

Creating place: Design education as vocational education and training

DAMON CARTLEDGE & MARK WATSON

LATROBE UNIVERSITY

This document was produced by the authors based on their research for the report *Creating place: Design education as vocational education and training*, and is an added resource for further information. The report is available on NCVER's website:
<<http://www.ncver.edu.au/publications/2022.html>>.

The views and opinions expressed in this document are those of the author(s) and do not necessarily reflect the views of the Australian Government, state and territory governments or NCVER. Any errors and omissions are the responsibility of the author(s).

© Australian Government, 2008

This work has been produced by the National Centre for Vocational Education Research (NCVER) on behalf of the Australian Government and state and territory governments with funding provided through the Australian Department of Education, Employment and Workplace Relations. Apart from any use permitted under the *Copyright Act 1968*, no part of this publication may be reproduced by any process without written permission. Requests should be made to NCVER.

Contents

Introduction	3
Appendix 1: Literature Review	4
Appendix 2: Methodology	14
Appendix 3: Frequency Tables	18
Appendix 4: Focus Groups	29
Appendix 5: Survey (as text)	37
Appendix 6: Full Bibliography	50

Introduction

These support documents are presented as a set of appendices to the NCVER report, *Creating place: Design education as vocational education and training*.

The support materials include an extended review of literature and research methodologies, as well as an overall bibliography for the project. Also presented are frequency tables/graphs from the survey data and a text-based version of the survey instrument.

The data presented in the graphs and tables are discussed in the body of the report.

Appendix 1: Literature Review

Between Policy and Practice: A review of the literature

This project was initially framed by experiences in the Victorian VET environment, leading to a broader investigation of the national context. Of primary importance was the need to consult as widely as possible with design educators and to present the voice of practitioners.

It is important to state that this project was conducted with a particular focus within a stratum of educational practice. It is attached to VET programs at the Certificate IV, Diploma and Advanced Diploma levels of the Australian Qualifications Framework (AQF) and specifically to design education programs. The additional element of management practice is included to look for ways in which design practice at the para-professional level may input to innovation in other professional areas. The area most immediately connected is the management of design-as-work and the way in which designers may approach their work as a variation of usual business practice. An important issue to consider here is that the project was seeking to reveal opportunities for *transfer* to new contexts, and not generalisation.

The opportunity to engage in focus groups of design educators was consistently lauded by participants as a chance to critically discuss educational practice for Design. Many teachers focused on national training packages and competency-based training (CBT) and these issues emerged as the uncomfortable topics that were not fully acknowledged and discussed at an institutional level. Research conducted through a national online survey was deliberately provocative in this area; with a view of CBT as a redundant issue for design education. Our aim was to use the survey as a springboard into discussion of pedagogies that best promote creativity and innovation. However, the passionate debate about CBT remained central to discussions, particularly issues of assessment and transfer of competence.

The most interesting elements of the data collection phase of the project rested in the ‘spaces’ between policy and practice. The operational thinking surrounding CBT is brought forward here briefly, as it is salient to the project intent and frequently articulated by the practitioner ‘voice’ in the data.

Many design educators were somewhat concerned about their established pedagogical practice being tracked against mandated requirements of national training packages. In most cases teachers indicated that they were able to satisfy the needs of students to be ‘job ready’ at the end of a course of study, but many challenged the veracity of the at-job-standard reporting of competency. In many cases attention to assessment practice was about making existing studio/project based strategies fit the reporting requirements of national training packages, rather than the packages informing the assessment choices.

Meyer’s (1983) study of design education in TAFE, for what were then called ‘non-professional’ designers, identified many issues that we discussed with current VET design educators. This indicated that many of the issues, underpinning debate on design education as VET, remain unresolved after more than two decades. Issues carried forward include levels of industry influences and understanding of design skills, professional versus ‘non-professional’ design work, and developing appropriate pedagogies for creativity and innovation.

With TAFE as the predominant VET provider in Australia, we approached the study with cognisance of the 2006 TAFE Futures study and its dialogue regarding the continued disquiet (and increased role diversity) attached to national training packages. In the TAFE futures document,

Kell (2006) cites a specific example from a Ceramic Design program where assessments for kiln operations for fine ceramics were drawn from building construction packages related to the manufacture of toilet pedestals. This surely brings into question the legitimacy of competency assessments made out of context. Discourse in the focus groups often led to similar examples of overextending the scope for transfer. These operational level issues remain critical to understanding the issues confronting design education as VET.

The design sector appears to suffer an imbalance in interest and support between states of Australia. Queensland and Victoria notably attract the praise of the Design Institute of Australia (DIA) for their proactive position on connecting industry and the design sector. However, TAFE's accordance with this position is reported as problematic by the 2003 report *Developing Victoria's Design Capability*, due to staffing limitations, restricted resources and diversity of its role (DIIRD 2003, p.34). In investigating a collective and collegial approach to design education as VET, the Western Australia and New South Wales/ACT focus groups were the only consultations held in VET design centres. Both of these centres are established as specialist TAFE colleges, indicative of a focused investment in design education as VET.

Adding to the imbalance and confusion about who and what constitute design education is the rhetoric about the directions, connections and stewardship of the design sector (DIA 2007; DIIRD 2003). An indication of the range of interested parties is that more than 60 government and non-government groups are currently listed by the DIA as being directly connected to the design sector. None of these groups appear as overtly connected to VET, yet several are exclusively connected to higher education. Arguably, this reinforces the notion of a confused 'space' for design education and design educators in VET.

Therefore 'design' and the educational principles and practices that properly support its many iterations remain contentious issues. There was much consultation and discussion during this project about the need for clearly articulated approaches to design education, yet little agreement on defining design; it is many things to many people.

To better understand this 'space' we need to conceptually frame the project and position the findings within current professional discourse; starting with the issue of defining *design*.

Defining Design

Design is an often contentious term and according to Sparke (2004), a recognised authority in the area of design, notoriously difficult to define in contemporary practice. Sparke states that in reviewing her published work that spans the preceding two decades:

I failed to provide any useful working definitions or defining frameworks for the two main concepts - design and culture- that I was at pains to document. This is still a daunting task as they are both difficult, complex concepts which have transformed themselves significantly over time and which have been defined by different people at different times in different ways. (Sparke 2004, p.4)

In this sense design, as a means of communication, is part of the dynamic process through which culture is actually constructed, not merely reflected. This cultural shift in what design proposes to contribute to communities can be defined by understanding the role of design in culture. For example, when you look at economics, the past decade has seen a shift from a sole focus on fiscal economics to that of the Triple Bottom Line (TBL, [Australian Government 2007](#)) a move that has seen social and environmental capital added to the ledger. For this study, links will be examined between current thought on the improvement of design education in the VET sector and the TBL outcomes of innovation in business practice, fiscal development and environmental sustainability. TBL approaches have proved very effective in development of innovative products and practices in many highly successful businesses and economies around the world.

In 2005 international consulting group KPMG reported on TBL approaches used by the top 250 of over 1600 companies worldwide, demonstrating improvement in business outcomes by attending to TBL criteria – including new product design and, in Australia’s case mandatory reporting against environmental regulations (KPMG 2005, p.44).

The capacity to link the VET dimensions of design education, as ways-of-knowing and not simply as ways-of-doing, should expose design education as part of Sparkes (2004) ‘dynamic process’. The importance of this study is therefore underpinned by examination of the effectiveness of current policy and practice for VET programs in design education and their role in achieving the arguably higher-order aims of good corporate citizenship in the 21st century. Therefore, in this project the definition of design shall not be limited to product development (e.g. furniture, buildings or consumer goods) per se, but rather will include aspects of problem solving, systems development and sustainability in the TBL context.

This more nebulous definition of design and design practice leads us to seek strategies that will support the new ways forward; innovative practices underwritten by purposeful VET programs. A 2003 study into the design sector in the state of Victoria declared at least 17 distinct *disciplines* (their emphasis) within the design sector for that state alone (DIIRD 2003).

The situation is amplified by the Victorian Industry Training Board for the Sport and Cultural Industries (including many elements of the design sector). In a 2003 report titled the ‘Design Qualifications Framework Project’ (VQA/ARTV 2003) it also realised the problems about defining design in the Australian context and state:

For the purpose of this research report we have kept the definition of ‘design’ broad and have not sought to restrict or define it in absolute terms...we have focused our attention on the ‘design industry’ as well as looking at how design has been adopted or perceived by/within other industries. (VQA/ARTV 2003)

Other pundits support this position such as noted management guru Charles Handy, who in his book titled “New Alchemist” (1999) likened persons such as Sir Terence Conran, through their appreciation of design and application of design principles in business model, to those who turned dross into gold. This is particularly so of the impact of marketing design as a product to a largely un-discerning consumer (Heartfield, 2007). Whether these definitions can be connected to the craft-base of design and designers is also connected to our perceptions of what design is all about. As an example from the Victorian context, the 2007 categories for Lab3000 awards for tertiary students reflect the complexity of design as a *discipline*. There are at least nine subcategories attached to three thematic areas in the awards. However the Lab3000 awards are well connected to the premise of TBL. Key criteria for a tertiary student to demonstrate are design excellence and innovation, and also “responsiveness of the design to the social cultural and economic environment of its market, users or audience” (Lab3000 2007).

The array of perspectives attempts to capture the elusive meaning of design from many different approaches. The problem is a nebulous one, and an issue that is arguably growing in intensity as design educators are pressed to deconstruct ‘design’ to match pedagogies of training and assessment, particularly in the VET sector. This ‘deconstruction’ of vocational competence and professional work has proved a source of concern in reviews of training packages in other industries (Harris, Guthrie, Lundberg & Hobart 1995; Boud & Solomon 2001; Brady 2002; Smith & Keating 2003).

As the skills council covering the Creative Arts (including design), Innovation Business Skills Australia (IBSA) are developing the Training Package for Australia’s creative industries; the Visual Arts, Craft and Design Training Package - CUV03. According to the National Training Information Service (NTIS 2007) the current nationally accredited training package contains only two credentials that are distinctively labelled as *design* qualifications. This is in stark contrast to the over 700

references to *design* across almost 70 disparate industry areas on the NTIS database (IBSA 2006). However increasing interest and investment in the design industry, as a specialisation, has provided the impetus for a broader range of design-specific VET qualifications and credentials. One example of this move forward is in Victoria, where state based *applied design* programs are being developed and delivered by VET providers.

These state-based offerings model a continuity of study from Certificate II through to Diploma level. However it is noted that these VET qualifications are considered to be most purposefully aimed at operator-level design practices (attached to competency based programs) which may place them at odds with views on skills development and capacity building through creativity and problem-based approaches. The Victorian Qualifications Authority/Arts and Recreation Training Victoria (2003) research revealed creativity and problem solving as essential components of Certificate IV programs. Yashin-Shaw (2003) states that creative problem-solving is 'integral to so many vocational fields' and that educators and practitioners need to understand the cognitive foundations of the design process (p.153). Our survey and focus group data both affirmed VET practitioner views that problem based learning (PBL) was a key component of their VET specific practice; especially in leading to the employability of graduates from VET programs. This contrasted with early speculation from the design community that VET programs, framed by CBT principles, may not attend to the needs of the industry in fostering creativity and problem solving strategies alongside enhanced craft skills at Certificate IV to Advanced Diploma levels.

Again it is important to remain focused on the VET environment as a boundary of this project. Our operational definition of VET is true to Smith and Keating's (2003) definition that it is "an international term that describes the development and improvement of skills and knowledge for the specific purposes of improvement in an individual's capacity in productive work" (p.3). The study also attaches to the four key features that Smith and Keating use to differentiate the educational 'place' of VET. They are that it has, association with industry; association with a job or task; learning is contextualised on and off the job; and it is skills-based. The skills-based component is amplified by the 'Learning to Work' report from the 2004 parliamentary inquiry into Vocational Education where they also declare the skills-based element as a key feature of vocational education programs in Australia (Commonwealth of Australia 2004). What we need to be mindful of is that design *skills* do not exclusive reside in the actions of designing, rather they are keenly developed through building a capacity for critical analysis and thoughtful application. Here is where the educational 'place' of design must be contextualised by the vocational field it supports – i.e. the design studio for interior design/furniture design, digital media workstation for multimedia work or other creative 'spaces' for design work in fashion, textiles and the like.

Attaching to these terms brings into focus the potential for a disconnect between the generic principles of VET and the education of *designers* per se. In viewing the DIA as an established representative body for designers in Australia, there is an interesting setting apart of the designer from the artisan. The DIA state that "The difference between a designer and a craftsperson or artist is that designers usually develop things that have requirements set by others and will ultimately be produced by others." (DIA 2007). This speaks to a difference in view from many of the VET practitioners consulted in this study where these practitioners are vested in the hands-on skills formation attached to product design and manufacture for industry. This study has illuminated that it also speaks to the professional background of those educators teaching design in the TAFE sector – with a predominance of members from the manufacturing, digital design and building construction industries; industries maintaining historic and direct associations between design and craft skills (Murray 2003; Longmuir 2006).

The need for greater scrutiny of the intellectual capital, or *knowledge*, component of VET design education has also been declared. This sits alongside the statements from researchers investigating the Australian context who declare the potential absence of *knowledge* components of VET programs, particularly in TAFE, as impacting Australia's skills base (O'Connor 2000; Ferrari 2007; Kell 2007).

CBT - Competency Based Training

Competency based training (CBT) has emerged as one of the most widely debated elements of Australia's VET systems (Harris et al. 1995; NCVET 1999; Smith 1998; Smith & Keating 2003). At CBT's formalised inception into the mainstream of Australian VET practice in the early 1990's, the Vocational Education, Employment Advisory Committee (VEETAC) offered a definition of the principle values of a competency based system as ensuring the quality of outcomes in training and learning processes; and the provision of a framework within which a greater diversity of pathways and training and learning methods can be applied (VEETAC 1992).

With these assertions in mind, to address the principles and features involved in CBT for design education it will be important to establish what the historic parameters of the concept are. At the beginning of the 1990's the National Board of Employment, Education and Training (NBEET) summary paper by the Employment Skills Formation Council (EFSC) argued that:

The essential aspects of a CBT system are that delivery, assessment and certification of training should relate to the identification of, instruction in, and demonstrated attainment of the specific mix of knowledge, skills and applications required at the relevant occupational level, as defined by industry in competency standards. (NBEET 1991, p.2)

This broad statement is indicative of the type of rhetoric to be found in early CBT literature in the Australian context.

When the Australian Government through its agency in the Australian National Training Authority (ANTA) chose to follow the international practice of competency based assessment, it set new ground rules for delivery of training and assessment along the given lines of 'task based' assessment (Smith 1998). However, it also sparked debate on the competition of defined industry needs competing with established educational practice. The National Training Board (NTB) described the transition to CBT as "the most radical reform of Australia's vocational education and training system ever attempted" (NTB 1993).

The relevance to industry drove much of the implementation of CBT, in that industry has operated with a powerful role in the process. The calls from industry for a nationally consistent training system to up-skill the Australian workforce and increase international competitiveness resonated loudly in political arenas. Connections between VET, CBT, industry and enterprise were also highlighted by the then Prime Minister, Paul Keating, stating:

Australia's training system should reflect the needs of a changing labour market...the system will become more flexible and more responsive to the requirements of both individuals and industry. (Keating 1994, p.98)

It is from this responsiveness to industry that CBT drew criticism that has persisted for over a decade. The delicate balance between industry needs and educational principles is also declared as a challenging premise for any education and training system (Harris 1995). In the decade or more since these statements there have been persistent voices of dissent from educators who resist CBT on the grounds of its perceived industrial bias (Harris 1995; OTTE 2003; Smith & Keating 2003; Stevenson 2003). Importantly, Gonczi (2004) reminds us that the Australian Government made its decision that all vocational education should be competency based 'without really knowing what that might mean' (p.20).

In reframing the ideological approaches of design education, CBT strategies and assessment practices were developed for Australian Qualifications Framework (AQF) certificates I, II and III levels. A national approach to analyse the training needs of related industries was invoked through establishing various agencies, in the case of the design sector it was initially through the Culture Recreation Education and Training Enterprise – CREATE. In the process, the deconstructing of

tasks practiced by designers was pursued as the most appropriate way to frame assessments of competence at the certificate I – III levels, but usually as generic design skills applicable to a range of vocational directions. Many educators examining VET pedagogies are critical of this atomisation of skill under CBT. Stevenson (2003) espouses that this practice obscures the conceptual whole from the learner, a point well made by participants in the design education project.

According to statistics reported in 2004 by NCVET, approximately 75% of VET delivery is in the area of AQF certificate I - III. However, the area that most design education and training occurs is certificate IV and above; the remaining 25% (NCVER 2004). With these figures in mind, the frame narrows somewhat in terms of the range of courses available.

Most industry-specific design qualifications do not appear until the certificate IV level, as an entrée to para-professional work, revealing the a need to redefine the more vocationally focused skills required of *designers* per se in these higher level courses. It has only been in recent years that course curriculum writers have had to shift from task based writing and grapple with the contexts presented by the creative industries, and formulate competencies that align with strategies such as problem based learning (Curtis & Denton 2003; Middleton 2003; Guy 2005; Yang, You & Chen 2005; Lindstrom 2006).

Smith and Keating (2003) also articulate the difficulties in CBT delivery that are attached to the currency of teachers industry knowledge. This issue cannot be discounted when considering the impact of transparency and accountability elements of CBT assessment in design education programs at the pre-professional level. Comments from Peter Kell, author of the national *TAFE Futures* review, add the caution that affording priority to the needs of government and industry in VET over the last decade have 'have failed to produce a workforce for the future' (Kell 2007). These issues combine to build a compelling argument to make better connections between pedagogy and professional vocational preparation.

Creative Industries and Design Education

Innovation is a key driver in current economic parlance, it is a descriptor preferred by the disciplines such as the physical sciences, economics, and management. Professionals from the *creative* industries prefer *creativity* as a descriptor and feel comfortable with it. Other terminology that has come to encompass *creativity* includes titles such as the Creative Economy, Innovation Economy, Knowledge Economy and the Experience Economy. Some practitioners in fields such as architecture, building construction and engineering are even speculating the demise of creativity (including the absence of the terminology) inside their professional contexts will erode creative behaviours (Maher 2007).

In writing for the Design Institute of Australia, David Robertson (2006) laments the waning interest in the design industry as a “symbiotic partner” to the manufacturing sector. Whilst Robertson’s article is clearly an insider perspective on the status of *design* as a commercially viable creative industry, it speaks to the issue of competing government priorities, policies and agendas. The essence of the piece is that whilst design is recognised as important in a supporting role to manufacturing, it has been slow to gather backing as a creative industry in its own right. This dilemma frames a need to investigate policy directions, including state and federal funding support of design as an autonomous sector of industry.

State based initiatives that identify design as a strategic capability have been underpinned by resource allocations to education and training. The Victorian Government’s innovation statement “Victorians. Bright Ideas. Brilliant Future” (2002) identified design as one of Victoria’s strategic capabilities leading to the conduct of its own VET Inquiry (OTTE 2006) that identified five key priority areas for VET training among areas such as nanotechnology and advanced manufacturing, design is identified as a priority area to be supported, yet it is only mentioned once in the entire report (p.15).

The Victorian context serves as a reference point for a review of priorities for creative industries in other states. In a press release from October 2006, the minister for Manufacturing and Export in Victoria, Mr André Haermeyer stated “The Government recently re-affirmed its commitment to design through a \$15 million package over four years to increase the sector’s competitiveness ; drive innovation and export performance; and establish Victoria as a centre of design leadership” (http://www.dtf.vic.gov.au/domino/Web_Notes/newmedia.nsf/ accessed 03 Mar 2007). The department of treasury and finance statement identified the value of design as a creative industry to the Victorian economy where *Design* contributed \$6.8 billion to the State’s economy and employed 67,000 people across various disciplines including industrial design, architecture, fashion and computer software design.

Evidence from the review of literature and research forums for this project support the need for skilled and knowledgeable design graduates; a hybridised entity equipped with not only artisan craft skills but also with critical-analytical thinking skills. Ideally these graduates will be both creative problem solvers and skilled artisans. In reviewing this potential the literature alludes to a separation of VET approaches from higher education approaches, founded on traditional models and pathways of professional preparation in design fields (Malecha 2002; Robertson 2005).

Design education as VET continues to operate in the margins of the professional design community, regardless of its renewed visibility on government policy agendas. However, the Australian design industry appear to be now critically reviewing own policies and practices. Issues of credibility of collective purpose have been raised from within this professional community. At the 1996 national conference of the Design Institute of Australia in Adelaide, it was stated:

In conclusion it must be reiterated that there is an urgent need for the DIA to take a far more active role in design education if it is to be seen as a credible organisation concerned, as it claims to be, with the promotion of excellence in design in Australia. The above comments and proposals may not be as well considered as they could be but they must be addressed with the utmost seriousness and urgency. (Stephens 1996)

Following on from this statement in 1996, there is growing evidence of a collective approach from Australian design community towards conducting ongoing national conferences and pursuing a coordinated national agenda. Even over the period of this project we observed a sense of renewal and repositioning of design from both the DIA and in educational provision. The visibility of design as a creative *skill* has increased markedly in the secondary education sector and also in higher education. In support of their sector the DIA cites a range of state-based award programs and forums that are conducted across Australia (DIA 2007), but again research into issues such as the pedagogies and practices of design education are not explicit. In the VET context, a 2003 study by the Booz Allen Hamilton consultancy, VET providers (TAFE specifically) are cited as contributing to an oversupply of design graduates (DIIRD 2003). Therefore, with a reported oversupply of graduates but an industry perception of an undersupply of design skills, surely the policies and practices of education at this level have to be brought to question. This ongoing tension regarding skills versus qualifications is also articulated in the UK experience, particularly at the para-professional level (UK Government 2007).

Design education as vocational education is yet to establish itself as a legitimate and autonomous player in Australia’s creative industries. In a similar context, VET design programs do not appear to be well recognised by the wider design community; however this may simply be symptomatic of historic divisions between VET and higher education sectors (Australian Government 2004).

Communities of practice in higher education appear to be more supportive of design research; through national and international conferences such as ‘Futureground’ (2004) at Monash University with the Design Research Society, and most recently ConnectED as an inaugural international design education event held in Australia in 2007. By default, the ConnectEd conference was centred on University programs and global industry perspectives. VET design educators were conspicuous

by their absence at ConnectEd; the senior researcher for this project represented the only 'declared' VET practitioner presenting at this Australia-hosted, international design education conference. Our experience of the conference was that VET practitioners would have added refreshing perspectives to the issues and discussions, and gained positive exposure in the international design education community. It raises the separate issues about the divisions (both real and imagined) between VET and higher education in Australia. This issue is set to continue to grow in relevance as historic credential-driven divisions disappear; notably through the increasing number of degree and post-graduate programs on offer from TAFE. The AQF levels pertinent to this project, especially Diploma and Advanced Diploma represent the foundation of this nexus and important potential for innovative and collaborative practices.

In 2006 IBSA published a discussion paper entitled 'Innovation, Creativity and Design: Collated Research'. The document presents instances of design in VET programs in the Australian context and their connection to creative process and innovation. The limitation of the document resides in its descriptive nature, it is essentially a collection of research snapshots that does little to inform the reader of context. Similarly it fails to adequately evidence assertions; its title as "collated research" and a "discussion starter" is an accurate reflection of its content and intent. With these criticisms aside it serves as particularly useful document to springboard investigation of professional practice in the VET context; teaching and learning practices in response to available resources and frameworks. The IBSA report (2006) also reveals a range of useful operational definitions and is also valuable for its currency in the available literature.

The literature from these recent research efforts infers that any compelling case to profile new directions for design education should be made by teacher-practitioners in the field of design. It is the authenticity of the voice of designers, who are actively engaged with both their industry and the education of the next generation that will determine how effectively education and industrial sectors attending to VET design programs.

Management Education

The body of literature surrounding design education as management education in this review has been limited to its most contemporary context. This is consistent with the emergence of design thinking as a 'way of knowing' and an innovative 'way of doing' in management practice. As the project explores the impact of training and assessment practices at the pre-professional and para-professional level it will also investigate the transfer of the design process into Australian management practice.

There are well documented links between creativity and leadership, including the stewardship of creative thinking and behaviour in Australian business (Sarros & Moors 2001). With their direct connections to training package development for the creative industries, IBSA realised the importance of innovation commissioned a report that revealed managing creativity as an important new role for the new manager in the 21st century (Nicholson & Nairn 2006).

The position of design as a management process is gaining momentum in the Australian context, but is more advanced in other western economies. The Design Management Institute (DMI) is an organisation founded in 1975 in the USA and has been influential in the development of Design Management as a discipline at an international level. DMI's international publications (http://www.dmi.org/dmi/html/publications/academic/academic_d.jsp) represent a credible concentration of ideas and discourse on the development of this particular area in other countries; this material informs the Australian context as local designers, and subsequently design educators, engage with a globalised marketplace.

To cast some light on current positions, Conley's (2004) writing on the strategic value of designers in business repositions design education within a management education context. However, Conley

(2004) cautions that those designers working from within design departments will not be able to contribute to improving strategic functions without moving outside the design environment to make their real contribution to management practices.

Owens (2007) extends this view that design thinking is marketable as a service to industry and enterprise, especially arguing that the process of design thinking drives innovative practice. In reviewing the context of application Owens is careful to discuss that we should expect problems when we move the context of design thinking to the strategic or policy level. This manifests itself at the teaching stage where:

Teaching design thinking, formally or tacitly, is one thing when the context is a traditional design career in industry or a consulting office. It will be quite another when the context is institutional or governmental policy planning. And our problem is just that: to train a new kind of student for that new context. To train students for roles as policy design synthesis advisors, it will be necessary to create a new kind of design program. (Owens 2007, p.25-26)

Other issues such as arguments for design awareness in the field of New Product Development and a more comprehensive understanding of design processes by management are constant themes in the design management literature, but these issues did not reveal themselves as an integral part of the design education platform in VET. It is here that we expected our project to reveal a nexus between the aspects of design education as professional vocational preparation and graduating designers as strategic assets for enterprise, not simply operational level resources.

Issues such as the scale of enterprise in which these graduates will operate is also a determining factor in how their skills might be deployed as a business 'resource'. For example, the para-professional design graduate in a small to medium enterprise may be more strategically positioned to develop and assert their professional influence within a management framework, than a contemporary who has landed a more operational design role in a large prestigious firm. However the latter graduate is more likely to be exposed to standardised systems and processes of a globalised industrial base such as ISO9000 or similar industry specific standardised compliance and endorsement schemes; as strategic tools for business.

The issue of competence and skill is therefore still bound by the context of the design-work for which the graduate is prepared at the certificate IV, diploma and advanced diploma levels. This resonates with Conley's (2004) assertions of professional 'place' and supports the argument for management education programs to incorporate the recognition of the contribution of the design community. In the UK, where *design* forms part of the Creative Industries, there is continued debate from employers about whether diploma level graduates have the required skills for their industries, yet that sector is reported as having double the rate of economic growth of any other industrial sector the country (Hutton et al. 2007). Similarly, the British Design Council are attributing expenditure on design functions in businesses to increased economic performance, across all industries. However that mood is tempered by wider research that speculates that the causal relationship may be inverse, viz.

The relationship between high performing firms and their spending on design can be often be attributed to other factors such as their overall competitiveness and commitment to high capital spending; the causation may run from their high performance to their willingness to spend on design rather than the other way round (Hutton et al. 2007)

We would argue that from the discourse generated by our project, that there is a genuine need to 'meet in the middle' on the matters of where the appropriate expertise is situated between business and design. A claim that designers, particularly those at the graduate para-professional level, are equally positioned as both creative and business professionals carries an unrealistic expectation of the students vocational preparation. However, acknowledgement of a symbiotic relationship

between business and design skills that is well connected to industry and enterprise contexts certainly value-adds to VET sector design graduates. Identification of what those skills should be is again contextually driven. Discussions during focus groups reaffirmed the difficulties attached to the transferability of units of competence across programs and qualifications. For example, something as routine as to 'liaise with clients' holds different meanings in different industry settings, especially in design contexts, but is seen as a universal business skill. If it is not approached carefully, students can end up with a very narrow, potentially non-transferable skill. This issue has been widely recognised and directly connected to a skilful teacher's capacity to impart critical understandings beyond singular workplace settings (Smith 1998; Smith & Keating 2003; Stevenson 2003). Sharing and transferring understandings is seen to develop collective competence inside organisations, particularly between creative, technical and management functions in knowledge-intensive industries and economies (Sandberg 2000).

Playing it forward

The apparent separation in design education of VET programs from more traditional models of professional preparation (notably higher education programs), has led us to ask questions about the balance of process and product in this period of preparation for professional work; particularly how to dispel over-simplified views of VET practice (in design education) as basic craft-skill acquisition. Redefining what constitutes professional skill, and how we assess it, is a central challenge of this project. These issues also led us to question what future generations of designers expect of design as an industry and as a vehicle for innovative practice.

The preliminary review of literature also revealed a relatively compelling argument on generational shifts in organisational thinking, however this was considered outside the bounds of the current project. However, the work of researchers and commentators such as Prensky (2004), Sheehan (2005) and McCrindle (2006) will impact the relevance of VET practice into a new generation of learners – bringing questions about 'digital immigrants versus digital natives', 'Boomer - Gen Xs transitions' and 'Generation Y or Generation Why Bother?' This material on generational change is increasingly salient to the fields of design and also education. In particular, the potential impact on labour markets and educational contexts.

Design is an emerging field of study and its growing importance to humankind is only just starting to be recognised. In fitting design into a matrix of competency, care needs to be taken in understanding and interpreting it, and courage is needed to recognise that new structures may need to be developed to accommodate it. The clarification of what it is to be a designer and investigation of improvements to learning and assessment strategies attached to that professional identity will be essential to the emerging operational and strategic roles of design and designers in industry.

Appendix 2: Methodology

Research Design

The project focused on articulating perceptions of VET practitioners of the effectiveness and capacity for innovation of extant techniques employed in design education as VET and their relationship to emerging expectations of professional competence in the design industry. The methodology is based on the assumption that the perceptions of education practitioners are an under-utilised measure of the effectiveness of current assessment methods in achieving the goal of encouraging innovation and developing high level creative skills.

The methodology applied was mixed-mode. Quantitative data was gathered through a nationally distributed online questionnaire. Qualitative data was generated and harvested through the inclusion of open-ended questions in the online instrument, and follow-up focus groups for each state involving survey participants and other key informants, including representatives of relevant professional bodies.

Purposive sampling techniques were employed for the survey, to accurately direct the study to those design professionals registered through professional associations and recognised as design educators in the VET context.

Members of professional associations and industry bodies accessed in construction of the sample included representatives from the TAFE sector as well as groups such as IBSA, the Design Institute of Australia (DIA), MaD and Verve. These associations and industry bodies seek to represent a critical mass of design educators in Australia and, most importantly to this project, in the VET sector.

Questionnaires were developed and piloted by the research team (including the *Peoplearn* consortium), in consultation with NCVET, before going live on the internet in May 2007. Administration of the survey instruments, including distribution, collation, cleaning and preliminary processing of data through SPSS, was conducted by *Peoplearn* as a field research partner. *Peoplearn* were engaged to conduct follow-up focus groups, however the Principal investigator and Senior researcher also attended at the NSW / ACT, Victoria and Western Australian forums.

Engaging a field research partner was an innovative component of the research design. The group were engaged for their understanding of the field of design education. This expertise is built on direct affiliation with the professional associations involved in VET delivery for the design industry, and strong contacts across associated industries. The national reach of such a field partner allowed the project to extend beyond localised and desktop research and assisted in purposive sampling.

The questionnaire was primarily developed to promote discussion for innovative practice at the focus groups.

Survey Method

Stage 1 – Development of Sampling Framework

Development of a sampling framework that ensures that data collected was faithful to the project, in terms of both focus and representation. The key tasks of this stage included:

- ✧ Determination of population size (through the state based ITAB's and Skills Councils)
- ✧ Determination of confidence levels of sample size and intervals required for follow up.

The target sample of 200 was considered adequate in a purposively constructed sample; to attain statistical confidence of the findings as representative of the broader population. Importantly, the study sought indicators of 'transfer'; rather than generalisation. The sector is quite specialised and it was important to seek out key informants. That is, people who have a good understanding of the design process and design education, and of management processes within the relevant industries.

Stage 2 – Recruitment preparation

The national *Peoplelearn* consortium, containing the relevant ITAB's (and equivalents), identified potential participants according to a purposive sampling process, with a focus on design educators in the VET sector.

Invitations to participate were distributed through state level professional associations – via newsletters and bulletins. Numerous direct approaches were conducted to encourage participation. This approach ultimately proved less successful than anticipated, it would require careful evaluation for future research with this population.

Stage 3 – Survey design

The research instrument was developed collaboratively by the chief investigator and senior research officer, along with *Peoplelearn's* survey team. The survey was reviewed and piloted by members of the design industry and approved for release by NCVET.

The survey instrument was constructed around a simple Likert scaled format. Responses are scaled from statements and supported with free-text sections to capture textual qualitative data. The survey was then converted into a web-based instrument utilising "Joomla" web survey software (see additional materials for screenshot). The survey was populated and hosted by Worklab in Tasmania as part of the *Peoplelearn* consortium.

The instrument contained 59 data fields, viz:

- ✧ Thirty seven items were in six statement-response sections constructed on a seven-point Likert scale.
- ✧ Four items were binary/closed questions,
- ✧ Eight items were open textual responses,
- ✧ Ten items collected demographic or administrative data.

Stage 4 – Data collection

The survey was in the field for three months. Telephone follow-up was conducted to enhance response and completion rates. The final sample achieved was 209 participants. Consolidated reports and field notes were collected from each focus group site. These data were examined separately as part of the qualitative textual analysis, including thematic coding. Once coded it was re-examined thematically to ensure its contextual validity with the project.

Other qualitative data was gathered through field notes and meeting reports from focus groups; reviews of unpublished (often internal) documents, exhibition and conference materials formed a body of 'insider' grey literature to inform the study.

Stage 5 – Data analysis

This stage involved the separation of quantitative material as discrete data and the merging of textual data from the survey instruments for analysis. Data was checked, cleaned and coded, then imported into qualitative analysis software (NVivo) and quantitative software (Statistical Package for the Social Sciences - SPSS) respectively. Analysis included standard validity/reliability tests and frequency counts as appropriate to report descriptive statistics. Alpha coefficients were relatively low per section but determined as fit-for-purpose. The survey was not designed for inferential factor-based analysis; the internal reliability ratings confirmed a valid and trustworthy set of quantitative data in support of qualitative analysis.

Stage 6 – Reporting

Reporting of the project is conducted progressively through three critical review filters:

- ✧ Progress reports to NCVER; subsequently posted to public website,
- ✧ Conference paper at International Design Education Conference (July 2007), and
- ✧ La Trobe University Faculty of Education research forums.

Reports were informed by ongoing analysis of data, revealing emergent themes and The final report stands as a distilled review of feedback from these key sources.

Focus groups

Focus groups were held in state-capitals; hosted by the *Peoplearn* consortium at ITAB offices and design education sites. Key informants to the groups were identified as those persons professionally engaged either as designers or design educators. Management practitioners and management educators from design related industries were also invited. Design educator participants were registered members (or eligible for registration) of their respective professional associations that regulate membership based on both qualifications and professional experience as designers or design educators in the VET sector.

The number of participants in the focus groups ranged from four to 30. South Australia was the only state where the ITAB attempt to establish a focus group proved unsuccessful. The national distribution of design educators was expected to impact the numbers, however the timing of the forums competing against teaching schedules and holiday breaks delivered less consistent groups than expected. However, many teachers did attend during holiday periods; suggesting a strong interest in the project topics. In concert with the emergent design model and consistent with the intent of a focus group – themes and priorities were identified by those questions in the survey that emerged as most contentious (Kayrooz & Trevitt 2005; Burns 2000). These sessions clarified and extended the range of qualitative data, and assisted in thematic coding.

Focus group sessions ran for two to three hours per group. Timings were based on consultation with design education groups and included:

- ✧ Time available to attend (as indicated by potential participants),
- ✧ Currency of the issues (as indicated by literature and emergent themes),
- ✧ Time required to capture appropriate data,
- ✧ Budget limitations.

Shaping of themes

Whilst there were themes attached to the declared research questions, the design of the study is in a constructivist framework that relies heavily on the participant voice to underpin its trustworthiness. Emergent design in this context dictates that an initial response to the survey was required to establish and pursue the predominant themes; brought to us by the expert industry practitioners undertaking the survey. Whilst the survey instrument is built from the preliminary review of the literature, it is the tool through which to inform and clarify (or modify) these directions. This underpinned the approach to wait for the first data set (>25%) before consolidating themes and agendas for the focus groups

Appendix 3: Frequency Tables

NB: Section numbers relate to their position in the survey instrument.

Section 5

5.a Competency based training (CBT) allows teachers to have greater scope for innovation and creativity in delivery than curriculum based programs

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	30	14.4	14.4	14.4
Disagree	47	22.5	22.6	37.0
Somewhat Disagree	20	9.6	9.6	46.6
Somewhat Agree	27	12.9	13.0	59.6
Agree	63	30.1	30.3	89.9
Strongly Agree	21	10.0	10.1	100.0
Total	208	99.5	100.0	
Missing	1	.5		
Total	209	100.0		

5.b Problem based learning (PBL) is an essential part of Vocational Education and Training (VET) design practice

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	5	2.4	2.4	2.4
Disagree	2	1.0	1.0	3.4
Somewhat Disagree	5	2.4	2.4	5.8
Somewhat Agree	24	11.5	11.5	17.3
Agree	91	43.5	43.8	61.1
Strongly Agree	81	38.8	38.9	100.0
Total	208	99.5	100.0	
Missing	1	.5		
Total	209	100.0		

5.c CBT has impacted on project based delivery of design education.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	2	1.0	1.0	1.0
Disagree	10	4.8	4.8	5.8
Somewhat Disagree	26	12.4	12.5	18.3
Somewhat Agree	62	29.7	29.8	48.1
Agree	78	37.3	37.5	85.6
Strongly Agree	30	14.4	14.4	100.0
Total	208	99.5	100.0	
Missing	1	.5		
Total	209	100.0		

5.d Core elements of design education are currently being encouraged through CBT.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	26	12.4	12.5	12.5
	Disagree	35	16.7	16.8	29.3
	Somewhat Disagree	25	12.0	12.0	41.3
	Somewhat Agree	46	22.0	22.1	63.5
	Agree	64	30.6	30.8	94.2
	Strongly Agree	12	5.7	5.8	100.0
	Total	208	99.5	100.0	
Missing		1	.5		
Total		209	100.0		

5.e In the design industry, VET practice is positioned differently than in higher education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	1.0	1.0	1.0
	Somewhat Disagree	6	2.9	2.9	3.8
	Somewhat Agree	53	25.4	25.5	29.3
	Agree	109	52.2	52.4	81.7
	Strongly Agree	38	18.2	18.3	100.0
	Total	208	99.5	100.0	
Missing		1	.5		
Total		209	100.0		

Section 8

8.a Industry has unrealistic expectations of design education graduates.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	2.4	2.4	2.4
	Disagree	42	20.1	20.4	22.8
	Somewhat Disagree	43	20.6	20.9	43.7
	Somewhat Agree	86	41.1	41.7	85.4
	Agree	21	10.0	10.2	95.6
	Strongly Agree	9	4.3	4.4	100.0
	Total	206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

8.b Criterion-referenced task-based assessments are currently used at all levels of VET Design programs.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	3.8	3.9	3.9
	Disagree	42	20.1	20.4	24.3
	Somewhat Disagree	74	35.4	35.9	60.2
	Somewhat Agree	57	27.3	27.7	87.9
	Agree	24	11.5	11.7	99.5
	Strongly Agree	1	.5	.5	100.0
	Total	206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

8.c Industry promotes CBT in design education.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	19	9.1	9.2	9.2
	Disagree	55	26.3	26.7	35.9
	Somewhat Disagree	36	17.2	17.5	53.4
	Somewhat Agree	40	19.1	19.4	72.8
	Agree	42	20.1	20.4	93.2
	Strongly Agree	14	6.7	6.8	100.0
	Total	206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

8.d Industry has a well developed appreciation and understanding of how to develop design talents in students

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	30	14.4	14.6	14.6
	Disagree	51	24.4	24.8	39.3
	Somewhat Disagree	50	23.9	24.3	63.6
	Somewhat Agree	56	26.8	27.2	90.8
	Agree	15	7.2	7.3	98.1
	Strongly Agree	4	1.9	1.9	100.0
	Total	206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

8.e The role of VET is balanced between educating the ‘individual’ and responding to the needs of industry and enterprise.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	14	6.7	6.8	6.8
	Disagree	9	4.3	4.4	11.2
	Somewhat Disagree	24	11.5	11.7	22.8
	Somewhat Agree	52	24.9	25.2	48.1
	Agree	61	29.2	29.6	77.7
	Strongly Agree	46	22.0	22.3	100.0
	Total	206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

8.f Task-based assessments are used effectively in all areas of design education in the VET sector

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	10	4.8	4.9	4.9
	Disagree	29	13.9	14.1	18.9
	Somewhat Disagree	27	12.9	13.1	32.0
	Somewhat Agree	78	37.3	37.9	69.9
	Agree	51	24.4	24.8	94.7
	Strongly Agree	11	5.3	5.3	100.0
	Total	206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

8.g Elements of critical analysis are present in VET design education program delivery.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	4.3	4.4	4.4
	Disagree	46	22.0	22.3	26.7
	Somewhat Disagree	16	7.7	7.8	34.5
	Somewhat Agree	67	32.1	32.5	67.0
	Agree	55	26.3	26.7	93.7
	Strongly Agree	13	6.2	6.3	100.0
Total		206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

Section 10

10.a Design educators are over-sensitive to CBT for the design industry.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	28	13.4	13.6	13.6
	Disagree	47	22.5	22.8	36.4
	Somewhat Disagree	57	27.3	27.7	64.1
	Somewhat Agree	29	13.9	14.1	78.2
	Agree	24	11.5	11.7	89.8
	Strongly Agree	21	10.0	10.2	100.0
Total		206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

10.b Design educators in the VET sector have the opportunity to innovate or deliver programs more flexibly with CBT.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	38	18.2	18.4	18.4
	Disagree	30	14.4	14.6	33.0
	Somewhat Disagree	27	12.9	13.1	46.1
	Somewhat Agree	37	17.7	18.0	64.1
	Agree	33	15.8	16.0	80.1
	Strongly Agree	41	19.6	19.9	100.0
Total		206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

10.c The introduction of CBT ‘deconstructs’ the elements of design practice.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15	7.2	7.3	7.3
	Disagree	27	12.9	13.1	20.4
	Somewhat Disagree	31	14.8	15.0	35.4
	Somewhat Agree	66	31.6	32.0	67.5
	Agree	30	14.4	14.6	82.0
	Strongly Agree	37	17.7	18.0	100.0
Total		206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

10.d Assessment drives the content for teaching design principles and elements.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	10	4.8	4.9	4.9
	Disagree	22	10.5	10.7	15.5
	Somewhat Disagree	43	20.6	20.9	36.4
	Somewhat Agree	59	28.2	28.6	65.0
	Agree	41	19.6	19.9	85.0
	Strongly Agree	31	14.8	15.0	100.0
Total		206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

10.e CBT assists in developing the holistic elements of design education.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	42	20.1	20.4	20.4
	Disagree	50	23.9	24.3	44.7
	Somewhat Disagree	31	14.8	15.0	59.7
	Somewhat Agree	25	12.0	12.1	71.8
	Agree	49	23.4	23.8	95.6
	Strongly Agree	9	4.3	4.4	100.0
Total		206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

10.f CBT give design educators more flexibility in the delivery of problem-based learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	40	19.1	19.4	19.4
	Disagree	44	21.1	21.4	40.8
	Somewhat Disagree	39	18.7	18.9	59.7
	Somewhat Agree	25	12.0	12.1	71.8
	Agree	26	12.4	12.6	84.5
	Strongly Agree	32	15.3	15.5	100.0
Total		206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

Section 14

14.a CBT and assessment practices assist in best-practice teaching in VET.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	25	12.0	12.1	12.1
	Disagree	39	18.7	18.9	31.1
	Somewhat Disagree	34	16.3	16.5	47.6
	Somewhat Agree	50	23.9	24.3	71.8
	Agree	49	23.4	23.8	95.6
	Strongly Agree	9	4.3	4.4	100.0
Total		206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

14.b CBT makes for better design practice by recent graduates from VET programs

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	27	12.9	13.1	13.1
Disagree	46	22.0	22.3	35.4
Somewhat Disagree	34	16.3	16.5	51.9
Somewhat Agree	59	28.2	28.6	80.6
Agree	33	15.8	16.0	96.6
Strongly Agree	7	3.3	3.4	100.0
Total	206	98.6	100.0	
Missing	3	1.4		
Total	209	100.0		

14.c Problem Based Learning (PBL) is often confused with design education.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	10	4.8	4.9	4.9
Disagree	25	12.0	12.1	17.0
Somewhat Disagree	77	36.8	37.4	54.4
Somewhat Agree	40	19.1	19.4	73.8
Agree	43	20.6	20.9	94.7
Strongly Agree	11	5.3	5.3	100.0
Total	206	98.6	100.0	
Missing	3	1.4		
Total	209	100.0		

14.d Core elements of design can be transferred below AQF Cert III to effectively accommodate PBL principles.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	12	5.7	5.8	5.8
Disagree	19	9.1	9.2	15.0
Somewhat Disagree	69	33.0	33.5	48.5
Somewhat Agree	76	36.4	36.9	85.4
Agree	27	12.9	13.1	98.5
Strongly Agree	3	1.4	1.5	100.0
Total	206	98.6	100.0	
Missing	3	1.4		
Total	209	100.0		

14.e CBT places more emphasis on outcomes than process.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	14	6.7	6.8	6.8
Disagree	9	4.3	4.4	11.2
Somewhat Disagree	35	16.7	17.0	28.2
Somewhat Agree	32	15.3	15.5	43.7
Agree	51	24.4	24.8	68.4
Strongly Agree	65	31.1	31.6	100.0
Total	206	98.6	100.0	
Missing	3	1.4		
Total	209	100.0		

14.f The traditional ‘heuristic’ (self-learning) approach to design education is supported by current practice in CBT.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	25	12.0	12.1	12.1
Disagree	51	24.4	24.8	36.9
Somewhat Disagree	29	13.9	14.1	51.0
Somewhat Agree	49	23.4	23.8	74.8
Agree	36	17.2	17.5	92.2
Strongly Agree	16	7.7	7.8	100.0
Total	206	98.6	100.0	
Missing	3	1.4		
Total	209	100.0		

14.g CBTs bottom up approach (focusing on lower AQF levels) facilitates the flexibility necessary for innovation in design education.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	51	24.4	24.8	24.8
Disagree	29	13.9	14.1	38.8
Somewhat Disagree	65	31.1	31.6	70.4
Somewhat Agree	24	11.5	11.7	82.0
Agree	36	17.2	17.5	99.5
Strongly Agree	1	.5	.5	100.0
Total	206	98.6	100.0	
Missing	3	1.4		
Total	209	100.0		

Section 17

17.a There is evidence of CBT's success in delivering improved outcomes for design education programs (when compared to more academic design programs).

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	16	7.7	7.8	7.8
Disagree	46	22.0	22.3	30.1
Somewhat Disagree	41	19.6	19.9	50.0
Somewhat Agree	76	36.4	36.9	86.9
Agree	18	8.6	8.7	95.6
Strongly Agree	9	4.3	4.4	100.0
Total	206	98.6	100.0	
Missing	3	1.4		
Total	209	100.0		

17.b The mix of units of competency currently available in design programs are too diverse to consolidate into a single ‘best-practice’ design education environment.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	10	4.8	4.9	4.9
Disagree	25	12.0	12.1	17.0
Somewhat Disagree	22	10.5	10.7	27.7
Somewhat Agree	44	21.1	21.4	49.0
Agree	74	35.4	35.9	85.0
Strongly Agree	31	14.8	15.0	100.0
Total	206	98.6	100.0	
Missing	3	1.4		
Total	209	100.0		

17.c Design based problem based learning scenarios can be utilised in management education.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	3	1.4	1.5	1.5
Somewhat Disagree	3	1.4	1.5	2.9
Somewhat Agree	102	48.8	49.5	52.4
Agree	59	28.2	28.6	81.1
Strongly Agree	39	18.7	18.9	100.0
Total	206	98.6	100.0	
Missing	3	1.4		
Total	209	100.0		

17.d Industry focused training packages remain true to the development of good design graduates.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	34	16.3	16.5	16.5
Disagree	52	24.9	25.2	41.7
Somewhat Disagree	32	15.3	15.5	57.3
Somewhat Agree	51	24.4	24.8	82.0
Agree	23	11.0	11.2	93.2
Strongly Agree	14	6.7	6.8	100.0
Total	206	98.6	100.0	
Missing	3	1.4		
Total	209	100.0		

17.e Creativity gets lost in the matrix of competencies in training package programs.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	15	7.2	7.3	7.3
Disagree	24	11.5	11.7	18.9
Somewhat Disagree	13	6.2	6.3	25.2
Somewhat Agree	37	17.7	18.0	43.2
Agree	30	14.4	14.6	57.8
Strongly Agree	87	41.6	42.2	100.0
Total	206	98.6	100.0	
Missing	3	1.4		
Total	209	100.0		

Section 19

19.a Design practices are readily transferable to management practice.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	4	1.9	1.9	1.9
Disagree	29	13.9	14.1	16.0
Somewhat Disagree	49	23.4	23.8	39.8
Somewhat Agree	67	32.1	32.5	72.3
Agree	35	16.7	17.0	89.3
Strongly Agree	22	10.5	10.7	100.0
Total	206	98.6	100.0	
Missing	3	1.4		
Total	209	100.0		

19.b Product realization processes are well defined in design education.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	1.4	1.5	1.5
	Disagree	39	18.7	18.9	20.4
	Somewhat Disagree	48	23.0	23.3	43.7
	Somewhat Agree	89	42.6	43.2	86.9
	Agree	26	12.4	12.6	99.5
	Strongly Agree	1	.5	.5	100.0
Total		206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

19.c Product realization processes are well defined in management education and training.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	1.4	1.5	1.5
	Disagree	32	15.3	15.5	17.0
	Somewhat Disagree	84	40.2	40.8	57.8
	Somewhat Agree	74	35.4	35.9	93.7
	Agree	12	5.7	5.8	99.5
	Strongly Agree	1	.5	.5	100.0
Total		206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

19.d Creativity and innovation are considered intuitive attributes of design work.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	1.4	1.5	1.5
	Disagree	12	5.7	5.8	7.3
	Somewhat Disagree	23	11.0	11.2	18.4
	Somewhat Agree	53	25.4	25.7	44.2
	Agree	75	35.9	36.4	80.6
	Strongly Agree	40	19.1	19.4	100.0
Total		206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

19.e Non-designers can grasp the otherness of the design process.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	12	5.7	5.8	5.8
	Disagree	39	18.7	18.9	24.8
	Somewhat Disagree	34	16.3	16.5	41.3
	Somewhat Agree	71	34.0	34.5	75.7
	Agree	45	21.5	21.8	97.6
	Strongly Agree	5	2.4	2.4	100.0
Total		206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

19.f Risk management has an important role in design education and industry.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.5	.5	.5
	Disagree	14	6.7	6.8	7.3
	Somewhat Disagree	27	12.9	13.1	20.4
	Somewhat Agree	57	27.3	27.7	48.1
	Agree	76	36.4	36.9	85.0
	Strongly Agree	31	14.8	15.0	100.0
Total		206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

19.g Good designers generate creativity and efficiency in the workplace.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	1.9	1.9	1.9
	Disagree	8	3.8	3.9	5.8
	Somewhat Disagree	12	5.7	5.8	11.7
	Somewhat Agree	40	19.1	19.4	31.1
	Agree	67	32.1	32.5	63.6
	Strongly Agree	75	35.9	36.4	100.0
Total		206	98.6	100.0	
Missing		3	1.4		
Total		209	100.0		

Limitations of the survey

Theoretical positioning aside, there have been some pragmatic resolutions attached to the results from the survey. Firstly, regardless of dogged attempts to move forward from the issues of CBT and training packages, the participants were passionate and determined on these themes. Innovation and creativity became secondary themes to issues of identity (and authenticity) of educational roles in design education, the efficacy of competency-based pedagogies and the management of educational practice.

The use of the online survey has illuminated that instrument development, extensive trialling and specialist technical administration are vital to the smooth running of research through this medium.

In 'knowing our sample', demographic data from the survey confirmed that aside from being experienced at-the-coalface teachers, many of the survey participants are senior and very experienced practitioners (CEO's, College directors, heads of schools, heads of departments, program coordinators). There is a mixture of full-time and sessional staff, and also a number engaged in management, development and delivery of design education in the VET context.

The data was investigated on items such as state, age, job role and employment mode, etc. looking for any discernable correlations; there were no reportable trends.

It was not certain on a state by state basis that design education was being delivered using units of competency, whether they were Training Package units or whether they were curriculum based units written as competencies. Most were state accredited and not national. Overall, when discussing these issues in focus groups, design educators did not feel they were being emotive or irrational when discussing CBT. The overall attitude in this section was that the fragmentation of competencies disrupted the educators' ability to effect good design education.

These issues were further confused by attempts to define the purpose of VET credentials at Diploma-Advanced Diploma levels.

A consolidated view

In attempting to reveal innovating for 'best-practice' we have instead seen a concentration on averting 'bad-practice'. Likewise, to better inform current modes, there is need for extended dialogue on effective pedagogies for design; dialogue that feeds back into the development of training packages.

So at the project level the intent of the survey design was to develop markers and conceptual stepping off points to revisit post-survey with the focus groups. Disrupted timetables of researchers, partner organisations and participants were compounded by technical limitations and meant that the project proceeded along non-linear lines. This departure from the original approach presented challenges in the administration of the project but also revealed opportunities. Opportunities such as presenting work on the project-in-progress and having it reviewed at the international level brought new dimensions and perspectives to the research that have assisted and informed the data analysis. Central to analysis was a high level of human interaction with the data, applying a critically informed and 'enlightened eye' (Eisner 1998).

The analysis has had the features and limitations of data being interpreted by the senior researchers as members of separate, but related, professional communities. Just as Gold (1969) differentiates between hybrid researcher roles in participant-observation contexts (e.g. the participant as observer or the observer as participant), so too have we been analysing through views as the Educator-as-designer and the Designer-as-educator. However, within the framework of a constructivist approach, we have remained mindful of the need to carefully temper researcher perspectives with the participant voice (Cartledge, 2002). During data collection numerous participants informally commented on the research as a positive and long-overdue collaboration between specialist teacher-educators and practicing designers. This said, the predominant motive was to reveal and present the participant voices in both fields.

Appendix 4: Focus Groups

Innovative Practice in Design Education Focus Groups

The following materials are selected key responses from the focus group data. It is an amalgam of responses from the different state based groups to articulate the practitioner voice. These data relate to the emergent themes drawn from the survey tool.

Note: this material represents only one source of qualitative data gathered for the project.

Survey Item –

Question A4 : CBT has impacted on project based delivery of design education.

Forum Question 1: Has it impacted in a positive or negative way?

I would say it has impacted in a negative way, if we played by the rules, absolutely.

- ✧ The building blocks don't quite mesh ...a strong negative, if lecturers absolutely played by the rules, and they don't.
- ✧ One other impact of CBT is the lack of discipline. This idea that you have to come to class and be there, is gone. If you are in class or not it doesn't seem to matter as long as you hand in the work at some stage.
- ✧ Training packages are all about the assessment process, so the students are learning that they can play the system, where it is no longer about attendance, taking part it is about the assessment process, it is becoming more common where students attend occasionally, sometimes never, and then front up at the end and want to be assessed.
- ✧ The question is 'Just tell me what I have to do to pass', not (about) improving my brain.
- ✧ We have been delivering CBT for 10 years, I have no understanding of anything other than CBT, I think I answered (the survey) in relation to what I did at University.
- ✧ Great faith in CBT, but not in training packages
- ✧ XXX has a skewed view of what competency is compared to the way design is defined in the courses that we run.
- ✧ The problem for me is when you say is somebody competent and you can only assess them on that. You want to encourage students so the yes or no situation is difficult. CBT is hard in the 50 % pass environment.
- ✧ Originally CBT was to be pass / fail but at the request of industry a graded assessment , industry says they want graded but don't use it, they prefer a folio.
- ✧ CBT is seen to be rigid, this is what must be done, yet pedagogically we work with the cohort that we have, sometimes that leads us to emphasis some things and de-emphasis others. Education and training is not about really reaching a written outcome it is richer than that, and so it should be.
- ✧ One of the problems with training packages interpretation of CBT is that the competencies are all workplace competencies, what you are doing in First Year probably are workplace competencies, so how do you write a training package for a design course, but I don't think that means you can't have CBT I just think the training packages interpretation is flawed.

- ✧ Yes a positive, with qualifications
- ✧ CBT and PBL doesn't necessarily go hand in hand, the consensus seems to be that if you demonstrate competency in one area that it transfers to another well it isn't (so).
- ✧ And again that is the training packages approach, 'that's ticked'.
- ✧ It creates mediocrity. You have to assess students on presentation to achieve results.
- ✧ It creates no drive to do extra or work harder
- ✧ PLA has better results (Prior Learning Assessments).
- ✧ PLA will be streaming downwards into lower level qualifications soon
- ✧ If you do not work through CBT but a grading system you will get some student mediocre & some good, but you can reward the good ones
- ✧ Competencies can embed more challenges, tasks if well written
- ✧ Fashion assessment going well based on project based assessments
- ✧ What is competency based? That the participant can or can't do tasks.
- ✧ Standards across the board – Industry standard.
- ✧ There is a higher degree of subjectivity in design area
- ✧ What is competent has more to do with the teacher than anything else.
- ✧ Its impact can be seen as negative
- ✧ In regard to CBT, the performance criterion is very vague and generic.
- ✧ It has not impacted in a negative way as it can be worked around, if needed.
- ✧ The Training Packages need to be developed and updated properly.
- ✧ There has been an impact on recruitment in regard to competencies.
- ✧ It can make it difficult to determine skill level in regard to recruitment.
- ✧ It is a broad brush if you are looking for someone with competencies, as it does not tell me if they are really competent. Someone who passes does not make them competent, so it makes it difficult to make a decision.
- ✧ No Designer would look for competencies when recruiting; they would look at the portfolio.
- ✧ Competencies should perhaps have a grading system; competency high, competency low or competency medium, as competencies also need to be marked on technical (aspects).
- ✧ Students can be very technical but have no concept of design, and this can make it hard to assess.
- ✧ It can also depend on the lecturers who are taking it. Unless you have trained outside a competency based area, then it is hard to comment outside of that.
- ✧ Variable results in graduating students.
- ✧ Negative responses included the fact that CBT reduces the role of teacher to that of "assessor".
- ✧ CBT is entirely "inappropriate" to the design field as it is "anti-process" which is fundamental to all of design.
- ✧ CBT breaks down the design process to "bite size chunks"
- ✧ Many were concerned that CBT would undermine the quality of design teaching over time.
- ✧ CBT is linked to budgetary requirements.
- ✧ It was felt that a creative person could put together an interesting program whilst still embedding CBT

- ✧ Transferability across other training packages is far too simplified and OH & S was given as an example of this.
- ✧ Positive responses indicated that CBT could be a means of “tightening” the delivery of art and design courses and be useful as a means of assessment.
- ✧ It is inappropriate.
- ✧ CBT is not about creation, it's not about education it is all about training monkeys.
- ✧ CBT tends to break down the processes into bit sized chunks of skills and outcomes,
- ✧ By increasing the competency based accountability you are further breaking down the holistic approach to the formation of process, it is really anti process development that is the problem solving design process model which underpins most design education.
- ✧ We revisited what the Industry required so we readdressing the competency base so that was a positive aspect, so now we have to weigh it up putting our own flavour in it when it comes to education.
- ✧ It is an assessment tool.

Survey Item –

Question B3: Are criterion-referenced task-based assessments, currently used at all levels of VET Design Programs?

Forum Question 2: Is CBT in use? (on a state by state basis)

- ✧ Yes – Up to Cert III 3 years ago, competency based Cert IV in design in Training Package two years ago. Any reaccredited courses are to be written in Units of Competency. Still curriculum modules but written in CBT.
- ✧ Yes but not as training packages.
- ✧ Yes – VET / Higher Education
- ✧ No – Private provider.
- ✧ Yes by individual teachers and sit hand in hand with CBT because CBT has to be part of the assessment criteria.

Survey Item –

Question B4: Industry promotes CBT in Design Education.

Forum Question 3: Which Industry – Manufacturing or Design?

- ✧ How can we keep being told it is what Industry wants, well who is our industry, we have so many industries,
- ✧ Our industry is actually the Design Industry.
- ✧ I don't think they (the design industry) know about competency based training.
- ✧ Industry as the Design Industry
- ✧ Industry doesn't differentiate between Higher Ed & VET.
- ✧ Multimedia Design (Information Technology)
- ✧ Graphics Design and Multimedia
- ✧ Manufacturing Design
- ✧ Doubt that industry knows what CBT is
- ✧ All they are concerned about is that the person must be able to do the job

- ✧ Design is subjective but still have to understand the manufacturing of product and manufacturer has to have understanding of design
- ✧ Creative industries has two types of people, the creatives & the technical (makers) All industry is concerned about is whether they can do the job.
- ✧ Coming from industry and delivering CBT since 1998, this method “breeds innovation”.
- ✧ CBT uses language that is very mechanistic versus Higher Education which has a more humanist approach and uses plain English to describe learning stages.
- ✧ People talk about clustering, we deliver probably only 2 competencies on their own
- ✧ I feel that we have become indoctrinated in CBT language as part of the mechanistic process that is related to compliance.
- ✧ Some of those competencies don't fit into these (design) projects and have to be assessed somewhere else.

Survey Item –

Question D4: Problem Based Learning is often confused with Design Education.

Forum Question 4: Is PBL used in other disciplines/teaching other than Design?

- ✧ That is where all the bad habits come from [the other disciplines], when they learn some of these processes, you spend a long time retraining them.
- ✧ This is one of the problems that causes us to not be able to fail a student actually, cause they say I've done the work
- ✧ The problems have been solved but they haven't been addressed in a methodical, evolutionary way...there is no creative input.
- ✧ Art outcomes are traditionally difficult to assess because you can't mark creativity against tick boxes.
- ✧ Many people have problems differentiating between higher Ed & VET. Applied learning works well with CBT but doesn't work as well with analysis as well.
- ✧ Problem based learning - CBT application needs to be tailored for each project.
- ✧ Yes, in Project Management and Risk Analysis.
- ✧ It is used in IT/ clothing production & design
- ✧ Creatives have to problem-solve when putting a design together
- ✧ Often creatives have to understand & work to a brief which involves problem solving
- ✧ Concept to problem needs creative solution which = problem solving
- ✧ Have to often have an understanding of technology & if & how to make it meet clients needs & budget which involves problem solving
- ✧ Creative's think: problem – how do I resolve that?
- ✧ Applied design and Industry use generic language.
- ✧ Most agreed that problem solving is common to many industries and is not reserved to the design industry

Survey Item –

Question D9 (2): Does CBT affect the core delivery outcome(s) of Design Education?

Forum Question 5: Is the effect positive or negative?

- ✧ Negative

- ✧ It really has affected for me in a very negative way, all of the delivery outcomes, how you teach and what you come out with.
- ✧ Curtin have now got a fashion school, they want a degree, they won't come to TAFE.
- ✧ Have found it hard to know how well they (teachers) really know programs.
- ✧ A grading system would be better if there is to be competency based training.
- ✧ (We) need to know the core delivery outcomes and how Competency Based Training impacts on those outcomes. I would say though, that it has an overall a negative impact; as when training skills are obtained there is a vast difference between abilities.
- ✧ It can be positive, if the training packages and units of competencies are up to date. However, if they are not up to date, we can be creative and innovative by working around the competencies to work them to our advantage.
- ✧ Consistency of assessment – it is open to interpretation, and subjectivity of Assessor. Questions to be asked would be, “What does the qualification mean?” and “How well can they ‘do’ the job and know the programs”.
- ✧ (Too many) variable electives within the qualification – employers do not know what they are getting from the qualification. Perhaps use other methods to supplement recruitment. Also there can be a lack of understanding of CBT and NTS.
- ✧ With some outcomes it can be negative - especially with working out a student's level of competency with areas like software knowledge.
- ✧ In industry, it is very difficult to know what people are able to do as an outcome. Also, there can be problems keeping people up to date in some areas.
- ✧ Yes but it is solved with using PLA's (Prior Learning Assessments)
- ✧ (Some discussion was had about the fact that PLA's are not on the end certificate but then Unis do not print credits, distinctions etc on end certificates either, PLA's are on the students academic transcript however).

Survey Item –

Question E3: The mix of units of competency currently available in design programs are too diverse to consolidate into a single 'best practice' design education environment.

Forum Question 6: Are they core competencies or imported ones?

- ✧ Too many too much (they) are asking too much
- ✧ How can we possibly tick all these (assessment) boxes?
- ✧ Too diverse
- ✧ Units of competency are diverse; it depends on the individual lecturers and the way they are going at the moment. It does not meet the needs of the industry at this point, as they are diverse and need to be updated more regularly. They cannot move with technology quickly enough.
- ✧ There is an overlap in Multimedia and Information Technology – trying to split the design component and web component out of IT.
- ✧ The industry cannot define itself, so how is it supposed to keep up? There is a difference between small and large businesses in this area.
- ✧ By the time packages are completed, they have become redundant.
- ✧ The competencies are not updated fast enough to keep up with environment. eg; Hospitality took over 4 years to update and complete. However, the diversity can also make the course great – there is opportunity there to create.

- ✧ Competencies should be somewhat diverse, but still have the guidelines for those lecturers who do not wish to create a learning plan outside of the guidelines.
- ✧ Competencies need to become more flexible; different age levels and competency from one level to another.
- ✧ Information Technology and Multimedia have pathways to Higher Education. Design does not have that scope. Design and Multimedia are a different focus.
- ✧ This question has various different answers in regards to diversity. Competencies need to be reasonably structured; yet can be diverse so that lecturers can implement the competencies to meet new technologies and industry standards.
- ✧ There is no single 'best practice' in design. There are too many aspects to it.
- ✧ These are controlled by the Training Packages for each area.
- ✧ Controlled by business
- ✧ There is a general feeling the T.P's are not diverse enough.
- ✧ There is a need for more units, some core lots of electives
- ✧ More units with a trust in the RTO to put together an appropriate course to deliver to their sector
- ✧ These are controlled by the Training Packages for each area.
- ✧ Controlled by business
- ✧ There is a general feeling the T.Ps are too diverse.
- ✧ There is a need for more design units, some core lots of electives
- ✧ More design units with a trust in the RTO to put together an appropriate course to deliver to their sector

Survey Item –

Question F3: 'Product realization' processes are well defined in design education.

Forum Question 7: How can design processes be better (defined and) integrated?

- ✧ Making more 'realistic' projects and industry work experience.
- ✧ Depends entirely on the individual teachers delivery strategy
- ✧ Aligned with Quality systems, Architecture practice for example.

Survey Item –

Question F4: 'Product Realisation' processes are well defined in management, education & training.

Forum Question 8: How is Design Education linked to management education?

- ✧ Not a strong link between competencies based training and industry.
- ✧ There are plenty of Management courses that could integrate design units.
- ✧ There is not a lot of this happening in Darwin.
- ✧ Information Technology – need to integrate into teams, therefore need to understand the management aspect.
- ✧ Employers are having great difficulty recruiting designers (in the NT) – getting applicants that are not suitable or not getting applicants at all as they are studying.

- ✧ The design(er) forms part of a bigger multi-discipline team, which is managed by a non-specialised Manager. There is no need, in this situation, for management experience or training for our designers. Communication skills are required, but not so much management.
- ✧ Management is offered with Advanced Diploma, but not so much with the lower level qualifications. Electives are a good way to add Management.
- ✧ No need for specific management qualifications. It would be more applicable to have a better understanding of the RTO/Industry, and how to contextualise existing qualifications to this industry.
- ✧ Response time of RTO's to industry training needs to be improved – time lag of 2-3 years.
- ✧ They can be linked to enable the student to progress in the industry further; although management can be studied separately if necessary.
- ✧ The ability to see overall issues impact on people's capability to work in team and management. Management knowledge can help them work better in a team.
- ✧ Often creative people come back to TAFE for management training
- ✧ Design skills & PR skills could be used in management training as it allows people to gain skills in creative thinking to use in business practice
- ✧ If there is a mix of creative & non creative students in a class (business competencies) there are often better solutions to problems & more creative projects
- ✧ Not a lot of business competencies in arts training packages
- ✧ Happy with it because I can use PLA
- ✧ Creativity's worth (is) in the eye of the beholder.

Some general observations on current VET design programs from focus groups.

Please Note: these are transcribed from field notes and are not direct quotes.

- ✧ VET is craft based rather than University, (it) doesn't teach 'creativity'.
- ✧ Industry doesn't differentiate between higher ed & VET.
- ✧ Its all very well to be told “Go and play” but you can't do that if you don't know how to use the tools.
- ✧ Main issue is not CBT but differentiating between Uni and TAFE.
- ✧ At TAFE we are about getting people into the workforce so CBT is about employability.
- ✧ TAFE and Unis have different students. Funding drives the difference between Uni & TAFE.
- ✧ CBT doesn't allow for grading, only giving pass or fail. Also where competence is treated as 50% pass this is not industry competent or ready to go. You need to be able to rank levels of competence not just say whether someone is competent or not.
- ✧ Originally CBT pass/fail. VET wanted pass/fail whereas industry wants folio based or rankings.
- ✧ Design is tied up in construction be it in a web page, product or 3D...but the words “innovation” and “creativity” get mixed up in that definition.
- ✧ CBT builds on qualities and values inherent in design and the “aesthetic value” inherent in design must not be undervalued.
- ✧ Aesthetic value difficult to measure.
- ✧ Designers must adhere to a range of moral and cultural values.
- ✧ Designers on average have a five year maturation period after graduating.
- ✧ CBT does not allow time to grow as a designer nor describe levels of competencies

- ✧ Many practitioners graded competencies internally and only a few stated they did not already do this.
- ✧ CBT is sometimes taught rigidly, which it should not be.
- ✧ Training package interpretation is the villain, not CBT.

Appendix 5: Survey (as text)

Innovation in Design Education



You are invited as a design educator in the Vocational Education & Training (VET) sector to participate in an online survey researching Innovative Practice in Design Education in V

Focus groups will also be organised later this year. If you are interested in participating please provide contact details in the relevant section.

The survey takes approximately 20 minutes to complete.

Senior Researcher	Mr Mark Watson
Principal Investigator	Dr Damon Cartledge
Ethics Approval Number	07-21

What is the project about?

The project, funded by the National Centre for Vocational Education Research, looks to establish a national 'snapshot' of educator's views on teaching and assessment protocols in use in the VET sector to establish whether current models are assisting or hindering innovation in development of skills and knowledge in the creative industries.

Who can be part of the project?

Design educators in the VET sector will be approached through a variety of supporting Training Boards, Professional Associations and affiliated databases. Other persons with aligned interests may also be approached.

How can you help?

You can get involved by completing the online survey. You can also leave your details on the last page of the survey if you wish to participate further.

Benefits

Your opinions are valuable in helping to assess whether existing teaching structures assist in innovation and creativity in design education in the VET sector.

Risks

You should not experience any problems by being part of this project. At any time you may choose not to participate and we will respect your decision if you withdraw from the research.

Voluntary Participation

You do not have to be part of the research if you do not want to be. If you decide to join but later change your mind, you are free to withdraw from the research at any stage.

Confidentiality

None of the personal details that can identify you will appear in the research unless you agree. Any written information collected during the research period will be stored in a secure place only accessible by the researchers. This information will be kept for five years and then destroyed. If the research is used for analytical purposes in Post Graduate research papers, no personal identification will be used. Should the researchers wish to accredit individual contributions, your personal approval will be sought.

Dissemination of Results

When this research is completed and the results are released, copies of the findings will be made available to the participants. If you wish to receive a copy, please give the researcher your contact details so a copy can be forwarded to you.

Questions or concerns

If you wish to contact someone, independent of the research, about ethical issues or your rights, you may contact:

**The Secretary
Education FHEC
Education Faculty Office
La Trobe University
PO Box 199
Bendigo 3552**

And quote the ethics Approval number 07-21

If you would like more information about the research, or if there is any matter about it that concerns you, please do not hesitate to ring:

Dr Damon Cartledge,

School of Educational Studies, La Trobe University, Bundoora,

(03) 9479 2288

email : d.cartledge@latrobe.edu.au

Innovation in Design Education

Background Information

Preliminary investigation has revealed that Competency Based Training and Assessment practices have impacted education and training in particular areas of the design and manufacturing industries. Building on this premise, please consider the following questions.

- Can VET programs encourage innovation and creativity for design educators?
- Where does industry and enterprise impact design education?
- Is the method of assessment a critical component of design education?
- What are the implications of Competency Based Training (CBT) and assessment practices for design education and design/commerce/manufacturing industry practice?
- How is Competency Based Training (CBT) and assessment currently applicable to the preparation of design and management professionals?
- Can we transfer contemporary design protocols (e.g. new product development skills) to innovation in leadership and management for industry?

Record your response to each statement by marking the appropriate check box and answer the open questions with a short statement.

N.B. The following is a basic text based representation of the questions included in the web-based survey tool . The survey was hosted online by *The Worklab* using Joomla survey software.

SURVEY

1. Your Name

First Names	<input type="text"/>
Family Name	<input type="text"/>

2. Would you like to continue?

I would like to unsubscribe from any further involvement in this project	<input type="checkbox"/>
Please keep me informed – I just don't have time for the survey.	<input type="checkbox"/>
I don't have time for the survey, but would like to participate in the focus groups	<input type="checkbox"/>
I'll carry on,	<input type="checkbox"/>

3. I understand that participation in this survey is voluntary and I can withdraw at any time.

Yes

No

4. I agree that the information I provide, including quotes, may be published in a way that does not identify me.

Yes

No

QUESTION 5. Can VET programs encourage innovation and creativity for design educators?

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
a. Competency based training (CBT) allows teachers to have greater scope for innovation and creativity in delivery than curriculum based programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Problem based learning (PBL) is an essential part of Vocational Education and Training (VET) design practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. CBT has impacted on project based delivery of design education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Core elements of design education are currently being encouraged through CBT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. In the design industry VET practice is positioned differently than in higher education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Yes

No

7. . Please explain your answer

8. Where does industry and enterprise impact design education?

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
a. Industry has unrealistic expectations of design education graduates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Criterion-referenced task-based assessments are currently used at all levels of VET Design programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Industry promotes CBT in design education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Industry has a well developed appreciation and understanding of how to develop design talents in students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. The role of VET is balanced between educating the individual? and responding to the needs of enterprise and industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Task-based assessments are used effectively in all areas of design education in the VET sector	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Elements of critical analysis are present in VET design education program delivery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. At what AQF level might task-based training transform into analytical based training?

10. Is the method of assessment a critical component of design education?

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
a. Design educators are over-sensitive to CBT for the design industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Design educators in the VET sector have the opportunity to innovate or deliver programs more flexibly with CBT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. The introduction of CBT deconstructs? the elements of design practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Assessment driven the content for teaching design principles and elements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. CBT assists in developing the holistic elements of design education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. CBT give design educators more flexibility in the delivery of problem based learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. What strategies are in place to review and improve CBT for design education?

12. Is CBT effective for use by design educators? Yes No

13. If not, what is a better alternative?

◀
▶

14. What are the implications of Competency Based Training (CBT) and assessment practices for design education and design/commerce/manufacturing industry practice?

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
a. CBT and assessment practices assist in best practice teaching in VET	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
b. CBT makes for better design practice by recent graduates from VET programs	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
c. Problem Based Learning (PBL) is often confused with design education	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
d. Core elements of design can be transferred below AQF Cert III to effectively accommodate PBL principles	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e. CBT places more emphasis on outcomes than process	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
f. The traditional ?heuristic? (self-learning) approach to design education is supported by current practice in CBT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
g. CBT's 'bottom up' approach (focusing on lower AQF levels) facilitates the flexibility necessary for innovation in design education	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

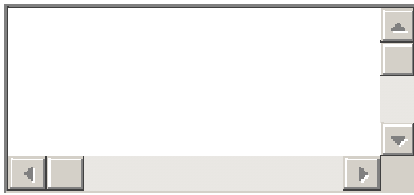
15 Does CBT affect the core delivery outcome(s) of design education? Yes No

16. Please explain your answer

17. How is Competency Based Training (CBT) and assessment currently applicable to the preparation of design and management professionals?

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
a. There is evidence of CBT's success in delivering improved outcomes for design education (when compared to more academic design programs)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. The mix of units of competency currently available in design programs are too diverse to consolidate into a single best-practice design education environment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Design based problem based learning scenarios can be utilised in management education	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Industry focused training packages remain true to the development of good design graduates	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Creativity gets lost in the matrix of competencies in training package programs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

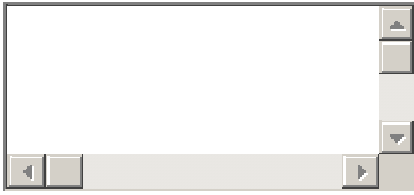
18. How can CBT and Assessment be developed to enhance education?



19. Can we transfer contemporary design protocols (e.g. new product development skills) to innovation in leadership and management for industry?

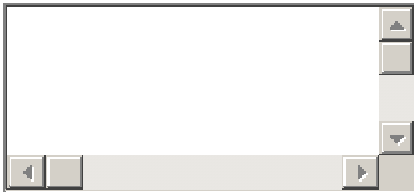
	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
a. Design practices are readily transferable to management practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. 'Product realization' processes are well defined in design education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. 'Product realization' processes are well defined in management education and training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Creativity and innovation are considered intuitive attributes of design work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Non-designers can grasp the 'otherness' of the design process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Risk management has an important role in design education and industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Good designers generate creativity and efficiency in the workplace	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. What is the most valuable aspect of the design education process for management training?



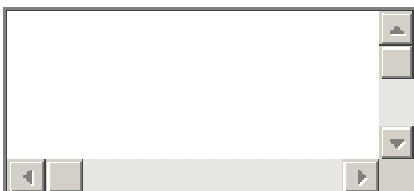
21. What is the postcode of your workplace?

22. Briefly describe your job role



23. Do you work...

- Full-Time
- Part-Time
- Casual
- Other, please specify



24. Gender

- Male
- Female

25. Your age

- Under 19 years
- 20-29 years
- 30-39 years
- 40-49 years
- 50-59 years
- Over 60 years

26. Would you like to participate in a focus group?

- Yes (if yes, please supply contact details in section 28 below)
- No

27. Please send me a summary of the findings from this research.

- Yes
- No

28. Please leave your contact details

Select the "next" button

Innovation in Design Education

Thank you

The National Centre for Vocational Education and Research will publish a report on this research in 2008.

Appendix 6: Full Bibliography

- Akker, J. 2006, *Educational design research*, Routledge, London.
- Anderson, D, Brown, M & Rushbrook, P 2004, 'Vocational Education and Training' in G. Foley. (Ed) *Dimensions of Adult Learning*. Allen & Unwin, Sydney.
- Athanasou, J. and Lamprianou, I. 2002, *A Teacher's Guide to Assessment*, Social Science Press, Tuggerah, NSW
- Bagnall, R. 2001, 'Ethical Knowledge and Learning in the New economy' in *Knowledge Demands for the New Economy*, Australian Academic Press, Brisbane
- Billett, S. 1999, *The CBT decade: Teaching for flexibility and adaptability - An overview*, National Centre for Vocational Education Research, Adelaide
- Boud, D. 2001. 'Creating a work based curriculum' in D. Boud and N. Solomon (Eds) *Work-based learning: A new higher education?* Open University Press, Buckingham.
- Bowden, J. and Masters, G. 1993, *Implications for Higher Education of a Competency-Based Approach to Education and Training*, Department of Education, Employment & Training, Brisbane
- Brady, P. 2002. 'The use of competency standards in the design of curriculum' viewed 02 Mar 2007 http://www.avetra.org.au/abstracts_and_papers_2002/brady.pdf.
- Brennan-Kemmis, M. and Smith, E. 2006, 'Discipline specific pedagogies' viewed 05 Sep 2007, http://www.icvet.tafensw.edu.au/ezine/year_2006/jul_aug/litreview_discipline.htm
- Brown, S. 1989, 'Opening up design education', *Design Studies*, vol. 10, no.1, pp.4-11. Burns, R. 1994. *Introduction to research methods* (2nd edition). Longman: Melbourne.
- Bucciarelli, L. 2003, 'Designing and learning: a disjunction in contexts', *Design Studies*, vol. 24, no.3, pp. 295-311.
- Burns, R. 2000. *Introduction to research methods* (4th ed.) Pearson Education, Frenchs Forest.
- Cartledge, D. 2002. 'The paradox of paradigm: What they didn't tell you about doing research', in P. Green (Ed). *Slices of Life: Qualitative Research Methods*. RMIT University Press, Melbourne.
- Coghlan, M. 2007 An accidental innovator: Barriers to innovation. http://innovateandintegrate.flexiblelearning.net.au/media/embedding_innovation_dsts/embedding_innovation_dsts/DST3/index.html viewed 31 Aug 2007.
- Conley, C. 2004. 'Leveraging Design's Core Competencies' *DMI Review* Vol. 15, No. 3, Summer 2004
- Craft, A. 2006, 'Creativity in schools' in N. Jackson, O. Martin, M. Shaw and J. Wisdom. (Eds) *Developing creativity in Higher Education*. Routledge, London
- Curtis, D. and Denton, R. 2003, *The authentic performance-based assessment of problem-solving*, NCVER, Adelaide.
- De Bono, E. 1970, *Lateral Thinking*, Penguin Books Ltd., London
- De Bono, E. 1993, *Serious Creativity*, Harper Collins, New York.
- De Bono, E. 1994, *Parallel Thinking*, Penguin Books Ltd., London.
- Department for Culture, Media & Sport, United Kingdom Government 2007 *Government response to the Culture, Media and Sport select committee report into new media and the creative industries*. The Stationary Office, London.
- Design Institute of Australia. 2007. 'DLA Educational policy'. Design Institute of Australia, viewed 01 Mar 2007, <http://www.dia.org.au/content.cfm?id=30>
- DEST 2006, *The Australian Government's Innovation Report 2005 / 2006*. Department of Education Science & Training, Canberra
- Dickson, M. and Bloch, B. 1999, *Not just falling over the line? A snapshot of competency-based assessment*, National Centre for Vocational Education Research, Adelaide.
- DIIRD 2003, *Developing Victoria's Design Capability*. Department of Innovation, Industry and Regional Development, Melbourne.
- Eisner, E. 1998, *The enlightened eye: Qualitative inquiry and the enhancement of educational practice*, Prentice-Hall, New Jersey.
- Feldman, D. and Csikszentmihalyi, M. 1994, 'Changing the WORLD - A framework for the Study of Creativity', Praeger Publishers, Westport.
- Ferrari, J. 2007, 'TAFE courses dumbed down'. *The Australian - Education supplement*. 24 Aug.
- Florida, R. 2002, *The Rise of the Creative Class*, Basic Books, New York.
- Foley, G. ed. 2004, *Dimensions of Adult Learning - Adult Education and training in the global era*, Allen & Unwin, Sydney
- Gerber, R. and Lankshear, C. (eds) 2000. *Training for a smarter workforce*. Routledge: London
- Gold, R. 1969. Roles in sociological field observations. In G. J. McCall & J. L. Simmons (Eds.), *Issues in participant observation: A text and reader*. Random House, New York.
- Gonczi, A. 2004, 'The New Professional and Vocational Education' in G. Foley (Ed) *Dimensions of Adult Learning*. Allen & Unwin, Sydney.

- Gorb, P. 2001, 'The Design Management Interface'. *Design Thinkers 2001*, The Association of Registered Graphic Designers of Ontario, Ontario
- Gordon, H. 1998. *The History and growth of vocational education in America*, Allyn and Bacon, Needham Heights
- Government of Australia. 2007. 'Prime Minister's community business partnerships – Triple bottom line reporting'. Viewed 01 Mar 2007 http://www.partnerships.gov.au/links/links_triple.shtml
- Gruber, H. and Wallace, D. (Eds). 1989, '*Creative People at Work*' Oxford University Press, New York.
- Guthrie, H. and Dawe, S. (Eds). 2004 '*Vocational Education and Training and Innovation*' - Research Readings, National Centre for Vocational Education Research, Adelaide.
- Guy, S. 2005, 'Teaching, Learning and Assessing Creativity in VET' *The Learning Powerhouse - Inaugural TAFE NSW ICVET Conference on VET Teaching and Learning*.
- Hammond, M and Collins, R 1991, '*Self-Directed Learning - Critical practice*' Nichols/GP Publishing, New Jersey.
- Handy, C. 1999. '*The new alchemists*' Hutchinson, London.
- Hardy, T. 2006. 'Domain Poisoning: The Redundancy of Current Models of Assessment through Art' *International Journal of Art & Design Education*, vol.25, no.3, pp.268-274.
- Harris, R., Sumner, R. and Rainey, L. 2005. '*Student Traffic - Two-way movement between vocational education and training and higher education*', National Centre for Vocational Education Research, Adelaide.
- Harris, R., Guthrie, H., Hobart, B. and Lundberg, D. 1995. *Competency-based Education and training: Between a Rock and a Whirlpool*, Macmillan: Melbourne.
- Heartfield, P. 2007. 'The creativity gap'. Viewed 02 Mar 2007 <http://www.wdis.co.uk/blueprint/creative.pdf>
- Hutton, W., O'Keefe, A., Scheinder, P., Andari, R. and Bakhshi, H. 2007. *Staying ahead: the economic performance of the UK's creative industries*. The Work Foundation, London.
- Innovation and Business Skills Australia. 2006. *Innovation, Creativity and Design: Collated Research*. Viewed 04 Mar 2007 http://www.ibsa.org.au/content/currentprojects/inn_creat_des_project.html.
- Jackson, N., Martin, O., Shaw, M. and Wisdom, J. eds. 2006. '*Developing Creativity in Higher Education - An imaginative curriculum*.' Routledge, London.
- Kearney, G. 2004. 'How businesses innovate today and what that means for the workforce' in *Vocational education and training and innovation*. Ed. S Dawe, National Centre for Vocational Education Research, Adelaide.
- Kayrooz, C. and Trevitt, C. 2005. *Research in organizations and communities: tales from the real world*. Allen and Unwin, Sydney.
- Kell, P. 2006. *TAFE Futures: An inquiry into the future of technical and further education in Australia*. AEU Commissioned Report. AEU.
- Kell, P. 2007. 'Towards a principled future for TAFE in Australia' *Professional Voice*, Vol 5 issue 1, pp33-37.
- Kelley, T. with Littman, J. 2001. *The art of innovation: Lessons in creativity from IDEO, America's leading design firm*. Doubleday, New York.
- Kiley, M., Mullins, G., Peterson, R. and Rogers, T. 2000. *Leap into problem-based learning* University of Adelaide: Adelaide. www.adelaide.edu.au/clpd/resources/leap/leapinto/ProblemBasedLearning.pdf viewed 25 Nov 2007.
- KPMG, 2005. 'KPMG International Survey of Corporate Responsibility Reporting 2005', KPMG, viewed 4 Mar 2007, http://www.kpmg.com.au/Portals/0/rassas_corp-resp-reporting-survey2005.pdf
- Lab3000 2007 website <http://lab.3000.com.au/news/news/index.jsp?page=article&id=25ec17a4-725f-47a6-ac78-cfb6596e8e6a> viewed 23 Aug 2007.
- Lindstrom, L. 2006. 'Creativity: What Is It? Can You Assess It? Can It Be Taught?' *International Journal of Art & Design Education*, vol.25, no.1, pp.53-66.
- Lincoln, Y. and Denzin, N. (Eds) 2002. '*Handbook of qualitative research*'. Sage Publications, Newbury Park
- Longmuir, R. 2006. 'Manufacturing craft in Victoria', viewed 4 Mar 2007, <http://www.craftculture.org/archive/longmuir1.htm>.
- McCrindle, M. 2006. 'Engaging with 21st century graduates ', viewed 08 Sep 2007, http://www.mccrindle.com.au/wp_pdf/GraduateEmployment.pdf
- McNiff, S. 2003. '*Creating with Others - The Practice of Imagination in Life, Art, and the Workplace*' Shambhala Publications, Boston.
- Maher, M. 2007. *Creativity: Have we lost it?* University of Wisconsin-Madison. Viewed 02 Mar 2007 <http://epdweb.engr.wisc.edu/aecarticles/rsr12.lasso>.
- Malecha, M. 2002. *Doctor of Architecture degree initiation and related first professional degree nomenclature strategies* (position paper) University of North Carolina viewed 02 Mar 2007 http://www.naab.org/usr_doc/Doctor_of_Architecture.doc
- Meyer, P. 1983. *Design skills for the workforce*. Hawthorn Institute of Education, Melbourne.
- Middleton, H. 2003. 'Developing problem-solving skills', in J. Stevenson (Ed) *Developing vocational expertise* Allen & Unwin, Sydney.
- Murray, K. 2003. 'Design and craft', viewed 21 Aug 2007, <http://www.craftvic.asn.au/papers/craftbase.htm>.

- National Centre for Vocational Education Research, 1999. *The CBT decade: Teaching for flexibility and adaptability*. NCVER, Leabrook.
- National Centre for Vocational Education Research, 2000. *Research at a glance: Competency-based training in Australia*. NCVER, Leabrook.
- National Centre for Vocational Education Research, 2004. *Australian Vocational Education and Training statistics: students and courses*. Viewed 03 Mar 2007.
<http://www.ncver.edu.au/statistics/vet/ann05/sum05/sum05.pdf>.
- National Training Board. 1993. *Fourth annual report 1992/93*. NTB:Canberra
- National Training Information Service. 2007. 'Visual Arts, Craft and Design Training Package - CUV03' <http://www.ntis.gov.au> accessed 01 Mar 2007.
- National Training Information Service, 2007. 'Visual Arts, Craft and Design Training Package - CUV03', National Training Information Service, viewed 01 March 2007, <http://www.ntis.gov.au>.
- Nicholson, J. and Nairn, A. 2006. 'The Manager of the 21st Century', Innovation Business Skills Australia, Sydney.
- Norris, S. (ed). 1992. *The Generalizability of Critical Thinking*, Teachers College Press, New York.
- O'Connor, P. 2000. 'Workers text, identities and learning possibilities in the smart workforce', in R. Gerber and C. Lankshear (Eds) 2000. *Training for a smarter workforce*. Routledge: London
- Office of Training and Tertiary Education, 2003. *Have your say – TAFE teacher forums*. OTTE: East Melbourne.
- Owens, C. 2007. 'Design Thinking: Notes on its nature and use'. *Design Research Quarterly*, Vol. 2, No. 1, pp. 16-27.
- Ozturk, M. and Turkan, E. 2006. 'The Design Studio as Teaching/Learning Medium - A Process-Based Approach', *International Journal of Art & Design Education* vol.25, no.1, pp.96-104.
- Parker, J. 2005. A Consideration of the Relationship Between Creativity and Approaches to Learning in Art and Design, *International Journal of Art & Design Education* vol.24, no.2, pp.186-198.
- Poggenpohl, S., Chayutahakij, P. and Jeamsinkul, C. 2004. 'Language definition and its role in developing a design discourse.' *Design Studies* vol.25, no.6, pp.579-605.
- Premsky, M. 2001. *Digital natives, digital immigrants* <http://www.marcprensky.com/writing/Premsky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf> accessed 07 March 2007.
- Quirke, B. 1995. *Communicating change*. McGraw-Hill, London.
- Robertson, D. 2005. *A most ingenious paradox*. Viewed 03 Mar 2007.
<http://www.dia.org.au/content.cfm?news=144&id=102>.
- Robertson, D. 2006. *A Co-ordinated Design Policy for Australia?* Viewed 03 Mar 2007.
<http://www.dia.org.au/content.cfm?news=144&id=102>.
- Rylatt, A. 2001. *Learning Unlimited - Transforming Learning in the Workplace*, Kogan Page, London.
- Saal, F. and Knight, P. 1995. *Industrial/organizational psychology* (2nd ed.)., Brooks/Cole, Pacific Grove.
- Sandberg, J. 2000. 'Competence – the basis for a smart workforce', in *Training for a smart workforce*, eds. R Gerber & S Lankshear, Routledge, London.
- Sarros, J. and Moors, R. 2001. *Right from the top: profiles in Australian Leadership*. McGraw-Hill, Roseville.
- Sayer, K., Wilson, J. and Challis, S. 2006. 'Problem Based Learning in Constructed Textile Design', *International Journal of Art & Design Education*, vol.25, no.2, pp.156-163.
- Searle, J. 2003. Developing Literacy, in J. Stevenson, (ed). 'Developing Vocational Expertise', Allen & Unwin, Crows Nest.
- Sheehan, P. 2005. *Generation Y: Thriving (and Surviving) with Generation Y at Work* Hardie Grant Books, Prahran.
- Simons, M., Harris, R. and Smith, E. 2006. *The certificate IV in Assessment and Workplace Training: Understanding learners and learning*. NCVER, Adelaide.
- Smith, A. 1998. *Training and development in Australia* (2nd ed.) Butterworths, Cahtswood.
- Smith, E. 2001. 'Training Packages: Ticky-Tacky Boxes or a Brave New Workers' Paradise? Knowledge Demands for the New Economy', Australian Academic Press, Surfers Paradise, Queensland.
- Smith, E. and Keating, J. 2003. *From Training Reform to Training Packages*, Social Science Press, Tuggerah NSW.
- Smith-Bingham, R. 2005. 'Public policy, innovation and the need for creativity', in N. Jackson, O. Martin, M. Shaw and J. Wisdom (eds). *Developing creativity in Higher Education*, Routledge, London.
- Sparke, P. 1986. *An introduction to design and culture in the twentieth century*, Allen & Unwin, London.
- Sparke, P. 2004. *An introduction to design and culture [1900 to the present]*, (2nd edition) Routledge, London.
- Stephens, H. 1996. 'Towards a review of the Design Education Policy of the DLA', Design Institute of Australia, Melbourne.
- Stephenson, P. and Galloway, V. 2004. 'Problem-based Learning', in G.Foley (Ed)*Dimensions of Adult Learning*. Allen & Unwin, Sydney.
- Sternberg, R., Grigorenko, E. and Singer, J. (Eds). 2004. *Creativity - From Potential to Realization*. American Psychological Association, Washington DC.
- Stevenson, J. (ed) 2003. *Developing Vocational Expertise.*, Allen & Unwin, Crows Nest NSW.
- Teese, R. and Polesel, J. 2003. *Undemocratic schooling*. Melbourne University Press, Melbourne.

- Verve 2006. 'Industry Overview', Verve, viewed 12 May 2006, <http://www.verve.org.au/arts.htm>.
- Victorian Qualifications Authority / Arts & Recreation Training Victoria 2003, *Design qualifications framework project*. Viewed 22 Feb 2007. <http://www.verve.org.au/reports/Research.Final.Report.pdf>
- Ward, A. 1989. 'Phenomenological analysis in the design process', *Design Studies*, vol.10, no.1, pp.53-66.
- Wilkerson, L. and Gijsselaers, W. (Eds). 1996. *Bringing Problem-Based Learning to Higher Education: Theory and Practice, New Directions in Teaching and Learning*, Jossey-Bass, San Francisco.
- Wolf, A. 1995. *Competence-Based Assessment*, Open University Press, Buckingham UK
- Wozniak, H. and Mahony, M. 2005. "Inquiry Based Learning in the health sciences : countering the limitations of 'problem based' learning." *Focus on Health Professional Education*, vol.7, no.2, pp.18-30.
- Yang, M., You, M. and Chen, F. 2005. "Competencies and qualifications for industrial design jobs: implications for design practice, education, and student career guidance." *Design Studies*, vol.26, no.2, pp. 155-189.
- Yashin-Shaw, I. 2003. 'Developing creativity' in, J. Stevenson, (Ed) 2003, *Developing Vocational Expertise.*, Allen & Unwin, Crows Nest.