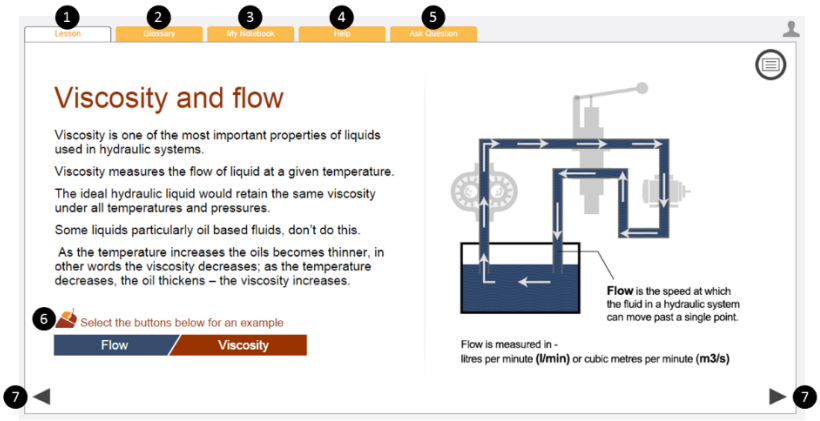

Figure 6: Learning Content Example

The default view (1) is the learning material itself, elements on the page can consist of text, images, animations, virtual coaches, videos or other interactive elements (6). The learner progresses page by page through selecting the bottom left or right navigation arrows (7). Throughout their learning, the learner can quickly access various functionalities via the top tabs: Glossary (2), Notebook (3), Help (4) and Messaging (5).

The learning content uses a variety of visual and interactive elements to enhance the learning experience, such as: images, learner input activities, virtual coaches (voice acted, animated characters) and animations (Figure 7).

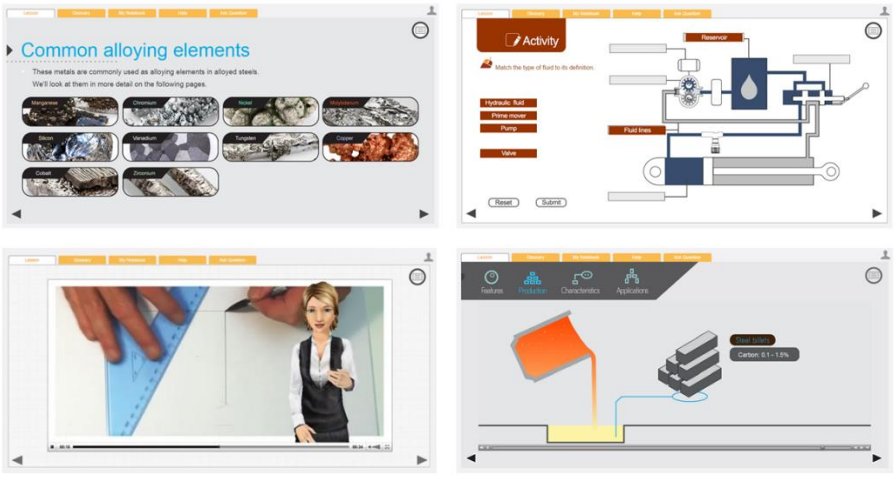

Figure 7: Different Types of Visual and Interactive Elements

2.4 Assessment Types

There are two assessment types – short answer and portfolio. A course may contain one or both types of assessments depending on the evidence needs of the US. Short answer assessments are questions that have a fixed answer and can be built as a multi-choice, drag and drop, fill in the gap, and so on. Short answer assessments are automatically marked by the eLearning platform and learners can receive their results instantly. Portfolio assessments on the other hand are used for essay or task evidence needs, where a human assessor is required to conduct the marking. Portfolio assessments allow dialogue to occur between an assessor and learner about a specific question or task responses. The learner can see their results to individual questions as soon as the assessor marks them.

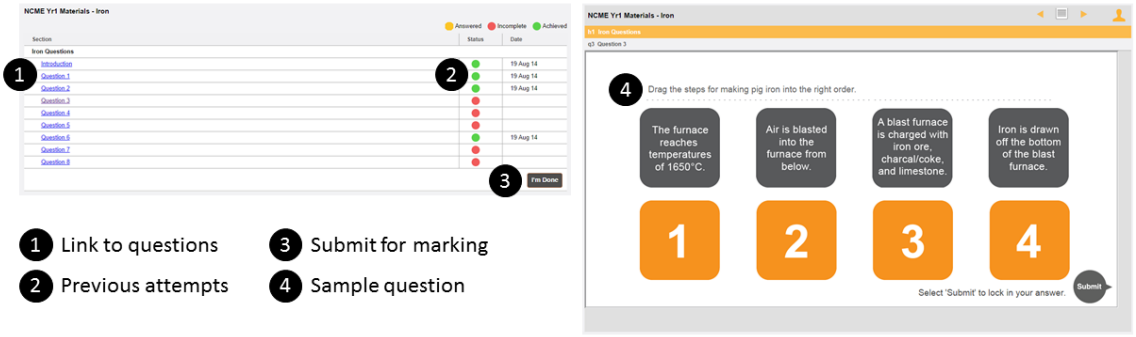

Figure 8: Short answer assessment example

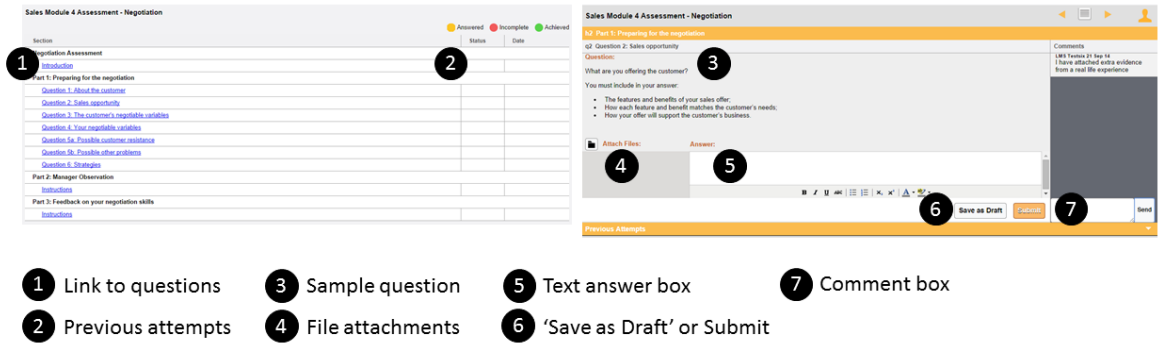

Figure 9: Portfolio assessment example

3.0 Building Learner experience

In order to focus on the learner and create engaging, interactive learning content, the development process should be backed by sound operational theories and best practises. Detailed processes and theories for design, instructional design and assessment writing are discussed in the following sections.

3.1 Design Theory and Process

The design team is responsible for the UI/UX of the eLearning system as a whole and the content of each individual course. The UI/UX process is influenced heavily by renowned authors Jakob Neilson and Steve Krug. Neilson's book, Usability Engineering (1993), outlines the important step-by-step methodology for agile development at various stages. It also includes information on how to run usability tests and tools needed to avoid unexpected surprises. The following tasks were implemented during the analysis and concept design stages.

Task Analysis

It is important to understand how the user conducted their learning previously. As our learners were studying off paper workbooks while attending classes, part of the analysis included the strengths and weaknesses of the delivery method.

Functional Analysis

We researched related products in the market, how they attempted to solve the problems from task analysis and the ways in which they fail to address the users' needs. This then combined with the task analysis, outlines the key functionalities needed for our own UI/UX. Goals were set on how to better categorize knowledge in the online environment and allow the learners to study at their own pace.

Iterative Design

Balsamic mock ups are created and tested with stakeholders, followed by a prototype of the interface. Prototypes can either be horizontal, where high level menus are present but non-functioning details, or vertical, where one specific function is presented and fully working. The choice of prototype will depend on what feedback from the users is required.

At times, other research methodologies were used to further understand stakeholder psychology (Table 1).

Table 1: Other methodologies to understand end users

Methodology	**Description**
Card Sorting	Functionalities and menus are laid out on separate cards for the end user to categorize themselves.
Survey	Understand current pain points and what they would like to see.
Contextual Study	Film different user demographics using eLearning and generalize them into personas. Each persona has a 'red route', which is a list of most commonly used functions and how they currently use it.

Steve Krug's book, Don't Make Me Think (2005), has laid the foundation for content design where the focus should always be on what the learner is trying to achieve. Simplicity was emphasized for the learner to absorb content more effectively; therefore the following guidelines were followed for every piece of design:

- Layout must be clean and non-disruptive
- Buttons and links must be intuitive and easy to reach
- Everything on the page should be there for a reason and add value
- Hierarchy of styles (heading, subheading, body, image, font, etc) must be consistent
- Style guides must be formalized for every eLearning course and user group.

The above operational theories play a key role within the overall design process, and the design team would often consult with the instructional designers regarding whether their designs support good learning science principles. The teams would work closely together to build the information architecture of eLearning courses and optimize how the learner views the content.

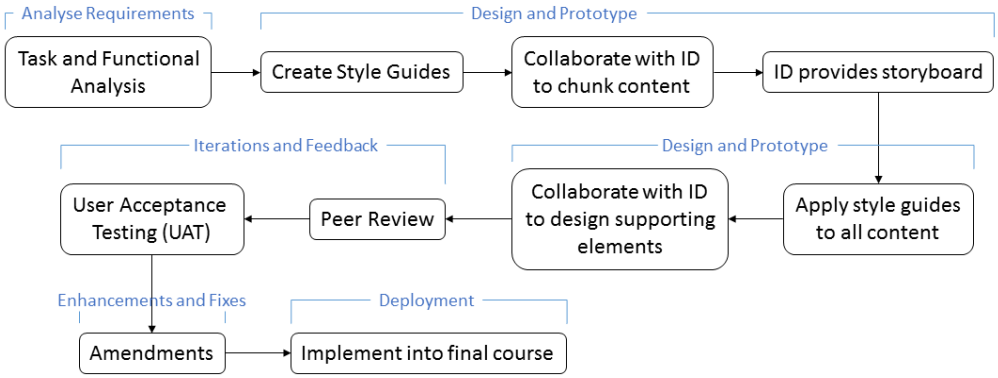

Figure 10: eLearning design process

Figure 10 outlines the overall process for the design team. Once the analysis stage has been completed and style guides are created, design team works with ID team to logically breakdown learning progression for a US. The ID team then delivers a stakeholder approved storyboard of the entire course (see section 3.2) for the designers to implement styles. The two teams then discuss whether certain parts of the content can be better communicated through media elements such as animations, diagrams, and interactive elements. The finished course undergoes peer review from members of both teams, and then goes out to the stakeholders again for User Acceptance Testing (UAT). Feedback is collated and amendments are made before the course goes live.

3.2 Instructional Design Theory and Process

The instructional design team is responsible for communicating with stakeholders to scope out eLearning course projects, apply learning science and digital literacy to create learning content, and delivering the final product back to stakeholders. The underpinning theories combine traditional literacy and numeracy standards (NZQA) with eLearning development guidelines (Seidel, 2014) and digital literacy articles (Gutierrez, 2014).

According to Gutierrez (2014), the key to good eLearning writing is putting learners at the center, take into consideration their learning styles and individuality, rather than giving them standardized curriculums. In practice we have implemented Gutierrez's guidelines into our content by:

- Writing short, conversational sentences that sounds less robotic and corporate
- Providing clear and realistic media elements that the learner can relate to and trust
- Ensuring authenticity of learning by using real world examples and opening communication with assessors
- Laying out content so that the human eye follows a logical flow instead of skipping around

The first step to start developing for a course is to scope out requirements and priorities. Usually stakeholders within the business such as area managers or program managers will present a business case to upper management for approval and sponsorship. These stakeholders then engage the ID team to scope out the project. During this process, eLearning courses to be built are prioritized based on factors such as: demographic, government funding, KPI, learner sign ups, ROI and political factors such as voices from industry. In general, the foundation courses that learners have to achieve before specializing are built first as they are more critical.

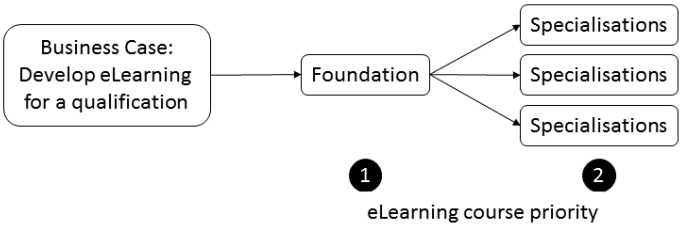

Figure 11: eLearning course development priority

During the scoping process, a responsibility assignment matrix (RACI) is documented to clarify roles and identify who needs to be communicated at during the various stages of development. RACI stands for who is: responsible, accountable, consulted and informed.

Table 2: Example of a RACI matrix

Task	Person	R	A	C	I
Storyboarding	ID lead	✓	✓		
	ID team	✓			
	SME			✓	
	Stakeholder				✓
User Acceptance Testing	ID lead		✓		
	ID team	✓			
	SME			✓	✓
	Stakeholder	✓	✓		

The overall ID process is shown below (Figure 12); much of it has been derived from Seidel's action mapping for better time and budget management. It is important to note that throughout the process, visualizing the content is critical in learning design and thus where possible, any work in progress, mapping, chunking, concepts, feedback should be visualized in some way, such as applying sticky notes and print outs onto a wall.

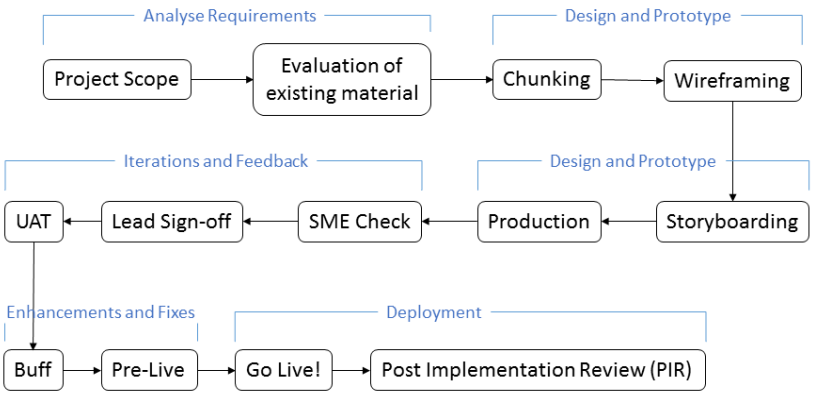

Figure 12: eLearning ID process

When a project has been scoped, the development process begins by evaluating baseline content, such as

existing workbook and documentations. These materials give the IDs an idea of what the course is about and what additional information is required to make it more streamline. To do so, the existing content is mapped against the US and its evidence requirements (ERs) in the chunking stage. Content is dissected into pieces and re-arranged for logical flow inside an eLearning environment. Learning checks (practice questions) are inserted where appropriate and with the support of the design team, some content are transformed into visual elements. Overall this step aims to achieve what we call 'framing' (Figure 13).

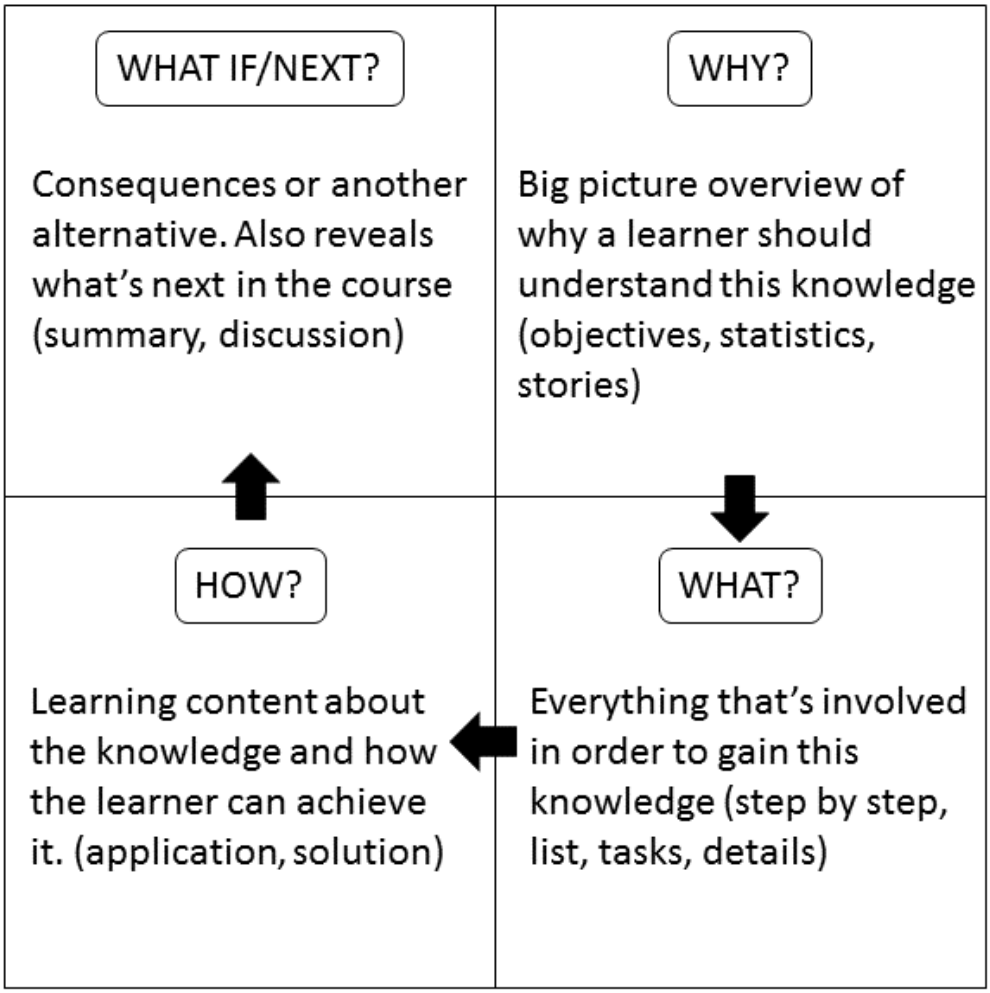

Figure 13: Steps for framing content

The next stage in development involves wireframing a concept course, which is shown to the stakeholder as a recommended plan of approach. This process involves categorizing chunked material into a list of content books to be shown in the student's eLearning portal (Figure 5). Once the stakeholder signs off on the arrangement, the IDs then enter the storyboarding stage and rigorously translate textbook writing into eLearning writing.

The completed learning content is then uploaded to the eLearning platform as courses during the production stage, and communications will go out to industry for recruiting a subject matter expert (SME) to review the courses. A clear contract and a schedule for conditions of service is very important to ensure SMEs are focused on what they are supposed to do and not waste billable hours going off on tangents. The ID team is constantly communicating with SMEs and implementing any valid changes to the content.

Before the final course goes out to User Acceptance Testing (UAT), the project leads check for formatting, layout, consistency, terminology, design and style, which are usually aspects that SMEs doesn't check. The UAT stage involves sending invites to stakeholders to trial the courses for feedback. UAT users will be provided schematics of the courses, US requirements, model answers to assessments, with which they can determine whether all necessary information are embedded into the content.

Once all UAT feedback has been reviewed, in the buff stage, IDs implement any final touch ups and test these courses on our recommended devices. Just before going live, glossaries and resources are uploaded and communications go out to stakeholders to announce the launch of a new course.

Post Implementation Review is a two phase review process that looks at:

- Phase 1 (immediately after project): What went well, what didn't work, new processes required, and list of non-critical enhancements to the course to be made later (has to ensure it does not impact current learners.)
- Phase 2 (two to three months later): Compare user feedback to what was originally discussed in Phase 1. Re-evaluate list of enhancements if necessary.

3.3 Assessment Writing Theory and Process

When building any course, we include two levels of assessment: formative and summative. The assessment team is responsible for designing and developing summative assessments that honours the US requirements and the overall learning experience. Underpinning all summative assessment development is key assessment design principles (NZQA, 2001). These principles include:

- Assessment methods are appropriate, fair, integrated with work or learning, and manageable for learner and assessor.
- Evidence is valid (measures what it should measure), direct (as naturally occurring as possible), and sufficient (enough).

Formative assessments, also known as learning checks or activities, help the learner practise and confirm key aspects of the learning. Including immediate feedback to the learner on their activity completions, helps them proceed with the learning, as well as helps them gauge their readiness for attempting the summative assessment. The ID team develops the formative assessments as part of storyboarding. Reference to the summative assessment is crucial to ensure clear scaffolding and coverage between learning content, formative and summative assessments.

The overall process for online assessment writing is shown below (Figure 14).

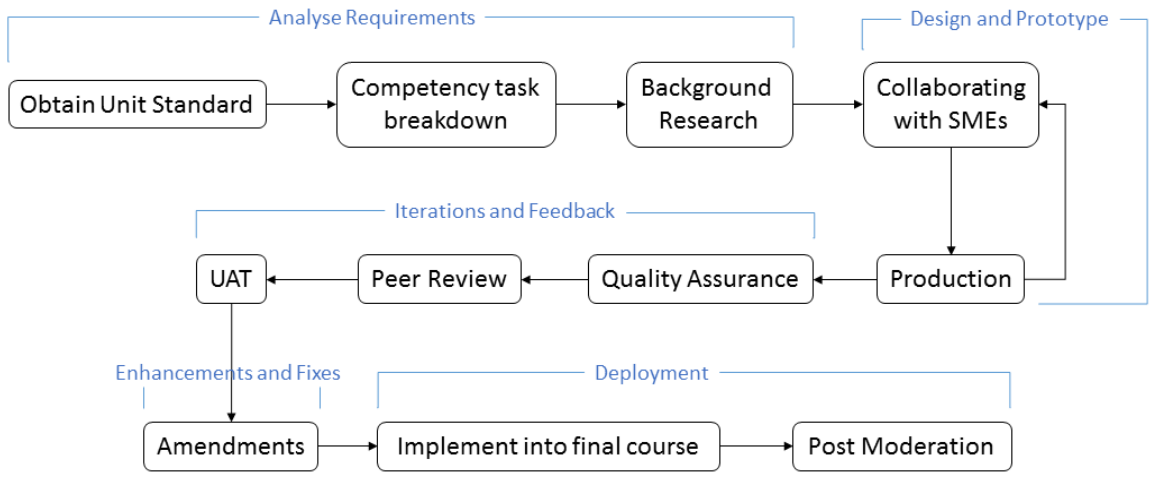

Figure 14: eLearning assessment process

When building online assessments, the assessment team works closely with the ID and Design teams, as well as SMEs. Their starting point is the US. The US outlines the measurable learning outcomes and ultimately the assessment targets and criteria. An informing part of the US criteria is the unit's Level, which guides the assessment writer on the level of demand expected of the learner.

The New Zealand Qualifications Authority (NZQA) is NZ's government body that defines these levels. Below is a matrix of the Level descriptors (Figure 15).

Dimension	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Knowledge	Basic general and/or foundation knowledge	Basic factual and/ or operational knowledge of a field of work or study	Some operational and theoretical knowledge in a field of work or study	Broad operational and theoretical knowledge in a field of work or study	Broad operational or technical and theoretical knowledge within a specific field of work or study	Specialised technical or theoretical knowledge with depth in a field of work or study
Skills	Apply basic solutions to simple problems	Apply known solutions to familiar problems	Select and apply from a range of known solutions to familiar problems	Select and apply solutions to familiar and sometimes unfamiliar problems	Select and apply a range of solutions to familiar and sometimes unfamiliar problems	Analyse and generate solutions to familiar and unfamiliar problems
	Apply basic skills required to carry out simple tasks	Apply standard processes relevant to the field of work or study	Apply a range of standard processes relevant to the field of work or study	Select and apply a range of standard and non-standard processes relevant to the field of work or study	Select and apply a range of standard and non-standard processes relevant to the field of work or study	Select and apply a range of standard and non-standard processes relevant to the field of work or study
Application [of knowledge and skills]	Highly structured contexts	General supervision	Limited supervision	Self-management of learning and performance under broad guidance	Complete self-management of learning and performance within defined contexts	Complete self-management of learning and performance within dynamic contexts
	Requiring some responsibility for own learning	Requiring some responsibility for own learning and performance	Requiring major responsibility for own learning and performance	Some responsibility for performance of others	Some responsibility for the management of learning and performance of others	Responsibility for leadership within dynamic contexts
	Interacting with others	Collaborating with others	Adapting own behaviour when interacting with others Contributing to group performance			

Figure 15: NZQF level descriptors (Source: NZQF, 2013)

After making time to understand the US requirements and demands, assessment writers work with industry SMEs to draft up relevant, valid and sufficient assessments. An assessment schedule document called the 'Model Answers' (MA) is developed that drafts assessment instructions, questions and tasks. This includes example answers, exemplars, and judgement statements that will support the assessor make consistent judgements on learner completions. Essentially the MA is assessments version of storyboarding.

SME and Peer reviews are completed on this document, which are then sent to Competenz' Quality Assurance (QA) team for a Moderator to check the summative assessment will support the learner achieve the US, and the assessor to make consistent judgements. QA approval at this stage is shown via a passed Pre-Assessment Moderation Report. This pass triggers the assessment build into online assessment books.

All assessment books once built, like learning content books, go through another peer review and then UAT. It is crucial that any short answer assessment books that are marked by the system, have been results tested and are accurate. These reviews also provide the last check that the learning and assessment in the course matches and are seamless. Any updates are made and signed off. Once assessment books pass UAT, these books are checked into the Production environment. Assessment is handed into the ID team to add the book(s) to the course build.

The MA is made available to approved assessors ready for when they need to either support and/or mark the learner in course assessment.

The assessment team joins in the project implementation review. As course assessments are completed, the post moderation process, managed by our QA team, can begin. Any end user feedback is managed as it arises.

Assessment version control is managed within the system.

4.0 Outcomes and User Feedback

There are currently 364 learners on the Competenz eLearning platform, studying towards their qualifications in multiple fields such as Mechanical Engineering, Wood Manufacturing, Plastics Processing, Glass Technology, Heating and Ventilation Air Conditioning (HVAC) and Sales. Their learning experience is currently supported by their assessors, Competenz account managers, solutions support team and contracted tutors from other polytechnics in New Zealand.

A recent survey went out to all learners on the 22nd September 2014, to ask for feedback on their experience in our eLearning platform. We had a response rate of 20% (72 learners) and below are some of the key statistics:

- On a scale of one to five, learners give our system 3.7 on average for ease of usability (Figure 16).

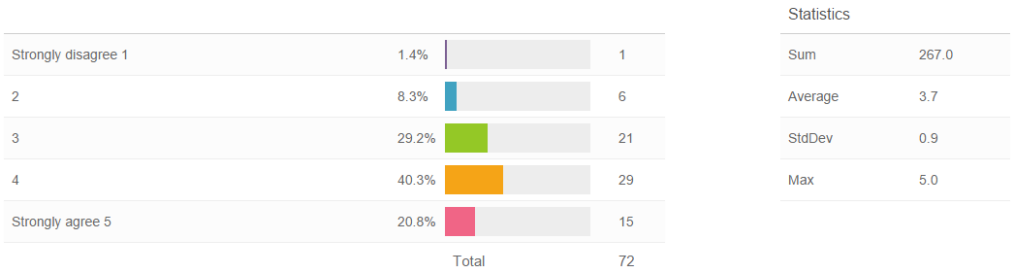

Figure 16: Learner response to "I think the system is easy to use."

- On a scale of one to five, learners give our system 1.9 on average for need technical support to use our eLearning (Figure 17).

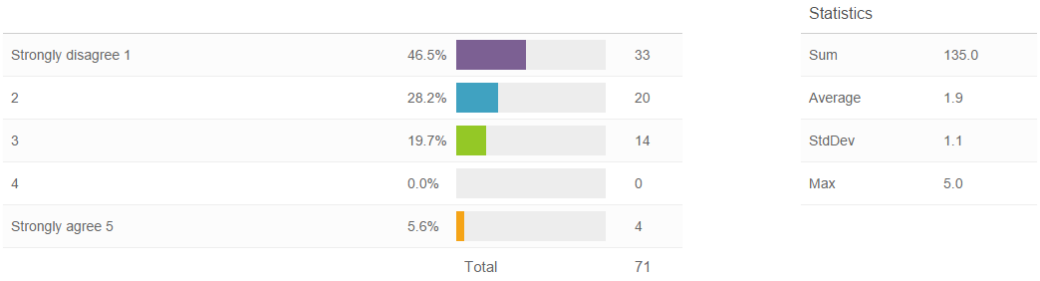

Figure 17: Learner response to "I think that I would need the support of a technical person to be able to use this system."

- On a scale of one to five, learners give our system 3.7 on average for user confidence (Figure 18).

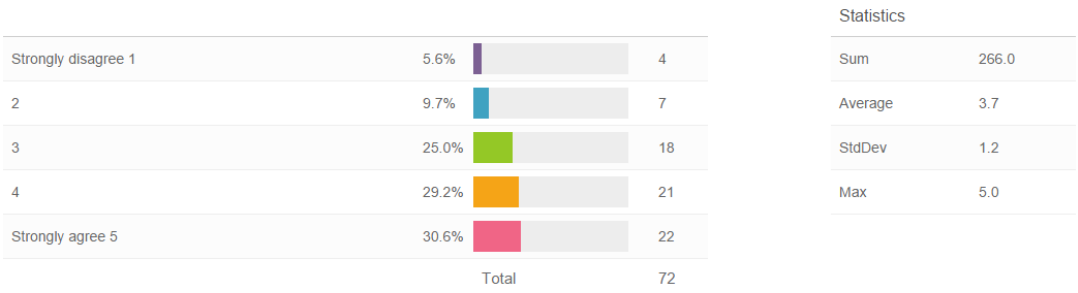

Figure 18: Learner response to "I felt very confident using the system."

As our eLearning is relatively new and earlier enrolled learners are only starting to complete, we have yet to collect enough content feedback. However of the few that has completed, we received comments such as:

> Yes I really like the eLearning programme and how it was set up, very user friendly and helpful that I could email my tutor straight from it and see my training plan and how I'm doing. I have finished it now but it is good to see that I can still go through it and have a read if I want to. I liked it.

> I would just like to pass my greatest thanks on to the tech team that oversee the eLearning portal. The newest update has made the assessments so much easier to handle, being able to re-answer individual questions as required instead of having to re-sit the assessment in it's entirety makes things so much more manageable and stress free. It truly has made the world of difference, and will no doubt provide a lot of relief to those people like myself who were dreading the next assessment due, unsure of exactly where they went wrong if things were to turn pear shaped. Keep up the good work, I am really beginning to like this new method of training!

> I find the system very good and practical for my type of learning.

5.0 Discussion and Recommendations

The Competenz eLearning platform may have, in part, resolved the issues posed at the beginning. We have identified the issues with the present learning model lacking flexibility and paper based assessments are both cumbersome and slow to deliver. The team and processes we have put in place not only attempted to remove these pain points but enhance learning content altogether. The goal was never to simply dump everything we already had in paper onto eLearning as it is, and expect the learner to absorb the content. Literature has shown that much dedication and resources were required to make it work properly, which we have experienced ourselves with the amount of manpower and research invested in recreating every course.

On the topic of developing eLearning content, we would highly recommend individual teams of experts in different fields such as design, instructional design, assessment, software. However more importantly is ensuring they work together cohesively, as we've learned from experience that individual teams working in silos for too long can cause discrepancies when putting everything together for learning and assessment content flow, UAT and product release. Changes could happen anytime in an agile environment, and sometimes assuming that the other teams are up to date can be dangerous. Over time we have learned to integrate team members into other's processes, so that there is a constant flow of communication.

Adopting an agile development cycle has worked well in terms of adapting to our stakeholder needs, although at times their changes can be unpredictable and adds pressure to team members trying to focus on meeting deadlines. It is important that stakeholders understand how much effort is required to implement their changes, as they are often unaware of the review and change process. At times we have communicated that certain low priority changes will be considered during the post implementation review (PIR) and implemented at a later date. Overall, maintaining an agile cycle while pushing back on changes can be a tricky balance, but the key is clear communication and good stakeholder relationship.

The concept of digital literacy and good UI/UX is still relatively new in terms of industry application, thus ongoing research and development is required. However it is pleasing to see that by following closely with the core principles, an organisation not in the design or software industry like Competenz can create an eLearning platform that users feel confidence in its usability. We are looking forward to hearing from more completed learners in the future, and continue to improve our quality.

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Self-Review - A New Zealand case study

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We know the benefits of early childhood education, but these benefits are conditional on quality (OECD, 2012). Wylie (1996), a prominent New Zealand researcher, goes further by stating that inadequate quality is deferential to children's wellbeing. So, what does quality look like? How can we measure quality? How can quality be improved? To answer these questions there is a need to consider what is meant by quality. Moss and Dahlberg (2008) suggest quality is about values and assumptions. We would add beliefs, as beliefs strongly influence behaviour, at both a conscious and unconscious level. From our perspective, quality sits within a social, political and cultural framework. It is never neutral, it cannot be universal and it is often controversial, particularly in an educational context when the outcomes (or lack of them) can have life-long consequences for children, families, communities and nations.

Keywords: quality, self-review, reflection

Introduction

This paper looks at one aspect of quality under the umbrella of Self Review. We present a case study on the experiences of staff, children and community in a childcare centre who have undertaken self-review in order to address a number of outstanding educational concerns. These include the promotion of positive learning outcomes for children; the delivery of a quality early childhood service and meeting the requirements for the Education Review Office (ERO). This self-review allows for the critical examination of practice and processes. It looks at current practice in terms of what is working well and what could be improved, and how potential changes could be undertaken. This in turn facilitates decision making by teachers and the management of the centre in two areas: what to focus on and what to question further with the aim of improving children's learning. Self-review knowledge of centre staff is crucial for effective review. In terms of teacher education training programme, student teachers must acquire an understanding of the self-review process in their studies, to enable them to provide quality early childhood education once they enter the teaching profession.

Researchers, policy makers and early childhood organisers provide insights and quality indicators to assist in understanding what quality means or looks like, for example, the New Zealand Early Childhood Development Unit (ECDU) back in 1996, proposed the following 11 indicators for parents, families (whanau) and teachers (p.9).

1. Responsive adult to child relationships and interactions
2. Stable staffing and consistent caregiving
3. High adult to child ratios
4. Small group sizes
5. Trained staff
6. A planned curriculum
7. Partnership with parents and families (whanau)
8. Biculturalism
9. A safe and healthy environment
10. Good management practices
11. Affordability linked to quality

ECDU states "each one of these indicators, on its own, will not produce a quality service. But combined, they assure high quality early childhood services"(p.9). The ECDU report offers a checklist for parents and families (whanau) to consider before enrolling their child in an early childhood service. It is stated that "evaluating the quality of an early childhood education service is complex. How the service looks, how pleasant and capable the staff are or how happy the children are, are not the only indicators of quality" (p.22). It is believed that when all the eleven indicators come together you see the following:

1. Care and education is integrated
2. Relationships with teachers are warm, caring and focused on the child/children
3. The environment is organised, so the child/children have many opportunities to learn
4. Children progress at their own pace – they are not pushed to do things they are not ready for.
5. The overall development of each individual child is what matters most
6. Parents and families (whanau) are actively involved, informed and acknowledged as the most important caregivers/guardians of the child.

Prior to the release of the ECDU indicators, in 1993 Podmore, a well-respected New Zealand researcher, identified the following characteristics of a high quality early childhood service:

1. Child-centred planned educational programmes
2. High staff to child ratios
3. Trained staff and ongoing in-service training and support
4. Stability of staff and children
5. Small group sizes with mixed age groups
6. Active/democratic parental participation
7. Language maintenance and cultural revival
   (as cited in Mitchell, 1996).

A report from a UK government agency (as cited in Moss and Dahlberg, 2008) identified seven factors indicative of good quality pre-school provision:

1. adult - child interaction that is responsive, affectionate and readily available
2. well trained staff who are committed to their work and children
3. facilities that are safe and sanitary and accessible to parents
4. ratios and group sizes that allow staff to interact appropriately with children
5. supervision that maintains consistency
6. staff development that ensures continuity
7. stability and improvement of quality and a developmentally appropriate curriculum with an educational content

Before moving on to the New Zealand Education Review Office indicators (ERO, 2010) which provide the parameters for self-review, it is useful to look at a recent set of indicators provided by New Zealand Educational Institute, Te Rui Roa:

1. 100% qualified teaching staff
2. good adult to child ratios
3. small group sizes
4. relationships
5. a warm and welcoming learning environment.

The report provided by ERO points out three overarching indicators:

1. Educators are interested in children - who they are and what they bring to their learning;
2. Educator's interactions with children create opportunities for meaningful conversations that provoke and extend children's thinking;
3. Assessment practices enable educators to notice, recognise and respond to children's emerging interests and strengths.

ERO also stated that children who participate in high quality services:

1. learn in safe and inclusive environments where they are respected;
2. are supported and challenged in their learning;
3. are happy and confident learners who are included and listened to;

4. are acknowledged and celebrated for their progress, achievements and successes
5. enjoy relationships between educators, parents and families (whanau) that are based on mutual trust and respect and strengthen partnerships for learning.

In addition, ERO found that it is the interweaving and interrelationship of many practices that contribute to good learning opportunities. These are:

1. leadership
2. philosophy of the centre or service
3. vision
4. relationships and interactions
5. teaching and learning
6. assessment and planning
7. professional learning, qualifications and support
8. self-review
9. management.

The general literature on quality in early childhood education emphasises:

- the importance of play for young children
- support for high staff to child ratios and low group sizes
- recognition of the importance of high parental/whanau engagement
  - the need for well qualified staff who know how to develop curricula and learning environments (pedagogical expertise)
- sensitivity of staff to individual children

It is interesting to note the comment from Peter Moss (as cited in May and Mitchell, 2012) that "New Zealand has confronted the issues" (p7), with the development of an integrated and coherent national approach to:

- funding - single funding system based on direct funding of services, rather than parents income
- regulations
- national curriculum [Te Whāriki]
- qualifications/single workforce – teachers educated to graduate level
- a single ministry to oversee the above.

Before moving on to the self-review process, it is useful to consider the common threads within the various lists of indicators offered by New Zealand academics and the literature, and how the focus and language change or can appear to change over time. For example, when the comparison is made between the ECDU position in 1996 and the ERO 2010 report, child teacher ratios are no longer prominent. However, child staff ratios are hotly debated, as is the qualification required for ECE teaching in New Zealand, with some researchers strongly believing teaching should be a post graduate qualification, rather than an undergraduate qualification as it currently is.

Despite differing views there are common threads that run through the indicators and literature. These are the need for:

- responsive, caring and informal adult child relationships
- responsive and respectful partnerships with parents and families (whanau)
- safe and healthy environment

The review of the literature and the offering of indicators is not an attempt to define quality, but rather an attempt to set the scene of how ideas over time have come together under the umbrella of self-review within a New Zealand context.

Self-review background

The Ministry of Education (2006) emphasises that there are two components to the self- review process. First, it is the understanding of what is involved in a 'review' and second it is considering the context in which the review will take place. Both components are reinforced in the ERO review as "the deliberate and ongoing process of finding out how well practice enhances children's learning and development" (p.9).

Furthermore, the Ministry differentiates between the definitions of a review and self-review. A **review** 'is the deliberate process of preparing, gathering, making sense of information, and deciding in order to bring about improvement', whereas s**elf-review** is 'a review that is undertaken from within an education service in order to evaluate practice' (p.8).

The above clarification of self-review clearly explains the purpose of this process: that self-review critically supports teachers when reflecting and evaluating their teaching practice. This approach assists teachers in monitoring the effectiveness of their teaching practice to enhance children's learning and development.

The compulsory self-review process (Ministry of Education, 2006) requires that practice is made visible and evidence is provided to support conclusions.

Review, when done well, allows for the critical examination of practice and processes. It looks at what is working well and what could be done better or improved. This, in turn, is used by teachers and the management of the centre to decide:

- what to focus on, and
- what to question further, with the aim of improving children's learning.

To assist teachers and management in the self-review process the guidelines are provided (ibid). They include the elements of effective review and a framework for preparation with examples and explanations.

Effective Review

R Relationships – *the way we engage*
E Evidence –*information we have to analyse*
V Vision – *what we value and why*
I Improvement –*possibilities to be used*
E Ethics – *implications of actions on others*
W Wisdom – *reflection and reflexivity*

Process of self-review

Preparing involves • identifying the trigger for review • developing a focus • establishing indicators to guide us • identifying sources of information • preparing a plan	**Gathering involves** • ensuring this information will give a fair representation of practice • being confident that the information provides evidence to inform judgments
Deciding involves • deciding on what needs to happen • planning to implement and monitor any changes • sharing the outcomes of the review	**Making Sense involves analysis of** • recurring issues • emerging trends or patterns • seemingly insignificant data • one-off or unexpected pieces of information

Effective Practice – What does quality look like?

Hattie and Yates discussing teaching and learning in an article published in the New Zealand Listener (as cited in Woulfe, 2014) write it is important that the teachers show students exactly what success looks like by providing exemplars. This notion also applies to teachers, particularly when introducing new concepts or change to practice. To increase teachers' and parents' understanding of what quality looks like in different contexts a number of booklets were developed and published by ERO, describing what they are seeking when reviewing practice. The following are some examples from an ERO review:

The Quality of Education and Care in Pacific Early Childhood Services (2007)

"Children make decisions about their involvement in the programme, select from a range of activities and resources, and initiate and direct dramatic play scenarios. Adults use strategies for developing children's understanding of literacy and mathematical concepts particularly well and are quick to make use of opportunities to include these in the context of child-initiated play. Both staff and parents use oral storytelling to share traditional legends. Children have good opportunities to enjoy books, to experiment with emergent writing, and to dictate stories about their drawings.

A shared enthusiasm for learning and high levels of participation by both adults and children are particularly evident in frequently planned and spontaneous singing. Messages about caring for others, health and hygiene, values and Samoan culture are often expressed in pese (song) and siva (dance). This music is also a very effective way of familiarising children with the patterns, rhythms, tone and pace of language.

- Staff record observations of children's activities and experiences, discuss these observations at staff meetings, and use this information to develop fortnightly programme plans.
- Informal discussion with parents contributes to teachers' very good knowledge of children.
- Links are made between planning and Te Whāriki. Children's individual portfolios contain analysis of narrative observations and some useful assessment information, as well as examples of children's art, emergent writing and dictated Samoan language.

Next steps:
The challenge for teachers now is to support children to increase the complexity of their learning by finding out what they want to learn more about and building on those ideas." (p, 15)

The Quality of Education and care in Kindergarten (2009)
"Children's literacy learning was well supported in many areas of the kindergarten. They accessed writing materials independently and frequently experimented with writing, making good use of resources in the literacy corner. Children enjoyed using a variety of books, including reference books relating to current interests. Self-made books contained children's dictated narrative to tell stories and to describe photographs and artwork. Children were becoming familiar with the use of ICT such as digital and video cameras to record their activities." (p.13)

The Quality of Education and care in infant and toddler centre (2009)
"Effective teachers:

- were nurturing, gentle, responsive, highly respectful, calm and unhurried when interacting with infants and toddlers;
- fostered friendships and social behaviour between children;
- articulated expectations in a clear and firm manner;
- skillfully read children's attempts at communicating and clarifying meaning when unsure;
- acknowledged children's feelings and frustrations, moving close to any areas of potential conflict to support them both physically and verbally through language;
- explained what was happening, or about to happen, to children and why;
- trust children to make competent decisions about their play choices, participation, physical needs and ability to solve problems;
- worked at children's level consistently;
- placed themselves throughout the centre in order to be available to the children; and
- were spontaneous in showing warmth to children on arrival and throughout the day" (p. 7).

How ERO reviews/measures quality in early childhood services
In preparation for self-review, centres use the ERO framework for review (2013). One of the parts of this framework is based on *Nga Pou Here* metaphor used to describe the factors that affect the capacity of early childhood services to promote positive learning outcomes for children. Pou means significant structure. There are four Pou. "Pou are also carved posts placed strategically on the land or in specific places to acknowledge and represent the relationship between tangata whenua [people of the land], their ancestors and their environment (p.16.)

The document uses Maori terminology and concepts, but the writers have elected to use English translations for an international audience. It is noted that some of the deeper meaning or understanding is lost in the translations.

The four structures (Pou) are:

1. **Management and governance** - vision; philosophy; strategic direction; up-to-date policies, resources; licensing requirements; capacity for sustainable quality and improved outcomes for children
2. **Human resources** - high level of skill in culturally and socially appropriate leadership
3. **Teaching and learning** – reciprocal process whereby teachers are learners and learners are teachers (co-construction)
4. **Partnership** – emphasis on the sense of coming together to work with and alongside each other.

The following are indicators for management and governance on the purpose of a vision and philosophical goals (ERO 2013, p. 27):

Vision
A clear vision sets direction for the service. This vision:

- seeks to realise the potential of Maori children and their whanau
- includes reference to the bicultural nature of Aotearoa New Zealand
- is responsive to the aspirations and expectations that parents and families (whanau) have for their children.
- guides long and short term planning
- reflects a commitment to high quality early childhood education for all children.

Philosophy
The service's philosophy needs to:

- be developed collaboratively by management, teachers, parents and families (whanau) and children
- be clearly documented and shared with all who are involved in the service
- be regularly reviewed
- be underpinned by shared values and beliefs
- reflect a commitment to the bicultural heritage of Aotearoa New Zealand
- outline the service's desired outcomes for children
- be evident in practice.

Before moving on to the actual review undertaken by the teachers and management it is necessary to discuss two more ministerial documents combined in one booklet – *Licensing criteria for early childhood education and care centres (2008); and The early childhood education curriculum framework (amended 2011)*.

The licensing criteria are woven into the review process and cover the regulations / minimum standards against which compliance is assessed. Teachers and management are required to provide evidence that the centre meets compliance requirements. The following is a brief summary of the regulations:

1. **Curriculum** – professional practice; culture and identity; children as learners; working with others
2. **Premises and facilities** – the design and layout of the premises; conforming to relevant bylaws and the building act including lighting; ventilation; acoustic absorption; preparation for food and eating spaces; toilets and hand washing facilities; sleep areas
3. **Health and safety** – hygiene; emergencies; sleep; hazards and outings; food and drink; child health and wellbeing
4. **Governance management and administration** – parent involvement and information; professional practices; planning and documentation

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Centre preparation for a review

Teachers and management complete a self-review report document that is sent to the ERO team prior to their visits. The purpose of the document is to provide the ERO reviewers with a context and sufficient information to help the review team understand what is valued, what the centre does and their knowledge of effective practices in relation to their centre.

Although the self-review process has been developed for childcare centres, it is critical that ECE student teachers understand this process in order to implement it, as they will be leading and developing quality programme for children in their care, when they are teachers and leaders of teachers in early childhood education.

Self – review: case study

Contexts: the centre

- Provides full day education and care for 30 children aged from birth to five years of age from diverse background/demographics.
- Is governed by a tertiary institution
- Implements three languages – Maori, Sign language, and English
- Has five qualified and registered teachers and 1 teacher aide - staffing ratio of 1 to 3 for children under 2 years of age and 1 to 7 for children over 2 years of age

The centre is required to provide a description of its philosophy – values, beliefs and its vision for the centre and the children.

The teaching staff are asked to provide evidence:

- on self-review knowledge and understanding
- on professional development undertaken
  - on curriculum planning, assessment and evaluation and how this is done to ensure all teaching staff are involved;
  - that parents and children have a voice; that children's dispositions, skills, abilities and interests are recognized and planned for; that the programme is challenging for children; how teachers and management know that the teaching and programme is effective and how is this information used.
  - on how the centre involves / consults parents and families (whanau) and meets parents and families (whanau) aspirations for their children
- on strategies for success for Maori and Pacific children
- on strategies to deal with transition processes – from home to the centre, from the centre to school
  - on strategies for supporting children with special education needs; special abilities; children with English as an additional language
- on steps taken to minimise potential barriers to learning for individuals or groups of children
- on leadership structure and capabilities
- on long-term development plan

Vision and philosophy

The information was provided to ERO and written by the teachers based on the indicators for management and governance (*ERO 2013, p.27*):

Vision for self-review

We are professionally and articulately explaining our practice, documenting this so that our community is drawn into what "we do here" and "how we make a difference to children's learning".
The self-review process when viewed from this perspective is worth getting excited about because teams make shifts in practice based on the principles of Te Whāriki that have long term effects on children's identities of themselves as confident and capable learners (Sands,2011).

Philosophical goals

The goals (below) were developed by the centre teachers. (Developed July 2004 and revised 13/02/2007, Reviewed 19/02/2008, Reviewed 12/02/2010, Reviewed 18/02/2013)

We believe in:

- Fostering a learning environment which values and respects the diversity of the children, their families, whanau and teachers
- Fostering a learning environment which values and respects, through implementation, the use of Maori protocol and Te Reo language
- Fostering a climate of mutual trust, dignity and respect to build confidence in young children
- Creating an environment which recognises, values and respects an individual's identity
- Creating an environment where all children, their families and whanau feel a sense of belonging
- Creating an environment where children can freely explore
- Creating an environment where children experience their world through sensory exploration
- Creating a safe and healthy environment which encourages children to take on risks and/or challenges
- Creating an environment which is responsive to children
- Recognising young children's dispositions and ways of learning
- Recognising and believing in the potential of the child
- Acknowledging that teaching and learning is a lifelong process
- Acknowledging the co-constructivist perspective to learning
- Maintaining professional and ethical relationships within the centre environment
  - Liaising with the appropriate agencies when reflecting on the diverse learning foundations and abilities of the children, families and whanau attending the centre
- Implementing non-discriminatory teaching practices
- Reflecting the aims and aspirations of Te Whāriki

Theories underpinning the centre philosophy are:

The philosophical approaches of the centre are based on the Values and Beliefs expressed in the goals for the centre. The Values and Beliefs did not sit neatly within one theoretical/philosophical perspective. Hence the philosophical position of the centre is based on an eclectic approach.

Ecological Approach
Learning and Development occur through increasingly complex processes of regular, active two-way interaction between a person and the immediate everyday environment. Processes can be affected by more remote contexts which the child and teachers may not be aware of. Being aware of these processes enables teachers to connect what is happening within the wider communities and the impact that may affect a sense of well-being and a sense of belonging for children in the centre's environment.

Experiential Learning
Foundations of learning and knowledge occur within a curriculum which is meaningful and enriching. The curriculum draws from the child's own experiences and forms the basis for the learning experiences and the quality interactions between young children and their environment. Hence, the experiential approach to learning is providing children with a meaningful context in which they can internalise, personalise and practice their growing capabilities and knowledge with teachers who are willing to share their expertise and help to co-construct new knowledge.

Humanist Philosophy
Community building prepares the ground work for young children's foundation of knowledge to grow. Verbal and non-verbal interactions with children using open-ended questions, problem solving, recalling feedback, demonstrating and describing allow teachers to participate in and instigate a disposition of inquiry and curiosity in young children. To achieve these aims the learning environment needs to value and respect individual children's identity. The Humanistic approach encourages children to foster their own development through the human capacities of choice, creativity and self-realisation.

Social Constructivism
Social constructivists, building on Lev Vygotsky's work, believe that children are active in constructing (forming) their own knowledge about the world and that this occurs as children interact with their physical world. Social constructivists see social interaction as the critical element in young children's meaningful construction. They believe that all knowledge emerges in the process of self and social construction.
This theory holds that children become knowledgeable and are able to give meaning to their world by negotiating meaning with others.

The Evaluation Review Office (ERO) Report
In the past ERO reports were rather lengthy and repetitive, they are now concise. All reports are available on the Ministry website. This enables parents and families (whanau) to check the rating and evaluation comments of a centre to assist them in making an informed decision.

Centre Report 2013

The September 2010 ERO report identified the centre should further strengthen knowledge of self-review, refine children's portfolios and extend literacy and numeracy experiences within play.

Self-review in action

1. The staff, parents and community attended professional development on self-review. As a result, a logical and practical process was put in place to guide them all.
2. Staff, parents, children and community implemented changes such as:
    a. constructive interactions between staff, parents and children
    b. a responsive and stimulating programme to foster children's interest
    c. a complex and challenging play experiences that support and promote learning outcomes for all children.
    d. effective communications with families by regular sharing of information
    e. valuing the aspirations and voices of parents for their children
    f. acknowledging the diverse demographics of children and the communities
    g. creating positive environment

The childcare centre staff, parents and community worked vigorously to meet the expectations and recommendations of the ERO for a quality service. The results are reflected in the answer to the following question:

How well placed is the Childcare to promote positive learning outcomes for children?

Not well placed	Requires further development	Well-placed	Very well placed

ERO's findings that support this overall judgment are summarised below.

Background
The Childcare centre provides full-day care and education for infants to five-year-olds. The service is licensed for 30 children, including up to ten who are under two.

Diversity is embraced. More than half of the children are Maori or Pacific. A sense of belonging and partnership with children and parents is evident. Teachers are calm and nurturing. The learning programme is very responsive to the children and is characterised by high quality resources and a focus on the natural environment.

The Review Findings
A positive tone promotes constructive interactions and supports the learning of all children. The curriculum sets direction for learning in line with the vision, principles and values of the early childhood curriculum, *Te Whāriki.* Children's daily experiences guide and support them towards being lifelong learners.

Teachers have positive and responsive relationships with children built on high levels of trust and mutual respect. They encourage and challenge. Problem-solving and experimentation are promoted. Individuality and self-expression are valued. Peer interactions promote learning. Children are confident, independent and seen as capable. Their strengths and developing learning in a range of contexts are recognised and documented.

The value and importance of children learning through play is recognised. Children enjoy high levels of interest in learning experiences that are relevant and real. The physical environment offers challenges and appeal that invite children to explore and become fully involved in a wide variety of activities.

The centre acknowledges and respects the range of ethnic groups represented. Teachers use a range of teaching strategies and practices to respond to the cultural backgrounds of all children.

The 'well-placed' result means the centre is viewed as having:

- Teaching staff with the skills and knowledge to undertake self-view for the purpose of continues improvement
- Practiced that reflects the stated aspirations (vision, beliefs and philosophy) of the centre
- Policies and procedures that meet the licensing requirements in all areas
- A leadership/management team who are focused on improvement of educational outcomes for all children
- Parents who believe the centre provides a safe, nurturing and stimulated learning environment for their children
- Parents feel welcome.

The findings of this 2013 report indicate significant development in each of these areas.
The next review will take place in 2016 (3 year timeframe)

Focus for 2014 for the centre

Since 2013 review the teachers have set new goals for their professional learning and are focusing on:

- How they collect and record evidence of children's learning - can this be improved further?
- How to write this information up in a way that better reflects the theories that underpin their observations

Conclusion
When considering the positive result achieved by the centre, it is important to acknowledge contribution of the following factors:

- The centre operates from purpose-built premises
- The centre has stable leadership and management

- There is sufficient income to ensure the premises and resources are maintained at a high level
- The staff make good use of the resources provided by the ministry to assist in the self-review process, they understand the process, but more importantly the reasons for self-view.

From the writers' perspective quality for an ECE centre sits within a social, political and cultural context and is the corner stone of all early childhood teaching practices.

Finally, self-view is demanding, as it asks New Zealand teachers and management to examine their own practice, through a number of lenses, against national guidelines based on the New Zealand context and the aspirations for the future.

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On-Job Training in New Zealand meeting industry needs

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Abstract

This paper presents an overview of on-job training in New Zealand – that is, training for work and employment typically undertaken by people currently in a role, as opposed to training for people before they take up a role in an enterprise. Key elements of on-job training, including how training is delivered, competence is assessed, quality assurance undertaken, are described. The funding, benefits to enterprises and employees, economic benefits, challenges and case studies are also described.

How this definition meets industry needs is covered. The implementation of how on-job training is carried out and industry training organisations' (ITOs) role in the model is described.

The model of on-job training will be demonstrated by two case studies from Skills International Limited.

Note the word 'enterprise' used in this paper in the New Zealand context refers to businesses that employ trainees, and is used interchangeably with the word 'employer'.

Keywords: Industry Training; Industry Training Organisation; On-Job Training.

Overview/ Introduction

This paper discusses on-job training – workplace learning that takes place in a trainees' workplace- within the context of New Zealand's industry training system. Industry training is a form of vocational education and training: education which aims to equip people with knowledge, know-how, skills and/or competencies required in particular occupations or more broadly on the labour market. Vocational training can take place in off-job (for example, at a technical college block course or night school) or in on-job locations, or a combination of the two depending on what best meets the needs of the industry and the trainee. It can also apply to work placements (where it is sometimes known as 'work-integrated-learning' - and programmes are in place with schools, for example, to enable young people to become work-ready.

This paper focuses on one aspect of industry training - on-job training – learning that takes place in the trainees' workplace.

The on-job model of training

Training

- On-job training is education and training that occurs while a person is employed by a particular enterprise and that takes place within that enterprise. It involves a set of key players – including other workplace staff – working in a community of practice and can utilise a range of pedagogies (see Fuller 2002 for a discussion of these).
- The training is vocational, that is, for work, whilst a person is in work. Trainees learn by 'doing' in their workplace.
- The workplace based training model is embedded; it makes learning and assessment a part of everyday workplace practice – it treats the workplace as the centre of learning and assessment (Ryan, (2009, page

14). On-job training combines theoretical learning and practical training, and hands-on and action-orientated learning are the key methods.

- The model of learning is student-centred. It is self-paced, and often involves supervision and/or mentoring from other experienced staff members (Baker, 2008, page 6). The teaching model is often project-based. ITOs provide workbooks and guides to the trainee; particular learning tools are used by trainees to produce their case studies which may include the trainees'logbook, follow-up interviews and supported by group discussions.
- Trainers and coaches employed in, or contracted to, the workplace facilitate and guide learning and may have a role along with specialist assessors in assessing learners' competence. Competence is assessed against evidence requirements/performance criteria as set out in the particular qualification which, in turn, has been influenced and agreed by industry.
- Trainees practically apply what they have learned in the workplace. The teaching 'activates' the trainees' current knowledge and links this knowledge to the new learning. Learning is highly relevant to the trainees' work being carried out on a daily basis (Vaughan, 2011, page 22).
- It's important to note that trainees not only master practical skills, but also develop other competencies such as the ability to communicate well, problem-solving, processing information effectively, thinking logically and learning to adapt to future changes.
- The skills trainees obtain are also transferable – for example, a person's contact centre qualification is a national qualification and applies to not just his/her own enterprise - he/she can go and work for another enterprise in the same industry. This transferability is a key component in benefiting the national economy and labour market, the enterprises themselves, as well as improving trainees' employment outcomes and career aspirations (Tertiary Education Strategy 2014, page 10).

- As the training takes place in the workplace, the model needs enterprises' commitment and co-operation to allow the trainee to achieve - for example, to allow them to be assessed during work time in the workplace.

Assessment in on-job training – valid, relevant, current, authentic

An assessor is allocated to the trainee in the workplace to assess the trainees' work.

As with other aspects of workplace learning there are variations of the assessment model to accommodate the different on-job learning and industry contexts. Assessors may be employed by the enterprise and be accredited supervisors, or be contracted in externally; while assessment may take place one-on-one or in a group situation. Interestingly, in the workplace training model, the assessors are not necessarily the same people as trainers.

Assessors match the results against the skills described in the qualification and find the trainee 'competent' or 'not yet competent'. Workplace assessors are trained and registered by ITOs and must participate in annual professional development.

Vaughan, (2009) puts it well when she states "*assessment in the workplace allows workers to demonstrate their achievements directly rather than being inferred from other 'performances' (for example, they can wire an electrical outlet, rather than drawing a diagram of the wiring and listing tools they would use)*.

Similarly, research has found that ambulance workers felt that scenario-based (indoor examination-style) assessments were of lesser value than assessments 'in the field', i.e. "on-the-job" (Hoy-Mack, 2005, page 42)

However flexible the on-job training is, (and industry-training generally) it must however match the relevant qualifications' components – ultimately the trainee needs to be found competent (or not yet competent) as measured against the approved qualifications and programmes in the New Zealand's National Qualifications Framework which contains the approved qualifications and programmes.

On occasions, there is a tension in workplaces where a trainee's job does not allow that person to demonstrate their specific skills and knowledge required to complete a qualification – for example, if a person requires Minute taking experience for a Business administration qualification but in fact does not have exposure to such a task in their day-to-day job then they cannot complete the required task. Enterprises (and ITOs) have a role to assist trainees remove any barriers to a trainees' successful completion of a qualification or programme.

In New Zealand evidence for assessment is collected through a person's normal work – documents can include emails, meeting notes, and powerpoints for example. Gaps in the evidence may be filled by assessors or trainers providing a coaching role helping the trainee identify what evidence is required.

The workplace learning model allows for a 'portfolio' method of supplying evidence which is sophisticated enough to address all learning outcomes.

Verifiers

Learning is assessed by specialist assessors or, where performance cannot be assessed in a single visit or session or where it is impractical to do so, verifiers may be used. Verifiers are typically a trainees' supervisor or manager who observe and confirm that the trainee has carried out the required task(s). Note however, that the assessor still retains the overall responsibility to find the trainee competent (or not).

Monitoring Quality

In industry training, there is a systemised method of checks and balances in place called 'moderation' which monitors the quality of the workplace learning model. This occurs at the government level and also at the ITO level.

Funding for workplace learning

So who funds workplace learning? Industry training is funded by government, industry, ITOs, enterprises and trainees.

ITOs utilise the funding they receive from the government to develop industry relevant skill standards and qualifications, to develop learning and assessment materials for on-job learning, and to subsidise the cost of off-job learning. ITOs are, generally, non-profit making organisations.

Importantly for ITOs, their source of funding from the government became performance-linked in 2012. This means that up to 5% of an ITOs' government funding is 'at risk' and allocated on the basis of qualification achievement. Consequently ITOs have increased their focus on pastoral care of their trainees to ensure that any barriers to completion of trainees' qualifications are removed.

In 2014, Government funding for industry training in New Zealand is NZ$168 million.

Why do we apply the on-job training model in New Zealand?

Economic benefits

Cost effectiveness – ITOs in New Zealand are funded at one quarter to one third the rate that institutes of technology are for the equivalent qualifications. Efficiencies arise particularly from on-job training, which utilises company resources rather than requiring the duplication of training facilities, equipment and supervisors that are required at entirely off-job training facilities.

Industry training is a tertiary education pedagogy which has been identified as desirable by the current (and previous) New Zealand governments.

"(New Zealand's) Tertiary Education Strategy focuses on ensuring that we have an outward-facing and engaged tertiary education system with strong links to industry, community and the global economy. Skilled people are essential to the success of businesses and other organisations." *....*

....The priority is to ensure that the skills people develop in tertiary education are well matched to labour market needs. It is not enough for students simply to gain a qualification – the time and money industry invests in skills' development means that those qualifications must match labour market demands. Skills gaps in particular sectors such as information and communication technology (ICT) (Steven Joyce, Minister of Tertiary Education, Skills and Employment, Tertiary Education Strategy 2014 - 2019).

Benefits to Enterprises

Enterprises benefit from their engagement and investment in industry training by productivity improvement (qualified and trained staff leading to costs reduction, increases in the quality of work) as well as having a direct influence on the shape of the qualifications and therefore their relevance to industry.

Returns accrue to enterprises and the broader economy (The Skills-Productivity Nexus, 2008). It should be noted that trained and qualified employees are also more valuable to competing employers, meaning potential

poaching of trained staff; though a robust industry training system means a deeper labour market to acquire skilled resources, and choice about whether to train new staff or acquire already skilled employees.

Recent research carried out in one sector – telecommunications – found that investment returns to enterprises are relatively modest from industry training in the first few years and achieve 1.4% however achieve a 7.53% after five years (Draper (2013). Need to explain this better

Benefits to Employees

Individuals are motivated to enter industry training because they achieve a repertoire of skills: literacy and numeracy gains, industry skill standards, national qualifications, as well as, of course, there are benefits job security, job satisfaction and career progression (The Skills-Productivity Nexus, 2008). Perhaps one of the biggest benefits to trainees is the fact that they earn while they learn: industry trainees are not burdened by high fees and student loans precisely because they are able to earn while they learn (Industry Training Federation, 2010). However, it should be noted that there are only modest wage gains in the first few years. (The Skills-Productivity Nexus (2008).

Regulated industries, ranging from electricians and plumbers to real estate agents, require licenses to operate, which are entirely or largely achieved through the relevant industry training qualification. Operating in such industries therefore requires industry training as a pre-requisite.

Trainees' nationally recognised qualifications are also often recognised overseas meaning trainees can take their skills, knowledge and competency outside of New Zealand (Nana, 2010).

Implementing On-Job Training in New Zealand - How do ITOs fit in?

ITOs facilitate the delivery and assessment of on-job training through the development of training programs, materials and training on-job assessors. Figure 1 below shows the role of ITOs in on-job training.

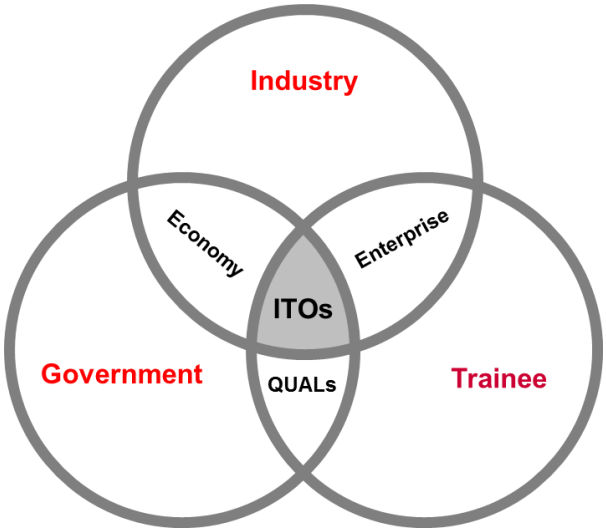

Figure1: Role of ITOs

ITOs sit between the government, industry and their employees for the purposes of industry training. ITOs are 'owned' by the industries they represent. As such, industry has a key role as a stakeholder in advising on and influencing the development of the qualifications and programmes identified as being required for their

respective industry sectors. The framework diagram below illustrates how the various stakeholders fit into the New Zealand industry training system.

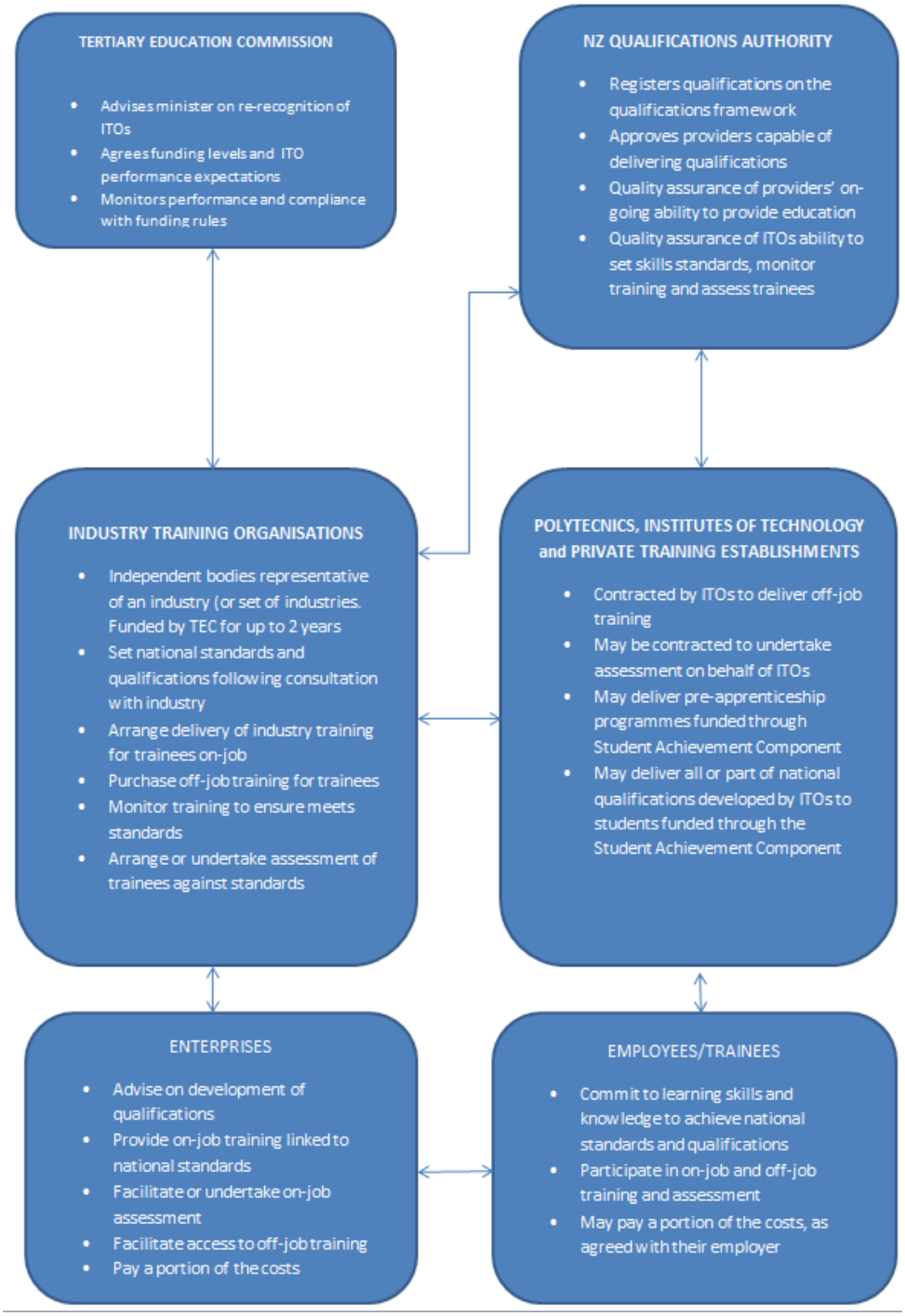

Figure 2: Organisational arrangements of the current industry training system (Ministry of Education)

It's interesting to note that in New Zealand one ITO can engage with many industries – for example, The Skills Organisation is responsible for the industry training arrangements for 20 industries - from electricians to public servants; plumbers to real estate agents.

Historically, workplace-related training in the 1990s in New Zealand was - other than in professional areas such as law, medicine and teaching - limited to only the traditional trades, industries lacked co-ordination and the number of enterprises participating in training was in decline. To expand training beyond the traditional trades

and link it to the New Zealand education qualifications framework, and ensure that qualifications developed were relevant to industries' needs the industries training system was created, based around the principle of industry fully engaging with and leading the development of their training arrangements (Green et al (2003).

New Zealand's Industry Training Organisations were established in 1992 with the aim of meeting industry needs, raising workforce skill levels and increasing New Zealand's economic responsiveness and growth.

The formation of ITOs dramatically increased industries' ability to influence training by placing them in charge of determining what courses and programmes needed to be delivered and who would deliver them. Previously, prior to large-scale deregulation of the labour market, enterprises had input into training systems through employer and employee representation on apprenticeship committees, but the industry training system represented direct control over these systems. This influence is underpinned through ownership and governance processes, as industry training organisations are owned by the industries they serve.

Since 1992 ITOs have evolved and developed in response to the changing needs of New Zealand industry – they were, and still are, the conduits between industry, enterprises and the labour market, the tertiary education system including tertiary education providers, and the Government (Nana, G. et al BERL, 2011).

In 2014, ITOs now provide services to over approximately 35,000 enterprises and 135,000 individual employees every year – it's clear that ITOs play an important role in industry-related vocational education and training in New Zealand.

In 2014, following a comprehensive review exercise to audit the effectiveness of industry training, the guiding legislation was reviewed and subsequently amended in 2014. The Industry Training and Apprenticeships Act 1992 as amended sets out ITOs obligations and provides that:

11B Obligations of industry training organisations

- *(1) An industry training organisation must—*
    - *(a) carry out 1 or both of the following core activities (whether or not it receives funding for those activities via a plan):*
        - *(i) developing and maintaining skill standards to be listed on the Directory of Assessment Standards and used in the assessment of trainees:*
        - *(ii) developing and maintaining arrangements for the delivery of industry training that will enable trainees to achieve the relevant skill standards*

ITOs are established by their particular industries or industry groups to carry out a range of activities, principally involving the development and arrangement of industry-related education and training. In practice, what this means is that ITOs equip learners who are already in the workforce with relevant, work-focused skills (Nana et al, BERL Economics, 2011).

ITOs do not provide training directly, but arrange for training to take place through training agreements between a worker, their employer, and the ITO. (Baker, 2008).

At the time of writing, there are 12 ITOs covering industries from the traditional trades to local and central government, the non-regulated health sector, and service sectors.

On-Job Training in Action

Our ITO

The Skills Organisation is an industry training organization serving 20 industry sectors we serve (including government, local government, telecommunications, security and prison services), and we arrange on-job and off-job training. Skills International is a wholly owned subsidiary that enables project teams and resources to be drawn from the wider organization for bespoke project solutions.

Off - job training, such as in block courses or at night school is delivered in New Zealand by Polytechnical Institutes, or, in the cases of some large government agencies (such as the Police or the Defence Forces), by their own training establishments. We maintain excellent relationships, and partner with, these training establishments. We facilitate the delivery and assessment of on-job training through the development of training programmes, materials and training on-job assessors.

Course Design that meets industry needs

The current government's number one priority is to ensure that the skills people develop in tertiary education are well-matched to the labour market needs (Tertiary Education Strategy 2014). For that to occur, it is critical that industry is part of and engaged in the process of industry training.

Government – through the New Zealand Qualifications Authority (NZQA) - centrally controls the accreditation of qualifications and the curricula, while ITOs consult with industry experts to review current, and develop new qualifications to ensure the qualifications are fit for enterprises and are of good quality. This arrangement means that training both meets an externally-assured education quality standard and is relevant to the actual skills and capabilities required by employees in a given industry.

The Skills Organisation sets up and manages industry advisory groups which comprise subject matter experts and advise on the qualifications and curricula. This approach avoids industry fragmentation and provides a clear and representative industry focus. The qualifications and programmes are reviewed regularly to ensure they continue to meet industry's current and foreseeable needs.

ITOs do not provide training directly, but arrange for training to take place through training agreements between a worker, their employer (the enterprise) and the ITO (Baker (2008).

Industry training combines theoretical learning and practical training.Theoretical training can take place at institutes of technology or polytechnics (institutes) but the practical training takes place 'on-the-job' – not in the classroom. More on on-job training later.

Progress and the attainment of qualifications are assessed by our registered assessors ('on-job' training) or through courses delivered by tertiary institutions – mainly Institutes of Technology and Polytechnics and private training establishments - ('off-job' training).

Training in the traditional sense has been complemented by a more holistic approach. The delivery of training is one part of a complex answer to meeting current industry needs. Therefore course delivery is flexible and industry-specific – off-job training for example can be classroom-based learning in classrooms, block courses, night school, or online at an Institute of Technology or Polytechnic, or a privately-owned training organisation. On-job training can be self-paced, but often involves supervisions or mentoring from other experienced staff members (Baker, 2008).

Most ITO training programmes involve a mix of on-job and off-job components, although a significant number involve only on-job training.

Support is given to the trainee before and during their training – e.g. Literacy and numeracy testing takes place before training starts – to make sure any barriers to success are removed.

Assessment

Our assessors are registered with The Skills Organisation and report trainee results through The Skills Organisation to New Zealand Qualifications Authority.

There are two types of assessment for our programmes – workplace assessment and assessment of prior learning (APL).

Workplace assessment

The Skills Organisation works with our industries to develop assessment material based on a collection of evidence model. To gain credits for a unit standard, trainees have to demonstrate that they are competent. Assessment involves the collection and recording of evidence demonstrating a person's competence in each unit standard for which they are seeking credit. This evidence can be gathered by observing normal day-to-day work, from the organisation's records, team leader's/manager's verification, completing workbooks, and verbal discussions.

When a trainee feels that they are competent and they have collected the required evidence outlined in the unit standards, they can then be assessed by a Skills Organisation registered assessor and credits towards completion of a programme can be awarded if they meet the required standard.

Assessment of Prior Learning (APL)

APL is a good option for people with considerable experience in the appropriate industry. APL is a process of gathering several forms of evidence so a judgement can be made to assess your ability to meet the requirements of the current unit standards registered on the New Zealand Qualifications Framework. It is up to the trainee to provide sufficient evidence to satisfy the assessor that they currently hold the relevant skills and knowledge. In determining whether they have presented sufficient evidence, the assessor must be satisfied that the evidence of prior learning is:

- Relevant - the items of evidence are relevant to the unit requirements
- Valid - the evidence addresses all aspects of the unit requirement, particularly the performance requirement
- Current - the evidence reflects the trainee's current competence
- Authentic - the evidence can be independently verified

If the evidence does not meet all the requirements the trainee will be asked to supply further evidence.

Achievement

Trainees are judged competent when they have supplied the appropriate evidence to meet the requirements of the unit standards they are seeking formal recognition for.

The assessor will decide whether the trainee is Competent or Not Yet Competent in their assessment.

If the trainee is found competent, The Skills Organisation will add the results to the trainee's NZQA Record of Learning. When all unit standards for a particular qualification have been completed, the trainee will be awarded the qualification.

Workplace assessors

The Skills Organisation's assessors are central to workplace training as they play a key role in supporting trainees throughout the training and assessment process. They need to be with us. To become a registered assessor, they need to hold the qualification they will be assessing or have requisite skills and experience, as well as have achieved the assessing unit standard 4098 'Use standards to assess candidate performance'.

Workplace assessors assess learners' skills, knowledge and competence in the workplace against the requirements of unit standards from the New Zealand Qualifications Framework (NZQF). They are also responsible for:

- providing guidance and assistance
- judging competency
- marking assessments as required
- providing marked worksheets to The Skills Organisation for moderation.

Workplace assessors:

- plan assessment with learners and others involved in the assessment process
- guide learners on how best to collect evidence of their competence
- assess learners' evidence against unit standard requirements
- provide feedback and advise on results and arrange for re-assessment if necessary
- report results to The Skills Organisation
- maintain records of assessment activities and results
- participate in moderation activities.

Becoming an assessor

The Skills Organisation's Assessor course is a two-day training workshop designed so that the trainee assessor can achieve the 4098 unit standard 'Use standards to assess candidate performance'. The focus is to provide trainee assessors with practical application in the art of assessment.

Course content includes an introduction to The Skills Organisation, NZQA, New Zealand Qualifications Framework, unit standards, evidence and assessment in general. Also covered is the assessment process: preparing, carrying out and reviewing an assessment; post assessment procedures. Candidates are also given the opportunity to go through the assessment process. Upon successful completion of the 4098 course, 4098 trainees will be able to register as a workplace assessor.

Assessment support

The Skills Organisation offers a wide range of resources, tools and dedicated staff to advise and support assessors and the management of assessment.

Quality

Quality assurance is about effective monitoring systems and processes to make sure assessments against our unit standards are fair, valid, consistent and meet industry and NZQA standards. To ensure this confidence Skills has a robust quality assurance system, which is made up of Industry developed standards and qualifications which only approved providers can use.

The Skills Organisation quality checks the assessment materials pre-assessment to ensure that assessments are in accordance with the qualifications' outcomes. Annually, the Government and the ITO checks trainees' materials post- assessment for consistency with the qualification and with other assessments. This can be carried out in group moderation meetings or by the submission of samples of a trainees' 'marked'/assessed work.

These systems are important because we are:

- are accountable to our industries, trainees and funding bodies
- need to ensure that we meet our obligations under the Industry Training Act 1992, and the requirements of NZQA's quality assurance standard for ITOs.

Challenges of, and to, Industry Training

However, the apparent success of Industry Training does not mean the model is free from challenges. These challenges are a good way of analysing industry training and workplace learning's' effectiveness.

For example, as Government-funded bodies, ITOs are susceptible to government and policy change. An implication of the desire to more closely link ITO funding to performance outcomes has been ongoing change in the policy and funding framework, which in turn has created challenges for ITOs business planning processes.

Another challenge is the perception that vocational training is held in. 'Academic' qualifications are often associated with higher wage premia than 'vocational' qualifications, although in many cases this is false. Qualifications from universities have a certain status: vocational and industry qualifications however can be seen as not being of an equivalent standard or status - there can be a stigmatisation attached to vocational qualifications.

A less obvious challenge but potentially more damaging is that there can be an over-reliance on standardisation of competencies in the actual qualifications or programmes, whereas the power of competency-based education lies in its embeddedness (Mulder, Concept of Competence, page 20) as well as its focus on being specific to industry needs.

An additional issue impacting on the success of the industry training system has been highlighted in a paper for a forthcoming New Zealand conference. The Metro Group of polytechnics and institutes of technology state that the vocational education training (VET) system is not fully integrated - it should be aligned more comprehensively to economic and business outcomes (ITP and Metro Group paper, 2014). As a component of the VET system, ITOs, engaged with and owned by industry, are a key way to redress this alignment.

Learning can, and often does come second to other imperatives in a business – i.e. making products and services (Vaughan 2009). Some writers (Billett, 2001; Unwin, 2004) have been critical of employers' commitment to workplace learning for this reason. Other researchers have noted training and assessment processes (and accordingly trainees) will fail unless employers receive accurate information about their obligations and advice

and support about fulfilling these obligations (Misko, Patterson, & Markotie, 2000). ITOs of course have a key role to play in ensuring that employers are 'on board' and aware of their commitments and progress.

Further, uncommitted enterprises, generally, can also affect the success of the system, and uncommitted trainees /trainee motivation is a recognised barrier to successful completion of their qualifications (Moses, 2010).

At a more micro-level, assessors are critical to workplace learning and on-job assessment, to be valid and relevant, is dependent on the content knowledge and assessment skills of the assessor (Vaughan, (2010). There is some research (ETITO, 2006; Pells, 2006) that questions the adequacy of assessor training. Assessors training is brief to minimise the imposition of additional costs and time requirements on enterprises – currently it generally comprises a short one or two day course and often no further training is provided. Also assessors are often drawn from the enterprises workforce and may not necessarily even have the requisite skills to be an assessor. Misko et al (2000, page 23) found that assessors are typically the trainee's supervisor or boss. Potentially assessing colleagues could theoretically pose problems (Clayton, Roy, Booth, & House, 2004) which in turn may impact adversely on the integrity of the assessor's judgements.

CASE STUDIES

The two case studies below use the Success Case Study methodology developed by Brinkerhoff (2002) which, in essence, is 'story-telling'.

Case Study One - Connecting employers and apprentices
A unique partnership between Vodafone New Zealand and the Skills Organisation which expanded the pool of telecommunications workers in 2013.

The two companies created the Vodafone Technology Apprenticeships scheme, establishing a vital link between school and business. More than 100 students who had completed Year 13 applied for the positions. A rigorous recruitment process led to 10 apprentices (five male, five female) being selected.

The programme, which results in apprentices gaining a National Certificate in Telecommunications (Level 3), offers permanent employment and a competitive salary from day one. The Skills Organisation was involved from the marketing and the recruitment through to supporting the delivery of the programme - including sourcing industry funding and the provision of pastoral care and learning advisory services. The 2012 Vodafone Technology Apprenticeships were so successful that another 10 were selected in 2013, with plans for another 10 in 2014.Vodafone Learning and Capability Development Partner Anton Pienaar said the "symbiotic" relationship with Skills allowed Vodafone to engage more successfully in education.

"It is part of our commitment to New Zealand and industry to bring young people into the business," Pienaar says.

"We also address the aging workforce and expand the pool of New Zealanders who have the option and awareness of working in the technology field – particularly telecommunications."

He said The Skills Organisation was the only ITO Vodafone chose to engage directly with. "This is due to the good functionality the Skills team offers, the high level of trust that now exists and the cementing of relationships that can only occur over time," Pienaar said.

The programme reflects the diversity of New Zealand's cultural landscape. As such, a strong representation of women and non-European apprentices features. "Our apprentices bring creativity and innovation into the workplace and are able to challenge traditional ideas and process. "It's because of this that we will continue, with the assistance of The Skill Organisation, to employ and invest in young people."

19-year-old Ash Thompson was part of the original intake. He was considering university to study engineering post-school when he spotted a poster advertising the apprenticeship scheme. "I chose to apply because of the chance to get a telecommunications qualification, which is where I wanted to go with engineering," Ash says. "Plus, I am spending two years getting paid to learn - that really was an important factor, too."

He says his time at Vodafone has all been smooth sailing, thanks to the supportive nature of his colleagues throughout the business. "The most enjoyable, aside from the learning itself, is the on-job side of things. I've got to mix with all of the teams and gain exposure to all areas of the business."

He also paid tribute to his fellow apprentices. “We constantly help each other out,” he says. “We all come from different backgrounds and have different strengths.”

The future for Ash and his fellow apprentices is now incredibly bright, thanks to this unique partnership between Vodafone and The Skills Organisation. “I developed a good idea of where I’m headed in future,” he says. “The big thing is that I have options… options everywhere. It’s a great position to be in.”

Case Study Two - Developing Competency Frameworks and Career/Learning Pathways in the Public Sector.

The Skills Organisation works in collaboration with various organisations to support the identification of the required competencies for each of the agreed job role areas.

The term 'competency' reflects the required behaviour within a job role and is more commonly understood as performance excellence. A Competency Framework should therefore identify a standard level of expected behaviour and competence in aim of supporting excellence.

These competencies need to be relevant to each identified core role to ensure each individual has the competence and capability to deliver on their core business activities. The competencies identified throughout each workshop are then implemented into a Competency Framework. This framework may continue to be built upon for other departmental areas of the organisation as the competencies are analysed, defined and agreed.

Competency Frameworks also provide a Career/Learning Pathway outline, demonstrating a line of progression within each business unit. The Pathway is greatly beneficial for succession planning.

The Pathway also assists employees and managers in identifying competencies at not only the current employment level, but equivalent (across) and above, as well. This is particularly useful for developing employees who aspire to or demonstrate potential for progressing into other roles along the Career Pathway. Already, this approach is being utilised by the State Services Commission (SSC).

The SSC and The Skills Organisation are working to develop a shared understanding of a pathway to support the Commission’s Better Leaders: Better Services drive. A Pathway has been aligned to SSC’s Leadership Success Profile. The move has allowed Skills to operate in a consultancy role, brokering programmes of learning from tertiary institutions in New Zealand and abroad.

Overview of Industry Satisfaction

In addition to the proven higher productivity gains, in New Zealand in 2013 (the 2014 figures are not yet available), 138,567 of trainees obtained 54,296 qualifications giving them high quality, transferable, technical skills and career prospects.

Some research states confidently that, through industry training, the Government and enterprises receive a skilled workforce and increased productivity. Further, that should the level of industry training funding be reduced then the research indicates that there would be a resulting loss over the long term in GDP to between 2.9% and 6% (Nana et al, BERL 2011, page 20 and 25).

While the contribution ITOs make to the New Zealand economy may be significant, identifying the precise returns specifically from industry training is difficult.

The Office of the Prime Minister noted that learning which is incorporated into workplaces ‘is a positive contributor to economic development, not a constraint on the ability to grow’. The research also shows that productivity gains appear to be highest in workplaces with cultures that support and promote learning. (Vaughan, 2009).

While there is a clear connection between higher skills and higher productivity the link is not clear cut – some research identifies that training is an ‘enabler’ rather than a direct link to productivity. The link is ‘not so much a direct one with training generating productivity improvements, but rather one of training being an enabler: enabling flexibility, the deployment and effective operation of new machines and processes (The Skills-Productivity Nexus, 2008).

It is important that ITOs demonstrate value to their various stakeholders including Government, industry and enterprises. Given that improved business outcomes are one of the key goals of industry training, the context in which training is designed and delivered therefore needs to be part of, not separate from, the strategy of the business (Skills Productivity Nexus 2008).

Research has found that competiveness challenges and productivity issues have led to a growing demand from enterprises for external support in improving workplace productivity and performance. (Skills Productivity Nexus (2008). ITOs, with their direct and regular engagement with industry are well placed to respond to this by reviewing and developing relevant qualifications and programmes and maintaining and improving the robustness of activities such as providing training material, selection of trainers and training delivery systems. For example, innovations such as online training and assessment are becoming increasingly more important.

Summary

On-job training is a method of training whereby a person carries out training and they are assessed on their skills and knowledge in the workplace. The required competencies are demonstrated by the trainees from the tasks they have to carry out on a daily basis in their job.

From the case studies, the benefits of industry training have been illustrated, including trainees getting a chance to obtain a nationally recognised qualification while they earn; those qualifications are transferable – enabling trainees to move from enterprise to enterprise with their skills, and enterprises obtain a skilled, knowledgeable workforce which aligns with Government's overall education strategy.

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International students from China enrolling to study visual arts and design in New Zealand come with a range of backgrounds and contexts. This cross-cultural ethnographic case study compares, observes and reflects on the learning experience of Chinese students, to enhance understanding of their learning contexts and support transition from study in China and its implications to studying in NZ. The conceptual framework is developed through the literature review and empirical observations gathered in 2013 from Xiamen University of Technology in China. Mixed methods are used to compare differing social and cultural contexts, educational expectations, attitudes and behaviours between the domestic profile of visual arts and design students and Chinese students. This research seeks to provide the basis for discussions on pedagogy to offer analysis, support and recommendations as part of specialist teacher professional development for international students in transition to tertiary studies in NZ.

Keywords: Visual Arts, Design, Textiles, Fashion, Pedagogy, Chinese students, Cross-cultural, Internationalisation

Introduction

Chinese students enrolled in a creative faculty within a New Zealand (NZ) tertiary institution are engaged in a subjective field of study rather than objective. Visual arts and design (VAD) pedagogy is less directional and more facilitative for these students who come from a different style of education. The aim of this case study is to discover how transitioning a Chinese student into different ways of thinking and doing may enhance their international experience and what the implications of cross-cultural internationalisation are for the NZ domestic student. The strength of a case study is that it allows the researcher to concentrate on a specific instance or situation and to identify, or attempt to identify, the various interactive processes at work (Bell, 1999) and can be used as a means of identifying key issues which merit further investigation. Each organisation or school has its common and its unique features, the case study researcher aims to identify such features and show how they affect the implementation of systems and influence the way an organisation functions.

The case study began with a four day visit to Xiamen University of Technology (XMUT) in China at the start of their academic year in 2013. XMUT is a large live-in campus facility for 20,000 students. Non-participant class observations as well as lectures with feedback were presented to a group of graphic design and fashion students from the researchers own teaching disciplines. The lectures were supported by a XMUT / NZ design trained Chinese interpreter, and discussed the application of design for branding, graphics, sustainability and textiles. The researchers gathered data and examined differences regarding art education entry level, age, gender, type of technical skills training, success rates, and what ratio of practical and theoretical mix was used. Tutor and student group interactions were sought to compare with NZ Chinese student data. This visit facilitated shared discussions with XMUT staff around steps that may be taken for Chinese students preparing to study VAD in NZ. The main areas being evaluated were Chinese student expectations, behaviours and use of resources in tertiary training in order to build experiences that scaffold and transition new learners into the WhitireiaNZ education model. Empirical observation pertinent to the researchers disciplines, are supported by literature at the end of the review.

Literature Review

The literature broadly identifies sensitivity to cultural differences, strategies for institutions as a guide for adjustments in social contexts and how to overcome such hurdles experienced by non-native speakers while adjusting to a new academic environment. A number of New Zealand (NZ) studies, focus on cross-cultural educational experiences linked to student's expectations on arrival, with one noting that they arrive with a variety of expectations from a variety of sources (Butcher & McGrath, 2004). Yeung and Fu's (2011) observe that there is a dearth of research on Chinese students' preferred learning methods while they are studying overseas. The authors found few studies examining challenges faced by international students in specific educational disciplines such as VAD. Our study seeks to remedy this imbalance through insights gained from the literature, and the case study with the aim of developing/proposing a pedagogical approach for staff and stakeholders that meets the needs and wants of Chinese students who choose to study VAD at WhitireiaNZ.

International students choose NZ as a study destination over the United States, United Kingdom, Canada and Australia for many reasons. These include similarities in living costs, the desire for a western education and opportunities to learn the English language (Marriott, du Plessis, & Pu, 2010). Gaining a western education and learning the English language are aspects shared by all five countries. According to Butcher and McGrath (2004), however some students come to NZ because it is perceived to be 'cheap and easy.'
Ten years on, it is difficult to ascertain if this is still the case. A recent Education New Zealand (2013) survey found barriers to increasing international student numbers included; the high NZ dollar and exchange rate (8.3%), and immigration visa issues, including work rights and financial requirements (22.9%). This same survey describes six key findings, with the first stating that priority international markets for NZ international education providers are China, Japan, and South Korea, although students coming from South Korea were found to be declining, whilst numbers from China continue to increase (Education New Zealand, 2013). Another study reports that there is no significant relationship between currency and international enrollments for ITPs or schools, but there is a negative trend between the NZ$/US$ and the number of international fee paying students in universities (Ministry of Education, 2006-2012). Further statistics on international students studying at universities have reported that fee paying enrollments in NZ universities peaked at 29,001 in 2004 and there has been a steady decline since, to 19,321 international fee paying students in 2011 (Ministry of Education, 2012). This decline appears to be offset by slightly increasing enrollments in institutes of technology and polytechnics (ITPs). In 2007, there were 10,625 students enrolled in ITPs, and in 2012, there were 12,255 enrolled students (Ministry of Education, 2006-2012). This reporting may indicate that there are other aspects, apart from cost, that international students consider before enrolling in ITPs than in universities in NZ. It is important to note that this is not the focus of the research, however it does provide context for seeking better pedagogical practice that meets the wants and needs of Chinese students who choose to study in the field of VAD at WhitireiaNZ.

Marriott et al (2010) suggest that other factors are influencing decisions for international students who arrive in NZ. These include perceptions of a high quality of education, good living conditions, safety, and a generally positive multi-cultural environment. In light of this, Marriott et al (2010) challenge private and government owned institutions to manage the student experience and increase the social and intercultural aspects of international study. They state that there is a gap between student expectations and their perceptions of the actual experience:

'Living in NZ can be a detached, aloof and distant experience for some overseas students, who sincerely want to melt into the local culture and wish they had more from NZ' (Marriott et al., 2010).

Conversely, an international student experience survey noted that students rated their experience very highly, finding that 89%were very satisfied or satisfied studying in ITPs in New Zealand (Ministry of Education, 2006-2012). This apparent disparity may in part be due to cultural differences between Chinese and NZ people.

FitzPatrick, Davey & Dai (2012) discuss how it is recognized that Chinese international students find it difficult to voice their dissatisfaction in the context of higher education because of the influence of the Confucian concept of moderation (zhongyong *avoidance of extreme behavior as a way for the individual to achieve internal harmony*). Further to this within the Confucian value system is an emphasis on group interest, teamwork and harmony over conflict. This group orientation, together with respect for authority, interdependence (guanxi), friendship (ganqing), and reciprocity (renqing), greatly contributes to the maintenance of harmony in relationships (Kim-Choy, Holdsworth, Li, & Kim-Shyan Fam, 2009). These values are important to note because there are tensions between a Confucian view where the rights of the individual are subsumed for the greater good, versus western liberal democracies that emphasise individual rights and freedoms. The Kim-Choy et al. (2009) study also reveals that NZ society appeals for its low corruption and high

level of honesty and fairness. These values are attractive to a specific cohort of individuals born after the late 1970s under the regime of the People Republic of China's (PRC) one-child policy because they help to reinforce group harmony, a prominent characteristic of Chinese society.

Within a multi-cultural pedagogical environment in NZ, in addition to the potential of misunderstanding nuance in different languages, is the misunderstanding of nuance in different cultural sensibilities. According to Suryadinata (2011), there is a requirement to pay attention to relations between Chinese and other ethnicities e.g., 'the Māori in New Zealand' (p.28) as well as other cultural groups such as NZ European. Thus the challenges of sensitively managing diversity in language and culture between students of all ethnicities are experienced by VAD teaching staff, and to master these skills takes time. Kirkebaek, Du, & Jensen (2013) write:

'Cultures co-exist like islands in the sea or pearls on a string, but each of them are defined, relatively homogeneous, and change very slowly' (p. 4).

However, according to Li & Du (2013) the transition for Chinese students into this environment should be less difficult than it was three decades ago. They argue that Chinese educational institutions have gradually made initiatives to transform their teacher-centred approach into student-centred learning in order to enhance student learning motivation and learning outcome (p.79). However, there are issues with this in Chinese pedagogy, which not only include students still expecting strong instruction and guidance, but also some teachers resisting a restructuring of traditional teacher-student relationships. Li & Du (2013) state:

'Traditionally teachers are authorities who represent wisdom from the past and they convey this wisdom to students in a unidirectional manner. The conduct of this educational approach is detrimental for the growth of the student since it oppresses and denies the subjectivity of the student in the educational practice' (p.80).

This is important particularly for students who study VAD, and who choose to study in the west. In design literature, many theorists have written about the importance of understanding subjectivity when designing emotion and human experience into all aspects of design creation, including and not limited to brand, graphic, fashion, textile and industrial (Gobé, 2009; Neumeier, 2005; Norman, 2004; Peters, 2003).

A study undertaken of a group of post-graduate management students at the Albany Campus of Massey University in Auckland, NZ concluded that there is a relationship between culture and education. Curriculum development and teaching style are seen as the product of cultural impact. The cultural impact is made up of factor inputs from demands made on the educational system (Selvarajah, 2006). Chinese students, especially those from mainland China, are from monocultural societies with very little exposure to a multicultural environment (Selvarajah, 1998). After two years in a multicultural education system, however, Selvarajah (1998) concluded that the students gained the ability to understand other cultures and this exposure gave them the confidence to work effectively. Of particular note, this study found that Chinese students have significantly different educational objectives to NZ European students. Developing English language competence and gaining qualifications for employment are the most important educational drivers for the Chinese students in the new country, whereas NZ domestic students undertake education to learn new skills for their career of choice.

Chinese students have different preferences for assessment methods, and that after prolonged exposure to the NZ education system, they will change their educational preferences (Selvarajah, 2006). One of the conclusions made by Yeung & Fu (2011), following their study suggested that Chinese students preferred to study in groups, in particular, under a new study environment and where there was language difficulty. Selvarajah (2006) found similar results but said that NZ European students become compromised and their preferred method of examination was individual:

'This reluctance to participate in group assignments is also expected as they perceive that the task of maintaining literary artistry is borne by them' Selvarajah (2006).

The ramifications of this has the potential to hinder the effectiveness of the wider class program through lack of participation in class discussions and group work (Selvarajah, 2006). Stone (1994), supports this, and includes language as a potential barrier to learning by saying:

'The great paradox in teaching is that although language is the instrument that creates the great complexity of human learning and human culture, and, indeed, is the great facilitator in learning and teaching abstractions, it can be the greatest obstacle to such learning and teaching' (p. 27).

A useful general case study by Jones (2013) noted aims to enhance the relationship with an affiliate college or partnership relationship are often signed without sufficient consideration and commitment to working at subject level. With limited resources priorities often rest with current and not future students. Without a commitment to build the relationship at several levels Jones (2013) notes students are at risk of entering the new culture department with less preparation and inaccurate expectations. Butcher and McGrath (2004) point out that orientation of students to NZ culture is important in establishing positive perceptions and experiences. Jones (2013), advice is to 'invest in the relationship' beforehand.

In NZ, Wintec are investing in this relationship with Yeung and Fu (2011), stating that their study came about because of the institutions decision to make quality, student-centredness and internationalisation a strategic priority. The NZ government also realises the value of internationalisation by recognizing that international education is an important enabler in strengthening NZ's economic, cultural and social links with the world (New Zealand Government, 2011). This government paper has identified that by engaging in international education, there is the potential to lift long-term economic growth rates to reduce the vulnerability of the NZ economy to further economic shocks. This rationale is borne out by a spike in the numbers of global mobile students rising from 1.3 million in 1990 to nearly 4.3 million in 2011, representing an average annual growth rate of almost 6%, with no apparent decline in growth rates during the economic crisis (OECD, 2013). International education is seen as a gateway to increasing work skills and trade relations with Asia. The benefits to the wider NZ community include positive flow-on effects for tourism and the labour market, and, international knowledge and skills of NZ students may in turn strengthen our communities (New Zealand Government, 2011).

For students coming from the east, simply transplanting western educational thoughts to a Chinese student may not work well because it neglects the particularity of the Chinese context (Kirkebaek, Du, & Jensen, 2013, p.8). Equally, an education system that forces students into an existing mould is problematic and may not serve well in a globalisation process that is imposed on all nations (Selvarajah, 2006). According to Jenson (1999), globalisation has been a major enabler for Western cultures to move from an information society to a dream society (p.210). It is important for VAD educators to understand, that appearance's may be deceiving, as Chinese students come from an information culture (Kirkebaek, Du, & Jensen, 2013, p.5), they are not used to complaining (FitzPatrick, Davey & Dai, 2012), and their values align to individual and group harmonies (Kim-Choy et al. 2009). Their education system is changing, but it will take time (Li & Du, 2013). The implications for Chinese students coming to study at WhitireiaNZ, suggest that it may be useful to introduce additional VAD concepts into the orientation process. Concepts may include the notion that a western VAD education is implicit in creating contexts, which are imaginative, experiential and emotional.

Observations from Chinese Education Institutions

Empirical observations taken from the Xiamen University of Technology (XMUT) visit to China were guided by a framework devised from a 2007 national survey on experiences of international students in NZ. Three key findings were found to be of particular relevance for this research, which was compiled by Deloitte (2008) for the Ministry of Education.

- Choice was influenced by safety, quality, recognition of NZ qualifications and cost.

The literature supports the notion choice is influenced by safety, quality and recognition of NZ qualifications, (Kim-Choy et al. 2009), however the cost of an overseas education can come at great sacrifice. Marriott et al., (2010) suggest that some students come to NZ with a lot of money, they buy cars, go to casinos, and flaunt their wealth, but some are not as wealthy as the stereotype. They struggle to pay their rent and buy their daily meals. They work part-time and study full-time, and cannot afford the expensive air ticket to return home for holidays. Despite this, the one-child policy means there is generally undivided attention, heightened financial and emotional support for those students now that competition rather than social harmony has become the accepted norm, and consumerism and hedonism are eagerly embraced by Chinese people (Kim-Choy et al. 2009). Conclusions drawn from observations and discussions with XMUT management staff suggest that Chinese government tax benefits on luxury goods for students on their return may also help drive the decision to study outside of China and the desire for status. China is an emerging economy with Wu (2013) stating:

'Today, China leads the wave of emerging economies poised to recast the Western-dominated geopolitical balance. Its development over the past three decades has turned it from a rural backwater – the Sick Man of the Orient – into the world's second largest economy.'

Consequently, western luxury brands have come to symbolise success and social standing (Chevalier & Lu, 2011, p. 54). The global financial crisis appears to have had little impact on luxury brands, which Ricca (2012)

suggests is due to the rise of conspicuous consumption in developing countries, which is offsetting a noticeable slowing or contracting of mature markets (p. 117). The researchers would suggest that there are implications for education brands in NZ with the rise of conspicuous consumption.

- New Zealand lifestyle and scenery weren't as important to Asian students

In contradiction to this finding, the researchers believe that NZ is considered a desirable location for study and partnerships. This was emphasised after an impromptu meeting with top Chinese menswear designer Zeng Fengfei who is based in Xiamen. Mr Zeng is highly awarded for his designs, which focus on sustainability and Chinese cultural values. He manufactures in his own factory, sells only in China mainly Beijing and shows at China fashion week (Xinhua, 2013). Main sponsors of China's fashion week are Mercedes Benz. The Xiamen textiles staff work closely with Mr Zeng as newly elected president on the Xiamen Textiles industry board, and in discussions he indicated that he has turned down many offers from European countries to collaborate with and/or visit. He was enthusiastic about a possible visit and collaboration with WhitireiaNZ. It was felt that his desire in choosing to come to NZ was based on our nation brand, and the link to international status brands.

- Tertiary students placed increased importance on scholarships and financial support from employers and government support.

Many Chinese students have limited access to funds. Students are required to live on the XMUT campus, and are accommodated in large blocks separated by gender. Cost is heavily subsidised, 1000 Chinese Yuan (NZD $195) per year total. Meals are served in canteens, which are paid for on a daily basis, and the fees for study amount to 3600 Chinese Yuan (NZD $700) per annum. In discussions on possible student exchanges in NZ, it was suggested that a competition be held at XMUT for students to compete with each other for scholarship placement at WhitireiaNZ. This suggested that Chinese institutions as well as students are looking for opportunities to increase internationalization.

Student observation: Design
Three lectures about design were presented during the two and a half days that were scheduled with the students. The subject of branding was well received across visual communication design (VCD) and fashion students. The principles of design were a little more difficult in concept for the students to understand, perhaps because more complex concepts did not translate easily for the students. The final lecture was about sustainability and a resultant project exhibited in NZ. This was well received. If this experience was repeated, branding and sustainability subject areas including conceptual and graphic design work by international students, appear to be the two subjects, which translate more successfully across language and culture.

The study areas for VAD students at WhitireiaNZ are not separated as they are in Xiamen. At WhitireiaNZ there are specific requirements borne out of living and working in a much smaller populated region. Students are required to be equipped with a much larger toolbox of skills that span design for print and web. The majority of businesses in NZ are small to medium enterprise (SME's) therefore to be competitive in this field, there is a desire for designers need to be multi-skilled. On reflection, the content of the design degree offered by WhitireiaNZ may be well suited for Chinese students. Combining traditional practice (drawing, printmaking) and contemporary digital technologies has the potential to ensure both Chinese and New Zealander students are well prepared for the NZ marketplace, and/or overseas specialization. The notion of embedding traditional applied techniques (including calligraphy) has the potential to offer the students a point of difference in a highly competitive marketplace. It is important to note however, that typography in a western context is problematic for a Chinese student. There are a myriad of font styles and faces to choose from, and there are differences between serifs and sans serifs. Chinese characters are pictures, therefore spacing, alignments, kerning and other typographic considerations are new to them.

Student observation: Fashion and textiles
A lecture on sustainable design processes for fashion was met with great interest (Stansborough Grey case study) as it was linked to the Lord of the Rings trilogy movies and actor's costumes. A studio for traditional cultural textile practice with natural dyes, was visited, which is also a studio used for research and practical based electives on textile dyeing arts. Here a common interest was defined. This recently upgraded facility enables students to gain experience in Chinese traditional techniques of; tie dye/shibori – zha rau and wax dye/batik – la rau. The resurgence of traditional and sustainable methods of textile design for fashion has seen a rise in the level of interest by students and businesses for mainstream fashion (see discussion of visit to Mr Zeng). The interest in research of traditional indigo dyes on cotton with authentic examples displayed in a showroom setting had been undertaken but as it was early in the academic year with few examples of student

works. The dyes students were introduced to both mineral and commercial dyes with salt mordant. At WhitireiaNZ, three classes of dyes are used to enable students to compare and select the best sustainable method for end use. On reflection, continued experience in natural dyes technology from NZ would place students at an advantage internationally based on the success of brand NZ which is arguably still relatively pure to Chinese perceptions. Coincidently at the time of the visit to Xiamen, the Fonterra milk powder scandal was unfolding, so there was the potential for this to be placed in jeopardy (Adams, 2013). The XMUT year 3 students had recently taken part in Shanghai Fashion week for the first time with nine student's collections. Although there are cultural differences between Chinese and NZ students, there are common focuses. Language is a barrier, however passion and curiosity for technical development and concepts may override some difficulties.

The presented cross-cultural ethnographic research has used empirical observation for the case study, and literature review. The purpose of empirical observation is to *describe* what is found without trying to change it. *This presents limitations because descriptive research methods can only describe set of observations about the data and does not draw conclusions.* However, the central focus of an empirical study is the dependent variable(s) and the purpose of the study is to assess how much variables depend on something else (La Pierre & Zimmerman, 1997, p.81-83). As this study is viewed through an interpretative lens and is in part questioning the role of stereotypes (almost post-structural) there is a requirement for the variables to be countered. Also it is difficult in case study method to cross check the information, therefore we aimed to minimise this. Since the XMUT visit, the researchers have adjusted the methodology (framework) for the study, to a mixed methods approach, which utilizes triangulation (Creswell, 1994, p.175). Triangulation in case study can strengthen research by providing evidence from different perspectives that serves to cross check and provide validity for claims being made (Crouch & Pearce, 2012, p.129; Patton, 2002, p.248). This adjustment has included a scoping survey. This survey was undertaken to identify whether the unique teaching needs of Chinese VAD students are being met, and whether the experiences of this study group require further research.

Design of VAD staff survey

On the basis of the insights from the literature and the observations from XMUT, the VAD staff survey was designed to explore the staff experience of teaching Chinese students. This was considered pertinent because of perceived differences in teaching and learning about VAD between Chinese students and NZ domestic students, and to determine significance of the research findings from the XMUT empirical observations (Gurung & Schwartz, 2009, p.114). The anonymous 12 item questionnaire was designed using a five point Likert scale response format in order to generate quantitative data, which was then analysed using descriptive statistics. Staff were approached to participate if they had experience teaching Chinese students. The sample group was small, (eight VAD staff), and the responses were separated between visual art and design in order to understand if there were differences between these two groups of tutors. The questions are discussed below in conjunction with data analysis.

The survey design consisting of twelve questions employed a structure comprised of two parts. Part one examined the art and design process through a *Rational* lens. (Process is optimized through constraints and objectives, and, is understood through a sequence of stages). Part two examined the art and design process through an *Action-centered* lens. (Process is creative, emotional, improvised with no apparent sequence of steps). This second part drew on the following two learning theories for construction of questions: *Reflection on/in action* (improvisation learnt in practice, Schon, 1983) and *Experiential* (transforming information into knowledge, making meaning from experience). Iterative experiential VAD process may follow a pathway of, concrete experience > reflective observation > abstract conceptualization > active experimentation /testing (Kolb & Fry, 1975; Smith, 2001, 2010).

This scoping study also doubles as a pilot trial of the questionaire.

Analysis of data

Observational notes were compiled while completed surveys were analysed using descriptive statistics in order to explore the experience of Chinese learners and to establish trends, themes and patterns. These findings were pooled together to deliver overall insights, and reactions of the participants to the various reflections and observations being presented in this research study. The data was not tested for statistical significance due to the nature of the scoping study and small sample size.

For response and analysis pertaining to survey questions refer to *Figure 1:* VAD staff survey: Mapping data of overall results and *Figure 2:* VAD staff: Modal ranges of Part One and Part Two of the survey.

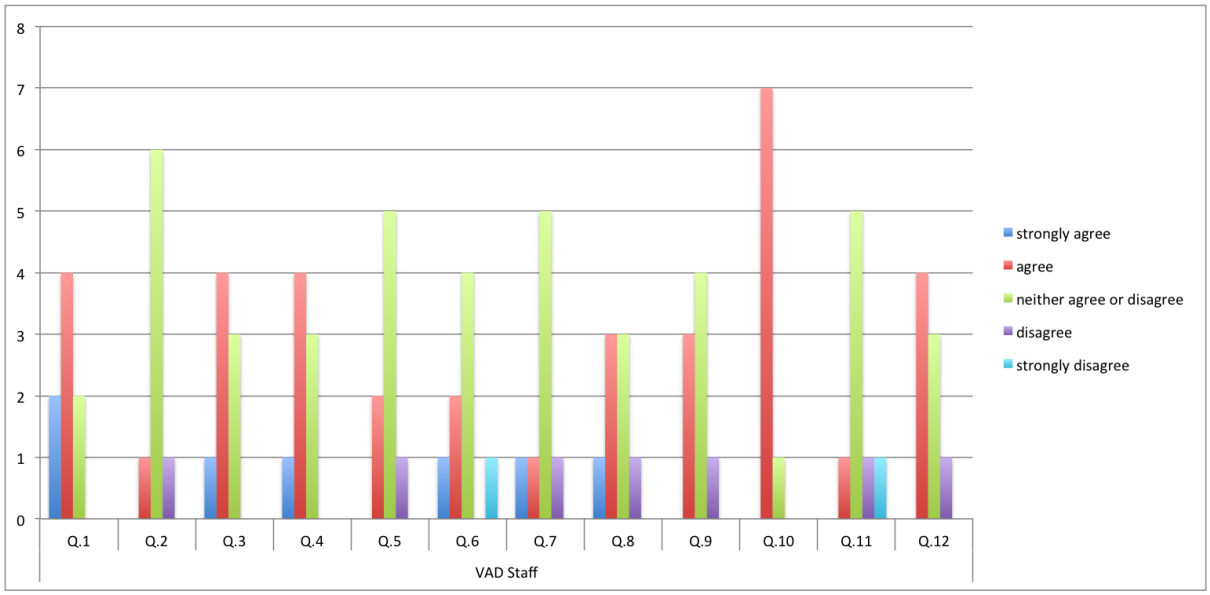

Figure 1: VAD staff survey: Mapping data of overall results

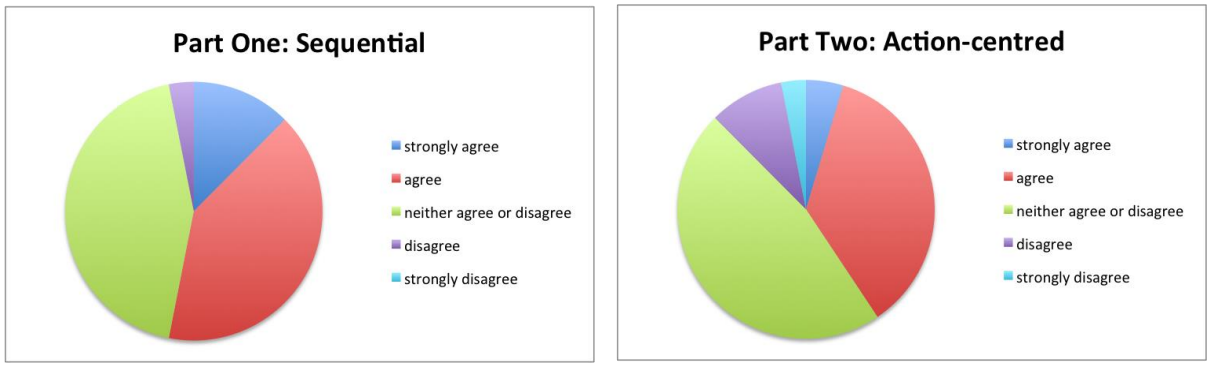

Figure 2: VAD staff: Modal ranges of Part One and Part Two of the survey

Questions and analysis. Part One: Sequential

Chinese Students (Cs) respond well to projects which have tight guidelines

50% of respondents agreed, and 25% strongly agreed with this statement, with comments suggesting this is particularly pertinent when a Chinese student first arrives at WhitireiaNZ.

Cs actively seek to push the boundaries of an art or design brief

The majority neither agreed or disagreed with this statement. Respondents suggested that it takes at least a year for a Cs to come up to speed with the freedom of a creative course in NZ (VAD Staff, 2014).

Individual creative outputs change when Cs are required to generate concepts within a group setting (e.g. brainstorming)

50% agreed with comments suggesting it takes at least one semester before Cs start to integrate more easily with group dynamics, although the desire to fit in is evident from the beginning (VAD Staff, 2014).

When presenting their work for critique, the thought process of a Cs is logical

As per Q.3, 50% agreed with this statement. Comments suggest that Cs are polite and will respond with what they perceive is expected.

Modal range Part One: Sequential

The results suggest that 53% of respondents strongly agree/agree that Cs VAD process is optimized through constraints and objectives, and, is understood through a sequence of stages (Strongly agree: 12%, agree: 41%). Therefore, as 47% of respondents were unsure or disagreed, the overall suggestion is that subjective opinion is divided over whether Cs processes are sequential or logical. This disparity may have come about because the survey did not state which level of study (year 1, 2 or 3) the respondent should consider when answering the questions.

Questions and analysis. Part Two: Action-centred

When a field trip is organized, Cs actively participate/interact with the wider group

The majority neither agreed or disagreed with this statement. Comments suggest that Cs are found to be shy to begin with, with males more likely to interact earlier than females.

Reflective observations are used by Cs in their art or design process

50% of respondents neither agreed or disagreed with this statement. This apparent non-response may have come about because of two reasons. Firstly, issues related to the survey question, or secondly, a poor understanding about the meaning of reflective observation. In the researchers opinion, the second reason seems incorrect because students are often required to record written reflections about their process in workbooks. Therefore this question should be recast for future use.

Improvisation is used to solve problems in visual arts or design work

The majority of respondents neither agreed or disagreed with this statement. Once again, this may be due to issues relating to the survey question, suggesting that the question should be reconsidered and/or recast.

The students use creativity and emotion to generate conceptual work

37.5% agreed and 37.5% neither agreed or disagreed with this statement, and 25% disagreed or strongly disagreed. This split in response may be explained because of differences between visual arts and design processes. Visual arts tended towards agree, design disagree. Design tutors disagreed, and described how an explanation of technical aspects in a brief can be communicated and understood in a satisfactory way. This type of teaching is instructional: Steps a, b, c on a computer will achieve outcome x and y. However discussions concerning concepts and narrative (story telling) prove challenging to communicate due to subtleties and nuances in language use (VAD Staff, 2014).

Cs appear comfortable using abstract ideas to generate new conceptual directions

50% of respondents neither agreed or disagreed with this statement, and 35% agreed. Comments suggest that this takes time to build confidence because the final product is privileged over process and a willingness to accept iterative processes is poor. This is challenging because within design and creative arts the process stage is highly necessary toward effective development of final ideas (VAD Staff, 2014).

New or different aesthetics are adopted by Cs after exposure to western influences in art and design

The largest majority of respondents, 87.5% agreed with this statement. This is perhaps due to a notion that the creative minds are curious and constantly seek new stimuli for their visual arts and design outputs.

Cs use other cultural aspects (Maori, Pacific Island) within their art and design practice

Surprisingly, this result is different to the result from question 10. 62.5% neither agreed or disagreed with this statement, suggesting that perhaps NZ cultural aesthetics are less important than global aesthetics for Cs.

Cs are willing to experiment with new and different media or technologies without tutor guidance

50% of respondents agreed with this statement, with comments suggesting that after time, and if well supported this is a possibility for Cs in the arts arena. However, it should be noted that the design tutors in discussion could neither agree or disagree or disagreed with this statement:

‘Giving and providing suggestions through critique are construed as literal *must do* directives rather than matters to reflect on critically and objectively to advance work independently’ (VAD Staff, 2014).

Often students in the last year of study are engaged in design work which utilizes complex software, such as Maya, and mastering these skills may potentially move the focus away from conceptual direction.

Modal range Part Two: Action-centred

40% of respondents strongly agree/agree that the Cs visual arts and design process is creative, emotional, and improvised with no apparent sequence of steps (strongly agree: 4%, agree: 36%). Therefore, the overall suggestion is that the majority (60%) of subjective opinion from VAD staff is that Cs are less comfortable with emotional reflective observation, abstract conceptualization and active experimentation in their visual arts and design process.

Conclusions and limitations

This research was designed to explore the suggested differences in how Chinese students adjust to VAD education at Whitireia NZ, and how VAD educators might facilitate better processes for Chinese students in transition to study in NZ. We were also interested to question how WhitireiaNZ VAD staff might refine this transition and be iterative in the process. The XMUT visit enabled us to observe how students responded to a series of western style lectures and how they might understand disparities in cultural context and creative learning processes when choosing to study VAD in NZ. This led the researchers to question if students such as these might thrive in NZ. Theorists hold opposing views in the literature about how successful a NZ education

might be for Chinese students, citing cost, language and cultural misunderstandings as potential barriers to success. The VAD staff survey was designed to pilot the questionnaire, while establishing a need for further research, and by questioning staff, did not place the burden of research participation on the current student group at this stage in our research. Limitations of particular questions have been discussed in the analysis, along with the small sample size. Next steps may include a more substantive sample group survey for staff currently involved in VAD pedagogy throughout NZ and then a comparison of this data, with that of Chinese students themselves. Are Chinese students as successful as other groups of international students in comparison with NZ national students? Are the expectations of Chinese students being met in VAD? How do Chinese students rate VAD educators? Extending the study even further, may potentially ask how successful Chinese students are when they graduate? Do they stay in NZ or do they eventually go back to China? These are some of the questions that remain unanswered. In addition, it may be useful to compare data obtained from Chinese students with other ethnicities. This would ensure that any basis for discussions on VAD pedagogy to offer analysis and support might include multicultural considerations as part of a series of recommendations for international students in transition to tertiary studies in NZ.

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The Living Consensus: *Growing transformative learning environments*

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Abstract

This paper outlines a recent research project that investigates the impact of The Living Consensus conceptual framework on learning environments and the development of transferrable learning skills for youth (vocational learners under the age of 25). Literature that considers each of the five key teaching and learning strategies that sit within the framework is discussed. The potential impact of the five strategies working together to help develop transferrable working and learning skills for youth is examined through the use of case studies.
As a result of this investigation, it is recommended that teachers employ facilitative and collaborative teaching and learning strategies (such as the five discussed in this study) to support the development of positive learning environments and transferrable learning skills for youth.
The work shop that has been designed to disseminate these findings will provide examples of the five key teaching and learning strategies in practice and ask participants to select and adapt at least one of these strategies to their own teaching context.

Keywords

Transferrable learning skills, ethics agreement, shared leadership, reflective practice, project teams, cultural inquiry

Introduction and literature review

In response to recent government policy we are seeing more youth entering vocational learning institutions but to date little research has been conducted into teaching strategies for this group (Chan, 2013). Many youth experience difficulty transitioning to these vocational learning environments (Chan, 2013; Eraut, 2004; 2007). Some educators believe that if this transition phase is viewed from a 're-situation' perspective, rather than an physical and social adjustment period, more positive outcomes would be experienced by the learners (Eraut, 2004; 2007; Franken, 2012). Essentially, a re-situation perspective explicitly acknowledges the learners' skills and knowledge that she or he had gained in their previous working, learning or social contexts so that these can be affirmed, developed and utilised in the new learning environment (Chan, 2013; Eraut, 2004; 2007; Franken, 2012).

This concept of re-situation causes the teacher or facilitator to examine what learners bring with them to their new learning environments in terms of pre-existing experience, skills and knowledge. The facilitator can then build on these existing capabilities and tacit knowledge with the new learning that will take place during the programme of study (Eraut, 2004; 2007; Franken, 2012). The re-situation concept questions the value of non-student specific, pre-determined and rigidly structured curricula in favour of more flexible programmes of learning that accommodate each learner's existing skills, knowledge and experience (Eraut, 2004; 2007; Franken, 2012).

The newly developed Living Consensus conceptual framework (figure 1) endeavours to incorporate this re-situated learning concept by recognising and building on the learner's existing skills and knowledge. Furthermore the framework is aimed at helping to develop the 'transferrable learning skills' that learners arrive with and build on them not only during their programme of study but also in their future learning and working environments.

The Living Consensus framework proposes a support structure that can be implemented to help learners re-situate these skills while providing positive and supportive learning experiences. The following literature review will identify the theories that have informed The Living Consensus conceptual framework and the five key teaching and learning strategies that sit within it. The remainder of this paper will discuss the research project that took place to answer the following key questions:

- What are facilitator and learner perceptions of the influence that The Living Consensus framework has on developing transformative learning cultures for youth?
- What are facilitator and learner perceptions of the influence that The Living Consensus framework has on developing transferrable learning and workplace skills?

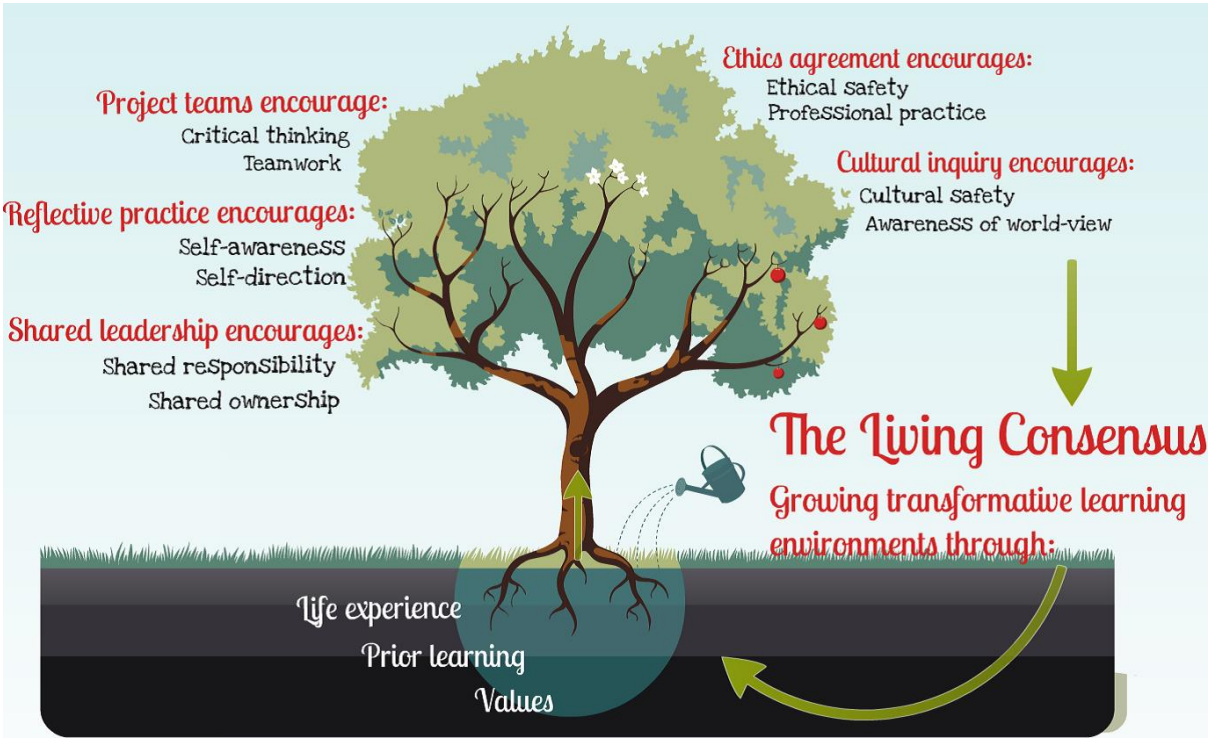

Figure 1. The Living Consensus conceptual framework

The five key teaching and learning strategies that form The Living Consensus

Ethics agreement

The ethical practice of any vocation must be learned at some stage in the learner's development so as to enable them to operate more successfully in the workplace after their graduation (Chan, 2011; 2013). Moreover, Chan describes the process of learning in apprenticeships as learning through "becoming" a professional in their chosen discipline. Part of becoming any type of professional includes the development of ethical practices that are closely aligned with the particular discipline. Hence, it is not surprising that there is a growing body of literature now pointing to a greater demand on teaching ethics alongside the development of professional practice in a range of fields (Achey-Kidwell, 2001; Gibney, 2011; Rogers, 2011; Wiggins, 2011). The methods of teaching ethics are varied, but many successful examples involve the use of learners using their values systems to argue, discuss and resolve various ethical issues (Achey-Kidwell, 2001; Rogers, 2011; Wiggins, 2011).

Achey-Kidwell (2001) posits an ethical development strategy when discussing a successful project that involves students working together to write proposals for their own code of ethics at Niagara University. The learners are involved in sharing, discussing and aligning their ethical viewpoints. The ethics development strategy that forms part of The Living Consensus framework is similar, involving an ethics agreement being developed by the learners. The development of this agreement is facilitated through continuous reflection and discussion on the desired ethical practices for the particular group of learners within the context of their discipline and their learning organisation. This gives the international learners, and the learners who have experienced a variety of workplace cultures, the opportunity to discuss and sort through the differing understandings of what ethical

practice looks like in a variety of contexts. The learners can reflect on this agreement on a weekly, fortnightly or monthly basis, first as small groups but then as a facilitated plenary. This strategy aims to develop ethically safe learning cultures and encourages the development of ethical practice that is transferrable to a future workplace. Through this process, ethical and reflective practice, critical thinking, and problem solving skills may be developed and strengthened. The degree to which this occurs within The Living Consensus framework was assessed when research participants answered the question:

- What are facilitator and learner perceptions about the influence of an on-going ethics agreement discussion on the development of a transformative learning culture and professional practice?

Shared leadership

Sharing leadership of the learning environment with learners has the potential to support the development of self-reflective practice, increased self-awareness, and the development of leadership skills (Begley, 2006; 2007; Branson, 2007; Crippen, 2012; Eriksen, 2009; Gardner, Avolio, Luthans, May, & Walumbwa, 2005; Gold, Evans, Earley, Halpin & Collarbone, 2003; Walumbwa, 2011). These combined skills help to develop autonomous learning capabilities for learning and working. Authentic leadership theory has been drawn on to develop the shared leadership strategy as part of The Living Consensus framework.

It is claimed that authentic leaders grow other leaders through an open-ended and visionary leadership style that incorporates inventive responses to shared issues (Begley, 2006; 2007; Branson, 2007; Crippen, 2012; Eriksen, 2009; Gardner et al. 2005; Walumbwa, Christensen and Hailey, 2011). The research sought to ascertain how successful these leadership strategies can be when applied to a learning context. This Shared leadership strategy framework sees teachers as authentic leaders who wish to share leadership responsibilities in order to develop leadership skills in the learners. Authentic leaders are said to develop people and build communities by using a moral and values-driven approach (Begley, 2006, 2007; Branson, 2007; Crippen, 2012; Eriksen, 2009; Walumbwa, et al., 2011; Gardner et al. 2005).

The shared leadership strategy that is facilitated within The Living Consensus framework uses the ethics agreement, as mentioned above, combined with further discussion on how facilitators and learners can effectively work and learn as a group. This discussion is based on the group's ideas about how they should behave according to their values systems and world views. Regular meetings are to be held with the learners to reflect on the effectiveness of these shared learning environments and the development of problem solving strategies (these meetings can be facilitated alongside the ethics agreement meetings). During these meetings the agreement is discussed and adjusted as people re-align components of the agreement to fit their values-systems and to overcome misunderstandings (often linked to differing cultural and values-based meanings). The leadership tasks of the facilitator, as an authentic leader, include facilitating "values, learning communities and shared leadership" within the learning environment (Gold et al., 2003 p.127).

Values alignment and sifting through the meaning that each learner places on aspects of the agreement because of their values system is critical to the success of the shared leadership strategy. Branson (2011) advocates the alignment of values with the development of organisations with a particular focus on the developmental needs of staff. In such an organisation, corporate and individual values and goals are closely linked (Branson, 2011; Walumbwa, et al., 2011). The shared leadership strategy, as part of The Living Consensus framework, aims to link individual goals with the goals of the curriculum and the goals of the group (class) in a similar way. Authentic leadership relies on leaders that have a strong sense of moral purpose and a commitment to their own values that allows them to put those values into practice (Stevenson, 2007).

For The Living Consensus framework to work to its full potential the facilitator of the shared leadership strategy must strive to model authentic leadership practice. In doing so, the facilitator can help learners work to their full potential by recognising their strengths and building on them to achieve shared goals (Begley, 2006; Crippen, 2012; Gardner et al., 2005). How this occurs in the practice of the facilitators and the learners who took part in the research was captured when the following question was answered:

- What are facilitator and learner perceptions about the influence of shared leadership on the development of a transformative learning culture and learners taking ownership and responsibility for their learning environment?

Reflective practice

The importance of including reflective practice within the learning environment is based upon the belief that it increases the learner's self-awareness which, in turn, increases self-direction, autonomous working and learning skills, and is critical to the development of authentic leadership skills (Begley, 2006; Branson, 2007; Luthans & Avolio, 2003; Garnder et al., 2005; Nevgi, Virtanen & Hannele, 2006; Nunan, 1999; Vaughn, 2004). To support learners in the development of these skills a number of studies have been conducted across a variety of learning contexts using self-assessment and goal setting tools such as reflective e-portfolios or diaries, combined with work based learning opportunities and classroom experiences. When learning has been facilitated by competent teachers the majority of learners discussed in these studies have develop increased autonomy and strength their self-concept (Nevgi et al., 2006: Nunan,1999).

Each of these reflective practice studies focus on the development of transferrable skills that are related to the learner's intended workplace or new profession. If we were to include leadership as one of these transferrable skills then, again, a commitment to the development of reflective practice and self-awareness would be required. Many studies point to the development of self-knowledge through self-inquiry and self-evaluation as essential to becoming an authentic leader (Begley, 2006; Branson, 2007; Luthans & Avolio, 2003; Garnder et al., 2005).

Hence, reflective practice is encouraged as part of The Living Consensus framework through processes that encourage the learners to reflect on their individual progress and the progress of the entire class as a community. In particular, discipline-specific skills and knowledge development, and the development of transferrable learning skills, are the core areas to be reflected upon. Reflection can take place in self-reflective journals, during project team meetings, in the development of the ethics agreement, and as an integral part of the shared leadership meetings mentioned above. The value of the reflective practice strategy as part of the Living Consensus framework was gauged when data was gathered to answer the following question:

- What are facilitator and learner perceptions about the influence of an on-going reflective practice on the development of a transformative learning culture and self-awareness?

Project teams

The concept of project-based learning and social constructivist theories have been in practice since being promoted by Piaget (1969) and Vygotsky (1978). Many studies since this time have gone on to support the view that working in project teams on inquiry-based tasks can help to develop transferrable learning skills such as teamwork, critical thinking, problem-solving skills, and co-constructive practices (Grant, 2002; Kohonen, 1992; Nevgi, et al., 2006; Rossett, Douglas & Frazee, 2003).

Instructing the inquiry process can be achieved while constructing and facilitating 'communities of inquiry' in both the online and face to face learning environments. Instruction from the facilitator may be more overt at the beginning of the programme, and become less so as learner autonomy increases (Akyol, Garrison & Ozden, 2009; Garrison, 2009; Garrison, Kanuka, & Hawes, 2004; Garrison & Kanuka, 2004). Building these learning communities has the potential to greatly extend critical thinking, autonomous learning and communication skills through collaboration with peers, teachers (as coaches) and, in some disciplines, workplace mentors (Grant, 2002; Nevgi, et al., 2006; Rossett et al., 2003).

The inquiry process is facilitated by the teacher but is achieved through the actions of the learners. This shifts a large part of the responsibility for the learning from the teacher to the student promoting the development of autonomous learning skills (Grant, 2002; Kohonen, 1992). While engaged in self-directed, inquiry-based learning experiences, students are encouraged to view themselves as increasingly competent and self-determined, and to assume more and more responsibility for their own learning (Kohonen, 1992).

As part of a The Living Consensus framework strategy, the learners are asked to self and peer-assess their progress in terms of discipline-specific skill/knowledge development and their ability to work as a team while participating in the projects through pre-set reflection tasks. This practice ensures that the opportunities to develop self-awareness and autonomous learning skills through team work are not lost to students who are primarily focused on course content. These opportunities are numerous as much of the learning that happens within The Living Consensus framework is project based. The degree to which transferrable learning skills are developed through the use of project team work was established when answers were gathered in response to the following question:

- What are facilitator and learner perceptions about the influence of team projects on the development of a transformative learning culture, critical thinking and problem solving skills, self-awareness and co-

constructive practices?

Cultural inquiry

Cultural inquiry is used within The Living Consensus framework to investigate each individual learner's culture and world view. The practice of cultural inquiry increases self-awareness in learners as well as an awareness of other world views. This strategy aims to build a culturally safe and inclusive learning environment where diversity is valued as a useful resource for learning.

To this end, The Living Consensus framework draws on Māori learning pedagogies to develop a culturally inclusive learning environment. When reviewing current educational literature, it becomes apparent that much of the work focuses on developing strategies to build lifelong learning skills, to scaffold learning, and to place the students back in the centre of the learning experience (Bruce 2012; Ferguson, 2008; Laws, Hamilton-Pearce; Werahiko & Wetini, 2009). It seems, therefore, that early Māori would have a lot to teach us about education as these practices can be seen in pre-European Māori teaching (Hemara, 2000).

A preferred Māori pedagogy is a concept known as Ako (Pere, 1994). This is a reciprocal process where teaching and learning experiences are shared by the teacher and student, who often switch roles. Ako also describes a holistic approach to learning (Bruce, 2012; Ferguson, 2008; Pere, 1994). Ako encompasses the relationships formed in the learning environment and recognises differences and individual learning styles but also uses the combined strength of the group as a resource (Bruce, 2012; Ferguson, 2008; Greenwood & Te Aika, 2010; Laws et al., 2009; Pere, 1994). The Living Consensus framework's cultural inquiry strategy draws on the concepts of reciprocal practice, supportive, collaborative and inclusive environments, and the recognition of cultural identity and self-awareness that all sit within Ako for the development of each and every learner (Bruce, 2012; Nevgi, et al., 2006; Rossett, et al., 2003; Salmon, 2002).

The concept of learners as teachers/facilitators is recognised as part of the cultural inquiry strategy which encourages all learners to recognise their cultural identities and own world views and then be able to share their beliefs, customs and values with the group. As part of this strategy, each learner is invited to bring an item that represents an aspect of their culture (for example: food, song, performance, video or similar) to describe and share with their class. The most important component of this exercise is when the student is able to explain how the aspect of their culture that they are sharing has influenced the way they think and/or behave. This practice can be limited to a 10 minute slot in each session, day or week and can be a revolving cycle depending on the structure of the course. The discussion on values and cultural understanding can be built on during the shared leadership meetings mentioned earlier. Recognising these differences and facilitating open discussion on this subject could become a powerful vehicle when reaching group agreements, resolving conflict, and developing self-awareness in individuals.

The extent to which cultural inquiry influences the learning environment and the development of transferrable learning skills was discussed when answering the following question was answered:

- What are facilitator and learner perceptions about the influence of cultural inquiry on the development of a culturally safe and inclusive learning environment, self-awareness and awareness of other world-views?

Literature summary

This review has considered a range of literature that can be used to support the development of transferrable learning skills in youth. Five key teaching and learning strategies have emerged with the potential to be highly effective. When these five strategies are integrated to form The Living Consensus framework they appear to overlap and complement one another. Cultural inquiry into one's own beliefs and world view can be developed through reflective practices while strengthening the learner's ability to honestly self-reflect. Increased self-awareness gained through these practices, supports the learner's engagement in shared leadership, ethics agreement discussions, and project team activities.

If these strategies are useful when implemented individually, as the literature suggests, what impact could they have when they are woven together as proposed in The Living Consensus framework? The research discussed in this paper has investigated the perceived benefit or otherwise of the Living Consensus framework in the development of transferrable working and learning skills for youth.

Research Design

The research was designed to provide suitable data to help answer the following key questions:

- What are facilitator and learner perceptions of the influence that The Living Consensus framework has on developing transformative learning cultures for youth?
- What are facilitator and learner perceptions of the influence that The Living Consensus framework has on developing transferrable learning and workplace skills?

The data that was required to answer these questions involved participants' thoughts, beliefs, values and feelings. Therefore the most appropriate epistemology for this study was constructionism. The constructionist paradigm considers reality to be determined by those who perceive it (Holstein & Gubrium, 2008; Lee, 2012). Constructionism takes the view that the meaning of knowledge is constructed socially as opposed to the constructivist position that sees meaning-making is an individual activity (Lee, 2012).

In the case of this particular study, the perceptions sought from each participant were inextricably intertwined with those that share the same learning experience. The facilitators and learners experienced the particular teaching and learning strategies implemented in their group and their perceptions of these strategies were developed through their shared involvement, reactions and discussion. Thus, it is highly likely that the participants influenced one another and the meanings made from this social experience promote constructionism as the preferred epistemological lens from which to view this research (Holstein & Gubrium, 2008; Lee, 2012).

Methodology

In order to gather the required constructionist data, an interpretivist approach has been used to gain the perceptions of learners and their facilitators. Interpretivism was a clear choice considering that this approach is said to help the researcher obtain knowledge of the social world that requires the interpretation of the perceptions, understandings and meanings that people connect with their actions and the actions of others (Burnett & Lingam 2012; O'Reilly, 2009).

Tertiary teachers from Polytechnics and Institutes of Technology (ITPs), and Private Training Establishments (PTEs), were invited to take part in this project. These teachers (facilitators) had been exposed to and had shown an interest in The Living Consensus framework and/or its associated strategies through previous workshops and training programmes. In the context and limitations of this particular research, it was decided to gather data from only two separate learning groups. Each of these learning groups was considered to be a case study.

This choice of case study methodology is appropriate as it will [investigate a contemporary phenomenon within its real-life context] (Yin, 1994, p.13). Using case study methodology in the research served a dual function; [the process of learning about the case and the product of that learning] (Stake, 2005, p.237). The first function of learning about the case explores, through the use of multiple data gathering strategies, the interpretations and meanings the teacher and the learners hold about the benefits or otherwise of applying The Living Consensus framework. The second function is for the researcher to reflect upon that learning through analysing and interpreting data to generate any new learning or understanding about the framework.

These perceptions were viewed as two separate case studies in order to consider the experiences of the participants in relation to their different contexts. Furthermore, it was deemed to be beneficial to quantify the types of experiences participants had in order to gauge the degree to which participants perceived their experiences to be either positive or negative. Arguably, this enables the researcher to gain as much data as possible despite the shortage of time allowed for this full completion of the research. Hence, a mix of qualitative and quantitative data were gathered, explored and analysed in order to help develop a valid interpretation of the participant perceptions.

Thus, two teachers were followed for six weeks as they worked with The Living Consensus framework by integrating the five key teaching and learning strategies into their teaching practice. Both of these participating facilitators were experienced teachers and so the five key teaching and learning strategies were provided as suggestions and examples, rather than as mandatory requirements, for how to implement these into their existing practice. The facilitators were encouraged to use an approach which they considered to be the best fit for their disciplines and their respective student cohorts. Both facilitators already employed components of The Living Consensus conceptual framework as part of their standard teaching practice. The difference in their teaching practice during the study was that the facilitators were being intentional about facilitating all five of the key teaching and learning strategies over the 6 week data gathering period.

The Data were gathered from the facilitators through one-on-one semi-structured interviews with the researcher. A journal was kept by the researcher to record the coaching sessions with each facilitator, especially to capture the issues that arose for the facilitators, the differences between the two facilitators' strategies and the degree to which learners influenced the facilitation of the strategies. Each learner was invited to complete a survey form and was interviewed by the researcher during focus group meetings. These meetings were recorded and transcribed.

Descriptions of the two case study groups

Case Study A

Facilitator A administers a Youth Guarantee's Early Childhood Education programme held within a Private Training Establishment (PTE). The age of these learners ranges between 15 – 18 years. There is a 'rolling enrolment' system in place meaning that the start and finish date of the programme could be different for each student. Students are finishing throughout the programme and new students are starting throughout the year. All 16 of Facilitator A's learners were identified as being female.

Case Study B

Facilitator B administers a second year Beauty Therapy programme held within a technical institute. All 16 learners start and finish on the same date. The age of the learners in this programme ranged from 18 – 33 years, with the majority being under 25 years. This cohort of learners was merged together from two separate year one cohorts. As a result, the learners had slightly differing ideas about some aspects of their professional practice across the two groups. All learners were female.

Research findings

An analysis of the data from the research show that the facilitators and the learners all considered their learning environments to be extremely positive. Most of the learners and both facilitators commented on the positive learning relationships that had been formed amongst the class group peers and with the facilitators. Some facilitator and learner comments attributed these outcomes directly to specific teaching and learning strategies that sit within The Living Consensus framework, in particular, the ethics agreement and the shared leadership strategies. Comments from the learners and the facilitators credit the shared understanding, the setting of expectations, and the shared responsibility for the learning environment as having a strong impact on the development of a positive learning environment.

These findings are similar to those described in studies that attribute the defining of expectations and the shared responsibility for learning to the successful management of troublesome learning behaviours and the development of positive learning environments (Anjala & Krishen, 2013; Appleby, 1990; Sierra, 2010). These studies provide evidence that a positive and productive learning environment can be developed by using some components of the strategies that make up The Living Consensus framework. Indeed, Anjala and Krishen's (2013) study even cited the development of some of the transferrable learning skills that were identified by facilitators and learners using The Living Consensus framework. However none of the studies used all of the five key teaching and learning strategies simultaneously and none mentioned the use of cultural inquiry.

Data from The Living Consensus study highlight the value of facilitating cultural inquiry within the learning environments that were studied. Facilitator A discussed positive experiences the learners had when researching their personal backgrounds and finding out where they were from and who they were connected to. Moreover, facilitator B gave an example of a positive outcome from the cultural inquiry aspect of The Living Consensus framework that involved a learner developing a method to ensure cultural safety for their clients. These outcomes support consideration being given to including the importance of learners being provided with an opportunity for developing awareness of their own world view and considering how this differs from the world views of others.

The results from The Living Consensus study show that the facilitator and learner perceptions of an environment facilitated with the use of the strategies that form The Living Consensus framework were noticeably positive. There were, however, additional contributing factors to which the learners from this study attributed their positive learning environment. These included the skills, experience and personalities of the teachers, excellent support staff, the self-paced nature of one programme, small class sizes, and the fact that [we

are all just good people].

The findings also suggest that most of the learners considered their programme to have had a significant influence on their understanding and development of transferable learning skills. In each case all but one of the learners rated their development of each of the named skills highly (7-10) on the scale provided. Comments from the focus group meetings, and semi structured interviews, linked transferrable skill development directly to the five key teaching and learning strategies that form The Living Consensus framework. Furthermore, the facilitator comments also made very clear links from the teaching and learning strategies directly to the development of transferrable learning skills.

Based upon these findings it can be suggested that The Living Consensus framework has had a significant impact on the development of transferrable learning skills of the youth enrolled on the two programmes studied. Again, however, there are the other contributing factors discussed above that influence the development of transferrable learning skills. Although it may not be possible to ever completely separate out these contributing factors from the teaching and learning strategies used, a number of studies show that facilitators simply being intentional about the development of transferrable learning skills does have a positive impact (Bruce, 2012; Chandra, 2006; Lynch & Dembo, 2004; Nunan 1999). The Living Consensus provides a framework that can be integrated into existing curricula alongside the development of discipline specific skills and knowledge to help keep transferrable skill development in the forefront for facilitators of youth learning environments.

Limitations

The Living Consensus study included a number of limitations. There are a number of additional factors that contribute to a learner's positive learning experiences. This includes, but is not limited to, the skill and experience of the facilitator. Both facilitators that took part in this study are very experienced teachers with excellent teaching practices which have been recognised through promotional processes and award nominations. Both teachers already employed components of The Living Consensus framework as part of their standard teaching practice prior to this study. This being so, it is difficult to ascertain how much of the positive ratings and comments from the learners are able to be attributed to the skill of the teacher and how much can be attributed to The Living Consensus framework. It may be that these factors can never be completely separated, however further study involving less experienced teachers across a broader range of contexts may provide some clarity.

Other limiting factors in this study were the small number of participants and each participant being a female (including both facilitators) thereby indicating a potential gender imbalance. In addition, the time period for this study was a factor given that the learners and facilitators were only followed for six weeks. This meant that the participating facilitators did not have the opportunity to fully implement some of the strategies. It was noted, however, that both of these facilitators expressed certainty that they would have gained further positive results in some areas if they had longer to implement the strategies.

Recommendations

While mindful of these limitations, a number of recommendations can be drawn from this research. First, the recommendations for teachers from this study are set around the approach taken to facilitating learning for youth. Both of the learning environments that were studied were perceived to be tangibly positive by the learners and facilitators. Their comments provided in this research highlight the facilitative and collaborative nature in which these programmes were led as prominent contributing factors.

To this end, a range of teaching and learning strategies that were designed to facilitate learning in this collaborative manner can be implemented by teachers to improve learning environments for youth. Such recommended teaching and learning strategies could include:

- Shared leadership which has emerged as the most powerful of all the strategies researched in the development of positive and transformative learning environments for youth. Both case studies have shown that when learners are given the opportunity to take ownership for their learning environment through well-facilitated shared leadership they can establish and maintain a harmonious environment that is conducive to student learning.
- Facilitating on-going discussion and agreement amongst learners on what constitutes ethical and

professional practice in the learners' discipline can be extremely useful to the learners' development as practitioners in any field. This teaching practice can also contribute to the development and maintenance of a positive learning environment particularly when practice-based learning occurs in a simulated environment such as the beauty therapy clinic discussed in Case Study B.

- Facilitating the cultural inquiry process can assist learners to develop increased self-awareness and an awareness of other world-views. These developments for learners also have implications for the growth of professional practice. An example of this was seen in Case Study B where a learner suggested that a question be added to the simulated clinics consultation forms to ensure cultural safety for clients.
- Facilitating learning using project teams is an approach that can engage learners in the inquiry processes while helping them to develop critical thinking, teamwork skills and self-awareness. Both case studies have shown that this approach can help maintain a positive learning environment as learners are actively engaged in the learning process. At the same time they are developing transferrable learning skills as they interact and share ownership of the projects with their peers.
- Incorporating reflective practice through goal setting, reflective journals and discussion can help learners to develop self-awareness and self-direction. An example of this occurred in Case Study A when one learner commented that she was applying her new goal setting and reflection skills to other areas of her life outside her programme of learning.

To gain additional value for teachers, these findings do require further research and it would be useful to collect the tools and strategies that have been developed and supported in practice to share amongst tertiary teachers. Such a study could generate not only new knowledge that could be used to enhance the learning experience for youth but also to develop a set of useable tools and strategies that facilitators could pick up and implement within their own teaching practice.

Conclusion

The findings from the study indicate that sharing leadership of the learning environment with learners helps develop positive learning behaviours and encourages learners to take ownership and responsibility. Shared leadership is achieved by being clear about intentions and developing shared expectations (Anjala & Krishen, 2013; Appleby, 1990; Sierra, 2010; Lesser, 2014; Weimer, 2014). Facilitator and learner comments from this study indicate that the shared leadership and ethics agreement strategies from The Living Consensus framework facilitate the development of transferrable learning skills alongside the development of professional practice.

It can also be concluded that each of the remaining three teaching and learning strategies that form The Living Consensus (project teams, reflective practice and cultural inquiry) aid the development of specific transferrable learning skills. Learner and facilitator comments from this study indicate these strategies support the development of self-awareness, awareness of other world views, team work, and critical thinking skills for learners. Facilitator comments show that these skills support the shared leadership process by further enhancing the group's ability to reach agreements and self-manage their learning environment.

Facilitator and learner perceptions gathered during this study strongly indicate that when these five key teaching and learning strategies are combined to form The Living Consensus framework they can be used to develop positive and transformative learning environments for youth. Other studies provide additional evidence that isolated strategies (similar to some that are contained in the framework) have proved useful in developing some of the transferrable learning skills mentioned in this study (Anjala & Krishen, 2013; Appleby, 1990; Bruce, 2012; Ferguson, 2008; Greenwood & Te Aika, 2010; Laws et al., 2009; Sierra, 2010).

The Living Consensus framework houses all of these strategies together with the explicit intention of developing a broad range of transferrable skills for learning and working. Comments from participants show that the five teaching and learning strategies, when implemented well, have the ability to positively alter the attitudes of youth toward education. This is evidence of The Living Consensus framework's potential to positively transform young lives through education.

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Deploying student / peer feed-back to improve the learning of skills and dispositions with video

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Abstract:

The work presented in this paper is based on a range of mobile learning projects using tablets in classrooms, workshops /workrooms and in authentic learning environments to video skills and dispositional learning. Videos are then used during peer, group and teacher-led feedback sessions to improve students' self-efficacy of their learning progress.

Peer feedback, through the application of feed-up, feedback and feed-forward strategies, was established to be crucial towards improving the learning of skills and dispositions. To be effective, learning through the videoing of skills or dispositional learning as they occur, requires planned learning activities. The deployment of peer learning also requires learners to be attuned to nuanced expression of skills or dispositions. Novices may not have the requisite skills to judge levels of competence. Learners who provide peer feedback require a scaffolded process to learn evaluative skills and the language of feedback as required in their discipline or profession.

Keywords: **technology-enhanced learning, learning dispositional skills, hospitality, nursing, video feedback.**

Introduction

Since 2010, Christchurch Polytechnic Institute of Technology (CPIT) has introduced tablets (i.e. iPads, Android and Windows Surface RT tablets) into workshops and workrooms as situated technology-enhanced learning (STEL) initiatives. These projects (Chan, Fisher & Sauer, 2012; Chan, McEwan & Taylor, 2013) build capability with vocational educators and institutional learning technology support, to implement the affordances presented by establishing mobile learning capability into situated learning environments, instead of shifting students from familiar and comfortable workshops, into computer suites. In response to the need for CPIT to deliver creative, nimble and high quality educational and training delivery solutions brought about by a natural disaster (i.e. the Canterbury and Christchurch earthquakes of 2011 and 2012), a technology-enhanced learning (TEL) strategy was launched in 2013. One of the TEL initiatives to improve flexible learning opportunities for students is project surface tablet with twelve 2014 projects deploying Windows Surface RT tablet into a range of discipline areas.

Pedagogical approaches anchoring project surface tablet include interventions to improve differentiated instruction deployed through CPIT learning support and with nursing students on work placement; eportfolio construction with a range of programmes; 'flipped' classroom with several 'lecture-focused' programmes; inquiry and problem-based learning across programmes from trades to degree level; and review and practice of knowledge and skills. This paper reports on one of the tablet-based teaching and learning approaches also

investigated in 2013 (Chan, McEwan & Taylor, 2013), which is the deployment of tablets to improve the learning of skills and dispositions through videoing role-plays, simulated practice or authentic practice.

Projects

The discipline areas involved in utilising videos recorded with tablets include the following:

- Hospitality students learning front office receptionists' 'service disposition' as they check-in or check-out guests
- First-year nursing students learning how to adopt 'duty of care' dispositions through role-plays of nurse-patient interactions
- First-year nursing students learning basic nursing skills through simulations
- Out-door education students learning rock climbing, kayaking and water safety skills
- Out-door education students improving public speaking skills when presenting project information to peers (see details in Chan, 2014)

In this paper, we report primarily on evaluations collected from hospitality and nursing students as these two cohorts of students engaged in learning activities centred on videoed role-play to improve learning of dispositions. For hospitality students, service orientation (Cran, 1994), defined as a set of individual dispositions assisting with service personnel to provide courteous but not obsequious responses or assistance to customers and workmates. For nursing students, there is the important dispositional approach to responding to patients, summarised by the term 'duty of care' (Bradshaw, 1999).

Why choose to use tablets?

Tablets were selected as they provided the following affordances:

- Sufficient screen size to allow a group of students to view, critique and offer feedback on performance
- Portability to allow for role plays in authentic learning environments (e.g. hotel receptions front desks, clinical room, rock climbing wall)
- Ease of video capture and user friendliness of videoing process
- Obviates some of the disadvantages of learning in computer suites (Moor, 2006).

Relevant literature underpinning deployment of videos

In this section, the key pedagogical frameworks informing the deployment of video-enhanced learning are introduced and discussed.

Learning through practice

The pedagogical approaches deployed across the project are founded on socio-cultural theories of learning. During learning, emphasis is placed on the contributions from both the individual and the social (Penuel & Wertsch, 1995). Therefore, individuals learn the occupational skills and dispositions through practice and inter-relationships between peers and trainers or experts. Learning through practice requires the presence of a practice and modelling environment. The practice environment includes the understanding of clear goal-orientated actions, supported by meaningful feedback (Laurillard, 2012). Practice-based learning or 'learning by doing' provide affordances for learners to engage in multimodal / multisensory engagement with authentic work processes. Supported practice-based learning provides scaffolds for novices, unfamiliar with occupational procedures to be introduced to specialised and sometimes difficult to access requisites for successful performance. The learning approach of videoed role play supported by pedagogical frameworks of deliberate / reflective practice and peer / teacher feedback is now introduced in the following sections.

Role play as a learning strategy

With hospitality and nursing, role play as a skills learning approach, was used to learn and develop front-office receptionists' skills and nurse / patient communication skills through deliberate and reflective practice. An adaption of the steps for role play recommended by van Ments (1989) was used to structure role play activities for students to learn and deliberately practise. Additionally, the precepts discussed in the sections below on deliberate practice, structured feedback and reflective practice were incorporated into role play sessions. Role play as a method for assisting the skills development has varied in popularity over the last four decades and includes skills, issues, problem-based and speculative-based approaches (Armstrong, 2003). Advantages of role play relevant to this project include: providing practice in various types of behaviours/skills; opportunities for communication skills other than written text to be practised; possibility for immediate feedback; being generally student- centred to address needs of the learner as they learn a skill; replicating real-world situations; and providing a technique to change dispositional outlook (adapted from van Ments, 1989).

Disadvantages of using role-play include the requirement of a large component of time for practice; dependence on quality of observers to provide appropriate feedback; some reliance on students having requisite skills/knowledge to perform adequately during role play and domination of the learning to exclusion of other learning outcomes (adapted from van Ments, 1989).

Video as tool for improving reflective learning

The process of using videos to collect student learning and then use these videos to encourage reflective learning is now widely used in sports skills acquisition (Summers, 2004). However, the use of video technology to improve learning in the vocational education sector is infrequent and examples available emphasise research approaches using video to study vocational education (for examples see Chan & Leijten, 2012 and Filliettaz, 2010) rather than improvement of skills learning. Advocates of using video feedback for learning (exampled by Darden, 1999; Rich & Hannafin, 2009; Yoo et al. 2009) recommend a structured framework for introduction and use of video feedback with students. Staged or scaffolded and teacher-assisted learning activities are important to maximise the advantages of video feedback.

Hence, the pedagogical principles underpinning deployment of videos include *deliberate practice* as defined by Ericsson and others (1993, 1996, 2006), *reflective practice* as described by Schon (1983) and *application of peer feedback* using guidelines suggested by Hattie and Timperley's (2007) and Nicol and Macfarlane-Dick (2006).

Both of deliberate and reflective practice rely on individuals' effortful and mindful learning of new skills and knowledge. Support and feedback from peers and teachers assist individuals to hone newly learnt skills. Deliberate practice refines skills, reflective practice allows individuals to evaluate nuanced expression of skills or dispositions. Novices may not have the requisite skills to judge levels of competence (Jones, 1999). Learners who are expected to provide peer feedback require a scaffolded process to learn evaluative skills and the language of feedback as required in their discipline or profession (Sadler, 2009). Hence, deliberate practice, in tandem with clear feedback indicators from peers, teachers or experts, provide material for learners' reflective progression.

The role of deliberate practice

Through undertaking a series of cognitive psychological studies on experts in chess, musical performance, the visual arts and sciences, Ericsson (1996, 2006) and with others (Ericsson, Krampe & Tesch-Romer, 1993) defined the premises for deliberate practice. The seven principles of deliberate practice to achieve expertise are that:

a) Informative and immediate feedback is fundamental towards assisting learners to define knowledge and skills
b) Measuring and analysing current performance is required to improve on performance
c) Specific definition and identification of activities is required to improve performance aspects
d) Activities need to be repetitive to allow for reflection on outcomes and processes
e) Learner motivations to improve performance is a prerequisite to achieving expertise
f) Time and effort are required to attain expertise
g) Teachers and coaches plan a crucial role in guiding individual development (Van de Weil, Van den Bossche & Koopmans, 2011).

Reflective practice to bring about dispositional change

Many models of reflective practice have been recommended with one of the most recognised based on the work of Schon (1983). Schon advocated the importance of practice but also recommended the need to supplement practice with critical reflection. In becoming efficient problem solvers, learners have to reflect critically as they identify or frame a problem, implement appropriate strategies to solve the problem and then evaluate the effectiveness of strategies and approaches used. Rolfe's framework for reflective practice (Rolfe, Freshwater & Jasper, 2001) recommends the reflective process can be (over-) simplified as: "What?" (i.e. describe the situation), "so what?" (i.e. theory & knowledge building) and "now what?" (i.e. how to improve the situation). Rolfe et al.'s framework, in turn informs and connects well with the process of peer feedback as discussed below.

Peer feedback process

The projects reported in this article also included clear guidelines to students and teachers for the provision of feedback as based on the work of Hattie and Timperley (2007) and Nicol and Macfarlane-Dick (2006). The use of three forms of feedback are advocated:

- Feed up – Are the learning objectives being met?
- Feedback – What is the performance level on learning?
- Feed forward – What does the learner need to do improve to learning or move to the next objective?

In implementing the above process, students were then encouraged to undertake a cycle of deliberate and reflective practice, as discussed in the above sections. Each video of role-play or practice is accompanied by a session of peer feedback. The feed forward element identified from each feedback session is then highlighted as a skill or disposition to be evaluated at the next iteration of the role-play or practice. Thus, a succession of feed forward components are progressed. Additionally, the peer learners' judgement of often difficult to describe and determine skill and dispositional factors are increased as novices begin using, examining and evaluating occupational competency requirements (Sadler, 2009).

The structured, peer feedback on videoed performances meet the criteria laid out by Nicol and Macfarland-Dick (2006) to achieve the following:

- Help clarify what good performance is on difficult to learn skills / dispositions
- Facilitate the development of learners' self-assessment and reflection
- Deliver high quality information to students about their learning
- Encourage teacher and peer dialogue around role plays and authentic practice
- Encourages positive motivational beliefs and self-esteem with learners
- Provides opportunities for learners to act on feed forward and thus close the gap between current performance and required learning goals
- Provides information to teachers to help them develop better teaching strategies and approaches.

Student evaluations

The main objective of the study was to find out '*Will videoed role-play assist students' to improve their self-evaluative skills'?* Data collection was carried out with hospitality students learning office receptionists skills (n=38) and first-year nursing students learning how to communicate with patients and patients' supporters (n=140).

Hospitality students: Two cycles of focus group and class room observations were undertaken to firstly to introduce students to the concept of 'self-evaluation' to improve the learning of 'service disposition'. Secondly to improve teaching strategies to support students as they engaged with using videoed performance to improve communication skills and 'customer-focused' dispositions.

Nursing students: A survey questionnaire utilising short questions with Likert scale responses and opportunities to add comments was collected at the end of the first-year nursing communications module. Nursing students worked through a series of formative scenarios or case studies. Students took turns to be nurse, patient / or patient supporter and observer.

Interventions used were documented and thematically analysed for applied teaching and learning processes contributing towards helping students become critically reflective learners. From these findings, guidelines to assist students to use video as a tool to enhance critical reflection were produced.

Pedagogical approach

The videoing capability of tablets was used to collect evidence of students' developing customer / patient relationship / interaction skills. Hospitality students were learning and practicing how to check-in and check-out guests. The check-in/check-out processes required students to learn a set sequence of tasks. During the check-in/check-out sequences, students had to maintain a pleasant customer service orientated demeanour. Nursing students practiced various ways to respond to a set series of formative scenarios or case studies involving interactions with patients or patients' supporters (parents, spouses or caregivers).

Using video to assist the learning of dispositional skills through role play

Tablets were used to video individual's role playing. Students worked in groups of three, cycling through roles, for hospitality students – as receptionist, customer and observer / video operator and for nursing students – as nurse, patient / or patient supporter and observer / video operator. Viewing of individual student's role plays was supported by checklists and feedback sheets, structured to fit into tight timeframes. Construction of the checklists was informed by the need to identify task components for deliberate practice of dispositional skills.

Feedback processes

Videos of individual student's role plays were appraised by each individual student, in student groups of three and through whole class teacher-led learning activities. Feedback sheets included feed up, feedback and feed forward (Hattie & Timperley, 2007) and framed as 'what?', 'so what?' and 'now what?' questions (Rolfe, Freshwater & Jasper, 2001).

Findings

The comments collected from students indicated a high degree of engagement with the process of using tablets to video their role plays.The reasons provided for their answer on the usefulness of the process revolved around the following. Student responses are signified using (H) for hospitality and (N) for nursing.

The ability to view their own performance from the point of view of an observer.

"I found it useful to watch other people and learn from them". (H)
"It gave us a chance to see ourselves and where we went wrong and get feedback". (H)
"'Out of self' perspective very helpful." (N)
"Good to see yourself rather than peer feedback." (N)
"Good to get used to seeing yourself on video." (N)

Capacity to learn from other's mistakes as well as their own.

"Watching it (the video) over was helpful because I could correct my mistakes". (H)
"You could see the process clearly and knew what steps you were missing out on or the order of the steps". (H)

Teacher's contributions were appreciated. In particular, the provision of a 'model' video, provided students with an example and a standard to be met.

"Videoed herself and gave us feedback on our video". (H)
"Filmed herself and showed the class her performance". (H)
"Ran through the videos with us and provided feedback." (H)

The opportunity for students to view and receive detailed feedback for each performance assisted in learning. The main improvements in learning were through the following:

Accelerated learning: The opportunity to video students' role play activity has decreased the in-class time required for practice. In the past, teachers had to observe each group of students through at least two iterations to provide formative feedback. With the use of video, students proceeded with each role play independently. Teachers provided feedback to each group after their first role play to model the feedback cycle. Students are then able to proceed with deliberate practice both during and outside of timetabled class time. Recordings of role plays could be viewed by teachers both during and out of class time.

"Because it's easier to criticise yourself and see mistakes to fix them if you can see yourself". (H)
"Reviewing service from a different perspective. See mistakes that I cannot remember and need to work on." (H)

Improved students' self-awareness: In the past, feedback from teachers of students' deportment was completed retrospectively and some students found it difficult to remember their actual performance. Video evidence confronts students with a physical record of their performance. Formative feedback provides students with strategies to improve performance and ensuing videos record progressive improvements.

"Helpful to see what I was doing well and what I needed to work on." (N)
"Helped me notice things I did not know I was doing." (N)
"Good to do our own reflection also made me look closely at our performance." (N)
"Feedback very encouraging but also constructive." (N)

Increased ability of students to identify and then deliberately practice skills: The videos provided evidence of skill attainment, offering students the opportunity to identify and centre on skills to be practiced and improved.

"It was perfect to get feedback on the good things I did and what I need to improve on." (N)
"It helped me think about what I need to change to improve the way I interact with patients." (N)

Visibility of students' 'service orientation' or communication / interaction skills through 'body language' signals: Discussed in peer feedback, teacher to group feedback and teacher to whole class feedback sessions. Teachers were able to draw on examples of the non-verbal aspects of dispositional skills using current class examples. The immediacy of feedback was an important advantage of videoing the role plays.

"Being able to look back and reflect on my performance was very helpful". (H)
"Being able to watch yourself and know what your (sic) doing wrong". (H)
"At first I hated being recorded but after it was great to be able to see how it went and be able to re watch the part I forgot." (N)

Development of a vocabulary to describe performance: When compared to observation of 'live' role plays, videoed role plays could be played back several times. This led to reinforcement of the specialist language of dispositional skills assessment.

> "Watched the videos as a class and gave feedback that helped us with assessment criteria". (H)
> "Practising made the assessment easier as I felt more comfortable with the interview environment." (N)

Learning of 'judgement': The videos could be compared to gauge appropriateness of performance and levels of 'service orientation offered to 'guests' or 'duty of care approaches to patient or patient supporter communication / interaction'. The videos become a shared learning resource amongst the students in the class, leading to improved understanding of the nuances of dispositional approaches.

> "Help me understand what I had to change for the assessment." (N)
> "Constructive for direction of what real life practise will be like." (N)
> "The lecturer saw things I looked over completely." (N)

Increased student confidence: The process assisted students to build capability, judge their performance and develop confidence.

> "Very good for lecturer to not only point out what you need to work on, but what you did well which was encouraging and built up confidence." (N)
> "It was perfect to get feedback on the good things I did and what I need to improve on." (N)

Recommendations

The following recommendations are summarised from evaluations completed with students and staff on the hospitality and nursing projects. Thematic analysis of evaluative feedback from students assisted to identity aspects of the process which contributed to efficacy. As with all learning activities, it is important to ensure the teacher is prepared, the students have the requisite skills to undertake the activity and the class room climate fosters a learning environment.

Prepare teachers

Teachers need to become familiar with learning-centred approaches to teaching and learning and be prepared to undertake the following:

- Build capability with the hardware and software used to support the role-playing or skill acquisition process.
- Develop supporting worksheets or resources to support the activity. Examples include customised instruction sheets for using tablets to video practice; learning activity resource sheets exampled by scenario / case studies in nursing role plays; and worksheets to structure peer feedback.
- Undertake to adopt a reflective teaching approach to deploying the video supported learning activities.

Set up culture of trust

The most important recommendation is to set up culture of trust in the classroom /workshop / learning environment. A safe and trusting environment contributes to engagement with role play learning activities, involves participation in providing and accepting feedback and commitment to individual dispositional transformation. The creation of a safe learning environment includes:

- Establishing a culture of sharing and inclusiveness.
- Teachers modelling how to provide and accept feedback – this can be done through a short session using a 'neutral example' i.e. providing feedback on teachers' example.
- Valuing of students' contributions supported by processes to increase students' confidence in their own abilities to offer and accept feedback.

Prepare students

The ability to provide and accept feedback is a learnt skill. Provision of a structured session on 'how to give feedback' (Chan & Leijten, 2012) provides students with confidence, increasing the learning potentiality of the videoed role-play process.

Student preparation includes the following:

- Plan learning activity around the concept of 'deliberate practice', 'critical reflection' and 'peer feedback' BEFORE the first role play begins.
- Provide learning activities to learn how to give and receive feedback as this will assist students to maximise the benefits of role play learning activities.

- Provide students with opportunities to practise providing and accepting feedback in small groups and with one-to-one teacher sessions BEFORE undertaking whole class feedback.
- Provide students with a structure for 'critique' so that feedback is focused on the procedures to be learnt.

Additionally, teachers must model the 'language' of good feedback and encourage students to use correct protocols and processes.

Conclusion

Careful learning programme design and planning ensures the efficacy of using tablets to video students learning sometimes difficult to describe dispositions and complex practical skills. Implementation of a structured approach to using videos to support dispositional and skills learning framed by pedagogical approaches to enhance deliberate and reflective practice and feedback processes, provide affordances for learners to learn some required occupational or professional tacit knowledge requirements. The structured approach include ensuring teachers are confident with implementing STEL learning activities; students are provided with support to utilise the process effectively; and a culture of trust and learning is established to allow the STEL learning activity to succeed.

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Education for Sustainability in Technological Vocational Education

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Building capabilities for the technological world of tomorrow is the primary aim of vocational education. That includes developing the skills and technical knowledge to problem-solve unseen needs by being able to design for a sustainable future. Education for sustainability is now a widely accepted concept which promotes sustainability skills and awareness throughout a learner's educational pathway. Using the results from three case studies this paper argues the necessity to integrate education for sustainability with traditional VET skills by involving students in practical applications. It contends that the inclusion of the quadruple bottom line (economics, environment, governance and society) into VET allows students to transform their attitudes to their trades and view productivity through the lens of maintaining a 'liveable' world. It concludes with the need to further research synergies between sustainability in the VET sector and aligning curricula to the needs of industry.

Keywords: Sustainable Technology; Integrated curriculum; Vocational education

Background

Since 1987 the definition of sustainability drawn up by the World Commission on Environment and Development has been *development that considers the needs of the present without compromising the ability of future generations to meet their own needs* (The Brundtland declaration). In order to bring about sustainability in practice a number of researchers have demonstrated that vocational education and training (VET) has to be the starting point for initiating workplace change and up-skilling workers in sustainability concepts, from design and manufacture to use and eventual disposal (Fien & Wilson, 2005; Mazzotti, Murphy & Kent, 2007; Panko, 2012).

This concept has been translated into broader educational goals by the United Nations (2002) as encouraging learning processes that lead to decision making in favour of the long term future of the environment, economy and equity for all global communities. To support the goal of incorporating sustainability into all educational levels and particularly into skills-based education, 2005 to 2015 was declared as the Decade of Education for Sustainable Development (Parliamentary Commissioner for the Environment, 2004). During this decade the UN encouraged countries to embed education for sustainability across a wide range of curricula, in the hope that this would lead towards a more sustainable future and provide corresponding opportunities for the present and future generations.

The Bonn Declaration of 2004 states that "since education is considered the key to effective development strategies, technical and vocational education and training (TVET) must be the master key that can alleviate poverty, promote peace, conserve the environment, improve the quality of life for all and help to achieve sustainable development" (UNESCO/UNEVOC, 2004, p. 2). Even with the Bonn Declaration, the experiences in a number of countries suggest that the embedding of sustainability across the curriculum and particularly into VET areas remains challenging and has been attempted with differing degrees of success.

In Australia the majority of VET programmes now have mandatory requirements to embed environmentally sustainable concepts into the curriculum, and this has been largely due to support provided by the government and VET organisations. A similar situation has happened in Europe where the European Union's Europe 2020 strategy (EC, 2010) contains a commitment to incorporating sustainability in the VET sector.

Barriers to embedding sustainability into VET

Research carried out by Sharma (2011) in New Zealand indicated that although there was general support for the concept of embedding sustainability into VET, there were also a number of barriers that could inhibit the process. Amongst the academics she interviewed a minority of faculty members raised the following issues they considered might be problematic:

- Sustainable practice was irrelevant for trades and only general trade skills are required by industry,
- Sustainability has economic boundaries and was too expensive to practice,
- Industry is unreceptive to sustainable practice and there is no expectation for academics to teach the concept,
- Educational compliance is not the answer to sustainability and will discourage students and academics,
- There was a general lack of knowledge about the concept amongst VET academics,
- Sustainability education will create extra work for everyone.

In addition, she discovered that in situations where some academics in the VET sector felt confident that they were already addressing sustainability, on further investigation they had only considered a small aspect of the topic, such as recycling. They were not considering the wider Quadruple Bottom Line (QBL) or applying any Life Cycle analysis into their teaching of overall technical processes. Nevertheless, she did discover that students largely had a more positive point of view and basically supported embedding sustainability into their programme of study.

The Quadruple Bottom Line and Life Cycle Analyses
Although fundamentally similar, the concept of triple and quadruple bottom line may demonstrate slight variations in areas of emphasis. The approach adopted by the authors of this paper focuses on four overlapping aspects of sustainability:

- Environment (Air, water, biodiversity)
- Governance (International, national, local and organisational)
- Economic (short and long term)
- Societal issues (Health, culture and employment)

These four fundamental aspects of sustainability create the complexity that has to be addressed in VET. "TVET for sustainable development is a process of incorporating into TVET considerations that impact on the long-term future of the economy, ecology and society. UNESCO-UNEVOC refers this as TVET for sustainable development" (Fien & Maclean, 2009, p. xxiv). These domains all have roles that need to be considered when examining the life cycle of products or processes from design and manufacture through use and eventual decommissioning. These will include pollution and energy expenditure and need to be addressed within the realms of diverse technical disciplines. When the QBL and life-cycles are examined for any technical product or process, the impact, both advantageous and detrimental can be assessed.

Educating for Sustainability at Unitec Institute of Technology

Although approximately twenty of the Programmes in Unitec Institute of Technology do contain aspects of sustainability, one programme in particular features it to a significant extent, and this is the Bachelor's Degree in Applied Technology where students are enrolled in a variety of practical disciplines such as Transport Technology, Electrotechnology and Building. Within this programme students encounter aspects of the Quadruple Bottom Line in conjunction with product and process life cycles - both under relevant topics within their individual pathways of study and collectively as a single semester course entitled Sustainable Technology, which is a compulsory second year subject. Participants are encouraged to explore cases within their own industry and creatively suggest where changes to the process or product could improve aspects of the QBL they had identified as currently highly damaging.

The initial question posed by this paper is: what teaching approaches resonate most with students and have the perceptions of students towards aspects of sustainability changed as a result of their learning? Answering this leads inevitably to 'where to from here?' as far as synergies between VET curriculum design and industry needs are situated.

Research

The students who participated in these case studies were all enrolled in the Bachelor of Applied Technology and were likely to move into practical careers once qualified. A large proportion of these students were international, coming from countries such as Saudi Arabia, Malaysia and China, and the majority expected to return to their home countries to practice in their professions after graduation.

Over a two year period three separate case studies have been employed to investigate the reactions and engagement of students under differing circumstances. For this paper findings from all three cases were compiled to show the perceptions of both local and international participants towards VET issues involving sustainability. The three case studies were:

Case study 1

Sixty second year students participated in a project designed to focus on reduction of waste materials. They were required to apply the guidelines provided by Jaques (2013) which emphasise the 5 Rs and also provide examples of the way in which these can be achieved:

- Reduce
- Reuse
- Recycle
- Recover and
- Residual disposal

Working as teams of five or six, students examined the construction waste bins around the Unitec campus and created an inventory of all the waste they identified. Then each team had to collaboratively debate online examples of the 5 Rs for all the material they had found. This included identification of the various categories of waste followed by research to explore options available to re-cycle or up-cycle all of this material, at each stage of a product's life cycle, from sensitive design to careful deconstruction. The students were then required to reflect on ways through which waste and pollution could be minimised, particularly within their own industries.

At the conclusion of the waste management project students were asked to complete a questionnaire designed to discover to what extent, if any, their understanding of waste management had been transformed by this process.

Case study 2

To investigate the responses of International students 22 students participated in an On-line questionnaire at the end of their course. Their ethnicities were diverse (Fig. 1)

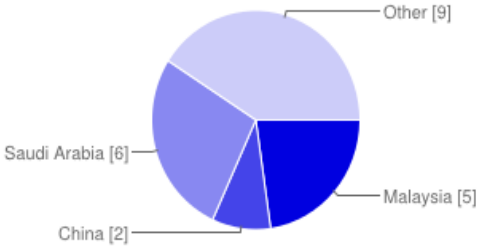


Figure 1: Origins of the International students

The international students were asked to respond to questions which explored their knowledge and perceptions of sustainability before and after their course. They were also asked about their views of the potential application of sustainable technologies in their industry in their own country.

Case study 3

Thirty four members of a different cohort of the class visited a council transfer centre and saw the quantity and nature of waste materials being handled at the centre. They received information about the problems of landfill issues by experts at the site and later, in groups of four or five, discussed online creative design solutions under three main headings: Energy Reduction, Waste Minimization and Water Reduction. These postings were

assessed as part of their course requirements. In addition, they provided oral feedback on the value of the site visit and to what extent it had affected their views about recycling.

Findings

All three cases showed an overwhelming degree of support for the concept of integrating sustainability into their degree programme, as can be seen from the results in Case Study 1 (Fig 2). This positive view was almost universal and was not affected by the students' country of origin nor by the technical discipline they followed. In addition, 82% of the participants believed that there were major opportunities for further application of sustainable practices in their own industries. Comments from the students' questionnaire indicated that they had undergone a stage of transformative learning in respect to sustainability in general and waste management in particular (Panko, Sharma & Fuemana, 2014) and these are represented by the following examples:

> I will try to plan out what is required initially before I do something that causes me to make mistakes and create cable waste.
> When I am qualified I will set up waste management so I can save more money in my business.
> If I work for a company that doesn't recycle properly I will bring this issue up with my boss to plan ways to recycle.
> [Lack of management is] waste of income, potential profits and the well-being of the human race.

They provided practical examples such as the potential for pollution reduction in China and energy conservation in Saudi Arabia. New Zealand participants considered factors such as the design of alternative energy sources and transportation mechanisms. There was, however, a degree of doubt as to whether changes could be implemented in reality. This feeling of powerlessness was more noticeable amongst participants from the developing world, whereas students from Germany who were previously familiar with the topic and who had observed it embedded in practice in their home country, considered New Zealand industries to be rather backward in sustainable practices.

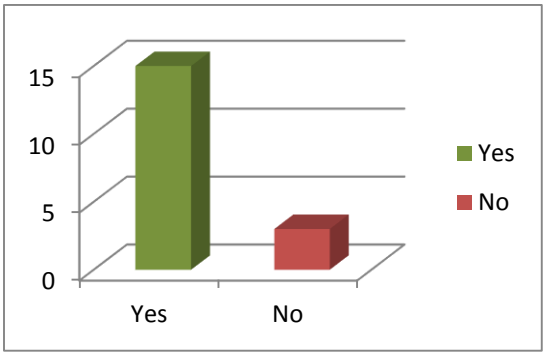


Fig. 2: Students' evaluation of the relevance of waste management in their industry.

Figure 3: Case Study2 – hands-on at the deconstruction waste bins

In Figure 3, one of the students is examining off-cuts from building construction before classifying the types of material. When the three case studies were compared, although in all examples student were engaged in

constructive learning activities, it was noticeable in their feedback that where they had undertaken hands-on activities such as the physical sorting of waste material, rather than simply observing this procedure, there was an increased degree of the value of the process.

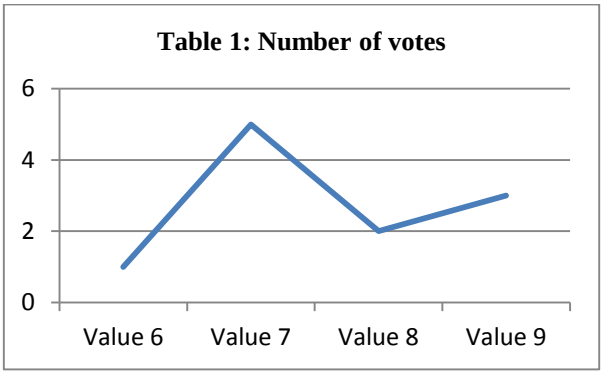
At the end of all three case studies , Figures Three and Four illustrate the difference between the two different learning activities.

Figure 4: Case Study 3 – viewing recycling at the transfer centre

Figure 4 shows students intrigued by the vision of a speedboat being prepared for deconstruction, and yet not being involved practically in the recycling process. Nevertheless, seeing steps in recycling actually taking place still proved to be a valuable step in conceptual transformation.

Students designed their own rating scale for the value of their field trip to the Transfer Centre on a Likert scale of 1 – 9, with 1 being of no value and 9 being maximum value. The results achieved by the 11 students who chose to register their evaluation was:

Table 1: Number of votes



After this visit one of the participants from Saudi Arabia said that this was the first time he had ever understood the concept of waste recycling. As far as he was aware all waste in his home country was piled up and dumped 'out of sight' and although he had seen recycling notices in New Zealand he had not realised what they related to. He stressed that learning about recycling would not only change his own behaviour but it also made him determined to introduce recycling after his return to his home.

However, not all students grasped the idea so readily. Another Saudi Arabian student said that he could not see any problem arising from continuing to use landfills and in discussion with staff said:

> Why don't you just dig them up when they are full? [*What would be done with the waste if it were dug up*?] You can throw it into the sea to get rid of it. [*But this would damage the environment and kill the fish!*] Fish are not as important as people and therefore this does not matter.

This absolute failure to grasp any of the principles of the QBL or Life cycle interrelationships, while being

unusual, did highlight the difference in sustainability values attained through prior study and experience as well as reinforcing the challenges posed by education for sustainability.

Discussion

Several issues emerged from our case studies, firstly that the majority of international students had little or no prior knowledge of sustainability before undertaking their programme of study at Unitec. Secondly, that in most cases (although not all) learners placed a high level of value on their new understanding, particularly when they had acquired it through a practical work-integrated approach.

A third point that arose from our work has been the demonstration that students need to be able to see that their actions can make an impact in the world. This finding reinforces the work of Brown and Sack (2012) who recommended that VET programme developers 'should draw on the motivations of future labour market participants, many of whom will also be future employers, for its direction about which 'skills for sustainability' should be included into VET programs' (p.23). Comparable investigations conducted in the UK (Kagawa, 2007) provided similar positive results but additionally indicated a sense of futility amongst the students regarding the future of society in the face of broad-based environmental challenges. However, it was noticeable that many of the international students from countries where sustainability was not practised became ardent supporters of the ideas and were keen to put these experiences into practice after graduating.

Conclusion

Once students are given an opportunity to discover the potential applications of the QBL and life cycle impacts within their own industry, they generally become impassioned supporters of sustainability design and use. This finding alone does not justify its inclusion into VET programmes but the introduction of more sustainable practices into the labour market should help the global movement towards the Brundtland declaration (WCED, 1987).

In New Zealand Sharma (2011) found that there was little or no collaboration between academics and industry when it came to education for sustainability (EfS) with neither group taking responsibility for embedding the concepts into the VET curriculum. The slow progress of embedding sustainability concepts into the vocational education curriculum is likely to result of this lack of collaboration.

The future of VET in New Zealand and in countries which have not previously integrated education for sustainability into their curricula must be a multi-step approach, built on the foundations of research within different industries and environments. This relationship is illustrated in Figure 5, where industry needs and economic pressures, both long and short term, need to be studied in greater detail so that the findings they reveal can then modify curriculum design.

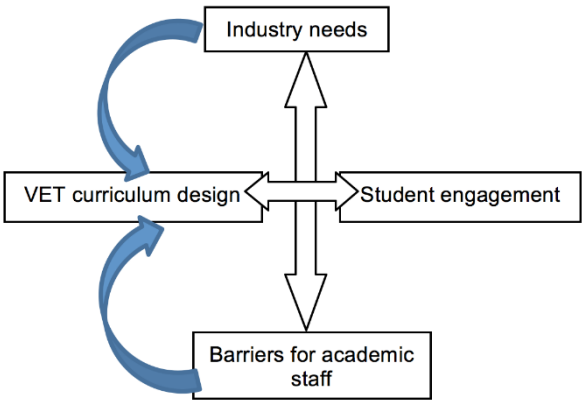


Figure 5: Potential for collaborative research

Future for potential collaborative research

The gaps in knowledge about the requirements in VET curricula are large and depending upon the questions being asked, are all worth posing. However, in order to bring some logic to the topics that could be worth

investigating applying the framework of the QBL could be a valuable starting point when examining the responses of any industry. In other words organisations that employ VET graduates might be investigated to explore what policies or even interest they currently have about:

- Their impact on the Environment (including pollution effects, ranging from extraction used in material acquisition through to decommissioning of products)
- The effect upon their business of existing regulations and/or financial incentives (Governance)
- Economic impacts of sustainability within their organisation (negative and positive; short and long term, including influences of marketing. Including energy consumption.
- Societal pressures (health, employment and values of employees)

This investigative approach should not only produce more in-depth results than a simple inquiry along the lines of "Do you think that a VET curriculum should include Sustainability?" but it may also produce the advantage of triggering an organisation to recognise long term benefits they had not previously considered.

The second area that requires further investigation is the issue of barriers identified by Sharma (2011) from her research with a proportion of academic staff. Although her interviewees responses indicate their beliefs that industry does not want or need graduates with sustainability education, their reactions also appear to stem from a lack of their own knowledge about the concepts of sustainability and how they can be applied to the disciplines they are working within. If this is found to be a general problem, it would indicate that substantial professional development will be needed by VET personnel. Such a potential need for re-education returns once more to the field of curriculum design.

Lastly, when considering the role of curriculum design in technological or industrial sectors, in order to fulfill the widest needs of an industry the curriculum firstly has to work with a graduate profile that fulfills the expectations and requirements of that industry. But that alone is not enough. If the premise of building capabilities for the technological world of tomorrow is truly the primary aim of vocational education, that must include developing the skills and technical knowledge to problem-solve unseen needs by being able to design for a sustainable future. In other words, what industry wants today cannot be sufficient and academic staff have to be prepared to work within that unknown.

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Personalisation of learning and reflective frameworks: Example from an industry-focused, post-graduate transdisciplinary degree.

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The New Zealand government has determined strategies to encourage research-driven innovation which include close collaboration between industry and the academic communities. In response to such direction, the Waikato Institute of Technology (Wintec) has developed a set of research-based, transdisciplinary qualifications grounded in real-world industry contexts. To assist learners in undertaking successful research inquiry, the transdisciplinary curriculum development team has developed an online training needs analysis instrument that enables learners to identify their readiness to undertake transdisciplinary research. The training needs analysis tool is supported by a reflective framework which assists the learner to self-reflect upon their levels of skills and knowledge against internationally-accepted standards. The intention of such tools is to enable the learner to commence the process of self-empowerment within the learning environment.

self-regulated learning, training needs analysis, reflective frameworks

Background

Over the last two decades the New Zealand government has introduced a range of strategies to encourage industries and educational institutions to collaborate on educational initiatives that result in a more productive, higher performing and competitive workforce (Ministry of Education (MoE), 2014). These reforms have been focused firstly, on individual capability building within the workplace and secondly, strengthening the applied research linkages between industry and tertiary institutions. To specifically address identified workplace initiatives, the Waikato Institute of Technology have begun the process of developing a curriculum to offer work-placed, post-graduate courses in transdisciplinary studies to commence in 2015. The *Post-Graduate Certificate of Transdisciplinary Research* (PCTR) and *Master of Transdisciplinary Research and Innovation* (MTRDI) have been designed to develop intellectually-capable, work-based and work-focused graduates with demonstrated research competencies, able to contribute to business-led innovation and applied research by working on industry-provided problems (Waikato Institute of Technology, 2014). There is a notable shift from the existing delivery system, where the curriculum is described in terms of knowledge contained within individual courses and qualifications, to a clearly defined specification of the outcomes that will be achieved during the guided conduct of exploring and coordinating collective enquiry.

It is anticipated that unlike traditional post-graduate, single discipline, course-prescribed, environments, where all participants are bound by time, place and pace (Syed-Khuzzan & Goulding, 2009), the learning environments developed for these outcomes based post-graduate programmes will provide learners with more choice in the time they learn, the tasks undertaken and the places that learning will occur. While industry mentors and academic supervisors will have clearly defined outcomes to monitor candidate progress against, the ultimate responsibility of achieving those outcomes will be transferred to the learner. In these more personalised environments learners require self-motivation and self-direction (Clayton, 2009). They will have to become self-regulated learners (Zimmerman, 2002).

Self-regulated learning and reflective frameworks

In educational settings self-regulated learning (**SRL**) has been loosely framed around four sequenced and

recursive steps (Winne, 2010):

- *Step one*: Learners construct a personalised understanding of the context in which a learning task is to be completed
- *Step two*: Learners establish goals and design a plan to enable achievement
- *Step three*: Learners employ tactics and strategies to achieve established goals
- *Step four*: Learners reflect on the processes used and the goals achieved and evaluate the appropriateness of the tactics and strategies employed.

In workplace settings similar recursive steps can be identified. In these settings it is argued SRL occurs through the application of systematic approaches. For example,

- *Step one*: Employees should be encouraged to plan for the completion of an identified task by acquiring strategies and knowledge that match the task
- *Step two*: Employees should monitor their performance against their plans and, if required, adopt different approaches
- *Step three*: Employees should evaluate the outcome and their performance to refine their approaches to task completion in the future.

From the workplace perspective, knowledge and skills are acquired as participants actively engage with and reflect upon the authentic tasks presented to them (Munby, Versnel, Hutchinson, Chin, & Berg, 2003). The knowledge and skills acquired in workplace environments do not occur in isolation. They are socially constructed within the context and culture of the situation in which they are created, developed and implemented (Brown, Collins, & Duguid, 1989).

A critical concept underpinning both approaches is self-reflection. The concept of self-reflection (the individual conscious act of purposefully thinking about actions undertaken) has been debated at length in educational circles (Kreber, 2004; Korthagen & Vasalos, 2005). Advocates of reflective practice argue deep learning, learning retained for future reference, is dependent on individuals making meaning from their experiences through the process of reflecting on the approaches used and the outcomes generated, in completing an activity (Brockbank & McGill, 2007). Self-reflection helps individuals firstly, highlight their current skill and knowledge base, secondly, identify areas for development and, thirdly, consider the significance of outcomes. It is argued this on-going reflection helps individuals iteratively improve their performance (Carlson & Parry 2003). In essence, reflection can create individualised learning environments that are on-going (sustained), connected to their needs (situated) and focused on individually generated tasks (authentic) (Clayton, 2012).

However, an inherent risk in the reflective process is that not all participants have the cognitive ability, in isolation, to understand and execute the processes that will lead to increased competence and capability. For these participants to succeed they need support and guidance (McLoughlin, 2002). To support participants engaged in the reflective process, to guide them in making connections between their current state and desired state, reflective frameworks, based on industry standards of accepted competencies and capabilities, have been developed (Clayton, 2012). This comparative process, using industry-accepted standards, enables the individual, no matter their location, culture or context, to identify which competencies and capabilities they consider themselves to be proficient in and those competencies and capabilities they need to develop. The outcome of this reflective process is an individually-generated, industry-grounded, personalised learning plan (Ward & Richardson, 2007).

A personal learning plan can be defined as a resource that identifies the current competencies and capabilities of the individual (looking back) and of the competencies and capabilities the individual needs to acquire to improve their performance (looking forward) and is used as a base to stimulate further learning (Beausaert, Segers, Fouarge, & Gijselaers, 2013). Fundamentally, personal learning plans develop the awareness to identify the need for learning, provides the confidence to articulate identified learning requirements and the ability to initiate action to accomplish their goals.

Personalisation of learning

The design of personalised environments is a complex task. These environments need to be able to continually respond to the idiosyncrasies of the individual. Constructivists argue learning is constructed through reflection and interaction. To constructivists learning occurs as individuals reflect on their current knowledge and interact with their surrounding physical and social environment (Brown, Collins, & Duguid, 1989). Therefore, any

process implemented needs to be cyclic and agile. The development these agile cyclical processes are based on fundamental building blocks (Clayton, 2012). These include:

1. *Reflective Framework*: Individuals interact with an intuitive, industry standards-based, reflective framework. Through responses to identified statements information on current knowledge, skills and capabilities is obtained,
2. *Learning Needs Identified*: Individuals' responses to statements identify knowledge and skill weaknesses and gaps that need to be addressed to improve performance,
3. *Personal Learning Plan Generated*: Individuals prioritise their learning needs and systematically plan how they will acquire the required skills and knowledge,
4. *Learning Needs Addressed*: Individuals undertake formal and informal learning activities to address skills and knowledge weaknesses and gaps identified,
5. *Progress Evaluated*: Individuals interact with a reflective framework to measure the improvement of their performance against industry standards.

A schematic diagram of this process is illustrated in Figure 1 below:

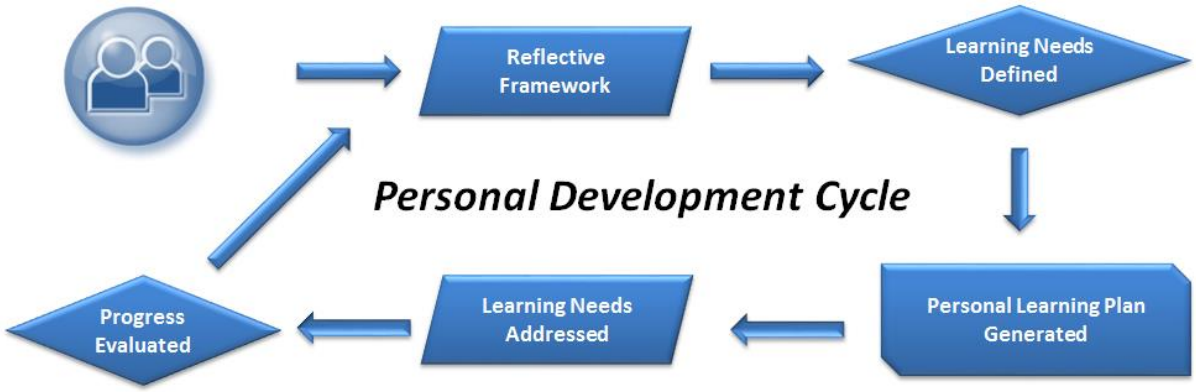

Figure 1. Personalisation of learning

Personalising post-graduate courses in transdisciplinary studies

In response to the New Zealand government's strategies for research-driven innovation, the Waikato Institute of Technology (Wintec) has c the development of industry research-based qualifications. During the developmental process members of the Post-Graduate Programmes Transdisciplinary curriculum development team at Wintec identified that a range of workplace, community and industry problems or contexts would be best met by a transdisciplinary research approach. A transdisciplinary approach to research is one where solutions are context-based rather than discipline-based and can involve any discipline or expertise relevant to a specific problem or context. The transdisciplinary approach requires collaboration across a multiplicity of stakeholders, such as customers, staff, discipline experts, business owners and industry leaders. Transdisciplinary research requires the researcher to possess the capacity to move outside discipline-imposed boundaries and to assimilate ideas and input from a range of disciplines and other sources to find practical, acceptable solutions to workplace problems. Given the varied nature of the research problems to be solved and the complexity of transdisciplinary approaches to research, it is expected that all candidates will need to create a personalised learning programme. The personalised learning programme should reflect accepted industry standards. The capacity for learners to engage in open, critical and imaginative forms of enquiry needs to be founded on acknowledged professional standards which tolerate rigorous assessment. These standards set by a particular knowledge community enable assurance that the researcher is capable of meeting the unique challenges of transdisciplinary enquiry.

Development of a reflective framework

The growing global trend to establish the career of 'researcher' as a valued profession has resulted in the identification of the fundamental knowledge, behaviours and attributes that the higher education sector has

deemed significant for researchers. For the purposes of the transdisciplinary qualifications Wintec has been developing, a specific framework - the Researcher Development Framework (RDF), created by the Careers Research and Advisory Centre (CRAC) (2010) – has been selected as a robust framework to guide developing researchers. The framework is structured into four domains and associated sub-domains:

1. *Domain A:* Knowledge and intellectual abilities: The knowledge, intellectual abilities and techniques to do research. (Sub-domains: Knowledge base, Cognitive abilities, Creativity)
2. *Domain B:* Personal effectiveness: The personal qualities and approach to be an effective researcher. (Sub-domains: Personal Qualities, Personal Qualities, Professional and career development)
3. *Domain C:* Research governance and organisation: Knowledge of the professional standards and requirements to do research. (Sub-domains: Professional conduct, Research Management, Finance, funding and resources)
4. *Domain D:* Engagement, influence and impact: The knowledge and skills to work with others to ensure the wider impact of research. (Sub-domains: Working with others, Communication and dissemination, Engagement and impact)

These domains and associated sub-domains establish the wide-ranging knowledge, intellectual abilities, techniques and professional standards required to undertake research, as well as the personal qualities, knowledge and skills to work with others and ensure the wider impact of research. They are illustrated in Figure 2 below:

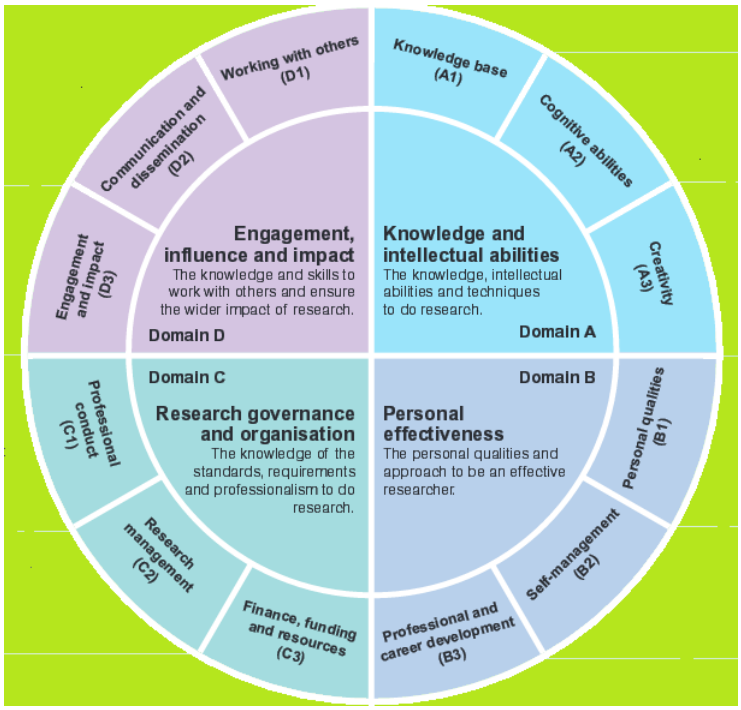

Figure 2. Researcher Development Framework (CRAC, 2010)

Implementing a reflective framework

To engage developing researchers in the self-reflective process and to assist them in making connections between their previous experiences, their current skills and knowledge and identified standards in research, assessment frameworks have been created. For example, staff at Leeds Metropolitan University in their Research Training Programme use a Training Needs Analysis (TNA) instrument exploring six themes: research skills and techniques, research environment, research management, personal effectiveness, communication skills, networking and team work and career management. As individuals address identified skills, (such as the ability to recognise and validate problems, show a broad understanding of the contexts in which research takes place, use information technology appropriately for database management, record and present information) they use a set of standard questions to prompt their responses:

- I have no experience of using this.

- I have some experience but feel I need to improve
- I have experience of using this skill but still need to improve in certain aspects
- I am an expert and feel that this is not a priority for my development

Fundamentally, the structure of the TNA is relatively simple:

- *Step one*: Individuals carry out an analysis of their existing skills and their levels of competency,
- *Step two*: Individuals formulate a plan to acquire the requisite skills and knowledge,
- *Step three*: Individuals detail how they are going to evidence that they have acquired the skill identified. (Clegg, 2014)

Based upon the TNA and RDF, Wintec created an Online Training Needs Analysis instrument (OTNA) for post graduate learners. The OTNA was designed to enable learners to assess their current research capability against the internationally-defined standards in the RDF.

The OTNA interface provides the individual with a series of statements relating to each of the four dimensions within the RDF. The statements within each domain are classified within two categories, competent and capable. Learners are asked to reflect upon, and then respond to, individual statements using a 'drop-down' menu using a scale from Disagree to Strongly Agree. This is illustrated in Figure 3 below:

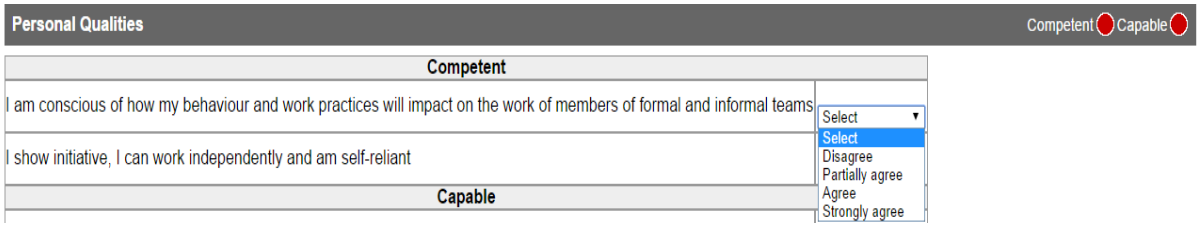

Figure 3. Example questions and responses

Individual responses to statements are colour coded using a spectrum from white (Disagree) to dark green (Strongly agree). This provides learners with a visual display of their current capabilities against that standard, as illustrated in Figure 4 below:

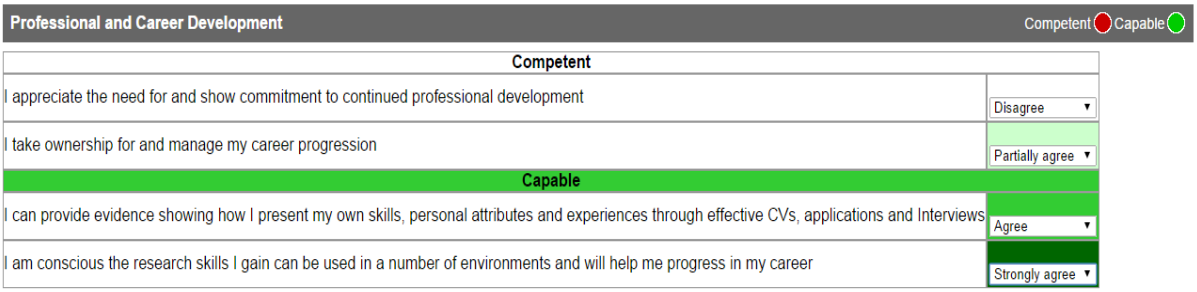

Figure 4. Colour coded responses

As learners progress through the OTNA their answers affect the indicator colour on the index page. The indicator colours are based on the familiar "traffic light" theme:

- Red: This indicates to the learner they have limited knowledge and/or experience in the attribute
- Yellow: This indicates to the learner they have some knowledge and/or experience of the identified attribute
- Green: This indicates to the learner they meet the requirements of the identified attribute.

A pictorial reflective framework carpet begins to emerge as the learner progresses through the domains, categories and statements. This reflective process and visual carpet enables learners to select which attributes they need to review and those they need to develop. This is illustrated in Figure 5:

Figure 5. OTNA visual carpet

The visual carpet produced from learner engagement provides the learner with:

- An initial assessment of their current knowledge, experience and understanding of each domain,
- An indication of potential starting points to begin their learning journey, and
- A map of a learning route from starting points to intended achievements.

Engaging with OTNA is intended to assist the learner in the creation of their personalised learning plan which will provide a framework for discussion with other stakeholders and, ultimately, empower them to become self-regulated learners.

Conclusion

Acknowledging the national impetus for continuous, self-regulated learning underpinned by the ability for the learner to reflect upon capabilities, Wintec has undertaken the development of an industry research-based qualification. Recognition that learners require guidance in identifying capability/knowledge gaps has resulted in members of the Post-Graduate Programmes Transdisciplinary curriculum development team using a theoretical framework of self-regulated learning. The key domains identified in the researcher development framework have been complemented by the development of an online instrument designed to enable learners to identify their readiness to undertake transdisciplinary research. The reflective framework developed is intended to allow learners to align their current skill and knowledge levels against accepted international standards. This activity will enable learners to generate a provisional personal learning plan and commence the process towards self-regulated learning.

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Inducting students into the engineering community using project based learning as the core methodology of an engineering foundation programme.

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This paper evaluates the development and implementation of a foundation module in Engineering that was designed to increase access to and improve retention in the National Engineering diploma being offered by the Wellington Institute of Technology. At the centre of the curriculum is a project, the construction of a model steam engine out of tin cans that was used to both power a car as well as later to generate electricity. Key concepts in mechanics, thermal physics and electricity were integrated into the task of constructing and testing the car and in addition to this, mathematical knowledge as well as using engineering language were addressed through a series of tasks integrated in with the mainly physics content. The combination of these elements of the course was intended to induct students into engineering in addition to making them learn physics in an authentic context. Diagnostic conceptual tests (Force concept inventory and mechanics baseline tests) were used to measure the level of conceptual learning that took place as a consequence of the project approach. Once the students had left the course, their performance as a group was measured against those students who had not been required to to a foundation course prior to entry onto the diploma. The collated data reveals that the foundation programme was successful in preparing the students for the academic rigour of the courses that followed and also it prepared them for being part of the engineering community.

Keywords: Curriculum development, Engineering, Project Based, Force Concept Inventory, Case Study, community of practice.

Introduction

Project based learning has long been a characteristic of engineering education. This paper outlines the design and implementation of a project based course intended to address the academic needs of students on entry into an engineering diploma at a polytechnic as well as to induct these students into the engineering community. The project has taken two years to design and implement and this report outlines the process of needs analysis, curriculum and materials design, implementation and evaluation of the certificate course. Finally, the implications for the further development of the certificate course are discussed.

Using projects as the focus for learning allows students to conduct investigations into a range of topics in basic physics that are related to a particular context. This contextualisation of learning has been shown by some researchers to help students' better deal with conceptual development rather than traditional non-contextualised approaches do (Linder, 1993). Through the construction of a meaningful artefact, learners are able to develop their content knowledge to deeper levels than they normally do (Harris & Katz, 2001) and in addition they are able to develop a number of important process skills as well as key literacies such as engineering report writing and the reading of engineering and scientific texts.

Central to this project, is an enquiry based approach to knowledge construction, where students are helped to find things out for themselves, design and conduct experiments and analyse, interpret and represent data in an effective manner. The purpose of this was to develop key academic competencies specifically in foundational physics and mathematics, as well as to induct the students into an engineering community of practice. This was accomplished by identifying mathematics and physics knowledge and integrating this knowledge into the

programme, while at the same time requiring the students to design, make and test a steam car made out of cost effective recycled materials in a way that required them to use some of the key conceptual knowledge taught. In the learning design, diagnostic tests (The Force Concept Inventory and Mechanics Baseline Test) were used to identify conceptual difficulties and these were ameliorated using a combination of practical and theoretical interventions, as well as computer simulations in a semi blended learning environment.

Curriculum Design

Figure 1 shows a schematic diagram of the different components of the course, which includes the development of understanding of core physics and mathematics conceptual knowledge, process skills in both Physics as an experimental discipline and Engineering, the literacy practices associated with Engineering and some core mathematical knowledge. All this knowledge is taught through construction and improvement of a steam car that is made from recycled tin cans and bits of metal.

Figure 1: Curriculum elements of the course plan **Figure 2: Steam Car**

The overall course design as well as the content of each unit planned was designed around the project. This enabled the course to be delivered in a flexible way in that the project construction was the main focus of the course and the physics content embedded in the construction and testing of the car. At appropriate times, the tutor would deliver a formal lesson on a topic that would be regarded as central to understanding the way in which the car worked or the way in which it could be tested.

The needs of each diploma module were interpreted and used to design a programme of study that would feed into the diploma and it included an introduction to Engineering, Mathematical knowledge development and Physics Knowledge development. A materials developer was appointed and the reference group then provided feedback on topics that were to be included in the module. This feedback was then included in the planning and design of eight units of work that made up the module. Materials were then developed according to agreed specifications.

The materials developed were focused on physics content with engineering skills as well as mathematical skills integrated in with the physics. The eight planned units are shown in the table below. It was not possible to complete all eight units in the time allocated and the completion levels of each unit are indicated as well.

Table 1: Topics covered in the course

UNIT	Topic
1	Introduction to Engineering
2	Statics
3	Force and Motion
4	Simple Machines
5	Thermal Interactions
6	Electricity and Magnetism
7	Final Project

A total of 23 students were selected and their initial school results recorded. The module was offered free of charge to students agreeing to participate in the project in the four weeks prior to the start of the first semester. Materials were printed and the module was taught in an intensive four week programme of 6 contact hours per day. Teaching activities included lectures, tutorials, practical work and computer simulations. These were integrated together, so that there was no differentiation between these activities. Initially, two other units were included in the curriculum, one on basic electricity and the other on introductory electronics. These were dropped firstly because of the initial cohort of 24, only two students were destined to follow later courses in electrical engineering and secondly, the course was too full, which meant for conceptual understanding to be adequately developed, it made sense to include less material.
The sequence of tasks in the project is outlined in table 2 below:

Table 2: Sequence of tasks

TASK (s)	Skills developed / knowledge gained.
Build the car from kit form	Engineering process skills (Cutting, shaping, measuring etc.) Develop ability to read engineering language at a basic level
Theory	Learn about basic thermal physics & mechanics
Testing & measurement of efficiency of a component of the car	Physics laboratory skills, measurement, collection and interpretation of data
Design & make a modification to improve the efficiency	Engineering process skills
Re-test the efficiency to see if there had been an improvement	Physics laboratory skills, measurement, collection and interpretation of data
Convert the steam car to a steam generator	Design & make skills
Theory	Learn about Electricity and Magnetism
Write a report	Development of basic literacy in science and engineering

Content based literacy

Historically, teaching reading and writing to develop academic literacy has evolved from study skills based courses that focus on decontextualized technical aspects of reading and writing, not related to any particular discipline, to courses where the reading and writing is situated within particular disciplines. The academic skills approach is perhaps easier to implement however it fails to address the fundamental issue of socialising the student into academic life. By writing and reading for a broader academic purpose, students can become acculturated into a generic academic life, but as Street (2004) point out, this approach fails to recognise that knowledge is constructed in different ways by different disciplines.

The development of writing and reading skills within the context of a particular discipline has the combined effect of not only developing the technical aspects of writing that are peculiar to a discipline, but also the advantage of inducting students into a discourse community based on the discipline. This genre based approach to teaching academic literacy is best done by using facilitators who are "insiders" in the discourse communities (Gee 2001, in Jacobs, 2005). Using an academic literacies approach looks at language as not only being part of the discipline, but part of a wider community of practice. In this curriculum, two literacy events were planned. The first was the writing of a laboratory report for a physics experiment and the second a project report on the testing and development of the steam car that was part of the project.

Constructing Science Knowledge through Project based work

Underpinning the learning of science content knowledge in this programme, is the theory of constructivism and a conceptual change approach to learning science (Novak, 2002), which has been used to inform the design of the learning activities. Everitt & Robins (1991), found that success in science subjects was better predicted by high school results than in the humanities, however later research suggests that this might not be true and that success in engineering is not associated with particular subjects taken at school (Engler, 2010). The conceptual development of key ideas in the core content areas is important, however since this curriculum is more focused on process skills and developing key literacies, a core competency in learning content is for students to learn how to question and interrogate new and also existing ideas in order to construct new knowledge for themselves.

In a sense, the content is not important, except that it must be authentic "engineering – focused" content. Project based work is ideal for this situation in that it creates a flexible learning context through which an engineering community of practice as well as different scientific concepts can be developed. In this course, the construction, modification and testing of a steam car (see figure 2 below) was the project that was undertaken by each of the students in the course. Through this project, physics concepts of energy, thermal interactions and motion were learned.

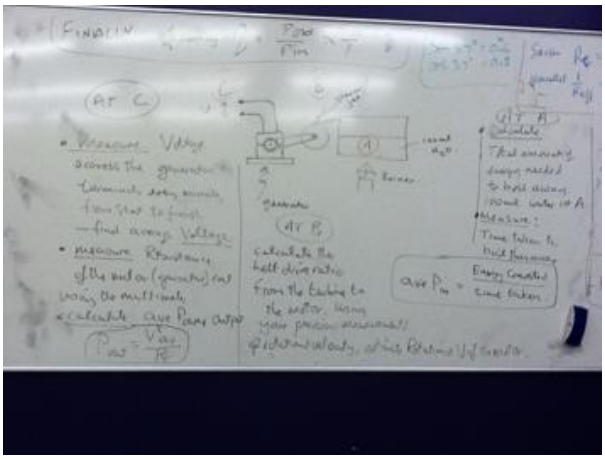

Figure 3: Scaffolding learning about efficiency

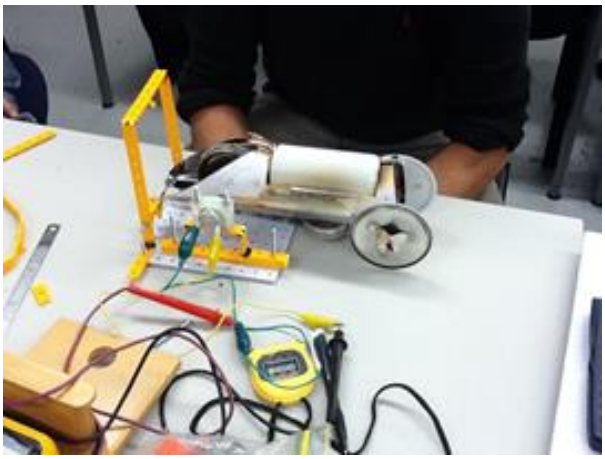

Figure 4: Converting the steam car to a generator

Figure 3 show a board discussion about different ways in which the efficiency of the car could be measured, leading the project from thermal physics into mechanics and figure 4 show the conversion of the steam car once it was working to steam generator, thus leading from mechanics into electricity and magnetism.

Developing a sense of being an engineer

Developing communities of practice is linked closely with the development of discourses that are appropriate for the different disciplines and professions that we are designing a foundation course for. Much modern research suggests that affective factors, more than cognitive factors play a greater role in student success in degree study (Madjar, McKinley, Deynzer, & Van Der Merwe, 2010). To this end, the model design has shifted focus to include a greater emphasis on affective factors that will include and develop student's sense of community and identity in their chosen field, engineering.

Different communities of practice draw on different learning domains to a greater or lesser extent and also in different ways. For example it could be that those students who are going into engineering would draw more on the psychomotor domain that say those going into pure science. This would be particularly true of students at a polytechnic as compared with those enrolled in university degrees. In addition, many engineering projects require skills used that are slightly different to those needed in the study of science. Using Blooms Taxonomy as a guide to designing activities highlights the differences in the nature of the process skills learned by different communities of practice.

Research Method

A case study approach was used to evaluate the effectiveness of the intervention to both improve the students' conceptual knowledge as well as induct them into the community of practice of engineers. Data from diagnostic tests as well as formal assessments was used in conjunction with a questionnaire to track students' academic progress as well as their attitudes towards the course and engineering in general. This was done both during the implementation of the course as well as after students had completed their first semester of work in the diploma.

Main findings: Student responses to the course

Student responses to the course were gauged in two ways, the first was through a post course questionnaire probing student attitudes and the second was by interviewing selected students after the engineering fundamentals course had been completed.

Questionnaires

The questionnaire revealed several interesting attitudes. The first is that identity as an engineer at the end of the course was not overwhelming, only seven of the 21 who responded felt like they belonged to the engineering community, 11 were unsure and two felt that they did not belong to the engineering community. Only 6 students actually said what they thought the engineering community was.

Gaining a better understanding of science and technology and skills for the workplace were seen as the most important reasons for enrolling in the foundation course, while the least important was having friends attending the institution. The biggest barrier to their studies was seen to be lack of ability in academic skills needed for the courses.

Generally, students were very happy with the teaching with an average score of 4.5/5 (5 being very happy with the teaching and 1 being the least happy with the teaching) and the overall impression of the course scored an average of 4.4. (5 being very impressed and 1 being the least impressed). Generally, the students were pleased with the course content and delivery.

Interviews

In depth interviews were carried out with four selected students after they had completed the Engineering fundamentals course that followed the certificate in engineering foundations level 4 course. At this point, the students were able to evaluate the effectiveness of the course in preparing them for the diploma programme. The response was overwhelmingly positive. The points itemized below summarise the students' evaluation of the steam car project based course.

The following features of the course were mentioned as being helpful to them in their first semester:

- Learning to draw free body diagrams
- Learning to do force calculations
- Making the steam car (this appeared to be the thing they remembered the most)
- The variety of teaching methods used
- The small class

Weaknesses were mainly to do with the length and structure of the course. Electrical engineering students would have preferred more electricity and magnetism. In the course, this was only started with the generation of electricity using the steam car. All students felt that the course helped them get through their first trimester.

Comparison with mainstream students

Comparison with those students in mechanical engineering who did not go through the Certificate of engineering foundations course in the Engineering fundamentals course was done by comparing the mean scores between the two groups using a t-test for significance at the 95% level of confidence for groups <30. The foundation students (n=16) were compared with the mainstream students (n= 36). This was for the pre and post force concept inventory (FCI) tests that give an indication of conceptual understanding of the physics subject matter that was taught.

The first comparison of the means shows that there was no difference statistically between the two groups on the pre-test [$t(50) = 0.72$, $p < 0.05$]; however, it appears that those students who had gone through the foundation course responded better to instruction than did those who had not, as there was a significant difference between the two groups on the post-test, with the foundation students outperforming the mainstream students [$t(50) = 2.41$, $p < 0.05$]. Given that the foundation students were initially selected from an academically weaker population of applicants and that the focus of the course was on developing some core skills in physics as well as an identity as an engineer, this appears to be a positive outcome. Figure 5 shows the comparison between the final marks obtained by the mainstream students (orange) compared to the final marks obtained by the foundation students (grey). In the paragraph that follows, there is further discussion on completion rates, but from this bar chart it can be seen that the foundation students who were supposed to be the weaker group outperformed the mainstream students.

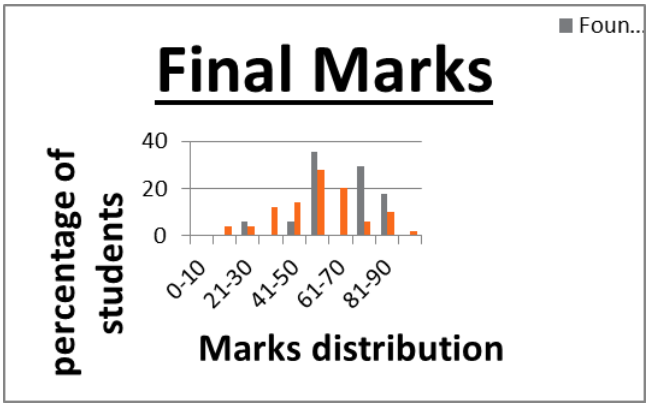

Figure 5: Comparison of marks

Discussion of course and year completion rates

Table 3 below compares the completion rates of engineering foundation students in the diploma programme with those who did not do the engineering foundation course. This comparison is made at two levels. The first is at the course completion level, where the comparison is made in terms of the proportion of total number of courses completed by foundation and non-foundation students. The second comparison is at the year completion level, where the comparison is made in terms of proportion of year completions made.

Generally, engineering foundation students outperformed non- foundation students in that they completed 77% of the courses they took compared with 67% completion rates by non-foundation students. The break down in terms of discipline is also better for the foundation students in terms of both electrical and civil, although the sample of only two electrical students is too small to generalize. Mechanical engineering students however performed worse than their non-foundation counterparts, suggesting that entry into this sector could be tightened. A similar picture emerges for year completions, where the foundation students outperformed the non-foundation students by completing 42% of years of study undertaken compared with 28%. In this case all three discipline year completions for the foundation students were better than those for the non-foundation students.

Table 3: Comparison of course completions

	Whole Class			**Engineering Foundation**			**Non-Engineering Foundation**		
Course	Courses completed	Total Enrolled	%	Courses completed	Total Enrolled	%	Courses completed	Total Enrolled	%
Mechanical	133	194	69	37	56	66	96	138	70
Civil	161	224	72	64	80	80	97	144	67
Electrical	70	102	69	16	16	100	54	86	63
TOTAL	364	520	70	117	152	77	247	368	67
Year one Completions									
Mechanical	6	26	23	2	7	29	4	19	21
Civil	10	29	34	4	10	40	6	19	32
Electrical	6	14	43	2	2	100	4	12	33
TOTAL	22	69	32	8	19	42	14	50	28

Mathematical abilities of the students

The mathematical knowledge, both procedural as well as conceptual was lacking in many of the students responses that required the use of mathematics. Some examples of conceptual knowledge problems that were recorded were:

- Poor to non-existent understanding of the trigonometric concepts of sine, cosine and tangent
- No understanding of calculus concepts (one person had done calculus at school)
- Poor understanding of graph concepts relating equations to shapes, slopes and areas
- Limited understanding of powers and manipulation of exponents
- Poor spatial reasoning (volumes, surface areas and dimension)

Some examples of procedural knowledge problems that were recorded were:

- Poor ability to rearrange equations
- Poor data handling and graphing techniques
- Poor estimating ability

Many of these problems it must be noted were not fixed by this course. The following year the course design was changed to address shortcomings in the development of mathematical knowledge.

Conclusion

In conclusion, we see the course as being successful, not only in preparing students for their first year of the diploma programme, but also in inducting students into the engineering community through the use of content based literacy activities but also through realistic engineering project work. Finally, the steam car project showed us that project based learning can help to develop a deeper understanding of physics concepts required for engineering and in addition, it also plays a major role in developing the literacy practices needed to operate successfully in the engineering community. Since the implementation of this project at WelTec, there have been a number of other project based courses implemented in engineering. This course also played a role in the decisions made by those students who decided not to pursue engineering. While there were not many, the steam car project seemed to accelerate the decisions of those students who were not sure whether engineering was a career they should be pursuing.

Finally, while the data presented looks positive and supports the notion that the steam car project course was useful in laying a good foundation in physics and inducting students into engineering, it did little for their mathematics performance and in addition, the data trends could have been affected by other factors such as the nature of the student cohort in the foundation course. Further research needs to be carried out to make sure that these conclusions are justified.

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Better than the Real Thing?" – Actor role-plays as part of Vocational Training

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《儒效篇》荀子曰:

"不闻不若闻之，闻之不若见之，见之不若知之，知之不若行之；学至于行之而止矣

> "I hear and I forget. I see and I remember. I do and I understand."
> Confucius
> Chinese philosopher & reformer (551 BC - 479 BC)*

When we are young, we learn by mimicking, playing, and experimentation. As our language skills develop, and formal schooling begins, these strategies are replaced by language-based learning, which can dampen our curiosity and motivation to learn. It has been argued that vocational education can re-ignite learning enthusiasm through teaching procedural knowledge.

Role-play simulation is a learning method whereby learners take on the role of specific characters or organisations in a contrived setting, aided by 'performers'. Role-play is designed primarily to build first person experience in a safe and supportive environment, and is widely acknowledged as a powerful teaching technique.

However, more often than not, the 'performers' used within the simulation are untrained. This paper explores the use of actors (or senior acting students) in vocational training. Essentially an Appreciative Inquiry, it draws upon examples of actors working with vocational trainees in three settings: The Royal New Zealand Police College; WhitirieaNZ's Bachelor of Health Science (Paramedic) course, and the WhitireiaNZ Bachelor of Nursing Year 3 simulation labs.

This paper concludes by highlighting the potential benefit of using actor role-play for cross-cultural teaching including working across the language barrier.

Keywords: Actor, role-play, procedural knowledge, simulation.

Why Role-play?

The vast majority of teaching and training in education and work continues to be conventional, narrow and highly prescribed - not experiential. Teaching and training is oriented to meet external needs, not people's individual needs and potential. This is largely because in education and work, commonly the needs of the organisations (whether educational government department or employing organisation) are put before the needs of the individual.

Constructivism is a learning theory that postulates that students learn best by engaging in authentic learning tasks, by asking questions and drawing on past experiences (Carlson, 2001). Thus, an effective learning experience can be considered as one that puts the students in control and encourages active participation, exploration, reflection and the individual construction of meaning.

Galarneau (2005) asserts ―there is a huge disconnection between knowing something in abstract and being able to make that knowledge actionable.

Allmark (1995) proposed that in fact knowledge of practice is different from theory and cannot be reduced to it. This is exemplified in the many work environments where the experience of the individual cannot be simply reduced to a list of knowledge and skills requirements but requires the addition of adaptability and being able to

deal with situational and interpersonal dynamics. Put another way, the embodied experience allows the individual to improvise and respond to the unforeseen out of a strong knowledge foundation.

People learn and develop in different ways and in different directions, if they can be given the chance. One size does not fit all. However, as proposed by Confucius, there is now considerable data gathered to support the learning benefits of experiential training. Figure 1, Dale's Cone of Experience (1969) is a slightly more modern illustration.

Essentially, the Cone shows the progression of experiences from the most concrete (at the bottom of the cone) to the most abstract (at the top of the cone).

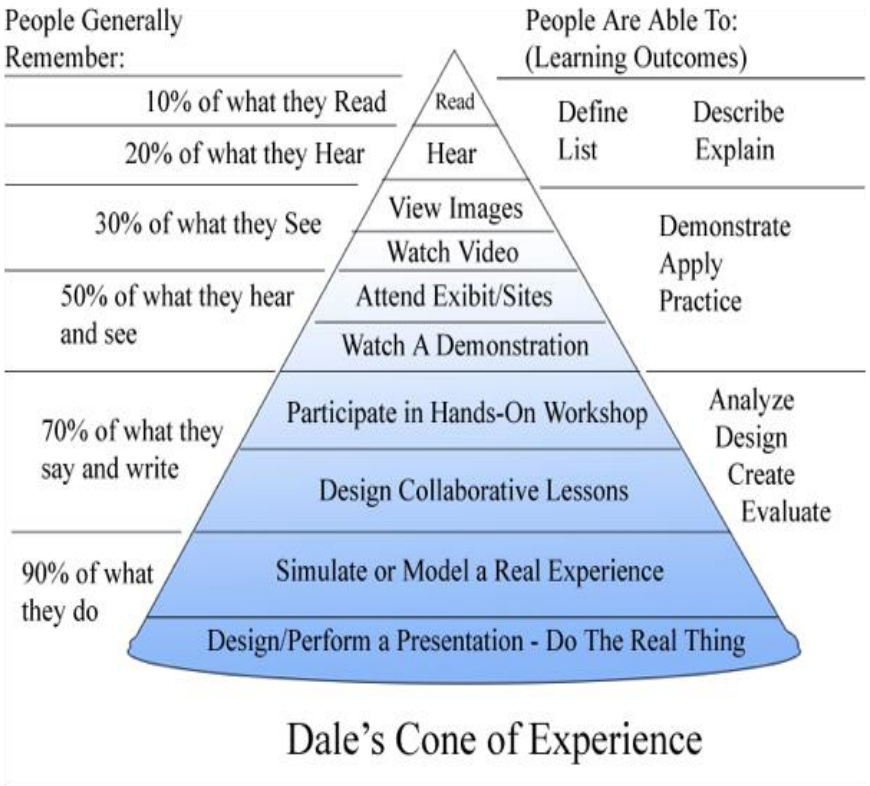

Figure 1: Dales cone of experience

Role-play Simulation can provide students with an active learning experience closely modelled on real situations that creates a bridge between the theory and practice. It has been proposed that "…simulation is supported by an educational philosophy of blended and multiple learning solutions in which change andxperimentation are valued and the lines between training, performance improvement and organisational development are blurred." (Kindley, 2002).

In simulation based training, trainees receive controlled exposure to a range of designated, pre-designed encounters. This is consistent with adult learning theory where trainees learn at different paces and in different styles. (Ziv, Small, & Wolpe, 2000).

Through role-play learners benefit from repeated exposure to a range of scenarios that encourage them to explore their capabilities. In the process they also learn to be more flexible, handle greater ambiguity, manage resources and solve problems.

Satish and Strenfert (2002) refer to the need for clinicians to gain intellectual processing skills to regulate his or her own processes of attending, learning, remembering and thinking, involving both external information as well as remembering information and concepts. "The intellectual processing skills must be adjusted to changes in task challenges or dynamics (including volatility, uncertainty, complexity, ambiguity and delayed feedback) and must be adjusted to gains in knowledge over time."

Being able to put theory into practice is not all that is required. Tynjälä (cited in Kilpiö et al., 2005) describes simulation based training as "…socialization into professional culture." The essential objective here is to have vocational trainees actively participate in authentic work practices and to familiarise themselves with the thinking and behavior of experts.

Figure 2 is a summary of further evidence of the benefits of experiential learning.

Boud & Prosser: Summary of Principles	
Engage learners	Consider learners' prior knowledge and desires and build on their expectations.
Acknowledge learning context	Consider how the implementation of the learning design is positioned within the broader program of study for the learner.
Challenge learners	Seek the active participation of learners, encouraging them to be self-critical.
Provide practice	Encourage learners to articulate and demonstrate to themselves and their peers what they are learning.
Siemens & Tittenberger: Summary of Principles	
Social	Learning is a social process and knowledge is an emergent property of interactions between networks of learners.
Situated	Learning occurs within particular situations or contexts, raising the importance of educational activities mirroring actual situations of use.
Reflective	Learners require time to assimilate new information.
Multi-faceted	Learning incorporates a range of theory, engagement, "tinkering" or bricolage, and active construction.

Figure 2 - Learning opportunities to address principles of high-quality learning design (Wills, Leigh & Ip, 2011)
Properly organised and facilitated experiential learning, along with other similar approaches to developing people as individuals, can help enormously in attaining a much more useful balance in the ways we teach, train, develop and attempt to give to people the skills and emotional well-being we all need.

> Simulation is a technique, not a technology, to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion. (Gaba,2004).

Herrington, Reeves & Oliver (2009) have described situated, authentic learning as engagement in an inventive and realistic task that provides opportunities for complex collaborative activities, listing nine elements of authentic learning:

1. Provide authentic contexts that reflect the way the knowledge will be used in real life
2. Provide authentic activities
3. Provide access to expert performances and the modelling of processes
4. Provide multiple roles and perspectives
5. Support collaborative construction of knowledge
6. Promote reflection to enable abstractions to be formed
7. Promote articulation to enable tacit knowledge to be made explicit

8. Provide coaching and scaffolding by the teacher at critical times
9. Provide for authentic assessment of learning within the tasks.

Increasingly tutors are using experiential methods to give individuals practice at dealing with real-life problems and many of these involve role-play. If it is used well, role-play simulation can vastly enhance the learning experience, but unfortunately all too often the full potential of the role-play is diminished as it is ineffectively or inappropriately applied.

The Advantage of Actors

Role play is often used as a way of making sense of the theory, of gathering together concepts into a practical experience. And yet, it often goes wrong. Why? Because like so many things which are simple in concept, in practice it can become very complicated. If used badly in a training environment the role play tool can be ineffective and sometimes even damaging. One of the main complicating factors surrounding role play is the attitude or emotional state of the people taking part. Many people are nervous, even terrified, at the prospect of participating in a role play situation. They often feel foolish and this impairs their ability to fully commit.

For example, using a theatre analogy to illustrate the important value of role playing, actors spend hours rehearsing a twenty minute scene. They do it again and again to get it right; to get the behaviors and the relationships right, to make sense of the scene and to understand the issues. They get feedback in the form of notes from the director, which they will immediately apply to the work in hand. They carry on in this way until it is perfect and the scene becomes part of them. This is not to suggest that people in learning and development situations should become actors and rehearse their life scenarios for hours on end, but the principle is the same.

Acting is the study and communication of human behavior in service of telling stories. The best actors are experts on the human condition. They are experts in using their bodies and voices to communicate all kinds of human struggles. They are expert storytellers. There is an infinite amount to learn about acting because there is an infinite amount to learn about life. (Bennett, 2007).

Performing Arts are increasingly used in educational settings around the world especially when development of complex communicative skills and abilities is targeted. In New Zealand there has been a growing awareness of the value of the use of actors in educational drama. Using actors to enhance nursing skills, paramedic skills, and specialist interviewing skills provides the vocational trainees with experience in a cost effective and efficient way.

An actor is less vulnerable because of their professional handling of the role. Actors bring realism to what can otherwise be an artificial situation. Their believability draws out authentic behavior from participants and encourages input from observers. By using actors, a character‘s behavior and attitude can be created to meet particular scenario requirements. Trained actors know how to take their own experiences and draw from them to create a real person who matches the role play scenario, but with significantly more depth and breadth.

Along with the capability of improvising within the defined parameters of the role play, they engage participants so that the self-conscious artificial behaviors we often see in role plays are replaced by involved, genuine behaviors by the participant. They can provide credible information based on their own experiences and preparation or can quickly change the focus of the situation from the unknown facts to something more relevant.

A trained actor can push a participant enough to force real involvement and real reactions without damaging the participant‘s self-esteem and motivation to continue skill improvement.

Consistency of the actors performance is particularly important when the scenarios are used for assessment. Trained actors will provide reliability.

The validity, or ‘realness’ of the actors‘ performance is very important too. This has been demonstrated through studies where it was identified that trainee‘s performance was not significantly different in a real situation as opposed to an actor based simulation (Wallace et al. 2002).

In other words the vocational trainee reacted to the actors as they would to the ‘real thing’.

Case studies – practice-based evidence

WhitirieaNZ Bachelor of Health Science (Paramedic) Mastery course

The Role-play: The aftermath of an out-of-control party. The Paramedic students go into an unfamiliar house to deal with graphic injuries, and unruly behavior.

> "Actors were great and having the assessment at an external venue made it seem more real. The injuries were, for the most part, realistic. However, an arterial bleed needs to look and behave like one!"
>
> "Best way to do the assessment. Got feedback, made it more realistic. Best way to do it."
>
> "It was really good and being in a different setting helped with the realism."
>
> "Really good venue and made assessment more realistic and enjoyable. Actors were appropriate and stuck to their roles. Probably most enjoyable practical assessment I have completed."
>
> "This was excellent. This is the first assessment since first year that I received feedback following an assessment."
>
> "This was really great, not only were the actors very convincing, but they allowed the assessors to gain some insight into how our practice made the patients feel."
>
> "This was the best assessment ever. I wish every mastery could be done in this way."
>
> "This was the best mastery scenario, it was easier to think when faced with "real" injuries and responses."

- Paramedic students comments

> Having these actors are integral for these assessments and having people skilled in acting and most importantly detached from clinicians provides massive benefits to the students.
> Callum Thirkell
> Lecturer BHSc (Paramedic)
> Te Kura Hauora | Faculty of Health
> Whitireia New Zealand

The Royal New Zealand Police College Specialist Interviewing courses

The Role-play: Ranging from sexually-molested 8 year olds to hardened-criminal murder suspects, the actors role-play to quite exacting scenarios, often one-to-one with the trainee interviewer. These are filmed for review.

> As per our discussion I find the partnership that we have in regards to interview training invaluable. Your students have been assisting with the Level 3 Specialist Child Witness Interviewing for many years, and in the last couple of years with the Level 3 Specialist Suspect Interviewing.
>
> For the introductory levels of interviewing we use the course participants role playing for each other due to the volume of training that is completed. We often end up with the 'role players' being too hard, too soft – as they know the processes and they are role playing for people they know (does make for some amusing moments in the training environment).
>
> The main benefits of using acting students/role players is that they bring a reality to the situation as our participants do not know them, they take direction well – and a side benefit that I see is that we are exposing them to police in a very positive interaction/engagement.
> Detective Inspector Annie Ryan
> Investigative Interviewing and Project Manager
> Royal New Zealand Police College

WhitireiaNZ Bachelor of Nursing Year 3 simulation labs

The Role-play: One actor was required to be a patient's relative. This patient has a cardiac arrest and recovers in the first two scenarios and dies in the last scenario. The other actor performed as a patient in the next-door bed, and accordingly asks the nurses for their needs to be met.

> Context based learning is highly beneficial to our students, solving problems in real time in an environment as real as possible can lead to profound learning. This has become even more effective since the introduction of the acting students. Playing characters who are stressed and emotional delivers a realism that cannot be underestimated. Their ability to read situations and improvise offers a whole new perspective on what we can offer our students. The feedback we get from the students is very positive as they are forced to engage the scenarios because of the realism of the acting. They are extremely grateful for their input and value the skills that the actors bring.
> Phil Hawes
> Senior tutor
> Bachelor of Nursing

In addition to correctly interpreting the data and diagnosing the patient, the nursing students are evaluated on behavioral interactions—communication skills, making eye contact, establishing a relationship, and identifying and dealing with any other 'outside' events that may impact on to the patient's condition.

> "That was the most fun but also challenging assessment/scenario I have ever had!"
>
> "We are clinicians and we focus on clinical aspects like knowledge and skills. Having actors with no clinical knowledge meant they reflected on the patient experience."
>
> "Some of the descriptions by the actors were – alone, cared for, distracted, panicked, comforting, stressed, gentle, controlled"
>
> "The patient experience or how the actors felt seemed to mirror very closely the quality of the nursing"
>
> "If they felt cared for well this seemed to reflect good clinical care as well"
>
> "These scenarios match as closely as you could to a real situation."

- Bachelor of Nursing students comments

> The actors share how they felt the nurse treated them physically, emotionally, and mentally. So students learn things that they may not cover in class, such as how close to sit to a patient or relative, or if they felt uncomfortable during any portion of the visit.
> Alexandra Wordsworth
> Senior Nurse Lecturer
> Bachelor of Nursing

Each of the three disciplines described above filmed the work for evaluation (including peer- and self-evaluation). The actors were trained in the details of each case, in the array of issues and behaviors a patient or client were likely to present, and to replicate the performance from student to student to ensure standardisation of assessment.

Even Better than the Real Thing - Conclusion.

Conventional methods of teaching and learning such as lectures, reading, discussions, and writing help students acquire a theoretical framework to fit future experiences into, but fall short in important areas. Actual experience vs reading/hearing about it more closely relates to the outside world, and helps the student develop not only interpersonal skills, but learn to handle human situations and uncertainty. It provides them with the confidence to encounter complexity and the unexpected.

"They were amazed at the way we could do a full performance with very little information; but man, what those guys have to go through in their training…"

"I feel for them: they have to ask some pretty intense questions, really get the details. They look so nervous. I

want to say, no, it's fine, I don't mind, I'm just acting. But I don't of course."

"We know scenario details they don't, and their tutors like us to mix it up a bit if things are going too smoothly…"

"…but we can tone it down a bit if the trainees are really nervous."

"Love the blood!"

"It's high pressure stuff, and you want to do well for the trainees. We try not to die, but sometimes…"

"Sometimes we die, and then they get to go again, and this time they save us, and we're all 'Yeahhh! Good one!!"

"As 'arty-types' that work a lot in fantasy, it's great to know that we contribute to the training of those who have to work in the real world!"

"Role-playing a criminal? Getting arrested?! Great fun!"

- Actor comments

The interplay between verbal and non-verbal material, interpersonal and communication skills, and the ability to receive feedback, can, carefully managed, help change students attitude or/and behavior.

In cognitive psychology, procedural knowledge is the "…knowledge exercised in the accomplishment of a task, and thus includes knowledge which, unlike declarative knowledge, cannot be easily articulated by the individual, since it is typically non-conscious (or tacit). Many times, the individual learns procedural knowledge without even being aware that they are learning" (Stadler, 1989).

Role-play simulation is a form of authentic assessment. When exposed to active, experiential, reflective and contextual learning approaches such as simulated environments, vocational trainees can see the direct relevance of their educational experience to their future practice.

Scenarios can be scaffolded, gradually increasing in complexity to ensure that students reach a sufficient level of competence, and allowing tutors to assess a trainee's preparedness for the practical placement component of their course.

Actor role-players provide consistency and reliability. They can help bridge the gap for trainees between their intellectual understanding of what should be done and their actually being able to make it happen in the real world.

The diverse makeup of many societies and global nature of education today make for the possibility of cross-cultural teaching. Unfortunately, many major disputes in need of resolution also cross ethnic and cultural lines. Communication etiquette varies widely across cultures. In France, it is rude to talk money over dinner while in Brazil the American 'A-OK' gesture (thumb and forefinger forming a circle) can be a major insult. Understanding when, where, how and with whom and what it is appropriate is extremely important to working across cultures. Role-play exercises can introduce some of the issues that can arise when teaching across cultures, and across language barriers, and how they might be addressed.

As has been discussed, practical trial and error, feedback, reflection and using actors in role-play for vocational training increases confidence and makes for an effective, long-lasting difference in learning.

Learning that is even better than the real thing.

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