Transforming Queensland VET: Challenges & Opportunities

Edited by Donna Berthelsen
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Foreword

The volume is a collection of papers that address issues associated with change in the delivery of VET programs in Queensland, foreshadowed by the release of The Queensland Skill Plan in 2006. Issues that relate to the implementation of the Actions identified in the Queensland Skills Plan are the focus of the collection. In particular, the incorporation of Information Communication Technologies (ICTs) and e-learning approaches in the delivery of training packages is a key topic, how such change can be managed in the delivery of training programs, as well as broader professional development issues for VET practitioners.

Change at an organisational level is the focus of two papers. Lyn Ambrose uses ideas from Diffusion of Innovations Theory to consider how the adoption eLearning in a TAFE community can be addressed. The paper by Susan Todhunter also discusses the organisational challenges in change initiatives in TAFE Institutes.

Specific issues related to in the professional development of VET teachers are the focus of the papers by Mary Campbell, Sharon Altena, and Judy Gronold. Mary Campbell discusses the importance of building staff capabilities within the TAFE system and how this might be managed. Sharon Altena considers how professional development programs are currently delivered and how new approaches to professional development for TAFE teachers are needed to ensure changes can be sustained in teaching practice. The paper by Judy Gronold takes up a specific challenge for VET practitioners in the Queensland Skills Plan. She addresses issues related to embedding employability skills into training delivery in order to address industries’ need for flexible, multi-skilled productive workers.

Mark Driver discusses the issues resulting from increased number of mature-aged learners in VET programs and how this change in the demographic profile of students presents challenges to the VET system. In the paper by David McKee, implications in the incorporation of ICTs into trade training are discussed and the need for effective change management strategies to ensure a smooth transition to new ways of delivering trade training. Finally, in the paper by David Roberts, the potential of Problem-Based Learning (PBL) approaches in VET training and the role of ICTs within such approaches are discussed. David uses horticulture training as an example to discuss the issues in implementing PBL effectively in VET programs.

These papers were completed by the authors as a part of their postgraduate studies at QUT. The views reported are those of the authors and should not be attributed to the Queensland Department of Education, Training and the Arts.

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The Diffusion of e-Learning: Moving from Vision to Reality

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Abstract

TAFE institutes aim to increase significantly the availability of programs through e-learning by 2010, in particular, Southbank Institute of Technology aims to make 30% of its programs available through e-learning by that year. This paper reviews Diffusion of Innovations theory (Rogers, 2003) to analyse how the adoption and implementation of e-learning by the Institute community might be increased. Communication with staff is identified as the essential element of the diffusion process. The paper discusses how communicating information and creating knowledge through opinion leaders can help persuade different adopter categories to implement innovations. It also discusses the facilitating conditions, success factors, and disseminating models that may be useful for integrating ICT into TAFE programs and how these can be considered in a renewed e-learning strategy for Southbank Institute of Technology.

In today’s technologically endowed, knowledge-based economy every educator has the opportunity to challenge and change general teaching practice by innovatively looking at the potential of weaving information and communications technology into the pedagogy. Rogers (1983) defines an innovation as “an idea, practice, or object that is perceived as new by an individual or other unit of adoption … if the idea seems new to the individual, it is an innovation” (p. 11). Rogers also describes a process for the diffusion of innovation. Defined simply, diffusion is the way something spreads. Understanding the key elements of diffusion theory and how innovations are communicated and implemented through social systems is important in order to increase the adoption and implementation of innovations.

The Business Plan at Southbank Institute of Technology requires 30% of all educational delivery to be achieved through e-learning by 2010. Currently, the percentage of programs using e-learning for delivery sits at 9% with the rate of adoption varying significantly from Faculty to Faculty. This report identifies strategies that could be useful in implementing innovations in practice through e-learning. In this paper, discussion about the diffusion of innovations begins by defining e-learning within the context of Southbank Institute of Technology. The second section discusses the need for implementing innovative practice in vocational education. The third section overviews Diffusion of
Innovations theory (Rogers, 2003) and discusses the impact that communication, time, social systems, opinion leaders, adopter categories and attributes of an innovation have on its likely adoption and implementation. Factors and conditions that facilitate adoption and implementation are then discussed. The conclusions summarise strategies that are likely to increase the uptake of e-learning at Southbank Institute of Technology.

The context of e-learning

E-learning means different things to different people. At Southbank Institute of Technology, it applies to the utilisation of Internet technologies to access and complete a sequence of learning activities to achieve learning outcomes. E-learning can accommodate different learning styles by offering a variety of learning activities. Behaviourist, constructivist and cognitive theories of learning can all be used to explain and inform the design of these learning activities (Anderson & Elloumi, 2004). In particular, e-learning activities can be informed by constructivist theories of learning through their design and incorporation of real life situations with a focus on contextualised learning and constructing personal meaning.

E-learning as an innovation can be considered as a complex system that comprises a myriad of technologies, each of which might fit Rogers’ definition of an innovation. Bowles (2004) identifies some of these technologies for e-learning as email, collaborative learning forums, message boards, text chat, threaded discussions, e-boards, application sharing, simulations, real-time tests and evaluation, video and audio streaming. E-learning encompasses three main areas of activity, namely content creation and management, learning management and learning activity. Any number of these e-learning technologies and activities will be used by Southbank Institute of Technology to achieve its e-learning goals in program delivery.

Implementing innovative practice in education

Implementation of innovative practice needs careful planning. It follows the development of a vision. Southbank Institute of Technology identified in its 2006-2010 Strategic Plan, a vision to change the focus of learning from a transmission model of learning to a model where students construct knowledge (White 2006). This is because the world around today’s learners is changing at an unprecedented rate. Life in the 21st Century revolves around lifelong learning that builds adaptability and capability. Breuleux (2001) writes of a more fluid relationship between learning, work and play. Collis and Moonen (2001) identify that pressure on educators is rising from new conditions in the market and, as a result, opportunities arise to make adoption and implementation of e-learning a personal problem felt by individual staff. Collis and Moonen contend that educators need to feel that they cannot not do it.

In designing e-learning activities, teachers need to understand the advantages and disadvantages of collaborative and independent e-learning. They also need to understand how to maximise the affordances of the Web, particularly the use of communication
and information tools (Anderson & Elloumi, 2004). White (2006) recommends selecting and training well-respected educational leaders in the use of ICT in education. These champions can then influence the widespread use of the technology.

Although Southbank Institute of Technology has ten formal Educational Leader positions, widespread use of e-learning technology is generally limited. The gap between its potential use and actual use is an implementation issue. Understanding of Diffusion Theory can inform its implementation.

> Diffusion of Innovations

Diffusion is “the process in which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 2003, p. 5). Communication is “the” essential element of the diffusion process because diffusion can not occur without it (Cragan & Shields, 1998). Diffusion theory has been used by professionals from a variety of disciplines to increase the adoption and implementation of innovative products and practices. Ryan and Goss (1943; cited in Rogers, 2003) applied Diffusion theory to understand the adoption of modern farming practices. Spil and Schuring (2006) used it to introduce e-health systems into the health care sector. Cragan and Shields (1998) applied it to their work on communication theory and Karlinsky (2004) used it to analyse Canadian psychiatrists’ adoption of technologies. The University of Sydney has also used Diffusion theory to evaluate the success of a recent e-learning project (Mahony & Wozniak, 2005).

Communication

Diffusion communication is a special type of communication. It is a social process that relates to planned and spontaneous communication about new ideas. A new idea is generated then diffused, adopted or rejected. Social change occurs if adopted. Examples of communication channels are mass media, interpersonal or face to face communication and interactive communication such as the Internet. Adoption and implementation of most innovations depends on subjective evaluation by the individual or group, and interpersonal communication. People working in an organisation work within a system within which communication links allow information to spread. These links can be formal (e.g., communication from manager to subordinate) or informal (e.g., around the lunch table) (Rogers, 2003).

Individuals do not generally evaluate an innovation by studying scientific research of its use. They tend to use the opinion of near-peers who have adopted the innovation and imitate their behaviour. The efficacy of informal social networks is important in diffusing innovation Trood and Gale (2000). Karlinsky (2004) reported that the subjective evaluation of respected peers was crucial when convincing Illinois doctors to prescribe the new antibiotics for patients. Ely (1999) noted that the establishment of good communication channels enables participants to share decision-making and
present their views through representative peers. When individuals have to work and communicate together to implement an innovation, it is more likely to be successful (Klein & Knight, 2005).

The problem with diffusion is that individuals have different attributes (Rogers, 2003). Transfer of new ideas is generally more successful between two or more individuals who have similar tastes, preferences and backgrounds, and share common understanding. These are referred to as homophilous relationships. However, some degree of heterophily in relationships is always present. Heterophily refers to the degree to which two or more people who interact are different in tastes and preferences. At Southbank Institute of Technology, some teachers are apprehensive about the intentions of management in the implementation of e-learning, concerned about the erosion of teaching hours through adoption of e-learning. Southbank Institute of Technology needs to allay these fears by identifying homophilous communication channels of people with similar qualities and personas, and utilising these communication channels as a part of its broad e-learning communication strategy.

**Time**

According to Rogers (2003), time in the innovation decision process is measured as a journey through five stages. The first stage is ‘knowledge’. This involves acquiring information about an innovation and how and why it works. The second stage is ‘persuasion’ which occurs when an opinion is formed about the innovation in relation to how it will affect a person’s situation. The third stage ‘decision’ involves activities that lead to using or rejecting the innovation. The fourth stage ‘implementation’ occurs when the innovation is used or even reshaped to suit users. The final stage ‘confirmation’ occurs when reinforcement of an innovation decision is sought.

Implementation is time consuming because it often requires the acquisition of new knowledge and skills, for example, using educational technologies requires individuals to learn, trial and adapt the technologies (Ely, 1999; Klein & Knight, 2005). Spil and Schuring (2006) cited previous literature which emphasises that time is required to get used to new tools and workflows. In adopting e-learning, teachers require paid time to learn new skills.

**Social systems**

A common objective binds a social system together. Rogers (2003) defined a social system as “a set of interrelated units that are engaged in joint problem-solving to accomplish a common goal” (p. 23). Diffusion depends on understanding the communication structure of a social system. Rogers (2003) discussed the application of diffusion theory in a health-related situation that involved diffusion of a new approach to family planning in Korea. He considered the acceptance of the new family planning ideas through the experiences of two women, one from Village A and one from Village B. Although the women shared many of the same characteristics, only the woman from Village B...
Village A adopted new family planning practices. Rogers suggested that this occurred because the head of her village supported the new ideas. It is very important that the leadership in an organisation demonstrates a strong commitment for implementation of an innovation. Demonstrated success of the innovation to the participants within a social system also influences adoption. Face-to-face network exchanges and social modelling of those who have already adopted an innovation are at the heart of a diffusion process (Rogers, 2003).

These ideas imply that the leadership at Southbank Institute of Technology show strong support for e-learning implementation. This needs to be evident in order to meet such targets as 30% of all educational delivery to be achieved through e-learning by 2010. Strategies to increase discussion and communication are also needed for effective diffusion of an innovation. There is continued value in the diffusion process of the bi-monthly online learning breakfast forums which have been held at Southbank Institute for three years. At these fully subscribed forums, teachers who have successfully implemented e-learning into their pedagogical practice, provide overviews of their adoption and implementation processes including examples of e-learning activities they have created. These presentations are in a “show and tell” format and colleagues and peers in the audience have the opportunity to ask questions of the presenters about their successful use of e-learning approaches. This strategy remains a key aspect of the e-learning communication strategy.

**Opinion leaders**

The diffusion process becomes self-sustaining if opinion leaders in a social system are targeted and their attitudes towards an innovation are positive. Rogers (2003) claimed that “the heart of the diffusion process is the modelling and imitation by potential adopters of the near peers’ experiences with the new idea” (p. 330). Opinion leaders activate local networks to spread the innovation and influence their peers. Anderson (1993; cited in Sherry, 2002) highlighted the important role played by a critical number of opinion leaders when the fundamental nature of an educational system is changed. If opinion leaders with a positive approach to innovation are ignored in an organisation, the rate of adoption will not reach critical mass. Southbank Institute of Technology needs to identify its e-learning opinion leaders and ensure they have adequate knowledge and support to incorporate e-learning into their pedagogical practice.

**Adopter categories**

Members of an organisation vary greatly in their willingness to adopt an innovation. Holden (2003) said that the “human aspects of diffusing an innovation are as important as (sic) or possibly more important than the technical innovation itself” (p. 10). It is almost an impossibility to expect all members of a social system to adopt an innovation within the same time period. Rogers (2003) identified five major adopter categories each of which possess distinct characteristics. Because of these characteristics,
adoption is systematic and not random. These adopter categories are very important in understanding and analysing diffusion processes. Knowledge and use of the adopter categories enables an organisation to better understand the diffusion process and also utilise this knowledge in implementation strategies.

**Innovators**

These risk takers enjoy working at the ‘cutting edge’ and represent approximately 2.5% of the population. They are sometimes viewed with suspicion by their colleagues and tend to form friendships with one another. Innovators act as gatekeepers allowing or not allowing the flow of new ideas and practices through the social system. However, their role in broader diffusion of an innovation may be limited.

**Early adopters**

Early adopters usually command respect from their peers and comprised 13.5% of the population. Potential adopters ask early adopters for their opinion of innovations. Hence, the greatest proportion of opinion leaders is found in this category. Southbank Institute of Technology needs to identify who the early adopters of e-learning are and enlist their support in successfully promoting e-learning teaching practices.

**Early majority**

These individuals comprise 34% of the population and tend to take fewer risks than the early adopters. However, they willingly follow early adopters but seldom lead the adoption themselves. Opinion leaders are also typically part of the early majority and Southbank Institute needs to identify their needs and provide them with support in implementing e-learning practices.

**Late majority**

Issues around uncertainty about change need to be removed before these people who comprise 34% of the population are likely to adopt an innovation. They approach innovation with scepticism and some caution. The pressure of peers can provide motivation for them to adopt an innovation.

**Laggards**

These individuals are mistrustful about innovations and are likely to reflect on traditional practices. Laggards sometimes do not adopt an innovation until it has been superseded by a newer model already being used by the ‘innovators’. Laggards comprise 16% of the population. However, it remains very important to listen to the objections that these individuals raise as they often identify key issues and impacts that may be overlooked by the innovators.
Attributes of an innovation

Rogers (2003) identified that the adopter’s perception of five key innovation attributes determines the likelihood of its adoption. These attributes are: relative advantage; compatibility; complexity; trialability; and observability. If potential adopters perceive that an innovation offers advantages over the current system, it is more likely to be adopted. Advantages can come in economic terms, social prestige, convenience or satisfaction. If an innovation is not too difficult to use and it is compatible with the needs, experiences, goals, values and beliefs of the adopters, it is more likely to be adopted. The more complicated the innovation is, the slower the adoption will be. Additionally if an innovation is trialable, it is more likely to be adopted because users can learn by doing. Finally, the results of using an innovation need to be clearly visible to others. This observability provides evidence for success.

Adopters need to be able to trial and observe the success of an innovation before they will adopt it. Elmore (1996; cited by Sherry, 2002) contended that if an innovation makes a teacher’s work easier and more efficient, it is likely to be adopted but if it changes the heart of how they work, it is unlikely to be adopted without some incentives to reward the additional effort required. Southbank Institute of Technology needs to clearly articulate the advantages of e-learning and ensure teachers are afforded opportunities to trial it and observe its success. Teachers need reassurance that e-learning is compatible with a competency-based vocational and technical education environment and that it supports the needs of their students. They also need to know that the level of complexity of e-learning technologies varies and that different levels of adoption are possible.

Facilitating implementation

Holden (2003) proposed that the diffusion of innovation requires an holistic approach that includes organisational issues as well as innovation attributes. A review of relevant literature (Collis & Moonen, 2001; Ely, 1999; Klein & Knight, 2005; Surry, Ensminger & Jones, 2002) reveals several different models for understanding the key issues on whether, or not, technological innovations will be implemented in educational environments.

- **Ely (1999) identified eight facilitating conditions.** The organisational setting and the nature of the innovation influences how much each condition is present. His eight conditions are: dissatisfaction with the status quo; existence of knowledge and skills; availability of resources; availability of paid (company) time; rewards or incentives; participation; commitment; and leadership.

- **Collis and Moonen (2001) proposed a four factor model (4-E model) to predict implementation success for technical innovations in educational settings.** The ideas can be used to gauge an individual’s likelihood of voluntarily making use of a specific technology for a learning related activity. The factors are: educational effectiveness; ease of use; engagement; and environmental factors.
Surry, Ensminger and Jones (2002) proposed seven elements in their RIPPLES model on the key issues associated with adoption of technological innovations. These elements are: resources; infrastructure; people; policies; learning; evaluation; and support.

Klein and Knight (2005) recognised six success factors that shape the outcomes of innovation implementation. These are implementation policies and practices; the organisational climate for innovation; management support; financial resources; learning orientation; and managerial patience.

Klein and Knight (2005) estimated that almost 50% or more attempts at implementing major technological and administrative change are unsuccessful or only partly successful. The complex interactions between local politics, financial resources, social, human and technological factors impact whether innovations will be implemented in educational environments (Surry, Ensminger & Jones, 2002). It seems prudent, therefore, to weave together key aspects of Rogers' (2003) diffusion theory with the key factors from the models by Ely (1999), Collis and Moonen (2001), Surry, Ensminger and Jones (2002), and Klein and Knight (2005) to understand the important contextual factors that could inform implementation strategies at Southbank Institute of Technology. It is possible to integrate and synthesise the key ideas into eight key themes that emerge from the different models. These form the LARRIKIN model. Its components are identified and explained in Table 1 and then discussed.

Table 1. The LARRIKIN model

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership</td>
<td>Clear vision from the organisational leadership</td>
</tr>
<tr>
<td>Advantages</td>
<td>Appreciation and understanding of the advantages of e-learning</td>
</tr>
<tr>
<td>Resources</td>
<td>Availability of resources to support implementation</td>
</tr>
<tr>
<td>Rewards</td>
<td>Extrinsic and intrinsic rewards for implementation of e-learning innovations</td>
</tr>
<tr>
<td>Incentives</td>
<td>Incentives to encourage implementation of e-learning innovations</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Professional development environment that enables new learning</td>
</tr>
<tr>
<td>Inclusive evaluation</td>
<td>Broad–based assessment of outcomes against the institution’s learning goals</td>
</tr>
<tr>
<td>New skills</td>
<td>Appropriate support to implement and use new skills within the specific teaching context in which e-learning practices will occur</td>
</tr>
</tbody>
</table>
Leadership

Innovators need to perceive that the leader or leading body of an organisation endorses and supports the innovation’s implementation. If they do not actively support it, employees may see it as a passing fad (Ely, 1999). Managers need to accept they may have to support diminished productivity and efficiency and relaxed performance standards in the short term, in order to achieve the long term benefits associated with integration of educational technology.

Employees will view an innovation as important when such a climate of support for its implementation exists. Managers should not abandon an innovation after deciding to adopt it (Klein & Knight, 2005). Project leadership is important so some individuals work more closely with the innovators (Ely, 1999). Management decreeing that an innovation should be implemented is unlikely to affect satisfactory outcomes without ongoing commitment and support.

Advantages

One of the affordances gained from using technology is its educational effectiveness. It can be used to solve personally relevant educational problems, provide new forms of learning experiences, and enhanced support for existing curriculum (Collis & Moonen, 2001). Rogers (2003) agreed that motivation is a key factor because “many adopters want to participate actively in customising an innovation to fit their unique situation” (p. 17). Surry, Ensminger and Jones (2002) noted that technology in education delivery can increase the student population. Students who could not previously enrol in an educational institution because of geographical location or work commitments are more likely to engage in programs if educational technology enables distance learning and participation. This is likely to result in financial gain for the institution (Collis & Moonen, 2001).

Rogers (2003) warns that change agents often consider all consequences of an innovation will be positive. Obvious disadvantages of e-learning include its expense, particularly at the start up stage and during development of materials. Access to off-campus technology is not possible for all students therefore Southbank Institute needs to ensure disadvantaged students can access college computers for their e-learning requirements. Strategies also need to be developed to prepare students for e-learning and to clarify what is expected from them at the outset.

Resources

Technological infrastructure also determines the level of implementation. This relates to the organisation’s vision about technology, its profile with respect to technology use, the readiness of the organisation to change, incentives available and past experiences with technology (Collis & Moonen, 2001). Surry, Ensminger and Jones (2002) contend that “a college’s technology infrastructure should include five components – teaching resources, production resources, communication resources, student resources, and
administrative resources” (p. 15). Implementation is expensive. The institution requires up-to-date computers, good network connections and an easy software environment. Training, communications campaigns and ongoing support also cost money. Surry, Ensminger and Jones (2002) identify three types of fiscal resources. The first type is the continuing resources that come from regular stable funding. The second refers to initiative funding or grants received from time to time. The third refers to the process of matching expenditure against revenue (i.e., resource allocation).

Rewards

Rewards are performance-based. Extrinsic rewards can be seen by others whereas intrinsic rewards, which are a powerful incentive to perform, are internal and personal. Klein and Knight (2005) identify praise and promotion as examples of suitable rewards of both an extrinsic and intrinsic nature. Collis and Moonen (2001) suggest offering such rewards as funded conference attendance to report on innovative work with new technology. They also suggest paying a subsidy on network connections for home use for both teachers and students. Surry, Ensminger and Jones (2002) suggest rewarding technological competency with tenure, retention or promotion and that if existing employment policies do not support this, they should be changed.

Incentives

Incentives motivate and encourage individuals to take a particular course of action. They influence a person’s preference for one choice over another. Offering an incentive, such as permission to work from home on a regular basis, might encourage more teachers to adopt e-learning into their practice. Elmore (1996; cited by Sherry, 2002) noted that lack of time limits the diffusion and sustainability of educational innovations and that if an innovation makes a teacher’s life and work easier and more efficient, it is likely to be adopted. If it changes the heart of how they work it is unlikely to be adopted without some incentives to reward the additional effort required.

Southbank Institute of Technology needs to promote the personal e-learning achievements of staff to help teachers gain the respect of their peers. This leads to an increase in self-esteem and approval. The personal and professional learning that accompanies the adoption of e-learning could also be promoted as an incentive. On the other hand, the fear of being excluded if they do not implement e-learning may also provide incentive enough for some teachers.

Knowledge

Organisations and teams need to develop a strong learning orientation. The ultimate users of an innovation require knowledge and skills to use it (Klein & Knight, 2005). This is one of the most important factors leading to innovation (Ely, 1999). If an innovation is to become fully implemented, it is imperative that staff engagement is sustainable. This is best achieved through the availability of a network of support. Users require a
supportive professional development environment. They need to feel safe expressing their ideas and opinions and admitting their failures or errors. A collaborative and sharing organisational climate fosters the development of new skills and knowledge. Klein and Knight (2005) indicate that employees will readily experiment, adapt and take risks with innovations if surrounded by a supportive climate.

**Inclusive evaluation**

Technology should be continually assessed against its alternatives and the institution’s learning goals. Factors that have facilitated or impeded implementation should also be evaluated. Cost-benefit evaluations should be used to determine return on investment (Surry, Ensminger & Jones, 2002). Care needs to be taken with evaluation to ensure both tangible and intangible benefits are included.

**New skills**

Teachers should not have to fit learning new skills in with their daily activities (Delahaye, 2005). Anecdotal evidence suggests that once teachers return to their classroom from a skills-learning session, they often do not have the time to practise their newly acquired skills because their daily work takes priority. The benefits of one-off skills training are quickly lost. Delahaye notes that skill development programs only create value when they are transferred and applied in the workplace. Gold and Powe (2001) confirm that hands-on workshops better enable teachers to build their new skills. Teachers need paid release from their teaching duties to attend a series of skills workshops in order to develop innovative e-learning solutions.

> **Conclusions**

Achieving the goal of 30% of all education programs being delivered through e-learning by 2010 is possible if Southbank Institute of Technology adheres to the principles of diffusion theory which are well grounded in research. Southbank Institute of Technology can develop a renewed e-learning strategy incorporating the principles of diffusion theory and other conditions identified from the literature and incorporated in the LARRIKIN model. It requires a communication plan and implementation plans with key performance indicators. Rogers (2003) reminds us that individuals in an organisation are connected by communication links that allow information to spread and knowledge to build. Understanding diffusion theory and its relation to the adoption and implementation of innovations will assist Southbank Institute of Technology to achieve its goal for 2010.

Communicating a renewed e-learning strategy and its goals to staff and other stakeholders is an important task. It requires identification of the homophilous communication channels of like-minded people from similar backgrounds, utilising formal and informal networks and other interpersonal communication channels to inform staff. Communication strategies like newsletters, broadcast emails and the Internet need
to be well utilised. Examples of successful innovative practice can be communicated through ‘show and tell’ breakfast forums and other promotional activities. Messages that articulate the benefits and advantages of e-learning for individuals and the organisation need to be developed. Demonstrating advantages over the current systems increases the likelihood of adoption, including emphasis on the changing nature of learning in the 21st century and the affordances of technology.

Time needs to be negotiated for teachers to trial and evaluate technologies. The potential for the use of new tools can only be recognised by engaging in dialogue about how they are or might be used. Southbank Institute of Technology should not underestimate the amount of knowledge teachers require at the point of implementation. Positive outcomes from utilising ICT in education are related to the knowledge and skills of the teacher (Breuleux, 2001). Providing just-in-time staff development may offset the perceived complexity of some technologies. Rogers (2003) says ease of use increases the rate of adoption. Opinion leaders need to be identified and adequate support provided to them when they are incorporating e-learning into their practice. Breuleux (2001) offers “renewal” as an appropriate term to describe the changes that can arise in educational practice from the merging of new technologies with constructive pedagogies. It enables a reinvestment in existing performance.

> References


Leading Change: Issues Affecting the Uptake of Educational Technologies in Queensland TAFE Institutes

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> Abstract

Better use of educational technologies for teaching and learning in the Vocational Education and Training (VET) sector is critical if the objectives of the Queensland Skills Plan are to be achieved and the increasing demand for flexible and contemporary training is to be met. This project suggests that leading the change is charged with issues and challenges through all areas and at all levels of the organisation. In this paper the uptake of educational technologies in the VET sector are explored and issues related to the organisation, culture, leadership and change management are examined. Importantly, it is argued that change can be driven and actioned by educators from the bottom-up. Finally, the report identifies key messages for those involved in planning and implementing change initiatives.

‘The times they are a-changin’ (Dylan, 1964) and, as far as technology is concerned, no sooner do educators understand and conquer one new technology then it is replaced with something smaller, faster and cleverer that our children always seem to master before we do. The Queensland Skills Plan (QSP) (Department of Education and Training, 2006) has thrown down a gauntlet to the VET sector in relatively gentle, sensible and logical terms. The challenge is to incorporate the latest technologies into current teaching and learning practices. However, the issues and barriers surrounding this challenge are as many and varied as the possible responses and solutions.

The demand for efficient, flexible and contemporary education and training when, where and how students require it, has major implications for the integration of technology into the Technical and Further Education (TAFE) teaching and learning environment. This paper presents a critical analysis of change issues and barriers affecting the uptake of educational technologies and also considers the organisational and change management necessary for this uptake to occur effectively. Although the change issues are complex and interdependent, they will be discussed independently in relation to how we can realise, sustain and grow the vision of the QSP.

1 Note: This report was formulated prior to the merger of the Department of Employment and Training (DET) and the Department of Education and Arts (DEA) and should be read in that context.
A number of TAFE educators are currently using technology in their teaching and learning practices and this change is occurring in spite of the barriers and challenges they face. However, it is argued that sustainable growth and the rate of uptake could be significantly improved through more supportive leadership and effective management of change. Key comments from informal discussion meetings with three senior executives and managers from the Department of Employment and Training (DET) on the topic of technology and change are included in this paper to contextualise and ground the theoretical ideas into the reality of the current TAFE environment.

> The Organisation

Change and the beast

Point

- DET is a large, bureaucratic and government organisation that at this point in time could not be described as responsive and agile.

Counter-point

- Its people, it is argued, can be and are responsive and agile, succeeding in situations where the larger organisation cannot.

If change is to happen, a sensible starting point is to attempt to understand the beast with which you are dealing. DET is a large and complex organisation comprising central strategic units and twelve metropolitan and regional TAFE Institutes that deliver a wide range of education and training to a diverse and dispersed student base. To a certain degree, the wider organisation of DET and the institutes themselves provide the directions for change, as well as the boundaries, within which the technological change to teaching practice in VET will occur.

So what is the starting point? Using organisational metaphors, DET may be viewed as a blend of the mechanistic (Burns & Stalker, 1961) and the organic (Morgan, 1997). However, such organisational types are not always distinct and pure types probably do not exist (Alexander, 2005). The metaphor of the mechanistic organisation reflects the bureaucratic nature of DET where hierarchical management can often prevent and stymie innovation, effective communication, creativity and dynamic problem-solving (Burns & Stalker, 1961). A mechanistic approach can also limit an organisation’s capacity to respond quickly and adapt to change, develop unthinking automatons that result in problems of high absenteeism and staff turnover (Morgan, 1986; Kelly, 1982). The DET machine’s response to change in the past has been slow and cumbersome and often blocked by gatekeepers, and individuals’ pursuits and foci have taken precedence. Is the future really this bleak?
Agile and active responses to innovation can be hindered by an organisation’s nature, size, complexity and structure (Thornhill, Lewis, Millmore, & Saunders, 2000). DET may not have the agility that characterises many private business enterprises. The Australian public sector has been restricted by policy and procedures in comparison to the private sector (Nankervis, Compton, & Baird, 2005), but movement towards flexibility and alternative approaches and options are now evident. DET is now progressing toward adopting new ways of thinking and working. The author does not consider that the desire for growth and change is absent. The reality is that changes are not adequately planned, supported, resourced and managed and it becomes too hard for the individual to execute. The TAFE Institutes are the public face of DET providing the organic interface between the ‘machine’ and the learner with the educators and trainers providing a supportive and people-oriented training and education environment. It is here at the more personal interface with DET’s customers that the effects of the proposed actions in the QSP and change are to be realised.

The dilemmas of organisational change are illustrated by the words often heard in staff rooms as: “Oh that! No, that’s not really new, that’s how it was before we had the last good idea about five or six years ago”. In the context of considering the use of educational technologies in training delivery in TAFE, six organisational dilemmas outlined by Carnall (2003, p. 58) are relevant. Each dilemma poses its own subset of challenges that would easily be recognised by most DET employees. These are:

- Centralization vs decentralization;
- Global vs local;
- Efficiency vs effectiveness;
- Professional vs management;
- Control vs commitment;
- Change vs stability.

For this paper, an important focus is considered to be the organisational dilemma of control verses commitment. This is viewed as a continuum. The control model describes organisational behaviours that do not develop employees’ latent capacities, which Carnall (2003) referred to as “the invisible assets” where employers expect and accept much less than might potentially be available (p. 64). The Actions identified in the QSP require high performance and high levels of commitment from employees. DET is now working towards the stretch and dynamic nature of a commitment model. The author considers that DET currently sits between the control and transitional modes with some movement towards the commitment end of the continuum. This is represented in Figure 1.
A healthy and resilient organisation that is flexible and adaptable must be nurtured in order to realise the technology-related goals of the QSP. An unhealthy, passive-aggressive organisation (Neilson, Pastemack & Van Nuys, 2005) is an organisation in a state of inertia. Maintaining this state of inertia would put DET on a fast road to nowhere with respect to change in teaching and learning approaches that have been proposed in the QSP. However, Neilson et al. contend that it is not ‘hostile or perverse’ intentions that individuals bring to the job that cause inertia and negative outcomes. It is mostly that well-intentioned people are the “victims of flawed processes and policies” (p. 84). TAFE Institutes might consider the ideas that Neilson et al. propose for addressing inertia:

- Getting the organisation to attend – by grabbing its attention!
- Bringing in new blood;
- Changing lots of things all at the same time – no time for complacency;
- Making governance clear, making decisions and making them stick;
- Spreading the word and the data – sharing the information;
- Matching motivators to contributions.

Figure 1: DET’s position on Control vs Commitment (adapted from Carnall, 2003, pp. 65-67)
> Culture

**Powerlessness coupled with a sense of hopelessness?**

**Or command of the reins from the saddle?**

**Point**

- *Change in organisational culture is essential if institutes are to successfully implement the technology-related teaching and learning Actions described in the QSP.*

**Counter-point**

- *What if cultural change is not driven from the top? Cultural change can still take place and can be grown from the bottom-up.*

So what is ‘culture’ and can organisations do anything to change culture if it presents barriers to organisational progress and growth? Culture, according to Thornhill et al. (2000) is something that an organisation has rather than is; implying that it is possibly something that can be managed. Brown’s (1998) definition of culture refers to the "patterns of beliefs, values and learned ways of coping with experience that have developed during the course of an organisation’s history" (p. 9). When the changing environment, in this case the multi-based demand for flexible contemporary training, necessitates different responses from employees, then the culture of the wider organisation and of the workforce itself might not be appropriate and will need to change (Robbins, Millett, & Waters-Marsh, 2004).

The edicts of the QSP look to reshaping the way that educators approach teaching and learning. This author suggests that cultural change is essential and, in this instance, movement towards the paradigm of a learning organisation may be a good fit with the vision and the desired outcomes of the QSP. Senge, Kleiner, Roberts, Ross, and Smith (1996) propose that, “change and learning may not exactly be synonymous, but they are inextricably linked” (p. 11). Cultural change can be guided, supported and managed from the top but if this does not happen all is not lost, the educator can grab the reins and grow the change from the bottom-up. Some literature already portrays the notion of a ‘learning organisation’ as passé (Kikoski & Kikoski, 2004). However, this author considers it is relevant. Something can only be passé if it has actually been in existence or experienced and, for DET, this is not considered to be the case.

The message and core work for organisations that centre themselves on a ‘never ending developmental path’ are embedded in the five disciplines of “personal mastery, mental models, shared vision, team learning and systems thinking” (Senge et al., 1996, p. 7). Although support, organisational vision and a learning culture can positively influence the uptake of educational technologies so that the opportunities and benefits for learners and educators are fully realised (Kotter & Heskett, 1992), it is individuals who are committed to practising the discipline of learning and contributing by expanding their own capacity who can build collective capabilities to support growth and change.
An image of organisational learning is presented in Figure 2. It shows a process of enduring change that can be described as a deep learning cycle, encompassing the facets of skills, awareness and attitudes and beliefs, as a part of the learning organisation equation. Secondly, there is the domain of action, where organisational architecture provides the tangible framework for the learning to happen. The rationale for the change and growth is in the improvement, desired output or results where success is measured. To complete the image, the ‘implicate order’ provides the more subtle and intangible level of thinking and being, which is regarded by Bohm (1980; cited in Senge et al., 1996) as the primary reality. Bohm explains this new implicate order as reality that is continually unfolding where humans play an integral and participative role in the ‘unfoldment’.

Figure 2: An image of organisational learning (Adapted from: Senge et al., 1996, p. 45)

The responsibility and ownership of culture can reside with the person as well as the organisation. The relationship between the organisation and the wider environment can be changed. Organisations are not just reacting to a world that is independent of their own making (Morgan, 1986). This position is supported by Schein (1985) who also suggested that organisational culture is developed through a natural socio-dynamic process that develops sometimes regardless of the intent of management. New and enhanced technological changes diffuse into everyday life and individuals in learning organisations “will be able to look forward to creating instead of merely reacting to the new world that emerges” (Senge et al., 1996, p. 12).

An informal discussion with a senior manager in TAFE sought to ascertain how her organisation enabled and championed change. Her ideas were that creative organisational cultures can be nurtured and change absorbed as accepted facets of evolving organisational growth. The ideas which she discussed are presented in Figure 3.
The "Hawthorne effect"

...behaviours and attitudes change over time if attention is given either to the people or the area of focus.

In the context of an approach to change:

- "what gets attended to – gets done."
- The drip-feed focus on the triggers or spotlights brings front of mind awareness – beds down awareness, focus and ultimately action.

Dialogue

- Meaningful visioning processes enable engagement.
- Dialogue gets change happening.
- On-going dialogue and conversation at all levels defines, consolidates, embeds and refines change.

Grow your own

Investment in human capital = growing capacity

- Identify emerging champions and invest in their enthusiasm and potential;
- Growing capacity involves risk-taking, support and mentoring, and learning through mistakes;
- Send strong messages to the people about the value of the people to themselves and to the organisation.

Figure 3: Representation of the ideas of a TAFE senior manager on organisational culture
Leading change

Leadership in its most simplistic sense can be defined as “the ability to influence a group toward the achievement of goals” (Robbins et al., 2004, p. 338).

Point

- Leaders are charged to take the QSP Actions by the scruff of the neck and make them happen

Counter-point

- Leading from behind, the ‘influencers’ are an untapped resource with potential to implement, support and sustain the QSP’s Actions.

Who is going to lead the change? There is extensive literature concerning leadership and how successful CEOs, politicians, sports coaches or other public figures have earned their claim to fame and how they have made the BIG difference in their chosen field. The construct of leadership encompasses many human dimensions and has resulted in numerous definitions from varying perspectives and foci. Parry (2001) suggested that generalising research findings regarding leadership can result in an endless cycle where explanatory theories become bogged down in situational variables, combinations and permutations. The most challenging leadership role in DET, especially in times of change, lies with the Institute Directors. The institutes are the organic hub and human interface between the training agenda and reform as outlined in the QSP. Leading change is about leading people and the recent DET reports, planning and policy documentation all suggest that the organisation is keen to impart and promote its more organic, people-oriented and culture-oriented side (DET Annual Report 2004–2005, 2005; Strategic Plan 2005–2009, 2005; QSP, 2006). The DET Annual Report refers to people as the most valuable resource, the determinants for success. The Strategic Plan 2005-2009 outlines the following specific leadership values:

- Encouraging leadership that is shared and inclusive where people are empowered to participate in decision-making that affects them;
- Believing that good leaders know how to listen and learn, are action-oriented with clear direction and vision and have the courage to make informed decisions.

Authentic leaders, committed to stewardship and making a difference in the life of people they serve are heralded as being the saviours of the corporate world’s crises (George, 2003). Such leaders could be successful in moving DET and the institutes towards more contemporary approaches for VET in Queensland. Being an authentic leader is described quite simply by George (2003) as being you, which is in direct opposition to the majority of leadership literature, which describes styles of leadership to be adopted and lists a multitude of leadership characteristics to be emulated. The rub, as always, is the challenge of leading and creating an organisational culture that is both values-centered and performance-driven, conceding that there are “times to be tough about
people decisions or financial decisions" (George, 2003, p. 14). Authentic leadership is also about the capacity to be able to adapt leadership styles to the demands of different situations and knowing when and how to deploy different styles. Cashman (1997) provides a view of authentic leadership through the experience of an executive with whom he worked who came to understand that his real power was in being ‘real’ rather than being ‘right’.

Staff in TAFE institutes expect management to lead the way and provide the support and guidance needed to embed new behaviours in current teaching and learning practice. Educators who really enjoy the teaching and the learning are a wily bunch and the use of technology in education is already happening on their patch, quietly and without fanfare. Nonetheless, with authentic, open and strong leadership coupled with a learning culture, the shift to agile and up-to-date responses to learner and industry needs can bring about change by growing expertise, intellectual and human capital, and improving client service.

A discussion with one of DET’s senior leaders on leadership reflected his values that changes proposed in the QSP should maintain a strong customer focus through developing personalised learning options. His ideas about the importance of a focus on a ‘customer-of-one’ with a personalised training product are illustrated in Figure 4.

![Figure 4: Representation of the ideas of a TAFE senior manager on his leadership focus in implementing the Actions in the QSP.](image-url)
> Managing change

*Span the process of 'how' the change is to happen to the ‘doing’ part and make sure what is intended to happen, happens.*

**Point**
- Most people hate any change that doesn’t jingle in their pocket (Anonymous)

**Counter-point**
- A common sense approach to managing change can work and achieve successful results.

The scene has been set. The horse has been led to the water and now the task is to make sure it drinks, drinks enough, drinks the right water from the right trough, does not get waylaid and finds its way back to the barn. This might not work! No single change-management approach can live up to the claim of being a cure-all (Abrahamson, 2004; Dawson, 2001). However, when dealing with and managing people who are faced with large-scale organisational change, an approach that encompasses a basic common sense methodology might have a greater chance for change management to be effective and have positive outcomes. Where there is no simple remedy for change to behaviour and attitudes, and mechanisms for coping are concealed, then Pascale and Sternin (2005) suggest an approach that is bottom-up, inside-out, and asset-based rather than top-down, outside-in, and deficit-based. They call this a positive-deviance approach. Figure 5 shows a comparison between the traditional and positive deviance approaches to change.

<table>
<thead>
<tr>
<th>TRADITIONAL APPROACH TO CHANGE</th>
<th>POSITIVE DEVIANCE APPROACH TO CHANGE</th>
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</thead>
<tbody>
<tr>
<td>Leadership as path breaker</td>
<td>Leadership as inquiry</td>
</tr>
<tr>
<td>Primary ownership and momentum for change come from above.</td>
<td>Leader facilitates search; community takes ownership of the quest for change.</td>
</tr>
<tr>
<td>Outside-in</td>
<td>Inside-out</td>
</tr>
<tr>
<td>Deficit-based</td>
<td>Asset-based</td>
</tr>
<tr>
<td>Leaders deconstruct common problems and recommend best-practice solutions.</td>
<td>Community leverages preexisting solutions practiced by those who succeed against the odds.</td>
</tr>
<tr>
<td>Logic driven</td>
<td>Learning driven</td>
</tr>
<tr>
<td>-----------------------</td>
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</tr>
<tr>
<td>Participants think into a new way of acting.</td>
<td>Participants act into a new way of thinking.</td>
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</tbody>
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<tr>
<th>Vulnerable to transplant rejection</th>
<th>Open to self-replication</th>
</tr>
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<tbody>
<tr>
<td>Resistance arises from ideas imported or imposed by outsiders.</td>
<td>Latent wisdom is tapped within a community to circumvent the social system’s reaction.</td>
</tr>
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<tr>
<th>Flows from problem-solving to solution identification</th>
<th>Flows from solution identification to problem-solving</th>
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<tbody>
<tr>
<td>Best practices are applied to problems defined within the context of existing parameters.</td>
<td>Solution space is expanded through the discovery of new parameters.</td>
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<tr>
<th>Focused on the protagonists</th>
<th>Focused on enlarging the network</th>
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<tr>
<td>Engages stakeholders who would be conventionally associated with the problem.</td>
<td>Identifies stakeholders beyond those directly involved with the problem.</td>
</tr>
</tbody>
</table>

**Figure 5: Comparison of change approaches (Source: Pascale & Sternin, 2005, p.75)**

Pascale and Sternin (2005) suggests the unearthing within organisations, the ‘secret change agents’, who are not the outside consultants that have been hired in to fashion and facilitate change, nor are they the organisation’s leaders. They are the groups within the organisation that the author has previously referred to as the ‘wily bunch’ that prevail often against the odds and manage to shine under the bushel whilst being innovative and keeping the customer happy. It is the utilisation of the organisation’s resource-rich human and intellectual capital, tapping into the experience and expertise of the educators that are already using technology for training delivery that will assist to bring about a more natural feel to the change. Pascale and Sternin (2005) aptly describe the concept:

“...when you fan the embers within a community rather than rely on firebrands from headquarters or outside the group, change feels natural. Internally developed solutions circumvent transplant rejection, since the change agents share the same DNA as the host. The trick is to introduce already existing ideas into the mainstream without excessive use of authority. Why use a sledgehammer when a feather will do?” (p. 80)

Resistance is useless? If only it were that easy. Not only is there organisational resistance but also individual resistance to change to be considered and addressed (Dawson 2001; Katz & Kahn 1978; Robbins et al., 2004). Kotter and Cohen (2002) argued that in the context of change, changing behaviour is the ultimate aim and is achieved by
influencing feelings. Behaviour is what needs to change and emphasis needs to be put on the truth that influences feelings rather than analysis that shifts thinking. This perspective gels with that of Pascale and Sterin (2005) who purport that “people are much more likely to act their way into a new way of thinking than to think their way into a new way of acting” (p. 80). These approaches utilise PAK (practice, attitude, knowledge) rather than a classic KAP (knowledge, attitude, practice) behaviour-change model (Pascale & Sterin, 2005).

Discussion with a senior TAFE leader identified how he explored a strategic and tactical approach to manage change to refocus directions in his organisational area using the Cynefin decision-making framework (Kurtz & Snowden, 2003). The Cynefin framework is used to understand knowledge management as well as conflict resolution. The model incorporates the components of: A - analyse, C - categorise, P - probe, R - respond, S - sense. The use of these components can be configured in different ways to inform understandings and actions. This senior TAFE leader noted that in implementing a change program: “… [that] initially fundamental issues of communication and trust were absent as changes were proposed and the organisation was locked into a very narrow way of doing things. The investment in capacity and capability building saw a huge return on investment. The turnaround has been very positive and rewarding in terms of business outcomes and staff satisfaction.” Figure 6 illustrates how this TAFE leader understood and used this decision-making framework in his institute.

Concerns and issues were divided into the following:

- Culture
- Change management
- Shared vision/strategic direction/planning
- Business systems
- Structure, functions and role clarity
- Marketing
- Staffing/staff development

Using the Cynefin decision-making framework this leader managed the cultural shift for the organisation and a change initiative that met the challenges of business and education.

Organisational issues were categorised by a group of staff into the four quadrants and decision rules applied to indicate how issues were to be addressed.

**Figure 6:** Representation of the ideas of a TAFE manager for the management of change
> The uptake of innovative change

A TAFE Senior Manager stated “TAFE is like the Titanic – it’s hard to turn around, but we haven’t the time, the iceberg is here” (Consortium Research Program Newsletter, National Centre for Vocational Education Research [NCVER], 2006, p. 2).

Point

- It is inevitable that technology will be embedded in the total student learning experience from enrolment to graduation.

Counter-point

- The capacity to extract maximum leverage off the innovative use of technology for teaching and learning will be opportunity and time lost if innovation is not encouraged, supported and managed.

Technology is already partly embedded within the TAFE Queensland teaching and learning environment. Greater diffusion in the use of technology must be understood within the wider organisational and cultural context of TAFE Queensland. It needs to become an integral part of the ‘living’ education and training environment. The VET pedagogical framework encompassing an educational philosophy and teaching and learning strategies informs the nature of the educational environment represented by the interplay between the educator, the learner and the technology. Such ideas were proposed by Goodyear (1999).
Do we have to be brought kicking and screaming to answer this demand for more collaborative and relevant teaching methodologies? Why is it seemingly so difficult to embed technology into the everyday teaching and learning practices of VET educators to match the expectations and demands of their information-age student counterparts? In this case the jigsaw needs all the pieces on the table to have any hope of completing the picture. Lloyd and Yelland (2003, cited in Wong, 2006, p. 13) suggest that avoidance of ICT is based on:

- Intellectualism: “It’s too hard, too difficult”;
- Rationalisation: Lack of time, gender and age;
- Denial: Refusal to ‘own’ learning about technology;
- Projection: Transferring responsibility to the students;
- Aggression: Either direct or displaced.

All of these avoidance strategies are perhaps understandable if you are an educator who is afraid, doesn’t understand, has few ICT skills, doesn’t have much time, has no access to training and feels undervalued. There are however good grounds for optimism for the learner-centred agenda as VET educators do demonstrate their knowledge and innovative approach to addressing differentiated, flexible and relevant training (Mitchell, Clayton, Hedberg & Paine, 2003). We just have to learn how to cash in on the success stories. The importance of recognising and acknowledging educators already using educational technologies to support the delivery in TAFE Queensland Institutes is important.

One of the major challenges to the QSP is the speed at which the technological innovations can be diffused. Diffusion is the process by which “an innovation is communicated through certain channels over time among the members of a social system” (Orr, 2003, p. 1). Different groups (innovators, early adopters, early majority, late majority and laggards) have different responses to the adoption of innovations in organisations. These adopter categories are very important in understanding and analysing diffusion (Orr, 2003). Salveron, Arney and Scott (2006) proposed that the adoption of innovations must take account of organisational readiness for change (e.g., tensions for change, resource allocation); implementation issues (e.g., autonomy of frontline teams, communication and collaboration between staff); and the sustainability of the innovations (e.g., reinvention and adaptation, feedback processes).

The persuasion of the opinion leaders (Orr, 2003; Rogers, 1995; Thoresen, 1996), together with an innovation and risk-taking mindset could prove to be easiest way to stimulate positive attitudes towards the uptake of new approaches. It is argued that when taking on new and creative challenges, employees need a failure-tolerant environment, and leaders who realise that the pathway will not be smooth and that mistakes will occur

Figure 7: Technology and the TAFE Queensland organisational context (Source: Adapted from Goodyear, 1999, p. 11)
Teachers need to take chances and risks, to learn and practise new skills. The DET Annual Report (2005) espouses its support for a departmental culture that “encourages employee innovation to improve efficiency and performance – [and] in return the department benefits from a workforce committed to achieving the organisation’s strategic goals” (p. 37).

> **Change issues and the way forward**

A range of change issues relevant to the implementation of the educational technology-related actions in the QSP have been identified from research. These have been considered in terms of DET as an organisation, the cultural perspective, leadership of change, management of change and the uptake of innovation. The author has delved into a range of issues related to the uptake of educational technologies in TAFE Queensland Institutes. It is by no means an exhaustive analysis of the literature.

It is important to keep in mind that change very rarely affects just one stakeholder group and it is therefore essential to ensure that stakeholder engagement and service to the customer remain the uppermost concern. The shift to greater incorporation of educational technologies should also retain a holistic organisational approach and be aligned to funding models, professional development policies and business plans. The insights and options for the way forward can comprise practical suggestions substantiated by, and built upon, with evidence from scholarly research about the incorporation of technologies into educational programs. A wide range of information is also needed to inform and provide support to address change issues that will enable the successful diffusion of technology innovations throughout the TAFE environment. The options and insights presented in this paper are not presented as formal recommendations. They are intended to be used as guiding ideas for participative discussions to inform solutions that will lead to positive and sustainable results. This will be possible by inviting people to be a part of the discussion and the change process.

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A journey without end: Building the capability of the VET practitioner for the future.

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Abstract

The Queensland Skill Plan (2006) outlined a fundamental shift in the way the VET system operates in this state and significant reform to TAFE Queensland. One of the most critical issues for TAFE that will profoundly influence the successful rollout of the Skills Plan involves staff. TAFE will need to train teachers with broader and higher-end sets of skills. Ongoing training is necessary around the delivery of new products demanded from industry. Professional development in product design and electronic learning is necessary for TAFE teachers to build capabilities. This paper focuses how to build capacity through building staff capabilities within the TAFE system.

The release of the Queensland Skill Plan: A White Paper in June 2006 outlined a fundamental shift in the way the Vocational Education and Training (VET) system operates in this state and significant reform to TAFE Queensland. It was heralded as the most significant policy reform in the Queensland VET sector in over 40 years. TAFE Queensland plays a central role in the delivery of VET and is the focus of a number of the Skills Plan reforms. Among the 24 Actions identified in the Queensland Skills Plan intended to transform and modernise the VET system, Action 6 recognised that in order to create a flexible, modern and innovative education and training system, “significant investment must be provided to support TAFE staff to deliver world-class educational outcomes for their students” (p.21). Developing and enhancing the teaching capabilities of VET staff is critical to the successful implementation of the Queensland Skills Plan and the future sustainability of TAFE.

TAFE institutes already have an older teaching workforce than the Australian workforce overall (Callan, 2005). They face the prospect of losing a highly experienced section of the teaching workforce over the next three to five years, whose impending departure endangers the institutes’ skill base. The current trend is to recruit trainers from industry to back-fill positions as they become vacant. The loss of these permanent staff will create a huge chasm of lost knowledge amongst TAFE professionals as we continue to employ casual and contract staff from various industry sectors as trainers. Such staff often
have limited pedagogical knowledge and experience. This situation places strain on the delivery of programs in the VET sector.

This paper examines current major drivers of change in the VET sector. It provides a capability snapshot of existing practices to inform how capacity can be built within the sector. It critically examines issues relating to the development and implementation of a Vocational Teacher/Trainer Training model for professional teachers in Queensland and explores the feasibility of driving a national agenda to develop the VET practitioner for the future.

> Forces of change driving future capabilities

A number of major drivers have made an impact on teaching and learning in the VET sector over the last decade. These include globalisation, the ready availability of a range of information communication technologies (ICTs), the emergence of the knowledge economy, and the consequent need for workers who can create and develop new products and processes. Schofield and McDonald (2005) in discussing the review of VET training packages indicated that there was growing recognition of the needs for innovative, responsive and high-quality approaches to teaching, learning and assessment in VET programs. This was crucial to meeting future challenges and to improving the skills and knowledge of the population.

The TAFE system in Queensland today represents a sophisticated learning system in which the needs of learners, communities and industries are met within the broader context of government policy. There are many challenges currently facing TAFE. These challenges include meeting student and employer demand and expectations, building and maintaining infrastructure, meeting technological change head-on, retraining and developing a highly qualified staff and continually improving access and flexible learning pathways for people to gain skills, confidence and opportunities to be employed.

New challenges for TAFE Queensland staff are constantly emerging and are the result of many drivers. Current drivers affecting TAFE Qld staff include the effects of globalisation of the training market, the need for a ‘different’ type of industry engagement at local, regional and state levels, chronic labour skills shortages in manufacturing and other key economic industries, as well as Queensland’s current economic growth rate, which continues to outstrip all other states. Further drivers of change identified by and Schofield and McDonald (2005) include demographic changes such as the aging of the workforce; changes in the ‘world of work’ and the expectations of workers and employers, including the realisation that we are dealing with an ageing population that makes it more likely that people will stay longer in the workforce. There are new policy directions focusing on the participation and retention of young people and growth of an increasingly diverse customer base demanding new products and services. There is a challenge for TAFE institutes to deal with new competitors in the VET sector. Additionally, the availability of new information and communication technologies impact on how
programs are delivered. Increasingly, sophisticated customers have expectations that products and services will be customised, flexible and workplace-based oriented to meet their individual needs.

Perry (2006) described external drivers for change as being the agendas of Council of Australian Governments (COAG); new Australian Qualifications Training Framework requirements (and ongoing legislative change); government workforce development and planning strategies; enterprise bargaining and award restructuring; the need to focus on partnering; and human resource issues. These all contribute to the new national training environment. Internal drivers are diverse. They include the shrinking recurrent funding budgets, the need to increase institutes’ fee for service business, restructures, and managing a large workforce within which there is a small element of cynicism and boredom. The overarching goals for TAFE Queensland for the future are related to its contribution to Queensland’s economic growth and skills base (Callan, 2005). Such goals are reflected in the Queensland Skills Plan by the 24 actions identified for implementation in order to reform the publicly funded VET system through the restructuring TAFE to meet the forecasted growth in future skill needs.

> Key challenges for VET practitioners

In order to meet the demands of more competitive markets due to the widespread and rapid changes experienced by the VET sector over the last decade, there is a need to be more flexible to meet the needs of changing workplaces and to adopt rapidly evolving global information and communication technologies (ICTs). VET practitioners are expected to deliver in an increasing range of contexts, to construct learning opportunities rather than instruct learners, and to actively maintain their professional currency in a complex constantly changing global ICT environment. Guthrie, Perkins and Nguyen (2006) reported that VET teachers believe that the major factors that will impact on their work in the next five years are new technologies, increasingly competitive training environments, demands for more flexible delivery of programs, and changes to funding arrangements.

The Queensland Skills Plan suggests that an increase in expenditure on ICT infrastructure will enable us to respond to the economic drivers for educational change. However, this suggests that current VET practitioners have the ICT capabilities to embrace and drive this change. Loveless, DeVoogd and Bohlin (2001) stated that “technology doesn’t change practice – people do” (p. 63). The real challenge is to convince teachers of the value of the use of ICT, to sell its worthiness and desire for its use by Generation Y and the Millennials who are digitally savvy. It is necessary to provide our teachers with opportunities that will support a paradigm shift in thinking and practice required for the effective integration of technology into the learning environment.
> **Capability snapshot**

Whilst it is impossible to provide a highly accurate view of the future based on what is happening in other industry sectors, VET professionals will require many new capabilities to operate as knowledge workers in a global economy that is rapidly changing, highly competitive and focused upon knowledge generation and innovation. Developing a profile of existing TAFE staff and their current capabilities and identifying new capabilities required for our future is critical for the successful implementation of the Skills Plan.

Critically, organisational capacity feeds off individual capacity and visa-versa. Stephenson (1992) defined individual capacity as an all round human quality - an integration of knowledge, skills, personal qualities and understanding used appropriately and effectively not just in familiar contexts, but also in response to new and challenging circumstances. There is currently a strong recognition of the need for capacity building within our own TAFE workforce as we, as an organisation, face significant issues with our own ‘aging workforce’. This ‘aging population’ is reflective across all 15 institutes particularly in the trades’ areas where some teams have an average age of more than 55 years. VET teachers in TAFE are, on average, older than VET professionals taken as a whole. Sixty-one percents are aged over 45 years (Callan, 2005).

> **The VET practitioner’s role in the knowledge economy**

It is widely recognised that due to the many drivers of change we need to re-examine how we will work and learn in VET in the knowledge era. Knowledge is not just about accessing more information but about how we learn to select, borrow, interpret, share, contextualise, generate and apply knowledge to our work, on an ongoing basis (Staron, Jasinski & Weatherley, 2006). Our working and learning environments are dynamic and constantly changing which impacts on what we do and how we do it. Because every industry faces constant change, the role of the VET practitioner must also change in order to meet these demands. Callan (2005) identified twelve capabilities required of Queensland VET teaching staff. These capabilities are engaging learners, learner support, planning delivery, ICT, flexible learning, workplace learning, assessment, industry currency, managing relationships, professional development, administration, budgeting and planning.

Callan (2006) identified a number of core capabilities required for teaching staff in order to keep teaching relevant for industry needs including:

- Engaging with employers in partnership to provide more flexible training that is customised to meet employer and learner needs;
- Embracing the use of ICT in our delivery to allow more flexible approaches to learning including acceleration;
- Streamlining skills assessment processes to ensure practical efficient and relevant assessment is undertaken;
• Embed more than present employability skills including the need for literacy and numeracy skills into our training programs;
• Prepare for an expansion of learning choices, as these will continue to increase in volume, range and availability including higher-level qualifications such as vocational graduate certificates and diplomas.

Current communication technologies bring us the immediate availability of a wide range of information from a variety of sources. This environment is often ‘virtual’ and ICT-dependent promoting communications in both synchronous and asynchronous time. Constant innovation and rapidly evolving technological tools are allowing learning to occur virtually ‘in any time and any place’. Lankshear, Peters and Knobel (2002) proposed that we are presently living through a period where the status of knowledge, learning, teaching and researching is in a state of profound upheaval due to the impact of rapid and far-reaching technological change.

The increasing capacity of digital technology to deliver large amounts of visual and text-based information to learners on-demand has raised the expectation of learners for these technologies to be incorporated into learning programs. ICT is transforming the context in which teacher-learner engagement takes place and is leading to more collaborative but also more independent learning which is more self-paced and personalised (Mitchell, Chappell, Bateman, & Roy, 2005). ICTs do not, and never will, replace the need for educators but they do increase the immediate need for people across all sectors to be trained to engage with technology as aspects of their jobs alter (Department of Education, Science and Training, 2005a).

> Building capability

There is a considerable body of research from different Australian states regarding the identification of key challenges and capabilities required by VET staff in the future. What appears to be missing is a comprehensive comparison or benchmarking between states of these findings, producing a definitive list of knowledge and skills required nationally across the vocational sector. With the current national focus on skilling and skills shortages, a national approach to the skills of vocational teaching staff should be integral to any policy.

> Comparisons of capabilities across the national VET sector

Each state has acknowledged the changing role of the VET practitioners in the knowledge economy. It is evident that each state faces similar challenges to Queensland - diverse and widespread training markets faced with a booming economy but lacking skilled practitioners to meet demographic changes and the needs of a dynamic economy. In order to respond to community and industry needs, the VET sector nationally needs to play an integral role in meeting these demands. Each state has
designed their own professional development framework and strategies to assist in the future capability development of its staff. However, this agenda is state focussed (based on individual state research and requirements) instead of being macro and driven nationally, as indicated by the following directions proposed within states. Findings from this literature review indicate that each state recognises the need for building staff capability in order to ensure the future success of VET and the practitioners that work within the sector. Each state has identified similar needs and developed their own frameworks and models in order to meet the challenges of change to VET in Australia.

**Western Australia**

In Western Australia, the Department of Education and Training (2005) developed the *Professional Development Framework 2005/2006 for Vocational Education and Training in Western Australia*. This provides a systematic approach to address the need for professional development amongst VET practitioners. It identifies the skill sets of key groups (Senior Managers of Registered Training Organisations (RTOs), Frontline and Middle Managers, and VET Practitioners). It provides a professional development framework that outlines the goals and systems to support RTOs to meet the challenges of change to VET in Western Australia.

**New South Wales**

In April 2006, New South Wales released the report: *Life Based Learning: A Strength Based Approach for Capability Development in Vocational and Technical Education* (Department of Education, Science and Training and TAFE NSW International Centre for VET, 2006). This report was the result of 12 months of research in the *Designing Professional Development for the Knowledge Era* project. The purpose of the project was to develop a business framework for professional development that assisted and guided workforce planning and development approaches in VET to support new directions in capability development for the VET workforce in NSW.

**Victoria**

In Victoria, there is a recently developed and accredited qualification for VET teachers. This is the *Diploma of Vocational Education & Training Practice* (21697VIC). It is the result of Victorian research, which identified the need for a course designed specifically for TAFE teachers. It provides professional opportunities and contribute to advancement within a recognised career structure (Office of Training and Tertiary Education, 2006). This course meets the requirements of the Guideline on Teaching Qualification Requirements for Victorian TAFE Teachers.

**Queensland**

Queensland does not have a system wide staff capability strategy or significant funds allocated to professional development. The *Certificate IV in Training and Assessment* has been the only mandatory requirement for Queensland TAFE teaching staff for the last 10
years. This has brought a range of teachers into TAFE who have a wealth of experience and talent in their vocational industry field and an enthusiasm to train but it provides only basic training knowledge and has minimal focus on appropriate pedagogy for VET courses. It is necessary that we nurture these teachers current capabilities and identify the new capabilities needed for the future success of the VET sector.

Barriers to capability building in Queensland

Whilst it is acknowledged that there is currently a multitude of opportunities for existing staff to undertake professional development within individual Queensland TAFE institutes, a significant barrier to long-term staff capability is the lack of a formal training programs upon entry to the TAFE system. The demise of the formal ‘beginning teacher’ program occurred in the early nineties. This was a two-year funded program undertaken by industry professionals wishing to enter the VET sector. Is provided valuable human resources to the TAFE system that linked vocational skills and knowledge with formal studies in education. This program provided upwards of 60 trained staff per year into the TAFE system across the state. The linking of a VET qualification to educational qualifications was an essential component of the beginning teacher program. Staff who entered the system (in the last decade) with skills in a particular vocational area may, or may not, have the skills to impart this knowledge (i.e., formal teaching or training qualifications in that particular area). Lack of investment in a formal teacher training program throughout the last decade has not allowed the system to build capability and capacity for innovation.

Throughout TAFE Queensland, there is a large number of delivery and assessment staff who have high levels of vocational skills and credibility in their industry but who hold the minimum educational qualifications (Certificate IV in Training and Assessment) for delivery of training programs. Confusion about the role of TAFE practitioner is also muddied by TAFE award and employment conditions. Qualification requirements for TAFE teachers include having a minimum of five years current industry experience in their area of teaching and the minimum ‘training’ qualification (Cert. IV) has sparked a robust debate in TAFE. There are perceived differences in the capabilities of the ‘professional teacher’ with a teaching qualification and assumed expertise in educational pedagogy, and the ‘industry expert’ with currency in industry skills and a basic qualification in training and assessment practices which does not develop pedagogical knowledge.

The Queensland Skills Plan offers a real opportunity to reconsider the qualifications and training of TAFE staff to determine the range of teaching skills required and the need for industrial relations reforms to meet future staffing needs. Unfortunately, the tight time frame for implementation of the Skills Plan means that the strategies associated with building staff capability will be developed at the same time as they are implementing the reforms, rather than allowing time to prepare staff for the demands of implementation.
Vocational teacher training in Queensland

There is a focus on self-directed and life-long learning in the recently released Skills Plan which illustrates the convergence of general and vocational education and a related convergence between work, education and training, as well as a ‘whole of life’ approach to learning that is personalised and targeted towards individual learning needs. Implementing a strategic model of teacher training across the state will be critical to the Skills Plan imperative of maintaining a highly capable, responsive and flexible TAFE workforce.

A training system can only be as successful as the people who develop and deliver the courses. Effective contemporary training relies on teachers, trainers and assessors being familiar with the latest technology and combining this with current teaching and learning techniques. (Queensland Skills Plan, 2006, p. 15)

An opportunity now exists within the Queensland Skills Plan to build an innovative learning culture that nurtures and develops VET staff undertaking the Certificate IV in Training and Assessment (as part of their Vocational Teacher Training program) to become ‘innovative’ educators. The cornerstone of such innovation will be facilitated by advanced information systems. Providers and institutions must continue to innovate and adopt new technologies and practices to reach out to existing and new learners (Department of Education, Science and Training, 2005c). Vocational Trainer Training has been introduced as a Skills Plan imperative and is designed as a formal teacher-training program that begins the process of knowledge transfer to new teachers by experienced teachers and promotes pathways to assist existing VET teachers to access higher-level qualifications. This is achieved through partnering with Universities to provide articulation into a Bachelor of Training that can be completed as one year full-time study, upon completion of the Certificate IV and the Diploma of Training and Assessment. This will enable our future teachers to also meet industrial relations requirements to allow them to be ‘seen’ and paid as professional teachers under the existing State Award. It should be noted, however, that the completion of the Diploma and Degree components of this model have not been made compulsory in the Skills Plan and must be funded by the individual undertaking the training.

The research and directions from other Australian states on teacher training supports an argument for developing a national framework for the formal training of VET practitioners to ensure a highly qualified workforce. A national framework for formal training of VET practitioners could also provide pathways that may assist experienced VET teachers to access higher levels of qualifications if they desired. Industrial relations reform could assist in eliminating barriers for attracting and retaining new teachers that currently exist under State Awards.
Retaining, developing and renewing organisational capability in TAFE

Perry (2006) identified that retaining, developing and renewing TAFE institutes’ organisational capability will not only involve planned recruitment and the retention of key mature teaching staff to be mentors but also commitment towards ongoing training and developing strategies which help share the critical knowledge that is otherwise lost as highly experienced teachers leave the VET sector.

Developing a knowledge culture

There is an urgent need to provide appropriate formal teacher training for industry professionals entering the VET teaching workforce and also a need to place more emphasis on the development of advanced pedagogical skills and skills for reflective practice for experienced VET practitioners (Guthrie, Perkins, & Nguyen, 2006). Clayton, Fisher and Hughes (2005) noted that teachers must have their vocational competencies sustained by training and re-training in industry as well through ongoing professional development and mentoring.

The current shift to non-traditional methods of course delivery requires the acquisition of pedagogical skills within a technology-enhanced teaching arena. Educators must take account of and use the changed educational landscape when designing instructional content for the changing vocational education ‘adult’ learning environment. Stephenson and Coomey (2001) proposed that the basic elements of good teaching can be represented as dialogue, involvement, support and control and that these elements seem constant across different learning environments. Good teaching through important learning principles involves:

- Making the content of the subject genuinely interesting and relevant;
- Recognising that learners must be engaged with the content of learning in ways that are likely to enable them to reach understanding;
- Recognising that learners learn in different ways but each method should include problem solving, question asking, cooperative learning and practical activities;
- Setting appropriate assessment tasks and using a variety of techniques to discover what learning has been achieved;
- Ensuring a safe, supportive environment exists for the learning to take place.

Educational renewal is a major imperative for the teaching workforce within TAFE institutes over the next five years. TAFE Queensland is faced with an ageing teaching workforce, many of whom are likely to retire within the next five years taking with them their considerable technical and teaching expertise as well as organisational knowledge. Knowledge transfer to support the retention of critical knowledge requires knowledge...
sharing between experienced and new staff. This is critical for the renewal and sustainability of the TAFE teaching workforce.

> The way ahead

This review has briefly explored some of the key drivers and changes in the VET sector in Australia that have impacted upon VET professional practitioners. The Queensland Government has acknowledged the importance of the VET workforce in the recently released Queensland Skills Plan. The model for development for the VET workforce is useful to consider to inform possible directions for Queensland, as well as nationally.

The Victorian government acknowledged the importance of the VET workforce in contributing to positioning Victoria as “knowledge and innovation-based economy” (Department of Education, Science and Training [DEST], 2006, p. 9). The Victorian government commissioned Monash University to conduct a comprehensive review of existing qualifications that support teaching and learning practice in the VET environment throughout Victoria. This review identified more than 40 existing courses in the field of education/vocational education. In 2004, an industrial relations certified agreement for Victoria was ratified that established “qualification requirements that entitled a TAFE teacher to progress to the top of the incremental scale for teachers and to be eligible for appointment to the Senior Education classification” (DEST, 2006, p. 9). A qualification that met the relevant standards was specifically designed for Victorian TAFE teachers that provided for professional growth within a recognised career path. The mandatory introduction of such a qualification across the VET sector at a national level would encourage teacher attraction and retention throughout the sector for two reasons. It was designed specifically for VET professional capability building and introduced the accompanying IR reforms needed to remove barriers to pay scales for industry professionals wishing to enter the sector.

The Queensland Skills Plan has not dealt comprehensively with either of the two issues identified above: a mandatory VET teaching qualification for all TAFE teachers entering the sector or reform to the existing industrial relations conditions that are a major barrier in attracting and retaining quality professional practitioners currently in the Queensland VET sector.

> Conclusions

There is no doubt that TAFE professionals will require many new capabilities to operate as knowledge workers in a global, networked economy that is rapidly changing, highly competitive and focused upon knowledge generation and innovation. The Queensland Skills Plan acknowledges that a major asset of TAFE Queensland is its people. The combined skills, expertise and experience of TAFE staff have been the foundation of the strong past achievement record in the TAFE sector in responding positively to changing demands and circumstances of the Queensland workforce and its industries. Retaining,
developing and renewing TAFE institutes’ organisational capability is essential if TAFE is to meet the complex challenges of the 21st century global training market.

This paper has argued that new teachers need to be given time to understand the VET sector; to be mentored and coached in order to develop new pedagogy; to build capabilities around more innovative teaching and assessment approaches, as proposed by Mitchell, Chappell, Bateman and Roy (2005). TAFE teachers need to understand their learners, their various learning styles, employ innovative teaching strategies and new learning technologies. New approaches to assessment need to be adopted as well as new roles including teacher as mentor, teacher as facilitator, and teacher as learning manager. Perry (2006) suggested that TAFE Institutes need to draw more upon processes used in other educational sectors and organisations to maintain their skill base. Research on vocational teacher training models, supports an argument for developing a national framework for the formal training of VET practitioners to build staff capability. Such an approach however, needs to be properly resourced and supported by funding bodies, policy-makers, TAFE management and the teachers.

> References


Effective professional development for 21st Century Vocational Education and Training Teachers

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Abstract

In order to implement training reform the Queensland Government, has committed substantial funding towards the professional development of VET teachers. This report reviews current literature and government reports relating to the effectiveness of professional development practices to achieve sustained changes to the classroom practices of teachers. A number of barriers and problems exist that prevent or limit VET teachers from engaging in professional development. An examination of these issues leads to the recommendation that organisations must develop a professional learning culture if they are to improve the quality of professional development and its outcomes.

The only thing that many teachers gain from most professional development experiences is the nice morning tea and a chat with colleagues. The notion that teachers can be taken out of a classroom for a day or two, ‘sold’ an innovation, a new teaching strategy or a new technology, and then sent back to the classroom and be expected to change their teaching practices is unrealistic. Research has indicated that this is not an effective approach to bring about change in practices (Gold & Powe, 2001; Knight, 2002, Boyle, While & Boyle, 2004).

The heart of every educational reform involves changing the classroom practices of teachers and improving the outcomes for students (Guskey, 1986). The recently released Queensland Skills Plan is no different. The goal of the Queensland Skills Plan is to implement a flexible and innovative education and training system (Department of Employment and Training, 2006). It proposes some major changes to the classroom practices of Vocational Education and Training (VET) teachers. In implementing the Queensland Skills Plan, we must avoid the temptation of throwing money at ‘one-off’ professional development events in a futile attempt to affect change in the classroom practices of teachers.

Researchers, administrators and those charged with putting together professional development programs need to realise that teachers are in a powerful position as ‘gatekeepers’ of educational innovations (Cuban, 2001; Luehmann, 2002; Ward, Robinson & Parr, 2003). It is teachers who decide whether a particular innovation has
merit and will be implemented in their classroom. Therefore, it is important that those charged with implementing educational reforms have an understanding of the process and motivation for teacher change.

This paper draws on a broad range of literature and government reports related to professional development in education and building staff capabilities in the Australian VET sector. It provides an overview of current VET professional development practices and examines the barriers unique to the VET sector that prevent teachers from participating in professional development. It explores the key factors that make professional development more effective and the conditions that must be present in an organisation to affect real changes in the classroom. The paper proposes a fundamental shift from a focus on professional development to the development of a continuous professional learning culture within VET. If the Queensland Skills Plan is to become more than just a nice idea, it is vital that the professional learning planned for teachers is relevant, effective and viewed as a strategic activity for implementing change and innovation.

For the purposes of this paper, professional development events refer to workshops, conferences and lectures. Professional learning is defined as the continuous formal and informal learning activities undertaken by teachers to enhance their skills and knowledge for teaching their area of expertise. Pedagogical practices refer to the strategies that teachers use to facilitate learning in the classroom.

> **Current state of VET professional development**

The Commonwealth Government’s drive for a national standardised delivery of VET programs gave rise to the Australian Quality Training Framework (AQTF) (Department of Education, Science and Training, 2005b). Compliance with the AQTF standards and the passing of AQTF audits is required by government and private VET providers. The implications of not meeting compliance obligations are serious and can result in the suspension or cancellation of a VET provider’s registration to deliver programs. As a result, a primary focus of professional development in the VET sector is compliance training. This compliance training is given priority, often at the exclusion of all other forms of professional development including the updating of industry knowledge and development of pedagogical and technological skills (Harris, Simons, Hill, Smith, Pearce, Blakeley, Choy & Snewin, 2001). This narrow focus on compliance training is a real issue when attempting to improve the quality of teaching and learning.

The Certificate IV in Training and Assessment has become the primary qualification required for teaching in VET in Queensland. This qualification focuses on compliance and meeting the AQTF requirements. It does not focus on teaching, curriculum design, and pedagogical skills. Unlike the primary and secondary education sectors, the majority of teachers who enter the VET sector do so without any university qualifications in teaching. Currency of industry skills and knowledge is more highly valued by accreditation bodies and VET employers than teaching skills. There is a general acceptance that teaching
expertise can somehow be developed on the job (Simons & Harris, 2001).

An Australian study conducted by Harris et al. (2001) into the changing role of teachers and trainers in the VET sector, and a subsequent Queensland report by Callan (2006) to identify a set of core capabilities required for all staff working in TAFE Queensland, identified the major challenges facing VET teachers. These challenges are:

- Operating in a competitive environment;
- Keeping current with VET program and delivery changes;
- Implementing programs with flexible delivery;
- Understanding and working with training packages;
- Using technology.

Scholfield and McDonald (2004) emphasised the need to focus on building the capacity of teachers instead of a strict focus on compliance training. Yet, two of the five major challenges identified by Harris et al. (2001) and Callan (2006) are related to compliance issues.

The report by Harris et al. (2001) paints a bleak picture of the capacity of VET teachers to meet the significant challenges that face the sector. Stakeholders interviewed in the research believed that only half of the current teachers had the necessary attitudes, knowledge and skills to improve the quality of VET education. This has significant implications for professional development, particularly when considered in conjunction with the aging population of teachers in this sector. Forward (2005) reported that 61% of VET teachers in 2001 were aged 45 years or over. This is an increase from 48% in 1998. As older teachers begin to retire, the VET sector is increasingly going to lose skills and expertise. Professional development that allows older VET teachers to share their knowledge and expertise with younger teachers is critical to insure against a loss of expertise in the VET sector.

Clearly, professional development must play an important role in meeting the challenges that lie ahead for VET teachers. The Queensland Skills Plan (2006) acknowledges that "training can only be as successful as the people who develop and deliver the training course" (p. 15) and, as such, is set to invest significant money in developing the whole teacher rather than a narrow focus on compliance.

> **Barriers to teacher professional development**

The Queensland industrial award for permanent and contract teachers provides for 10 days annual professional development for permanent and contract teachers (Department of Employment and Industrial Relations, 2003), yet surprisingly many teachers are not taking their entitlement. Australian reports (e.g., Callan, 2006; Harris et al., 2001; Simons & Harris, 2001) examining professional development in the VET sector have identified five barriers that prevent or limit the amount of professional development teachers undertake:
• Access to professional development;
• Cost of professional development;
• Organisational culture;
• Geographical barriers;
• Teacher workload.

**Access to professional development:** The VET sector is built on a highly casualised workforce (Dickie et al., 2004; Harris et al., 2001; Stehlik, 2003). Casual teachers in TAFE, according to the industrial award, are not entitled to professional development funded by Institutes. In order for casual teachers to participate in professional development events they must organise and self-fund the cost of professional development, and undertake the training in their own time (Harris et al., 2001). For these teachers to attend training programs, many must sacrifice their wages as they cannot earn income whilst attending these courses. This is a significant barrier to engaging in professional development for the majority of casual staff who must carefully evaluate the worth of each professional development event.

**Cost of professional development:** The high cost of professional development events and the associated costs of replacing a teacher while they are attending professional development programs stretch the limited budgets for professional development. Therefore, professional development is not usually adequately funded by the VET sector.

**Organisational culture:** Callan (2006) found that there was a “lack of motivation among some teachers to participate in professional development due to their low levels of morale, high levels of organisational cynicism, and beliefs that they have nothing further to learn” (p. 18). Lack of support and encouragement by management for professional development, especially informal professional development, is also seen as a barrier for teachers.

**Geographical barriers:** Most professional development events are conducted in capital cities or in major centres. This geographical barrier makes it difficult for teachers in remote centres to get access to professional development. The costs involved in travel and accommodation add an even larger burden to the limited funds available for training.

**Teacher workloads:** Skill shortages in Australia mean that VET teachers are under increasing pressure to deliver training to more students in shorter periods of time (Department of Education and Training, 2006). Employment opportunities also result in teachers opting to return to industry, placing increased demands on the remaining teachers to teach more classes. Harris et al. (2001) report that increased workloads is the most critical factor in preventing teachers from undertaking professional development. VET teachers who undertake professional development must attend in their own time or organise their own replacement. The effort required by teachers to attend professional development events makes them question the value of the training.
Teachers play a major role in the implementation of any educational reform and professional development for teachers is viewed as the most effective way of implementing top-down changes within the VET sector. Unless the barriers that block teachers from participating in professional development programs are lifted, we cannot hope to improve the quality of VET education in Australia.

> The importance of professional development for VET teachers

The role of VET teachers is under attack from a constant barrage of changes and educational reforms that shows no signs of abating. Over the past decade VET reforms have resulted from significant changes in government policies, as well as changes in the nature and expectations of students. Factors of importance include the opening up of the VET training sector to competition; the introduction of a national VET curriculum; demands by students and employers for more flexible and faster delivery of training; new means of communication and global competition being driven through technology. These have all affected the work performed by VET teachers and are outlined in Figure 1.

**Figure 1: Changes impacting on VET teachers**
Against the backdrop of all these changes, effective professional development is seen as a mechanism for helping teachers to keep pace with change (Guskey, 1986; Ingvarson, Meiers, & Beavis, 2003; Knight, 2002; Queensland Skills Plan, 2006).

In an era of change and rapid obsolescence of knowledge it becomes clear that initial teaching training, industry knowledge and skills have a short shelf life (Doring, 2002; Knight, 2002). As noted by Sparkes and Hirsh (1999; cited in Gold & Powe, 2001), “We cannot expect teachers to teach what they don’t know, nor to use yesterday’s training to prepare today’s students for tomorrow’s future.” (p. 4). Ongoing effective professional development must be given a priority by administrators if teachers are to meet the demands of a constantly changing world. The question remains whether current approaches to professional development are effective in making sustainable changes to the classroom practices of teachers.

> What is wrong with current approaches to professional development?

Current approaches to professional development usually consist of ‘one-off’ workshops, seminars or lectures conducted over a period of a couple of hours or perhaps days. These professional development events are often conducted by outside ‘experts’ who are often far removed from the classroom and who have no knowledge of the local conditions present within an organisation (Richardson, 1990). Professional development events of this nature have come under criticism for a number of reasons.

The first criticism is that the ‘one size’ and ‘one pace fits all’ approach to professional development fails to acknowledge teachers as adult learners. Teachers arrive at professional development events with a vast array of prior experiences, skills and knowledge. Yet, rarely is there any attempt to draw on this expertise or to customise the professional development to meet the specific learning needs or styles of teachers. In the majority of cases, teachers at these events are passive recipients of knowledge. However, this approach is in conflict with the research conducted by Ingvarson et al. (2003) who found it was vitally important for teachers to be actively engaged in their learning. Furthermore, Rogers (2001) and Gold and Powe (2001) suggest that a ‘one-pace fits all’ approach is not an effective way for adults to learn. In spite of all the research into effective student learning, professional development practitioners continue to use antiquated teaching methods for teacher development. Clearly, this type of approach to professional development is unable to sustain the development of VET teachers in the 21st century.

The second criticism is the reliance on professional development events. Informal types of professional development, such as self-directed learning, collegial collaboration, mentoring and learning communities are not recognised as acceptable professional development models (Knight, 2002). This is in contrast with research conducted in the United States and emerging trends in the United Kingdom that shows job-embedded
collaborative professional development is significantly superior to traditional professional development events (Boyle, White & Boyle, 2004). Until more research is conducted into the effectiveness of ‘informal’ professional development activities, the attitudes of administrators are unlikely to change.

Increasingly, current approaches to professional development are being criticised for their failure to significantly transform the classroom practices of teachers. Meyer (1988; cited in Richardson, 1998) estimated that only 15% of teachers implement what they have learned through attending professional development events. This leaves a staggering 85% of teachers attending professional development events being unaffected by the experience or implementing any changes in practice. The question remains, if this approach to professional development has such limited impact on the classroom practices of teachers, why do we still persist in using ‘one-off’ professional development events as the primary means of professional development for teachers?

The current approach to evaluating the effectiveness of professional development usually involves the completion of a participant evaluation form at the conclusion of the professional development event. This type of evaluation provides only superficial feedback from participants and does not evaluate the extent to which the professional development event has impacted on the practices of teachers (Wilson & Berne, 1999). In-depth and longer term empirical research is needed to improve the effectiveness of professional development programs in the VET sector.

Lack of adequate time is yet another criticism of professional development in the VET sector. In their longitudinal study of primary and secondary teachers across England, Boyle et al. (2004) found that not enough time was allocated to ensure that knowledge and skills gained through professional development are consolidated, implemented and shared with others. Richardson (1990) also identified the critical importance of teachers needing time to experiment and reflect on the knowledge and skills gained at professional development events. Anecdotal evidence recently collected from teachers at Southbank Institute of Technology also indicates that lack of time to experiment is a major barrier to changing classroom practices.

Current approaches to professional development are further criticised because of a lack of follow-up support for teachers after the professional development event. Ingvarson et al. (2005) found in their evaluation of professional development programs for teachers that effective professional development provides ‘at the elbow support’ for teachers during the critical implementation phase of change.

With all of these criticisms, it is widely accepted that the current approaches to professional development are ineffective in making sustainable changes to the classroom practices of teachers (Gold & Powe, 2001; Guskey, 1986; Knight, 2002; Wilson & Berne, 1999). Guskey (1986) argued that this is primarily due to the failure to recognise two key factors - the level of motivation for teachers to engage in professional development and the process of teacher change.
The motivation for teachers to attend professional development events varies significantly depending on whether professional development is imposed or whether teachers attend voluntarily. Harris et al. (2001) found that teachers in the VET sector attend professional development events often at their own expense and in their own time in order to enhance their long-term job prospects and to remain current with changes in their discipline, industry and teaching knowledge. Research conducted by Guskey (1986, 2002) found that the main reason teachers attend professional development is that training is viewed as a vehicle for becoming a better teacher and improving student outcomes.

An understanding of the motivation of teachers to attend professional development can be used as leverage to enhance the overall effectiveness of professional development programs. Professional development programs should build upon teachers’ existing motivations and be made relevant to meeting the specific learning needs of individuals.

> Teachers and change

In general, there is a lack of understanding of the process of teacher change. There is a widespread perception in education that teachers are reluctant to change. Richardson (1998) suggests that teachers resist change that is mandated or imposed upon them, usually by people who are very removed from the realities of the classroom.

Research indicates that teacher change happens voluntarily over a period of time (Guskey, 2002; Knight, 2001; Richardson, 1998). Knight (2001) reported that the changes teachers make are incremental and tend to be minor adjustments to their practices rather than wholesale changes. However, it must be realised that over time, the multiplying effect of these small changes will result in significant changes to the classroom practices of teachers. An understanding of the incremental nature of teacher change identifies why current approaches to professional development do not show immediate significant changes to the classroom practices of teachers.

Professional development activities traditionally try to initiate change in the beliefs and attitudes of teachers towards an innovation. This model is based on the premise that if a teacher can see the value of the innovation, how it will change student outcomes, or make their job easier, then they will adopt the new practice in the classroom (Figure 2).

![Figure 2: Traditional teacher change model](image-url)
Guskey (2002) proposed a different model of teacher change. In this model, it is the actual experience of successfully implementing an innovation resulting in improved student outcomes that changes the beliefs and attitudes of teachers towards an innovation, and this change consequently results in a change to classroom practices (Figure 3).

**Figure 3: A model of teacher change (Guskey, 2002, p. 383).**

This model of teacher change is seen as developmental and based on experiences in the classroom. Guskey’s model of teacher change would appear to highlight the critical importance of providing support to teachers during the implementation stage of an innovation. Research indicates that teachers reflect and evaluate the effectiveness of new approaches and quickly make a decision whether to adopt new practices dependent on whether they see immediate benefit to student outcomes (Guskey, 1986; Knight, 2002; Richardson, 1990, 1998).

Understanding the motivation of teachers to attend professional development and the process of teacher change can help organisers and developers of professional development for VET teachers make professional development more effective.

Seven principles for effective professional development

The aim of professional development is to affect changes in the classroom practices of teachers. Clearly, there are a number of barriers and shortcomings of current approaches to professional development in the VET sector. What can we do to make professional development more effective? An examination of current literature identifies seven features of effective professional development.

**Institutional Support**

Institutional support for professional development is critical. Without leadership and commitment from the top, the structural and cultural changes needed to transform current approaches to professional development in the VET sector will fail to eventuate. Institute leaders must demonstrate that they value continuing education for everyone within the organisation, including themselves, by providing incentives such as the provision of time and funding to develop staff capabilities (Gold & Powe, 2001; Richardson, 1990).

Professional development can be viewed as a strategic activity. A planned and developmental approach to professional development, similar to the practices in the
corporate world, is needed. Wilson and Berne (1999) suggest that teachers need to own and control their professional development. Gold and Powe (2001), in contrast, advocate that professional development should no longer be an individual responsibility but rather a joint responsibility between an institution and the teacher. Guskey (2000) supports the view that teachers need to have input into the planning and development of their learning.

Continuous professional learning

If long-term sustainable change to the classroom practices of teachers is the aim, then the most significant factor in achieving this aim is the need for learning to be continuous. Teachers themselves must become lifelong learners, where the process of continuous learning over the course of their career is embedded into their role as a teacher (Doring, 2002; Gold & Powe, 2001; Salpeter & Bray, 2003). Boyle et al. (2004) found in their study of schools in the United Kingdom that if professional development had a substantial number of contact hours and was sustained over a period of time, then it had a stronger impact on teaching than one-off professional development events. Teachers cannot be expected to squeeze professional learning around all of their other duties. Institutions need to provide adequate learning time to facilitate engagement in professional development activities.

Related to the classroom

Opportunities for teachers to share ideas and classroom experiences with colleagues is what teachers like most about attending professional development events (Guskey, 1986). Teachers need to see ‘real-world’ examples of classroom practice as well as have the opportunity to work on ‘hands-on’ activities and projects that they can take directly from the training course and use in their classroom.

Individualised learning

Effective professional development needs to be learner-centred. The ‘one size fits all’ approach to professional development is not effective in meeting the needs of all participants (Gold & Powe, 2001). McRitchie (2003) found that when training is customised it is more productive. Empowering teachers to be involved in the planning of their professional learning provides scope for learning to be truly individualised. Unstructured time for reflection and self-directed learning opportunities are important aspects of individualising training.

Follow-up support

It is essential that teachers be provided with follow-up support after attending professional development. Few teachers can move directly from a professional development event to the classroom and implement with success (Guskey, 1986). Salpeter and Bray (2003) have found that regular visits to the classroom following
professional development events provide the support that teachers need to translate what they have learned into practice. Gold and Powe (2001) in their research found that when follow-up occurred, 50% of participants tried to use what they learned at training, with a third of participants reporting that they actually implemented changes. Follow-ups provide opportunities to reinforce new knowledge and skills and build teachers’ confidence to make changes. Failure to provide follow-up support results in a loss of the momentum to implement changes in practices.

**Mentoring**

Changing classroom practice is greatly enhanced with the support of a mentor to guide, discuss and advise how changes can be implemented. Guskey (1986, 2002) emphasised the importance of teachers knowing that they have assistance readily available if problems arise or unexpected results or difficulties occur. Coaching, personal hands-on support and feedback on classroom practice has long been recognised as a vital requirement for professional development programs (Ingvarson et al., 2003).

**Collegiality**

Teaching, by its very nature, is traditionally a very isolating activity that normally takes place behind a closed door. Doring (2002) suggests that the interaction between teachers is an important form of learning for professionals. Subject departments are a prime site for professional development. Through informal interactions, teachers can share their knowledge, experiences and strategies with others (Knight, 2002). The challenge for institutes is to change the structure of the organisation to provide opportunities for teachers to collaboratively work and learn together.

Ideally, all of the above elements should be present for effective professional development.

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> **The way forward: Creating a professional learning culture in VET**

With the competitiveness of the global economy and information era we can no longer continue to use last century’s approaches to professional development. Change in the nature of education is inevitable and the pace of change is unlikely to diminish. In order for teachers to keep pace with change, an entire cultural revolution is needed in the way VET organisations are structured and in the attitudes of teachers and administrators towards professional development. We need to borrow some ideas from the corporate world and begin investing in the planned, proactive, continual development of teachers over the course of their careers. A change in focus needs to be made from a professional development culture to a professional learning culture where continuous learning becomes integrated into the role of the teacher. A deeper analysis of how this could be addressed and implemented in VET organisations is an area for further investigation.
The pace of change and the increasingly unpredictable and dynamic training market is driving the need for a shift in focus from a training culture to a learning culture. Many organisations are beginning to recognise that in order to remain competitive in the 21st century their competitive edge lies with the intellectual capital of their staff. In order for the VET sector to move forward it is proposed that VET organisations embrace and value a professional learning culture as a means of developing staff capabilities.

A professional learning culture is built upon the seven principles of effective professional development discussed in the previous section. A position is proposed that views professional development events as only one of an extensive range of formal and informal strategies for developing the capacities of staff. Learning in a professional learning culture is viewed as a continuous process, not an event. Teachers in such an environment are actively engaged in their learning and the construction of new knowledge; this learning culture is diffuse across the organisation. Collegial collaboration, networking and problem solving are encouraged and fostered by effective leadership. Learning is integral to the role of the teacher and is viewed as a natural extension to their work, so that the lines between work and teachers’ own learning are blurred.

The nature of a professional learning culture represents a move away from a sole reliance on professional development events but opens up opportunities for more informal, but planned, forms of professional development such as observations of other teachers’ classrooms, shared learning forums, ongoing collegial collaboration, planning for self-directed learning, formation of networks and learning communities.

The transformation from a professional development culture to a professional learning culture would represent a cultural shift for VET organisations. Such a transformation, like the process of teacher change, may evolve incrementally, but evolve it must.

**Footnote**

Based on this literature review, funding for a pilot professional development program at Southbank Institute of Technology in 2007 has been granted by Institute management. The program will enable 16 teachers across the institute to be released for one day per week from their teaching duties in Semester 1, 2007 to develop their eLearning capacity. The program has been developed based on the seven elements for effective professional development. Depending on the effectiveness and sustainability of changes to the practices of teachers and support of institute management, this could be the start of a professional learning culture at Southbank Institute of Technology.
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Embedding Employability Skills in Queensland VET: Possibility or Pipe-dream?

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Abstract

The Queensland Skills Plan requires employability skills to be incorporated into training delivery to address the needs of industry for flexible, multi-skilled, productive workers. The policy neglects to consider the important role of teachers in this agenda. This paper focuses on the impact on teaching staff of the introduction of employability skills into VET Training Packages. Acceptance by teaching staff is crucial to the success of the initiative. The paper reviews the introduction of generic skills into VET courses internationally and also from an Australian perspective. The paper considers the key role of teachers in this policy direction to integrate a generic skill focus into their teaching. In order to move the rhetoric toward reality on the incorporation of employability skills, appropriate professional development for Queensland VET teachers must be planned and resourced to meet the expectations of the Queensland Skills Plan.

Equipping workers for the challenges of globalisation and the knowledge economy has been identified as a key role for the Vocational Education and Training (VET) sector in the 21st century. The Organisation for Economic Co-operation and Development (OECD) argued that, to operate in current environments and overcome the gap between new technologies and current workplace practices, industry requires workers who, in addition to technical skills, have highly developed generic and transferable skills which optimize individual productivity (Rychen & Salganik, 2003).

Policy-makers in Australia have, at various times, considered embedded and stand-alone approaches to the inclusion of generic skills in training. The most recent iteration is the evolution of ‘employability skills’, which have been defined by the Australian Chamber of Commerce and Industry (ACCI) and the Business Council of Australia (BCA) (2002) as: “skills required not only to gain employment, but also to progress within an enterprise so as to achieve one’s potential and contribute successfully to enterprise strategic directions” (p. 2).

In the Australian national training system, industry define the skills, knowledge and attributes required for effective performance through nationally agreed statements.
called ‘competency standards’ (Department of Education, Science and Training, 2005). These standards are shaped into units of competency which form the basis of all VET Training Packages. Although the dimensions of competency are defined, and cover all aspects of workplace performance, the focus of much VET training in practice has been on technical skill acquisition rather than generic or employability skill development (Clayton, Blom, Meyers & Bateman, 2003). Recently, the Department of Education, Science and Training (DEST), commissioned a report to investigate the introduction of employability skills into VET programs. This resulted in the report, *Employability Skills for the Future* (Allen Consulting Group, 2006). The National Quality Council decided that, from 2007, as national Training Packages were developed or reviewed, employability skills as identified in an Employability Skills Framework would be embedded into all units of competency in VET Training Packages.

The employability skills agenda is strongly reflected in the Queensland Skills Plan (Department of Employment and Training, 2006). This policy document focuses on the positive impact this strategy will have on the external clients of the training system (i.e., students and industry). It does not appear to consider the complexity of the learning required, or the implications of its introduction on internal customers (i.e., teaching staff). It is unlikely that teachers will embrace changes in practice mandated from above or that the mere inclusion of employability skills into units of competency will generate the results the Skills Plan desires. Teachers must be convinced of the value of incorporating employability skills into the planned learning experiences for their students and have the confidence in their ability to incorporate them into their teaching and learning strategies, if the initiative is to move from a pipedream to a reality.

This paper focuses on the implications of embedding employability skills in Queensland VET programs, particularly in relation to the impact on teaching staff whose acceptance is crucial to the success of the initiative. This report will establish the background to the current situation by reviewing generic skills implementation into VET courses, internationally and nationally. It will identify issues raised by the research and make recommendations to support the implementation of the employability skills agenda in Queensland.

> **Generic skills implementation**

**International experience**

Internationally, generic skills are identified by numerous terms including ‘key skills’, ‘key competencies’, ‘core skills’, ‘basic skills’, ‘essential skills’, ‘employability skills’ and ‘employment know-how’. Regardless of the nomenclature, in the late 1990s, many countries revisited their models of generic skill development in their deliberations about building a workforce that could respond effectively to the challenges of internationalisation and globalisation. Progress was informed by the reports sponsored through OECD, such as the *Definition and Selection of Competencies: Theoretical and*
Conceptual Foundations (DeSeCo, 1997). This report identified competencies required of individuals to contribute to productivity and market competitiveness and support innovation in a world dominated by global competition. DeSeCo also recognised a broader social agenda in the importance of the development of generic skills in order to increase individual participation in democratic institutions, support social cohesion and justice, and strengthen human rights and autonomy (Rychen & Salganik, 2003). Such reports stimulated a range of responses from countries across the globe.

In the United States for example, generic skills were promoted as ‘elements of workplace know-how’ and recommended for inclusion in the school curriculum to address high youth unemployment (Secretary’s Commission on Achieving Necessary Skills Report [SCANS]; cited in Turner, 2002). Later the 21st Century Workforce Commission reignited the debate, amid concerns about competitiveness of industry, to develop a focus on lifelong learning for all workers (Curtis, 2004). Similarly in Canada, a set of ‘essential skills’ were identified to prepare students for employment within the Essential Skills Research Project initiated in 1994. This initiative evolved into the Employability Skills 2000+ Program which focused on a much broader set of skills and the need for work-focused learning opportunities for students to develop usable and transferable skills (Jackson, 2006).

Alternatively, in the United Kingdom, generic skills training in VET was provided in two different settings, through a National Vocational Qualification (NVQ) and in Enterprise Education Programs. The key skills NVQ provided specific training and assessment (separate from technical skills) in a set of core skills designed to assist new entrants to the workforce. This approach was opposed by industry which questioned the validity of a certificate in generic skills, criticised the strong assessment focus, demanded more integrated, flexible approaches, and a concentration on more attitudinal-based skills (Curtis, 2004; Hyland, 2006; Pumphrey & Slater, 2003). In response to industry demands, Enterprise Education Programs were trialled which focused on the development of generic skills by involving students in the design and management of business projects where generic skills were integrated into their learning and assessment and grounded in workplace expectations. This approach was judged more successful in developing generic skills than through the NVQ pathway but was criticised as focusing on only one sector of the workforce - entry level workers (Davies Review, 2002; cited in Turner, 2002).

Australian experience

Similar to other countries (US, Canada and UK), in Australia the scope and definition of generic skills have changed over time. Interest in generic skills was first identified in the 1980s and 1990s (Finn Review, 1991; Quality of Education Review Committee, 1985), and the focus resurfaced in 2002 with a report from the Australian Chamber of Commerce and Industry and the Business Council of Australia commissioned by DEST, culminating in the embedding of employability skills into national Training Packages.
from 2007. Generic skills have evolved from a very narrow list of core skills focusing on entry level workers, into the current Employability Skills Framework. This framework incorporates previously identified competencies (communication, teamwork, problem solving, planning and organising, and technology), includes personal attributes (relating to self-management, learning to learn, initiative and enterprise) and has a broader application to support progression within enterprises as well as entry level capabilities (Allen Consulting Group, 2006). DEST have commissioned the development of a set of professional development materials to assist Registered Training Organizations (RTOs) identify their responsibilities in the design of training in relation to the delivery of employability skills. However assessment and reporting requirements have not yet been identified (Allen Consulting Group, 2006).

These directions in international and Australian policy focus on the importance of the joint responsibility of employers, teachers and individual learners in fostering the development of generic skills. Policy directions identify three key issues to be addressed in implementation: the promotion of generic skills, the provision of teacher capability building programs to implement programs to incorporate generic skills, and the clear definition of a workable assessment and reporting framework.

> Implementation issues raised in the research

There is general agreement that, to-date, initiatives introduced to build generic skills have not been effective. This has resulted in VET approaches to generic skills training being undervalued by teachers, learners and employers and does not auger well for the introduction of employability skills in Australia (Curtis, 2003; Down, 2003). Researchers (Clayton et al, 2003; Jackson, 2006; Julian, 2002; Pumphrey & Slater, 2003) stress the importance of raising the profile of generic skills by actively promoting their value for both large and small business operations particularly when businesses are seeking to move into new markets or improve service quality. Related to this is the need to change the perception that generic skills align with entry-level worker aspirations since research indicates that demand for generic skills is particularly high at managerial, professional and paraprofessional levels (Curtis, 2004; Leroux & Lafleur, 1995; Tumer, 2002). Also to be addressed is the recognition of the complexity of learning activities that can promote the development of generic skills and, consequently, the need for highly skilled teachers to implement the generic skills framework.

Innovative teaching strategies, the involvement of employers and workplaces in learning activities, and the attitudes of teachers are identified as key success factors for generic skill implementation. Cornford (2005) and Dawe (2002) emphasised that students must acquire conceptual, technical and generic skills and adapt and apply knowledge to new and different contexts to operate effectively in a workplace. They noted that this transfer of learning is a complex process and to be successful requires a variety of learning experiences facilitated by experienced and confident teachers. In order to
meet employer demands for generic skill outcomes to be reliable indicators of capability in the workplace, it is necessary to firmly base generic skills training in the context of technical skill development and to explicitly teach strategies to enhance transferability of skills across contexts (Clayton et al., 2003). Other researchers (Callan, 2003; Curtis, 2005; Denton, 2005) identify the importance of training design which accounts for the interdependence of generic skills and technical skills so that they are taught and assessed in ways which treat them as having equivalent value to technical skills.

Effective training in generic skills, therefore demands highly skilled teachers, who can confidently utilise adult learning principles and align learning experiences to workplace competency expectations. In these learning environments, the teacher works as an enabler or coach to encourage students to link real life experiences in training, workplaces and social activity to generic skill development. Strategies must support the development of students as self-directed learners, empowering them by providing opportunities for them to take responsibility for their own learning and to make their own choices. Denton (2004) recognised the difficulties associated with the design of assessment and suggests that generic skill development would be encouraged if teachers adopt the role of a validator of student collated evidence rather than as an examiner of a teacher-directed evidence collection.

The difficulties associated with measuring and reporting generic skills are significant barriers to effective development of generic skills within learning programs (Dawe, 2002; Down, 2003; Williams, 2005). Consistency in competency-based skills assessment in VET has been identified as a key concern of public and private providers across the nation (Booth, 2000, Clayton, Roy, Booth, & House, 2004, Maxwell, 2001). The requirement for teachers to assess additional criteria in the form of generic skills increases the complexity of both delivery and assessment in learning environments where there is already a recognised need for capacity building of current staff. Many TAFE staff have been recently recruited from industry and have minimal training skills (Callan, 2003). There is a responsibility for government policy to provide practitioners with a clear direction on how generic skills should be delivered and assessed, and to identify a framework for reporting and certification. This must be supported by well designed, clearly articulated comprehensive and readily accessible information for learners, assessors, employers and other stakeholders.

> The Queensland context

The Queensland Skills Plan, released in 2006, provides a policy framework designed to shift VET structures and cultures to a client-driven paradigm. It cites skills shortages, low unemployment, and an ageing workforce as impacting on a rapidly growing economy as primary drivers for change in VET practices. Action 23 of the Skills Plan identifies that employers consider generic skills like “communication, teamwork and problem solving as just as important as technical skills in the workplace” (p. 44). It directs that employability
skills must be incorporated into all training delivery from 2007 and, in addition, that all accredited training clearly identifies how these skills are “taught, assessed and recorded” (p. 44).

This Skills Plan response to the economic drivers for educational change in incorporating generic skills implies three crucial assumptions: generic skills can be taught; mandating the initiative will achieve the outcomes required; and the role of the teacher in the process will be a passive, accepting one. To-date implementation of generic skill initiatives rests on the actions of an individual RTO rather than being a part of a systemic program. However, with the imminent release of the first Training Packages in which employability skills have been embedded, strong demand for systemic advice and support on employability skill implementation is to be expected.

The implementation of the employability skills agenda offers both a challenge and an opportunity for Queensland VET. The challenge is to change traditional perceptions of the teaching role. The opportunity is for the Department of Education, Training and the Arts (DETA) to provide systemic leadership to RTOs to assimilate new strategies to benefit student learning and personal growth. Developing teacher readiness for change and the management of the change process will require careful planning if implementation is to be successful. Kotter (1995) identified the need for a sense of urgency to ensure change, a compelling vision to guide the process, and a powerful guiding coalition to empower others to act and to remove obstacles to change. If new approaches are supported and embedded into the way the organisation functions and behaves, it becomes part of “the way we do things around here” and there can be some confidence that the change will “stick” (p.18). Considering the level of investment and the importance of the successful implementation of embedding of employability skills into VET programs it is vital that this change “sticks”.

**Teacher engagement in employability skills implementation**

The Queensland Skills Plan provides the sense of urgency and compelling vision identified in the Kotter (1995) model. Teachers however will not necessarily recognise as legitimate the goals and concerns of those in governance and management. Given the extent and rapidity of change within the training sector, staff have become distrustful of change initiatives. Forcing change may seem an appealing prospect to ensure progress, however when the change impacts on staff and their professional roles, it is problematic if it is mandated. Teachers must be convinced that the new practices are consistent with their epistemological beliefs and personal theories. If new initiatives are to support tomorrow’s practice then educators must learn to effectively implement the initiative. Although policy is an enabler, true educational innovation begins with a confidence in the pedagogy.

Student perceptions of employability skills will be shaped by teacher attitudes, so initiatives which showcase how teachers can motivate learners, supervisors and employers in the generic skills agenda will be particularly valuable. Teachers will need to
develop expertise in the design of strategies to assist students recognise the importance of employability skills and motivate them to learn and to document their skills and achievements. Students must be able to link learning and workplace application and be explicitly aware of their employability skills, to be empowered to discuss them effectively with employers.

Staff professional development activities based on learner-centred action learning methodologies which establish collaborative environments and emphasise teachers learning with one another would be particularly useful to assist staff in employability skills implementation. Ward (1998) identifies that learner-centred methodologies that allow flexibility, a mix of experience, practice, theory, reflection, and structured contact with other learners have a greater long-term impact on attitudes and behaviour. Other reports (e.g., (Australian National Training Authority, 1998; Honey & Mumford, 1986; Mitchell Young & Wood, 2001) align the principles of work-based learning with adult learning principles because by learning through work participants can readily identify what they need to know, relate what they are learning to practical activity and challenges, relate new learning to previous experience, feel that they are in charge of their learning, and have a clear sense of their own progression. In advocating action learning, work-based activities they add that in utilising action learning processes, participants learn with and from each other, reflecting on experience and challenging established knowledge. Action learning requires a dual focus on task and learning with a deliberate concentration on reflection and learning from the project tasks which supports the generation of solutions and participant confidence in implementation.

In action learning programs centred on employability skills implementation, teachers can share good practice and expertise, and engage in rich professional conversations about the policy imperative and the impact on their practice. Opportunities would be provided to experience the benefits of interaction, mutual support and the co-construction of knowledge. In such interactive forums, learning models, exemplars and benchmark materials could be developed and shared to build teacher confidence.

Finally, any staff development program must be supported by systemic structural reform. Formal, nationally agreed processes for consistent assessment decision making, reporting and certification are critical. If employability skills are not consistently assessed and reported teachers and learners will not view them as important and employers will have no confidence in the quality of information provided.

> Recommendations and conclusions

Effective implementation of the employability skills agenda requires careful planning and promotion to ensure staff, students and employers understand and support the initiative, and can develop the skills required for success. However, because of the tight time frames, RTOs need immediate notification of the training package implications of embedding of employability skills and the proposed Departmental response.
It is therefore recommended that a comprehensive implementation strategy is developed by the VET Product Services team to support the implementation of employability skills in Queensland VET programs which includes:

- A Stakeholder Engagement Strategy to involve teachers, employers and students from across the VET system and provide communication channels for consultation, decision making; and the dissemination of information;

- A Staff Capability Building Strategy which identifies the skills and understandings that teachers need to demonstrate capability in the implementation of employability skills and provides a training plan to support the achievement of those skills;

- Lobbying of national employability skills committees to establish national assessment frameworks for reporting and certification and to provide opportunities to engage in national professional development initiatives.

During the strategy development phase:

- Information is provided to RTOs across Queensland on the employability skills agenda, and the proposed professional development strategy;

- Teachers who have significant experience, and belief in the value of generic skills, are identified and engaged as mentors/champions to lead staff in the implementation phase.

So is the embedding of employability skills in Queensland VET training and assessment, a policy maker’s pipe dream or a real possibility? The Queensland Skills Plan has created a sense of urgency for change, and the establishment of the new VET Product Services Unit provides a powerful guiding coalition for the initiative. Although the support of industry and learners is important and national frameworks for assessment and reporting are critical, for the embedding of employability skills to become part of “the way we do things around here”, teacher engagement will be the key. Teachers must be supported through comprehensive professional development programs, if employability skills are to be embedded effectively into Queensland RTO practice.
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Age shall not deter them: Challenges arising from increasing numbers of mature-aged learners in TAFE programs

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Abstract

The number of mature-aged learners in TAFE will increase over the next decade due to a ‘greying’ of the population and policy responses to skill shortages that encourage mature-aged learners to participate in skill development programs. Increasing numbers of mature-aged learners present issues for TAFE due to training requirements and learning styles that are different from those displayed by younger learners. This review of published literature examines how TAFE can reduce barriers to effective participation of mature-aged learners and also cater for their characteristic ‘self-directed’ learning style.

Australia’s vocational education and training (VET) system is challenged to satisfy the needs of its aging learner profile. Policy initiatives in response to structural skill shortages that are aimed at increasing engagement of mature-aged learners (aged 45 years and over) in VET will amplify an underlying natural increase of this cohort in training programs. Mature-aged learners may bring with them attributes and learning styles that differ from most students that fit the current VET learner profile which is dominated by younger age groups.

The purpose of this study is to identify the implications, within the Queensland context, for TAFE as a major VET provider, arising from the increasing representation of the mature-aged learners and to foster thinking regarding provision for these learners. The paper discusses expectations of mature-aged learners and identifies issues arising through the learners’ interaction with the VET system. In light of the evidence presented, the paper makes recommendations for how TAFE can adequately respond to increasing numbers of mature-age learners.

Policy issues and mature-aged learners in the VET sector

Australia’s ‘greying’ population is creating economic imperatives to encourage mature-aged workers to remain in the workforce as long as possible. “Based upon the current patterns of labour force behaviour of older Australians, the overall Australian labour force
will eventually stop growing in around 30 years time” (Queensland Government, 2005, p. 43). The dynamics of the aging population is also seen by the Queensland Government (2005) as “changing the nature of skills shortages in the economy” (p. 43) to a structural problem where underlying skills shortages persist. As such, there are reasons to also lift the educational profile of this cohort. Cameron (2005) points out that compared to younger learners, the mature-aged group have lower levels of educational attainment; are less likely to have engaged in any formal post-compulsory education and training; are less qualified; and are less likely to have recently trained.

Given that the skilling requirements of a workforce that is already responding to technological change, the number of mature-aged learners in VET programs can be expected to markedly increase. Queensland’s mature-aged VET learner numbers are already increasing - rising from 17.5% of learners in 1998 to over 20% in 2005 (Queensland Government, 2005). Hagan (2002) forecasted that even without the effects of policies encouraging training of mature-aged individuals, their numbers in Queensland’s VET enrolments will increase substantially over the next decade.

Faced with impending labour and skills scarcities, Australian governments have developed policies to encourage entry, re-entry and retention of mature-aged workers in the workforce. For example, the Queensland Skills Plan (QSP) (Queensland Government, 2006), in outlining the state’s strategy for creating a modern VET system that addresses skills shortages and future skilling needs, incorporates actions intended to cater for the mature-aged learner.

The plan for using a ‘customer of one’ approach, proposes to efficiently assess individuals’ training needs. Individual training plans are then assembled and training resources are allocated to give learners a choice of training delivery through ‘face to face’ instruction, online, distance education, or in the workplace. This plan also ensures that older workers can satisfactorily access training including the linking of any required ‘add-on’ training in literacy, numeracy and information technology skills. This ‘customer of one’ approach conceivably follows contemporary education theories that shift from the traditional view of education as purely a pedagogical relationship where the teacher controlled both the ‘what’ and ‘how’ of learning to a view that learning is not a artificial construct but an extension of natural functions that gives rise to adult (andragogical) education. With such approaches, the teacher controls to a large extent ‘what’ is learnt while the learner assumes greater control of ‘how’ things are learnt (Kenyon & Hase, 2006).

> Understanding mature-aged learner issues

Recognition of mature-aged values, ‘ways of doing things’ and learning styles are fundamental in identifying mature-aged learning requirements (Fisher, 1995). These characteristics of mature-aged learners may create barriers to learning in contemporary training institutions such as TAFE.
Barriers to learning

Milheim (2005) considered that those working in programs for mature-aged students need a fuller understanding of the impact of barriers on learners’ motivation, resolve and sense of identity and their differences from traditional learners. For example, mature-learners may experience extensive ‘discomfort’ through entering a new environment with its new expectations. Milheim (2005) also identifies issues that a typical undergraduate might not face. These include differing orientations towards academic staff, different learning styles and even ‘hostility’ toward other age groups in the learning programs. Grace and Smith (2001) contended that lack of learner success is not related to one factor but is “a complex interplay” (p. 198) of a number of individual learner and system factors. Decisions to drop out are made “when the sum of the negative aspects of the educational experience outweighs the sum of the positive aspects” (p. 198).

Cameron (2005) outlined that besides the effects of being less well educated in literacy and numeracy, mature-aged learners may have self-esteem difficulties in adapting to change and new technologies. Similarly, Cantwell and Mulhearn (1997) in examining the experiences of disadvantaged mature-aged women studying in the university sector found that these learners held naïve conceptions of knowledge and the process of university learning that was manifested through inappropriate learning strategies and poor time-management techniques. Self-doubt about being successful also arose from their negative self-evaluations. From an educational viewpoint, these emotions serve as ‘barriers’ to positive training outcomes and can be manifested in a lack of readiness for self-directed learning, inability to balance competing life and study demands, and poor adaptability to assessment requirements. These factors decrease motivation and confidence. Many such emotions will be present among those mature-aged learners who are socially and economically disadvantaged or recently retrenched from their jobs.

Cameron (2005) considered that the appropriateness of training programs to be offered needs to be considered in order that older workers are willing to participate and that they can be effectively engaged. Barriers to effective engagement of mature-aged learners may exist in the design, presentation and pitch of the course; availability of appropriate learning support; access to computer technology; and the impact of previous negative educational experiences of the learner.

Reducing barriers to learning

Cameron (2005) and Milheim (2005) in recognising the complex interplay of barriers, suggest remedies in packages of learner-empathic responses to the various issues that create learning barriers. These packages may involve improving the accessibility of registration procedures and ongoing orientation sessions and tutorials (particularly using information communication technology); aligning the timing of classes with the mature-aged learner requirements (nights, weekends, short semesters); innovative location of classes and group work (satellite classrooms off-campus perhaps located...
within businesses, independent self-paced learning program delivery); and a concerted effort to make libraries less threatening to the mature-aged learner (assigning mentors, providing more in-depth instruction and explanations). Additionally, supported payment programs to offset immediate costs of engagement in the learning programs may be important.

Such measures may be learner- or group-specific requiring separate programs that address learning strategies and time management (Cantwell & Mulhearn, 1997) or the use of stepping stones (such as short non-award courses) to gain skills and qualifications (Taylor & Rose, 2005). Gelade, Catts and Gerber (2003) produced a ‘Securing Success’ pamphlet on behalf of the Australian Government to provide practical examples of how older learners can be encouraged into the training systems. In distilling strategies that were identified from empirical research, the pamphlet emphasises the need for learning and teaching principles that create a safe and non-threatening environment, that enable students to negotiate the process of learning, and that support motivation and engagement through a learner-focussed approach.

> Shaping an education system for the success of mature-aged learners

Besides identification of practices that will promote the success of mature-aged learner through reducing barriers to engagement in learning programs, the VET system needs to adopt training philosophies that are compatible with ‘self-directedness’ – a learning style associated with mature-aged learners.

Self-directedness

Fisher (1995) defines self-directness as “an internal force which compels individuals to assimilate, synthesise and internalise new information, given the circumstances in which they find themselves” (p. 3). Kenyon and Hase (2006) consider the self-directed concept as an extension from andragogy to a point where the learner assumes control both over the ‘what’ and the ‘how’ of learning and dubbed this advanced form of learning as “heutagogy” (p. 2). Heutagogy can be viewed as a key approach to building a capability in individuals so that they acquire an all round capacity to effectively deal with turbulent environments and workplaces (Stephenson, 2001). Conceivably, through encouraging heutagogy, VET programs can be more effective in encouraging entry, re-entry and retention of mature-aged workers in the workforce.

However, not all mature-aged learners will display self-directedness. While Fisher (1995) proposed that the self-directedness of mature-aged learners may be quite high at 70%, there are conceivably 30% of mature-aged learners that do not display this learning style. Grace and Smith (2001) provide a note of caution about an assumption of the self-directedness of mature-aged learners. They propose that many mature-aged learners lack the disposition and skill readiness to be self-directed and participate in flexible
learning programs which, in theory, provided a self-directed approach. The propensity of the mature-aged learner for self-directedness may depend upon the learning context. Sutherland (1995) found that groups of mature-aged professionals favoured different models for their educational programs, as a result of the conditioning arising from the models employed at their respective training institutions. Sutherland also suggested that the effects of work and family pressures impact on the nature of the pedagogical approach that learners favour. Choy and Delahaye (2002) also challenged the idea that individuals fully engage in advanced learning modes, such as andragogy, in formal learning situations, noticing gaps in what the VET learners stated was their preferred learning styles and the learning style demonstrated in practice.

It is therefore suggested that while a self-directed learning approach is characteristic of many mature-aged learners, it is not displayed all of the time or even some of the time by many individuals. Given that all situations will not require employment of self-directed learning methodologies, the teacher must recognise when to use them (Fisher, 1995).

**Employment of appropriate training philosophies for mature-aged learners**

Educators can build and effectively facilitate training programs that cater for various learning styles including those that support self-directed learning, with the idea that the learner can be directed to, or chose, the one that is appropriate to their needs. Robertson and Sweeney (2000) in delivering online learning programs developed models of delivery that reflect supra-groupings of learning styles ranging from a traditional pedagogical learning system (i.e., teacher managed) through to a technology-enhanced support system (andragogy), and finally an integrated online learning system in which the learner had greater control over the what, when and how of the learning (heutagogy).

Taylor and Rose (2005) found in a case study that a major contributing factor to the success of adult-learner programs was the attitude and skills of the teachers. Teachers that were successful in engaging mature-aged learners employed a learner-centred approach based upon andragogical and even heutaogogical learning principles that were appropriate to the circumstances.

However, while measures can be taken to design training programs, success will ultimately be ensured through an effective relationship built between the teacher and the mature-aged learner. Fisher (1995) saw a need for both teachers and learners to understand the common stages that mature-aged learners experience in engaging in new education programs in order to lessen the anxieties involved in these experiences. In addition, in providing what purports to be a self-directed, learner-friendly, vocational education system, there is a need to be mindful of the effects of the world views of those teachers that provide oversight and delivery of such systems. Robertson (2004) found that a teacher’s personal teaching style tends to be incorporated into any new online learning system and, that without reflection, teachers may forgo many opportunities through which they could cater for different student learning styles. The
imprint of a predominantly pedagogical teaching style is found in many examples of new developments in the VET sector: for flexible delivery (Grace & Smith, 2005); online programs (Robertson & Sweeney, 2000); and Recognition of Prior Learning (RPL) (Cameron, 2005). There is merit in Fisher's (1995) contention that there is a need for increased awareness of the self-directedness of mature-aged learners and increased attention to addressing this issue in teacher training.

> Recommendations for meeting the needs of mature-aged learners

The VET system can not simply ‘bolt on’ additional practices to existing structures to effectively meet the learning needs of mature-aged learners. It requires the adoption of an overall philosophy aimed at reducing learning barriers and providing practical responses in training programs that are appropriate for mature-aged learning styles. An important issue for the VET system is to reconsider the expectations within the ‘customer of one’ approach and not assume that the needs of mature-aged learners will be addressed through the normal process of training product development.

One recommendation is that a range of choices in delivery mode needs to be reconsidered that would feasibly cater for mature-aged learners. In all programs, there is a trade off between customisation of learning which take into account individual learning styles, expertise and capacity and the effects of that customisation on learner-teacher ratios (Westera & Sloep, 2001). These are challenges for delivering programs that meet the needs of mature-aged learners, let alone all learners. The design of programs should focus upon supra-groupings of learning types (e.g., pedagogical, andragogical) and consider carefully how the ‘customer of one’ approach can be effectively delivered.

Secondly, training programs need to facilitate mature-aged learning engagement through reducing emotional and administrative barriers by creating a range of supports and appropriate learning environments support including a compatible RPL process. Thirdly, the practices of teachers, who could be described as the gatekeepers for organisational change, require support to incorporate adult learning philosophies into their teaching. This issue is paramount for the professional development programs of teachers. The question arises: ‘Are the administrators and executives also willing to make the journey?’ TAFE, like other large organisations, tends to display ‘passive/aggressive’ tendencies (Nielsen, Pasternack & Van Nuys, 2005). These organisations can feature implicit resistance by employees to incorporating ‘top-down’ directives and as a result employees put in just enough effort to comply. The recommendations made above need more than just changes in some practices but overall changes within organisational philosophies. There is a role for both senior and middle management to encourage changes in practices in learning programs for mature-aged learners away from the ‘passive/aggressive’ stance. In this case, it should be middle management that establishes projects that address the issues and styles of the mature-aged learners (and
for other learner groups as well). It is up to senior management to ensure that change management projects are properly championed, supported and coordinated so that effects pass through and over the artificial and implicit boundaries that exist within TAFE.

> Conclusions

The number of mature-aged learners in VET programs is increasing through structural changes to the workforce age profile and because of government policies. This presents challenges to the VET system. These challenges will be manifested in the emotional and administrative barriers that currently exist for these learners to successfully assimilate into the system. Challenges are also manifested when the needs of many mature-aged learners who display a self-directed learning style are not met if programs are delivered with a traditional pedagogical style commonly used in vocational training systems.

In addressing these challenges, the system needs to go beyond the expectation that a range of learning modes (i.e., flexible delivery, online programs, workplace training) will remove learning barriers and accommodate self-directed learning styles. While these delivery modes will continue to serve as useful models to guide VET delivery, they only form part of the package of appropriate learning options in how learning environments can be developed to cater for the needs of mature-aged learners. It is essential to develop teachers’ professional practices and positive attitudes to support the engagement of mature-aged learners. To effectively meet these challenges in TAFE, an understanding of these issues and support of middle and senior management is required. It is clear that the numbers of mature-aged TAFE learners will increase through structural changes to the workforce age profile and government policy. In terms of the QSP, TAFE needs to seriously take account of the attributes and experiences of mature-aged learners through properly targeted and supported projects. Addressing the issues for mature-aged learners requires positive cultural change and the development of effective professional development programs.
> References


Challenges in Managing Change in Trade Training

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Abstract

Ongoing change now characterises most educational systems. This is so with trade training in vocational courses, as in any other educational context. Change is driven by demands for greater economy and effectiveness in the competencies that students achieve. Three areas of change are addressed in this report. First, issues for teachers will be considered, including their attitudes, pedagogies and skills. Second, the clients, students and employers, and their expectations of outcomes will be discussed. Third, the teaching and learning environment will be examined, with a focus on how Information and Communication Technologies (ICTs) may be used so that a new approach to trade training can be realised. Finally, consideration is given to why there might be resistance to changes in vocational programs. Roadblocks to change need to be understood. These can be addressed through effective change management strategies so that there is a smooth transition to new ways of delivering trade training.

The Queensland Government has acknowledged the requirement for radical change in trade training by introducing the Queensland Skills Plan in 2006 (Department of Education and Training, 2006). Australia’s first Trade and Technician Skills Institute at Acacia Ridge is a major initiative of Queensland Skills Plan and should improve and modernise the way in which the TAFE system delivers trade training (Welford, 2006). This state-of-the-art delivery system has been discussed extensively and is now taking shape. The purpose of this paper is not to debate what training in the future should look like, but to examine the areas that will need to change, so that the TAFE system can have an improved and modernised delivery system for trade training. Many innovations fail, not because of lack of vision, but because there is a lack in understanding of the challenges at the implementation stage. Individuals involved in the change management need to identify the areas that need support, as well as the roadblocks that could spell disaster, in order to have a greater chance of success.

Three areas of change will be examined in this report. First, the attitudes, pedagogies and skills of the teachers will be considered. Second, the expectations of clients, students and employers will be discussed. Third, the teaching and learning environment will be examined with a focus on Information and Communication Technologies (ICTs).
and how they can be used in new delivery methods. The change that is expected will take more than ‘bricks and mortar’ or new institutional modes in order to be permanent and effective. Finally, consideration will be given to why there might be resistance to change - roadblocks to new approaches. When planning for change these should be addressed so that a smooth transition to new ways of delivering trade training can be implemented. This final section of the paper identifies strategies through which the organisations can minimise resistance to new approaches in trade training.

Trade training has been delivered using traditional face-to-face methods for decades. The traditional approach is for one experienced teacher to teach approximately fourteen students in the theory and practice of any particular subject. While there have been many successful tradespersons trained through these arrangements, the present skills shortage has brought considerable pressure on the system. The increase in student numbers and insufficient teachers has compounded this problem. It is expected that new systems of delivery will accommodate flexibility through blended learning modes and online delivery, ICT support, on-the-job experience, and face-to-face instruction. These approaches will produce more qualified trades people to meet the present skills shortage.

Improved delivery methods will include flexible attendance and a variety of media to teach theory. A considerable amount of the practice will be assessed in the workplace. As previously stated, this paper is not about proposing the shape of the new models of delivery but examining areas that need to be managed to deliver these new models.

> The Teachers

Teachers will require support to implement changes to their delivery methods. If there is no support for the changes undertaken by teachers, it will not be implemented. Lubans, (2006) explains:

*We have all been there – the old way of doing something no longer works as well as it once did. Something different is needed, and, being an intelligent workforce, we probably have a good notion about what needs doing. But, as we start exploring new ideas, like trying to light a fire in the rain, our well-intentioned efforts are swamped by a deluge of rationalisations for not changing. However, Promethean, our fire, the nay-sayers, the uncertain and the fearful, drench the sparks of change, until we are left with an ever expanding puddle of doubts with no fire." (p. 201)*

Professional development is required to combat these problems. Exploring new pedagogies through staff development activities is needed to support new ways of delivery. Awareness of the range of ICT tools available, as well as development of ICT skills is needed for teachers to be able to operate confidently in new pedagogical environments, in order to enhance the prospects of successful change.
Attitudes and beliefs

New ways of thinking about learning and moving from a transmission view of teaching to a constructivist’s view of teaching and learning is required. Peters (2006) noted:

> The constructivist view of learning challenged what had previously been a ‘transmission’ view of teaching, in which the role of the teacher was to transfer a fixed body of knowledge to the learners. Instead, the ultimate responsibility for learning belongs to the learners and the teachers’ role is to facilitate the learner’s interaction with information and experiences in ways that challenge and develop existing constructions and enable them to make new personal meaning. (p.4)

Educators are the product of their past experiences and their values, beliefs, knowledge and skills have evolved from these experiences. Changing their practices involves changing them as people. To encourage trade teachers to change, persuasion and incentives are needed. The temptation toward superficial and rapid change without adequate support to teachers will only produce a veneer of change. In-service courses for new approaches to teaching must reflect constructivist views of learning. The problem in trade training is that experienced tradespersons are essential to effectively deliver the content. Teachers in trade training are older and often set in their beliefs and ideas. Identifying teachers who are willing to change their practices can provide an important first step that will then influence others to make changes in their practices.

The present system has been static for a considerable time and fundamental changes demand a strong developmental process. Teachers have taken a long time to settle into the present comfortable and stable environment. It will take a lengthy process to progress towards new visions of teaching and learning. New partnerships with higher education institutions are needed to assist in these transitions. Teachers would have the incentive of better educational qualifications in order to expose them to new worldviews about teaching and learning. If these programs were delivered in the ways that they were expected to teach in the future there would be practical demonstration of new teaching approaches.

New pedagogies

Pedagogy, according to Loveless, DeVoogd, and Bohlin (2001), is the science and art of teaching. Traditional pedagogy focused on accumulating knowledge and remembering as much as possible. New pedagogies concentrate on helping students focus more on ‘knowing’ what to know and on how to locate and evaluate relevant knowledge. To-day, professionals must have enough working knowledge to perform their roles effectively but they must also have the skills to access new and reliable information and evaluate sources of information. Trade teachers will need to instruct students in information-gathering and management of that information within the normal delivery of content knowledge. In trade training, for example, electricians repairing washing machines
cannot know the details about every brand and model of machine now on the market. When new products become available, they need to access the Internet for information on product functionality. Many teachers follow examples of pedagogy that they have experienced in their own training and judged to be successful. Many traditional teachers support the idea that a good tradesperson ‘knows’ and that research is for academics. However, this is a flawed argument, as many tradespersons do access new information regularly to upgrade their knowledge and skills.

The tools for trade teaching must change to support new teaching approaches. These tools will include learning management systems, blogs, chat, ICTs and Internet Search tools. Just as carpenters and artists change for efficiency and effect, teachers must also change. The old pedagogies were effective when transmitting knowledge with the aim of producing tradespersons that knew what the teacher knew. However, the new generation of tradespersons need to have different skills, attitudes and outlooks. It will take new teaching and learning approaches to achieve these outcomes. Teachers must be up-to-date on the ICT tools that are available and how to use them with confidence in their teaching. However, requirements for success are more than just the provision and operation of the new tools. There must be greater assimilation of the usage of the tools into the ways that teachers practice.

**Practical skills**

Teachers, in general, and trade teachers in particular, when participating in professional development, are looking for practical skills that will help them in their teaching. Guskey (2002) explained that professional development is attractive to teachers when they believe it will expand their knowledge and skills, contribute to their growth, and enhance their effectiveness with students. Teachers are quite pragmatic. What they hope to gain through professional development are specific, concrete and practical ideas that directly relate to their day-to-day practices. Professional development programs need to take account of these issues.

Trade teachers understand and effectively use whiteboards, overhead transparencies and video players. However, they need to move to new pedagogical approaches with more extended usage of ICT tools that require new sets of practical skills. These include new ways of communicating with students through email and text messaging, and being confident in organising and facilitating video conferencing and on-line chat. Such skill development will be essential to implementing new delivery methods effectively.

A constant frustration to the majority of trade teachers is not having a match between practical skills and the available ICTs. Sometimes the equipment is available but the teachers lack the training, while at other times the teachers have the ideas and skills but not the equipment. These frustrations increase the temptation to revert to the old, secure and familiar ways of delivery. Staff training must address the practical day-to-day skills of effectively using the appropriate tools, so that the teachers can see value for their efforts.
Communities of practice are effective for allowing new ideas to be shared and integrated into day-to-day experiences. Pastoors (2007) proposed that communities of practice are a valuable means to efficient sharing and creating knowledge. They can reduce the time in learning that is otherwise spent on reinventing the wheel. Sharing of new ideas can lead to innovations in practice. This is what is needed for trade training. New skills and tools for teaching and their application can be developed and shared in collegial ways with peers so that new ideas permeate more quickly across areas of practice.

> The Clients

In trade training often the employer is the one who meets the expense of training. However, it is the apprentice who receives the training. Therefore, managing change and the perceptions of both these groups are important if new approaches to trade training are to be implemented.

Employers

When trade training is viewed as a product, it is expected that the buyer will need to understand and be satisfied with what he/she is receiving. Robustelli (1998) explained the importance of the alignment of training strategies with the customer’s expectations. Trade training is providing a product to companies that employ apprentices. It is expected that the development of their staff will be to their satisfaction. It is essential that not only the product, that is, the training outcomes will be current, appropriate and relevant, but that it is delivered in an acceptable manner to the purchaser. The outcomes of new delivery approaches need to provide value to the customer, in this case, the employer.

Creating awareness and understanding with employers is essential when changing the delivery methods for trade training. Most employers view their own experience of training as successful and therefore expect that their apprentices will receive the same training in the same way. The marketing of changes in pedagogies to employers is crucial, as well as providing staged transitional arrangements to enable employers to become accustomed to what they presently view as radical delivery methods. Not every employer will ‘buy’ new models of delivery so there is likely to be some continued face-to-face teaching in trade training.

Students

Kotze and du Plessis (2003) claim that students ought to be co-producers of education in tertiary institutions. Their ideas are also appropriate to the training of trade apprentices. Students are active participants in the delivery of educational services and the outcomes of that education. Student active participation in how education is delivered is more likely to lead to the desired outcomes. Students need to understand the value to their learning of new delivery methods. Otherwise, this is a total roadblock to the change
process. Students should be able to make informed choices about the methods of delivery of their trade training, with blends of different methods through which the student and teacher can negotiate individual arrangements. However, the cost of this idealism may be prohibitive in practice. Movement towards these ideals would allow students to choose from a menu of modes of delivery methods and blends that suit their personal preferences at different times in their training. The nature of the e-learning approaches in these new training models should also be considered. Misko, Choi, Yee Hong and Lee (2006) noted that students need to be self-starters and motivated to undertake e-learning programs and, furthermore, they need appropriate levels of literacy and numeracy skills to engage effectively in such programs.

Teachers and managers need to develop mechanisms to access students’ ideas and be open to incorporating these ideas into practice. Students need to receive complete information about proposed changes. They are then more likely to be receptive to change. Effective marketing of the new methods and tools of delivery in trade training needs to take place. Students, who essentially are the clients, need to have their expectations met in order that satisfaction with their learning programs is achieved.

> Change environments for trade training

Managers must do their part in providing the right environment when introducing change (Beer, Eisenstat & Spector, 1990). A balanced and realistic view of the resources needed to implement change is important, including consideration of the expenditure needed on equipment, as well as skill development for teachers. ‘Swamping’ the environment with ICTs and expecting that this would provide everything required to bring about changes in teaching practices would be unrealistic. There needs to be balance with a staged implementation process as new infrastructure in ICTs for trade training is developed and appropriate training made available to teachers progressively during implementation.

Traditionally, professional development for staff followed the idea that changing teaching beliefs, in turn, led to changes in classroom practices, and finally to improved student learning outcomes. Guskey (2002) proposed that an alternative perspective of ‘teacher change’ was needed that was the reverse of the traditional model to explain change through professional development. He proposed that significant change in teachers’ attitudes and beliefs only occurred after they see evidence of improvements in student learning. Therefore, professional development should focus on skill and knowledge development to implement immediately in teaching practice. It is the actual experience of successfully implementing an innovation that results in improved student outcomes that leads to changes in beliefs about an innovation. In trade training, the most effective way to change practices would be to emulate the Guskey (2002) model. This would involve introducing new ICT tools and evaluating student learning as a result of new practices. This could be done in ‘pilot’ environments so that teachers using new approaches have the opportunities to trial new practices, as well as allowing for teacher observers to
assess the value of new ways of delivering trade skills to students.

Communities of practice would provide opportunities to share successes and failures during implementation stages. Lefoe and Albury (2006) in discussing higher education environments and communities of practice suggest that for innovations to be mainstreamed there needs to be more extensive collaborative approaches to change. In addition, when groups of innovative individuals work together for a common goal, this is more likely to achieve the continuation of the innovation after the initial implementation. With trade training there are isolated areas of innovation but to bring these groups into the mainstream there must be recognition of their achievements. Resources need to be made available to support implementation of new ideas. Opportunities can then be given to such groups to share their experiences with other teachers. This would effectively model a community of practice.

Change that is nurtured and supported in the teaching and learning environment has a greater chance of success. The teaching and learning environment also reflects the wider culture of the organisation. If there are doubts, opponents, or resistance to change across the organisation this will impede the implementation of new approaches in trade training.

> **Resistance to change**

Opposition to new practices can be expected. Zimmerman (2006) explained that in educational contexts umpteen reforms have come and gone that have often left disillusionment and cynicism in their wake. Educational leaders must ask themselves what they can do to beat the odds of implementing changes for which the outcomes are not known. Zimmerman suggested that educational leaders need to work with teachers in respectful ways to address their concerns before launching into change initiatives that are proposed. Teachers need to be supported in taking new initiatives while managers may also simultaneously insist on the need for progress.

In vocational education there have been extensive reforms to the extent that many practitioners are weary of it. Some past changes have resulted in failures and others in success but there are often no clear acknowledgements of either the successes or the failures. Some changes have required a large input of energy without incentives or rewards. The factors that cause resistance, the concerns of the practitioners and ways in which they can be supported during change processes must be understood for the successful implementation of any innovations to trade training at this time.

**Forces and concerns**

Van der Vegt, Smyth, and Vandenberghe (2001) discussed change in educational policies and considered that policy change always required new ways of looking at the educational organisation’s identity and the need for capacity building of staff to support change. They noted the importance of recognising concerns about fairness
in who benefits from changes. Change always brings a certain amount of stress to individuals, involving a reassessment of personal abilities, as well as one’s position in an organisation. In trade training, older employees may show the most concern about any changes. Issues of re-allocation of work loads and fairness in these processes are unresolved topics for trade training. The traditional method of delivery and how this relates to workloads has been well defined for many decades. However, when teachers are required to make the transition to new delivery methods, definition of hours of work, numbers of students, and general award conditions will be different and need to be addressed.

Trader-Leigh (2001) listed key resistance factors to change in a case study focussed on a government organisation. These factors were self-interest, psychological input, tyranny of custom, redistributive effects, destabilisation effects, culture incompatibility and political factors. Similar factors might be considered to operate against change in the present case of implementing changes in trade training in vocational education courses. The psychological impact of change will probably have the largest effect on trade teachers. To change attitudes and beliefs about best practices that have been successful for many decades and still operate acceptably is a significant issue. Practitioners who have extensive experience also have self-interest in maintaining the status quo so that they do not have additional development work. Employers who have been satisfied with the outcomes in the past will resist because of the tyranny of custom. Mid-level managers may oppose changes because of the destabilisation effects. New teachers may view change as leading to a redistribution of power while other teachers may look for political advantage in opposing the change. All of these barriers need to be recognised in order to support individuals through change processes. Care must be taken to market any changes to employers appropriately, showing that the content, outcomes and quality will be maintained and thus, the identity of trade training.

Organisational support

To balance the concerns outlined above when managing change, an organisation can do a number of things. Szanisu and Duxbury (2001) identified a range of ways. This included keeping in contact with customers to ensure they are aware of the proposed changes; keeping employees well informed regarding changes through good communication practices, such as bulletins and teleconferences; communicating the messages clearly about why changes are needed; and benchmarking performance across similar organisations. Consultation was viewed as very important, especially asking employees if there are better ways to do things and allowing employees to be flexible in the use of their skills sets in new practices. Although this research was conducted in commercial companies, it has appropriate application to understanding and implementing change in trade training. To positively support change towards flexible e-learning programs, expectations about what is to change as well as the need for the change must be clearly conveyed. There is a need to ensure that mixed messages are
not received in different areas of the organisation so that some groups are perceived as receiving more favoured treatment while other groups with innovative ideas are ignored.

> Conclusions

Change proposed by the Queensland Government in trade training to improve and modernise delivery methods is a major challenge which requires careful management. This paper has addressed three areas where change is required to be managed. For teachers, changes in attitudes, pedagogies and skills must be considered. Meeting the expectations of employers and students were also identified as important. Changes in the teaching and learning environment, with a focus on ICT, will need to be managed carefully. Finally, some resistance to change can be anticipated and these roadblocks should be considered in any planning so that smooth transitions to new ways of delivery in trade training are realised.

Trade training is at an important threshold to adopting more innovative approaches to delivery. The challenge is to manage the process of change to produce excellent learning outcomes for students with minimal stress to all concerned. Wise choices and appropriate support based on a firm understanding of the issues involved can avert difficulties in these extensive changes to how trade training will be delivered.

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What’s the problem? Incorporating problem-based learning approaches into “blended” horticulture training programs

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> Abstract

Problem-based learning (PBL) has been widely adopted as a pedagogical approach in a range of settings. This paper investigates how PBL might be effectively incorporated into VET programs, using horticulture training programs as a focus. Core elements of a PBL approach are identified through consideration of the “Generic PBL Essentials” (Savery, 2006), as well as the role of ICTs in the development of blended PBL programs. Research evaluations of PBL approaches are made and a critique of two examples of the use of PBL in horticulture training is provided.

The pedagogical approach known as Problem-Based Learning (PBL) has become increasingly popular over the past three decades (Savery, 2006). Many features of PBL - including the fact that learning is “situated” within authentic contexts, and that learners are required to play an active role in constructing their own understandings fit well with recent themes in the provision of Vocational Education and Training (VET). The approach has hence been recommended as an appropriate strategy in VET programs (Smith & Blake, 2005).

The primary purpose of this paper is to investigate how PBL might be effectively incorporated within vocational training programs that have not yet generally adopted it. Horticulture training is used as an example. However, the recommendations made here will be relevant to many other vocational training areas. Any adoption of PBL will take place in a context in which information and communication technologies are increasingly being used to offer “blended” training programs. This paper hence also aims to explore the role that ICTs might play in the development of PBL programs.

In the following sections, a review of the key features of the PBL approach and the use of ICTs in implementing it are discussed. This is followed by an evaluation of its success. This discussion is used to make a critique of some examples of the use of PBL in horticulture training. Finally, a number of recommendations are made concerning the incorporation of PBL into blended horticulture programs.
What are the essential features of PBL?

PBL may be described as a student-centred pedagogical strategy based on constructivist principles, which requires learners to actively engage with ‘authentic’ problem situations. In typical PBL programs learners are presented with the problem first. A facilitated learning process follows over the next week or several weeks. The students collaborate within small groups to define key elements of the problem, identify knowledge gaps, and then develop knowledge and skills relevant to the problem through self-study. Groups then share and apply this knowledge, and reflect on their learning and the processes they have used (Savery and Duffy, 1995).

As Savery (2006) notes, many papers describing particular applications of PBL begin with such a context-setting outline. However, descriptions of actual PBL programs reveal that there are many versions or manifestations of the approach (McDonald, in Spronken-Smith, 2005), and this allows for some “misapplications and misconceptions of PBL” (Savery, 2006, p. 11). While some writers (e.g., Woods, 1996) appear relaxed about the term being used with a wide range of applications, others are concerned that some criticisms of PBL derive from a misunderstanding of key elements of the approach (Butler, Inman, & Lobb, 2005). These key elements have been set out by a number of authors, whose arguments are summarised by Savery (2006) in an article providing an overview of PBL. He listed the “Generic PBL Essentials” and these are discussed below.

Student-centred

“Students must have the responsibility for their own learning” (Savery, 2006, p. 11).

Savery and Duffy (1995) note that in order for learners to have full ownership of the learning process they must have responsibility not just for attempting to find solutions for the problem they are engaging with, but also for determining the process they will use. Where teachers specify or model the process the approach remains “teacher-centred”. Butler et al. (2005) argued that some versions of PBL are not student-centred and hence the term should not be used. Student ownership of the process requires that learners first articulate what they know already, and what they have to learn. That is, they have to formulate “learning issues” to drive their further self-study. They then have to accept personal responsibility for gathering relevant information to help the group move towards a solution (Savery, 2006).

Mechanisms for generating student ownership of learning are laid out in the process for PBL developed originally at McMaster University and described in Savery and Duffy (1995). These ideas are also incorporated in the “seven step” process employed at Maastricht University (Moust, van Berkel, & Schmidt, 2005). The role of the tutor in this process is to bring out the best in a group, in part by ensuring that students identify all relevant learning issues. Greening (1998) noted that PBL lays the control of the learning process at the feet of the student. However, support in the learning is still required.
Ill-structured problems

“The problem simulations used in problem-based learning must be ill-structured and allow for free inquiry” (Savery, 2006, page 13)

PBL aims to expose learners to “authentic” problem situations that display the complexity and challenging nature of problems in the real world (Savery & Duffy, 1995). A good problem for this purpose is one which is highly relevant to the students’ situation, contextualised, and ill-structured (i.e., it is not clear which are the key elements to be addressed). It should ideally have no single “right” answer, and the methods for its solution should not be obvious. Engaging problems may well include emotional content which makes them more meaningful (Duch, Allen & White, n.d.; Savery & Duffy, 1995; Jolliffe, Binns, & Riseman, 2005).

Savery (2006) warned against confusing PBL as a pedagogical technique that is about the teaching of problem solving. PBL, as Butler et al. (2005) noted, leads to understanding, but not necessarily to a solution of the problem. Problem-based learning situations may arise from a problem which has a multiple solutions or from a situation which has no solution at all. Samples of open-ended problems of this sort are identified by Spronken-Smith (2005), Savery and Duffy (2005), and Jolliffe et al. (2005). Many examples are also available on the University of Delaware PBL website at http://www.udel.edu/pbl/.

Multi-disciplinary approach

“Learning should be integrated from a wide range of disciplines or subjects” (Savery, 2006, p. 13).

In the real world, information from all sources is integrated to understand and resolve problems, and PBL aims to emulate this process. Hence, for example, in many medical applications of PBL basic science facts are learned in the context of particular problem scenarios, rather than through a discipline-bound lecture program (Savery & Duffy, 1995; Nandi, Chan, Chan, Chan, & Chan, 2001). Part of the aim is to encourage students to become active, independent, lifelong learners who are equipped to continue to investigate and resolve the problems they will encounter in professional practice.

Collaboration

“Collaboration is essential” (Savery, 2006, p. 13).

Woods (1996) takes a catholic approach to the definition of PBL and is prepared to include individual investigations under the banner. However, the classical model developed at McMaster University is built on “social constructivist” principles in which the role of the small group is seen as critical. Savery and Duffy (1995) argue that the alternative views held by other people are a rich source of the “puzzlement” that stimulates new learning. The social environment also provides a forum for testing
whether our understandings of the world are as viable as those of others; it is through learning communities such as those employed in the PBL process that knowledge is ‘socially negotiated’.

Effective PBL hence appears to rely on the development of effective group processes, and this presents a challenge to those implementing PBL programs. The tutor plays a key role here, although Woods (1996) argues that this role may be taken on by the group itself so long as the participants have had appropriate training. He provides suggested models for tutor and/or participant training. Clouston and Whitcombe (2005) supply a set of reflective questions which can be used by potential tutors and participants to assess their own readiness to undertake PBL.

**Application and reanalysis**

“What students learn during their self-directed learning must be applied back to the problem with reanalysis and resolution” (Savery, 2006, p. 14).

When the group meets again after individuals have completed some individual research, they should not simply tell what they have learned. Different students should have been pursuing different lines of enquiry, and resolving and accommodating these should involve the group in re-examining the problem from a new and higher level of understanding (Savery & Duffy, 1995).

Moust et al. (2005) lamented the ‘erosion’ of PBL practice at Maastricht University. Tutors (at least in some areas) supplied students with selected rather than extensive reading lists, and students all read the same material. This meant that they gained nothing from the follow-up meeting, which merely featured rushed reports of the main findings from the readings. The tutors in this case, Moust et al. argues, had become “infected by the ‘coverage’ virus” (p. 673) and focused on the content aspect of their role rather than providing the “scaffolding” students need to become deep, self-directed learners.

**Debriefing**

“A closing analysis of what has been learned from work with the problem and a discussion of what concepts and principles have been learned are essential” (Savery, 2006, p. 14).

The purpose of the debriefing meeting is to consolidate learning and ensure that all aspects of the PBL process have been experienced. Woods (1996) argued that this is a critical stage for the development of ‘expertise’. In working through the PBL process, students have been engaged in problem solving, using ‘backward’ reasoning from the ‘goal’ to the given information. Anyone encountering an unfamiliar situation would apply the same process. However, in the real world, as people encounter a number of similar problem situations over time, they begin to recognise key patterns within them. This is the mark of the expert; as Woods points out, experienced doctors are probably engaged in ‘pattern recognition exercises’ rather than ‘problem solving’ during much of
their practice. Hence, he recommended that students were asked to ‘elaborate’ during a debriefing and to suggest other problems which they could solve based on the same principles, or to suggest similar problems. The aim was to ensure that students were able to ‘generalise’ so they were not locked into associating particular concepts or principles with the particular problem situation with which they have been working.

**Appropriate assessment**

“Self and peer assessment should be carried out at the completion of each problem and at the end of every curricular unit. … Student examinations must measure student progress toward the goals of PBL” (Savery, 2006, p. 14).

The issue of assessment is clearly one of critical importance to the implementation of PBL. In medical schools, standardised multi-choice tests have traditionally been used to assess basic science knowledge. Given that the goals of PBL include encouraging problem-solving skills, deep learning, the integration and application of knowledge from a range of disciplines, and skills in collaborative group work, then multi-choice tests are an inadequate assessment strategy (Major & Palmer, 2001; Greening, 1998; Moust et al., 2005; Woods, 1996). Accounts of particular PBL programs hence frequently describe assessment processes. The range of appropriate assessment items have included reports, group projects oral and poster presentations, individual reflections, and portfolios (e.g., see Spronken-Smith, 2005; Waters & Johnston, 2004; O’Kelly & Noone, 2005). Woods (1996) provided an extensive description of possible assessment strategies and instruments, including some for peer and self-assessment.

**Authentic problems**

“The activities carried out in PBL must be those valued in the real world” (Savery, 2006, p. 14)

Savery and Duffy (1995) argue that PBL should be based on real-world problems (e.g., business cases should feature real businesses). Such scenarios provide rich detail, engage learners more and have realistic outcomes. Savery and Duffy provide examples and guidelines for problem selection. However, “realistic” PBL activities may also be associated with problems that have some exotic features, as long as students can see their practical applications (Joliffe et al., 2005).

**A PBL-based curriculum**

“Problem-based learning must be the pedagogical base in the curriculum and not part of a didactic curriculum” (Savery, 2006, p. 14).

The interpretation of this dictum depends on how broadly the term, curriculum”, is to be applied. In practice, PBL programs often run alongside more traditional ‘didactic’ approaches and PBL is not applied to the students’ entire course of study. The medical school at the University of Hong Kong employed a ‘hybrid’ program (Nandi et al., 2001),
as did the Harvard Dental School (Susarla, Medina-Martinez, Howell, & Karimbux, 2003). Spronken-Smith (2005) applied PBL to one subject within a larger program of studies in geography; O’Kelly and Noone (2005) applied PBL to one subject within a nursing program. Some units of study may well be more appropriate for the PBL approach than others, and a tentative and gradual uptake of PBL within a larger program, as advocated by Woods (1996) and also described by Piggott (2005), is feasible.

> Blended and distributed versions of PBL

Although PBL has traditionally made use of library research and face-to-face meetings, new technologies have opened up new possibilities. In practical terms, the inclusion of online components has the potential to make the implementation of PBL much easier than it would have been in the past.

Firstly, the use of the Internet can make the task of finding and retrieving information relatively easy. Students may, of course, require early scaffolding in the form of training in information literacy. The effective use of search engines and databases can minimise what has been seen as a problem with PBL in the past; namely, the amount of time it takes for students to search for information (Greening, 1998). Moreover, the information accessed through Internet searching will be in a non-linear format that suggests that there are no predetermined solution paths (Brittain, Chambers, & Marriott, 1998). This is highly appropriate in the PBL process.

Secondly, meetings held through online communication and collaboration tools offer some real advantages over meetings held face-to-face. Obviously, there is no need for all students to be available at the same time and place in order for them to contribute to a group which is making use of asynchronous discussion boards or Wikis. Less obviously, online tools can be used to keep a permanent record of discussions and of individual student contributions, which may both make discussions more productive and assessment easier. Asynchronous discussion also encourages reflection and measured comments (Ivergard & Hunt, 2004) which may improve the quality of group products.

PBL has been recognised by e-learning practitioners as an attractive approach. Gurrie (2003) argues that PBL because of its ability to stimulate high quality collaborative discussions is likely to be a highly effective strategy for online teaching and learning. Zumbach and Reimann (n.d.) presented a model for online PBL offerings, which essentially substituted online discussions for the group meetings in the classical PBL process.

Technologically there seems to be no reason for not offering PBL programs wholly online. In general, however, it appears that some face-to-face contact helps to foster rapport and decreases ‘psychological’ distances between learners (Ausburn, 2004). However, a significant proportion of students in PBL programs have been found to require regular face-to-face contact (Brittain et al., 1998). Since effective group processes are essential for the implementation of PBL it would seem desirable that some face-to-face (or
videoconferencing) contact is made between group members. Blended or multi-modal programs have been found particularly effective in providing for the support and learning needs of many students (Ausburn, 2004).

Recent accounts of the use of online tools within PBL programs include Spronken-Smith’s (2005) description of the use of a WebCT framework to provide course housekeeping and content information as well as online discussion spaces. Waters and Johnston (2004) described an online environment (CAOS), which provided cases for analysis, group discussion spaces and spaces for groups to post their case analyses for critique by others. Both these programs also featured face-to-face tutorials.

> Evaluation of PBL

Sanson-Fisher and Lynach (2005) noted that there were six major reviews of PBL conducted in the decade from 1993. Each of these reviews involved meta-analyses of large numbers of studies. In distilling the findings, Sanson-Fisher and Lynach reached the conclusion that “Available evidence, although methodologically flawed, offers little support for the superiority of PBL over traditional curricula” (2005, p. 260). Savery (2006) concluded that this result indicated a gap in research regarding the short-term and long-term effectiveness of PBL, despite the numerous studies that have been carried out.

One cause of this null result seems to be that different studies have attempted to measure different things. Another possibly arises from the compounding effects of combining the results of large numbers of studies together. For example, Greening (1998) argued that while earlier studies may have shown that students in PBL programs achieved inferior basic science scores in standard examinations, this is not the case with later studies. He suggested that this effect illustrated a maturation of the PBL process. Butler et al. (2005) argued that not all PBL programs deserved to be called by this term, since they did not include the ‘PBL Essentials’. Savery (2006) also argued that some have taken “a naïve view of the rigor required to teach with this learner-centred approach” (p. 12). Maxwell, Mergendoller and Bellisimo (2005) indicated that the qualifications of individual teachers may have significant effects on the outcomes of students in standard PBL programs. In other words, specific PBL programs varied widely in practice under the influence of a number of factors. Attempts to reach clear overall conclusions about the effectiveness of PBL from aggregating these data may be doomed to failure.

Kirschner, Sweller and Clark (2006) took a negative view of the effectiveness of PBL in medical education. They cited the results of meta-analyses. They argued, from a general position that the demands made on short-term memory were minimal and ‘constructivist’ approaches to instruction were likely to make any such educational strategies ineffective. However, their conclusions were based on a review in 1993 by Albanase and Mitchell and from other evaluations from the early and mid-1990s, rather than from any later findings. Moreover, to argue that PBL is a ‘minimally-guided’ approach seems to take
no account of the strong structure and significant degree of tutorial guidance provided in the classical model of PBL. Woods (2003) noted that PBL does not offer a universal panacea for teaching and learning because like other pedagogical approaches, it has advantages and disadvantages. Nandi et al. (2001) in their review of the evidence regarding medical training programs seemed to offer a balanced view on these debates about the effectiveness of PBL. Their findings are summarised below.

The academic process: There is evidence that students in PBL programs place more emphasis on understanding and less on rote learning than those in conventional programs. They also make greater use of journals, databases, library resources and self-selected reading. They learn in a more reflective way, and report better retention of information. They tend to use a more ‘in-depth’ intrinsically-motivated approach to learning than students do in traditional programs.

Students’ attitudes: Students in PBL programs find the learning environment more stimulating than those in conventional ones, and experience greater interest and enjoyment in their studies. Nandi et al. (2001) remarked that “any educational process that promotes enjoyment of learning without loss of basic knowledge and skills must be a good thing” (p. 303).

Academic performance: Nandi et al. (2001) concluded that although evidence is mixed, the general perception is that students in PBL programs do not perform as well as those in traditional programs in basic science examinations, although they achieve as well as other students in clinical examinations.

Graduates’ performance: A majority of medical graduates from PBL programs are described by their supervisors as performing better or much better than graduates from conventional programs. Nurses rated the knowledge of graduates from PBL programs highly, and graduates from PBL programs are rated more highly in terms of their interpersonal relations, reliability, communication with patients, and skills in self-directed learning (Nandi et al., 2001).

Costs: It’s generally assumed that PBL programs cost more in terms of faculty time than lecture-based programs, and Nandi et al. (2001) find that this is the case, except for small classes.

This review of the evidence led Nandi et al. (2001) to the overall conclusion that while PBL appears to have a number of benefits, especially in terms of students’ attitudes to learning, learning strategies and interpersonal skills, there is “no compelling evidence of improved learning per se. … an ‘intelligent combination’ of traditional and PBL approaches through a ‘hybrid’ curriculum to provide the most effective training” (p. 305).
> A critique of PBL programs in Horticulture

There have been few documented examples of the adoption of PBL in horticulture training programs. Few problem scenarios appear to have been developed for this subject area (Jolliffe et al., 2005). PBL approaches, however, would appear to be eminently suitable. Horticultural practitioners are called on to integrate knowledge from a wide range of domains in order to solve problems and make rational management decisions. They often need excellent interpersonal and negotiation skills. Students must be lifelong self-directed learners, since no training programs can provide all the knowledge they will need in practice, and they must remain abreast of new products and techniques.

The introduction of PBL into horticulture programs at the University of British Columbia (UBC) was prompted by a perception that the traditional lecture program was failing to provide students with a range of necessary skills. The implementation of PBL involved a faculty-wide transformation, which was associated with a significant investment in tutor training and case writing activity (Riseman et al., 2005; Jolliffe et al., 2005). In Australia, PBL was explicitly adopted as a pedagogical model in an online soils program for the unit. RUH HRT358: Soil characteristics and survey techniques. The implementation of this program is described by McAlpine and Dudley (2001). The associated online materials are available at http://www2.tafevc.com.au/SCRIPT/001_RUHHRT358A/scripts/serve_home (Retrieved 22/6/06). A discussion of key features of these programs follows and is informed largely by the “Generic PBL Essentials” (Savery, 2006).

**Student-centred:** The implementation of PBL at UBC followed the classical model and early cases were based closely on medical examples. Student groups determined the problem solving processes they would use and further information on the problem was disclosed in a progressive manner as the students identified particular learning issues. Students were required to carry out active and independent research in order to respond to these learning issues (Jolliffe et al., 2005). In contrast, in the Australia example from the Victorian soils program, the claim to follow a PBL model was precluded in that the students were provided with the materials. For example, in the first problem of the program, students were expected to make recommendations about where and how soil sampling should be carried out on the property in the scenario. They were provided with a video and text commentary showing an expert actually carrying out this task. It seemed clear that they were expected to learn from and follow the recommendations of the expert. This was the approach throughout the program. Students were provided with all the information that they needed to carry out the tasks required. They were also provided with notes on how to use this information. Therefore, program activities were entirely teacher-led. To consider another example, the ‘expert’ identified some ‘buried’ soil horizons at the sampling site. This sort of anomaly might have been a fruitful source of further investigation in a true student-led problem situation. It could have provided opportunities to investigate soil formation processes and the sorts of soil profiles they
may produce. In this case, the teacher-led program did not follow this path any further. Ill-structured and authentic problems: The three example problems identified by Jolliffe et al. (2005) seemed admirably open-ended. They had no immediately obvious right solutions and offered no clear single routes to a solution. They also contained motivating features and some emotional content and were deliberately designed to intrigue and arouse curiosity. The account by Jolliffe et al. (2005) indicated that UBC staff paid a great deal of attention to the collaborative development of problem ‘cases’ during workshop sessions. The initial presentation of problems was deliberately kept somewhat open to prevent students from pursuing narrow and focussed enquiries too early in the process. As students identified particular learning issues, more information on the details of the case were released to them. In the Victorian soils program, in Australia, the situation the students were presented with was ‘situated’ in the context of a particular farm. However, the problems were not open-ended and the ‘correct’ solutions were provided in the resource material. Because of technical problems, the teachers were forced to provide learners with the course resources on CD, and McAlpine and Dudley (2001) lamented that this meant students were, in effect, provided with an electronic workbook. The actual structure and nature of these resources meant that this would have been occurring anyway.

Multi-disciplinary approach: The examples provided by Jolliffe et al. (2005) required students to integrate knowledge from a wide range of discipline areas. The Victorian soils program was limited to a single unit.

Collaboration: The UBC program used small group interaction through face-to-face meetings, in accordance with the standard PBL model (Riseman et al., 2005). The Victorian soils program was meant to include online discussions, although this was prevented through technical problems (McAlpine & Dudley, 2001). There was clearly no effective collaborative group work generated through the program.

Application, re-analysis, and debriefing: The UBC program followed the classical PBL model in placing importance on this phase of the process. In this hybrid curriculum, the debriefing meeting was used as the starting point for future lectures and discussions on related topics (Jolliffe et al., 2005). There was no mention of this phase of the process in McAlpine and Dudley’s (2001) account.

Assessment: The UBC program used summative examinations for assessment. Students were required to attend PBL tutorials, but their contributions to these were not assessed (Jolliffe et al., 2005). Assessment in the Victorian soils program was based on the students’ completion of what are essentially workbook tasks.

The incorporation of online components: The UBC program used face-to-face meetings, although students made use of online resources in searching for relevant information (Jolliffe et al., 2005). The Victorian soils program was intended to make extensive use of online discussion and online tutorial assistance. In the pilot program, reported by McAlpine and Dudley (2001), this aspect of the program failed. Partly, they
claim, because of technical problems and partly because of the students’ lack of skills. Poorly chosen discussion questions may also have been a factor.

In comparing these programs, one is essentially contrasting one which for the most part followed the classical PBL framework (apart from the issue of assessment) with one that failed to include the “Generic PBL Essentials” (Savery, 2006). The Victorian soils program situated student learning in a realistic context but the problem solving activities it offered were not “authentic” in the sense that students were not given responsibility for the process (or the solution). This program was not student-centred, or incorporated ill-structured problems, or collaboration. Its design was therefore unlikely to generate deep learning (Greening, 1998; Waters & Johnston, 2004) that PBL is intended to foster. The decision to offer this program as a wholly online one clearly added to the difficulties students would have experienced in engaging with it.

> **Recommendations**

Following consideration of all of the foregoing discussion, the following recommendations are made concerning the incorporation of PBL into training programs in horticulture.

1. Evidence indicates that PBL, when implemented according to the classical model described above, provides some significant benefits for student learning. It promotes student motivation and enjoyment of study, deep approaches to learning, interpersonal skills, independent research and problem solving skills; it fosters lifelong learning habits. For these reasons, it is recommended that PBL be incorporated into horticultural training programs.

2. Not all manifestations of PBL include the “Generic PBL Essentials” (Savery, 2006). It is recommended that the form of PBL incorporated into horticulture programs follows the prescriptions of the classical model and includes these ‘essential’ elements.

3. Effective implementation of PBL requires specific training in tutoring skills and a significant investment in the development of well-planned problem scenarios or ‘cases’. It is recommended that the implementation process is modelled on that followed for the implementation of PBL in horticulture at the University of British Columbia, as detailed in Riseman et al. (2005).

4. It is recommended that PBL is adopted gradually, as part of a ‘hybrid’ curriculum. Particular units (notably those which include multi-disciplinary elements) should be selected for the initial development of PBL scenarios.

5. ICTs may play important enabling roles in the implementation of PBL. In particular, online communication and collaboration tools offer some significant advantages. It is recommended that PBL programs are offered in a blended mode which makes use of the potential of ICTs. However, to enable the development of effective group processes, a wholly online PBL approach is not recommended. PBL programs should incorporate some face-to-face meetings or, at least, make use of videoconferencing technology.
References


