EDUCATIONAL CHANGE:
a designer's journey

PhD (Education)

Macquarie University: Australian Centre for Educational Study

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100 word thesis abstract:

In this thesis I argue that there is inertia in the higher education system in Australia that works against change and then identify through literature the pressures that arguably contribute to, or are responsible for, this inertia. I make the case for employing visual design and design thinking to promote improvement and change in the system. This approach is documented through a relevant selection of my educational innovations and interventions implemented over a ten-year period. The examples focus on criteria-based assessment and the development of graduate attributes and include the design, development and commercialisation of an award-winning online assessment system.

CERTIFICATE OF AUTHORSHIP/ORIGINALITY

I certify that the work in this thesis has not previously been submitted for a doctorate nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

There has been no editorial assistance in the writing of this thesis and all research, analysis, diagrams, spreadsheets and tables were produced by me unless otherwise referenced in the text. I did all typing, formatting and reference checking in the thesis including the compilation and indexing of the enclosed DVD. In addition, I certify that all information sources and literature used are indicated in the text.

Signature of Author

Acknowledgements:

To PhD supervisors Associate Professor Dr. Ian Solomonides, Director of the Learning and Teaching Centre, Macquarie University, Australia, and Associate Professor of Statistics at Macquarie University, Dr. Peter Petocz, for their support throughout this study;

To Professor Dr. Keith Trigwell, Director of the Centre for Learning and Teaching, University of Sydney, Dr Jo McKenzie, Director of the Institute for Interactive Media and Learning, University of Technology, Sydney and Associate Professor Mark Freeman, Director of Accreditation at the University of Sydney, who inspired my original engagement with educational theory and research;

To Professor Simon Barrie, University of Sydney, for his PhD and subsequent 2004 article as precursor to national and international projects on graduate attribute development that posed the problems of assessment partly addressed in this thesis;

To Associate Professor Jenny Toynbee-Wilson (retired Head of the School of Design, University of Technology, Sydney) who inspired a love of innovation in teaching and learning.

To the many mentors and 'critical friends', too numerous to list here, whose work continues to contribute to the ongoing journey of overcoming inertia in educational change.

Finally, personal thanks to my partner Philippa Coltart who contributed many years of support and facilitation both during this thesis and the design and development of the software systems, *ReView* and *SPARK*.

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ABSTRACT

In this thesis I argue that there is inertia in the higher education system in Australia that works against needed innovation and change. Following the introduction (Chapter 1), I identify the pressures on the higher education system that arguably contribute to, or are responsible for, this inertia (Chapter2). I then make the case for employing design practice and design thinking as a powerful approach to promote improvement and change in some important aspects of the higher education system (Chapter3). I illustrate this approach through documenting a number of educational innovations I have implemented over a ten-year period. These are presented in five chapters comprising two case studies of curriculum design (Chapter 4), two government funded projects, one on graduate attributes in Business faculties, the other on the development of an educational hub for creative industries (Chapter 5), followed by the software design and development of an online criteria-based assessment system, *ReView*, and the collaborative development of a Self and Peer Assessment Resource Kit, *SPARK*, (Chapters 6 and 7). Throughout the thesis I focus on two areas that I regard as being in need of educational reform: the assessment of student work and the integration of graduate attribute development. My innovations in these areas are based on a design thinking mindset, and are offered as exemplars of how design and design thinking can promote educational improvement and change in a higher education context.

Chapter 1

INTRODUCTION & METHODOLOGY

Foreword

Educational Change: A Designer's Journey begins with a story about engagement with education research and the notion that 'linearity, conformity and standardisation' tends to be the result of school education (Robinson, 2011 p.8). It is proposed that higher education may benefit from design thinking and design practice where non-linear, non-conformist, trial and error approaches are often foregrounded.

The chapter includes an introduction to design thinking and an explanation of autoethnography as an aspect of the methodology used including a section on ethical issues. The autoethnographic content in this thesis is derived from diaries, emails, video documentation and reports, some of which are included in Appendices, the accompanying DVD and online Google Drive. Notes on style and thesis structure reflect the non-linearity of some chapters and explain the use of other devices to aid the reader's investigation of the text. The Thesis Statement and Research Questions, used as a guide in this partly autoethnographic approach, serve to clarify the aims and motivations behind this study.

Education Research and Design Thinking

My experience prior to emigration to Australia in 1989 included 15 years as a design professional in London with some part-time teaching and a basic postgraduate education certificate. I eventually decided to focus on design teaching and after 6 years full time teaching in Australia realised that I had a serious lack of understanding about the principles of learning and teaching. The decision to apply for a six-month secondment in 2000 to the Centre for Learning and Teaching at the University of Technology, Sydney, was pivotal to the journey in the following years that became the focus of this thesis. The secondment at the Centre then led by Professor Keith Trigwell and assisted by Dr. Jo McKenzie, inspired an engagement with educational theory and research, and more importantly with its application.

Design and design thinking are fundamentally concerned with the application of theory and research and during this secondment period I realised that design thinking was useful in considering the complexities of education. The relationship between the two was foregrounded in a keynote address by an elder statesman of design and design thinking Donald Arthur Norman:

> *For centuries the work of visual artists and designers has been referenced as visible evidence of innovative thinking and brilliance. Yet, ironically, this "design thinking" has never been translated into educational practice. (Norman, 2001, p.92)*

Norman's 'irony' was partly the inspiration for my research and educational practice in the ten-years between 2002 and 2013 that are used to delimit the source of work for this thesis.

Sir Ken Robinson, in the introduction to the 2011 revision of his 2001 book 'Out of our Minds' *(Robinson, 2011 p.8),* states *'The more complex the world becomes the more creative we need to be to meet its challenges'*, and that education *'mirrors'* industrial production emphasising *'linearity, conformity and standardisation'* A hundred years earlier, John Dewey, disillusioned with education systems, became an advocate for educational change and one of the most influential authors on the subject. He famously proposed that the aim of education should be to teach us how to think, rather than what to think, and this

thesis provides evidence that 'design thinking' and indeed design itself can be useful to *'meet the challenges'* of complexity in creative ways.

A decade before Robinson's book Elliot Eisner spoke of the need for systemic change in the John Dewey Lecture for 2002 at Stanford University:

> *'I am not talking about the implementation of isolated curriculum activities, but rather, the creation of a new culture of schooling that has as much to do with the cultivation of dispositions as with the acquisition of skills.'... 'The public's perception of the purpose of education supports the current paradigm. We need to sail against the tide.' (Eisner, 2002 p.1)*

The consistency of messages from these scholars through a hundred years of research and educational practice provides strong evidence that educational change is a slow process. Both secondary schools and the higher education systems that follow them are characterised by inertia and a great number of pressures that work against improvement and change in those systems.

Given these preconditions this thesis explores the contribution that design thinking, and to a certain extent design practice, can make to the higher education context. The evidence provided uses examples from my relevant teaching, research and educational initiatives as a university academic and visual communication designer over a ten-year period. This text also includes creative design work as part of the thesis that was conducted beyond my academic role, notably the design of educational assessment software and design strategies for Government funded projects.

My background in design and design thinking and engagement in educational research continue to be significant influences in my attempts to facilitate educational change. Design thinking is particularly important to explain in this introduction to underpin the positioning of the researches and initiatives explored in the chapters that follow. From literature on design thinking the following diagram in Figure 1. *(Owen, 2006 p.18)* attempts to show the relationship between Design and other fields of study including Science, Law, Medicine and Art by positioning each on a quadrant with two vectors. The vertical vector designates the content of the field spanning from 'symbolic' to

'real' and the horizontal vector designating the process of the field from 'analytic' to 'synthetic'. Science and Design are positioned in opposing quadrants with Science mostly in the analytic-symbolic quadrant and partially in the analytic-real. Design is mostly in the synthetic-real quadrant and partly in the synthetic-symbolic.

Whilst there is a great deal of overlap in these quadrants and the reader may easily question the over-simplification implied, it does position the practice of design and design thinking correctly, as largely a process of synthesis and experimentation in a real world context.

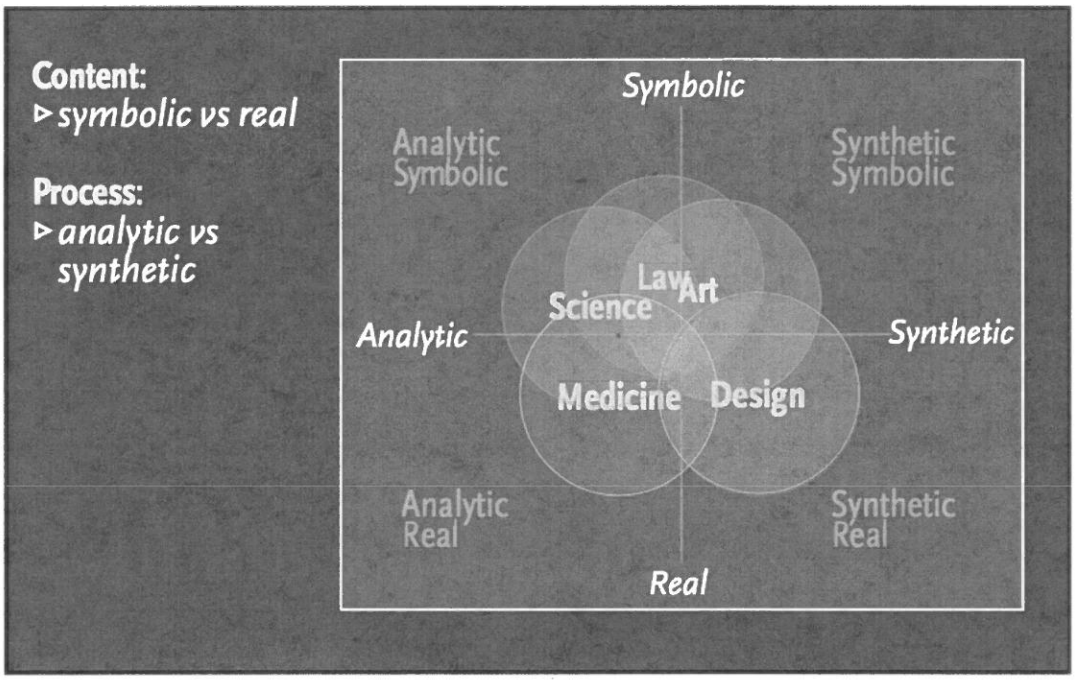

Figure 1: 'Design Thinking: Notes on its nature and use'. (Owen, 2006 p.18).

There are other interpretations that emphasise analysis rather than synthesis, for example:

> *Design thinking is generally defined as an analytic and creative process that engages a person in opportunities to experiment, create and prototype models, gather feedback, and redesign. Several characteristics (e.g., visualization, creativity) that a good design thinker should possess have been identified from the literature. (Razzouk & Shute, 2012 p.330)*

Whilst this thesis does not intend to explore the extensive discourse on the term design thinking, thoroughly elucidated by *Dorst (2011), Kimbell (2009), and Lawson (2005),* there follows a brief background about the term used in both business and academic contexts.

Roger Martin, Head of the Rotman School of Management at the University of Toronto is a well-known writer in the field of business education and suggests that all managers of businesses need to develop an appreciation of design thinking and to adopt it as part of their business strategy. In his book, 'The Design of Business: Why design thinking is the next competitive advantage' he gives a particular description aimed at business leaders:

> *'The most successful businesses in the years to come will balance analytical mastery with intuitive originality in a dynamic interplay that I call design thinking' (Martin, 2009, p.6)*

He later characterises a simple dichotomy between left and right brain thinking and explains this as a difficulty for business managers:

> *For a middle manager forced to deal with flighty, exuberant "creative types," who seem to regard prevailing wisdom as a mere trifle and deadlines as an inconvenience, the admonition to "be like a designer" is tantamount to saying "be less productive, less efficient, more subversive, and more flaky"(Martin, 2009 p.65)*

Tim Brown, CEO and President of the global design consultancy IDEO, maintains a blog on design thinking and has written and spoken extensively on its transformative influence on organisational change. In a Harvard Business Review article he softens the difference between business and design in his description of design thinking:

> *'A discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity.' (Brown, 2008. p.86)*

In his book Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation *(Brown, 2009)* there are many stories of businesses

transformed by a client-designer relationship based on design thinking methods. Although these references and quotes relate to the business context it is also important to locate the term academically.

In philosophical discourse the two major forms of reasoning: deductive (specific truths derived from a general context) and inductive (deriving general ideas from the specific) both seem rather too prescriptive to accommodate design thinking. Charles Sanders Peirce, one of the 19th Century American pragmatist philosophers is known for proposing a third type of reasoning, namely 'abductive logic' *(Kapitan, 1992. p.1).* In this approach, rather than trying to prove that something is true, abductive reasoning is concerned with wondering whether it might be, a concept much closer to the thinking referred to by the term design thinking. Dorst *(2011)* takes abduction much further by revealing the subtle contextual iterative *'reframing'* processes involved in the *'what'* and the *'how'* of *'achieving an aspired value' (p.525).* Dorst's explanation of how designers think was not applied systematically in the examples in this thesis but the identification and achievement of aspired values underpins the educational designs explored in this journey of educational change.

The term design thinking continues to resist formularisation in both academic and business contexts because it tends to involve variant processes that are integrated with and often reliant upon iterative practice and trial and error. Hallman hints at the difficulty creative disciplines may have with formulaic or scientific methods:

> *'The creative personality is unique in that during the initial stages he prefers the chaotic and disorderly and tends to reject what has already been systematized'. (Hallman, 1981 p.297)*

However, in an academic research context design thinking does bear similarities with action research, particularly *'Action research as critical praxis' (Cohen et.al, 2008 p.302) or 'emancipatory action research' (Grundy, 1987 p.146).* This is usually aimed at the improved autonomy of participants and involves *'viewing teaching as an emancipatory praxis-based act' (Kincheloe 2003, p.138).* Design practice and design thinking applied to the design of learning activities and assessment processes evidenced in this thesis also relates to social constructivist research *(for example in Rust, O'Donovan & Price, 2005).*

When referring to design thinking in this thesis it would be appropriate for the reader to refer to my own working definition of design thinking that has emerged as a result of the research:

Author's working definition: Design Thinking is a meta-cognitive creative problem solving process that takes into account the subtle dynamics of any context using trial and error solutions in the service of improvement and change.

Notes on style and thesis structure

While the thesis has familiar elements it also includes some design features not normally apparent in the text of a thesis. These are:

1. Symbols with links to reflective comments and stories, key quotes, and triangulation with external evidence.

2. A DVD containing research evidence in the form of photographic, video and animation content together with reports that would be wasteful as appendices.

The symbols used in the text are as follows:

■■■ This symbol indicates pivotal anecdotes and comments informing the need for educational change;

★★★ This symbol highlights key quotes that relate to my core purposes and intentions as a design thinker and educator;

▲▲▲ These triangles foreground relevant evidence, or 'triangulation', in providing an external voice to support this partly autoethnographic thesis.

The thesis is structured with the first three chapters in sequence but the following four can be read independently and do not follow on from each other:

Chapter 1 ...

➥ Chapter 2 ...

➥ Chapter 3

• Chapter 4 • Chapter 5 • Chapter 6 • Chapter 7

Chapter 8 - Reflections and Conclusions

As a design feature of the printed thesis there is a bookmark containing the symbols described together with the research questions that have informed the ten-year journey. In the pdf version of the thesis these symbols can be used in a search of the text to quickly access anecdotes, key quotes or triangulation examples, and the research questions, that are explained after the section in this chapter on Methodology.

The first person style is only used in this introduction and changes to third person and there is an explanation for this in the Methodology section. Quotes from references are indented with a different typefont whereas those used within a sentence remain in this same font as the text. Double quote marks are only used where there is a quote within a quoted text.

Individual text headings within chapters are not numbered but can be viewed in the Contents section prior to Chapter 1. Each chapter has a title page with a 'Foreword' briefly explaining the aim and content that follows in that chapter.

There is a DVD and link to an online Google Drive included with this thesis in order to provide research evidence in the form of photographic, video and animation content together with reports that would be wasteful as appendices.

Thesis Statement

In this thesis I argue that higher education in Australia is impacted by a range of pressures that contribute to 'change inertia' within the system. Design and design thinking are proposed to be powerful agents of change through holistic approaches that alleviate some of these pressures and to some extent bypass inertia. The study makes a contribution to knowledge by focusing on detailed and specific examples where I have used these approaches. There are unpublished models, definitions, visual designs and interpretations together with refereed journal articles and reports published within the candidature of the thesis. Evidence of originality is provided through these examples brought together in this study and have led to Government grants, a *Learning Impact Award and the commercialisation of criteria-based assessment software (**_ReView_) in which a background in design and design thinking have played a significant role.

▲▲▲* http://newsroom.uts.edu.au/news/2012/01/award-winning-assessment-software-goes-commercial ** http://review-edu.com

Methodology

The familiar features of a thesis namely literature review, research questions, case studies and chapters are used in this case to support a narrative influenced by design, design thinking and an autoethnographic method. In order to compensate for the bias of a single narrative voice in the *'possible articulations that can be given to any experience' (Johnston & Strong, 2008. p.48),* that voice is afforded some neutrality in the analyses, descriptions and reflections in the thesis through my decision to use the third person written form in the majority of the text.

Autoethnography incorporates two perspectives that are in harmony with the author's design background and the 'in-situ' educational initiatives and research explored. Jones *(2005)* argues that autoethnographic researchers disrupt and contest views of the world and Renner *(2001)* suggests that the focus is on making a difference in the researcher's context. However a definition of autoethnography is elusive with many variations dependent on individual circumstances. Goodall *(2008)* has written a how-to guide that focuses on the development of qualitative researchers and others refer to concepts such as *'thick description' (Geertz, 2003 p.3)* in which the context is as significant as behaviours and events. This aspect influenced the author's inclusion of autoethnographic methodology in that design thinking also foregrounds context as an important platform for creative solutions *(Owen, 2006 p.18).*

Although autoethnography is considered to be relatively recent in the realms of mainstream research methodology Buzard as early as 2003 wrote in the Yale Journal of Criticism that 'one might have expected to see it crowned and acclaimed across the human sciences' *(Buzard, 2003 p.61).* Later in the article Buzard recalls a much earlier 1979 essay that mentioned the term in the title 'Autoethnography: Paradigms, Problems and Prospects' *(p.66).* There is also a range of contributions that exemplify the use of autoethnography in higher education research *(Sambrook, Stewart, & Roberts, 2008; Doloriert & Sambrook, 2009).* In their journal article 'Accommodating an Autoethnographic PhD: The Tale of the Thesis, the Viva Voce, and the Traditional Business School', Doloriert and Sambrook argue that *'supervisors and examiners are crucial for reinterpreting criteria to accommodate contemporary ethnography' (2011, p.582).*

The narratives and design processes described in this thesis are supported as a methodology particularly useful for the complex dynamics of an education context. Ellis et al. *(2011)* explains that *'as a method autoethnography is both process and product' (p273).* Dyson *(2007)* also considers autoethnography an empowering methodology for educators:

> *Autoethnographic writing links the personal to the cultural and is recognised as a methodology that combines the method with the writing of the text, which in turn explicates the personal story, or journey of the writer, within the culture in which the investigation, or experience, takes place. (Dyson, 2007. p36)*

The culture in the case of this thesis is the Higher Education system in Australia explored through literature in Chapter 2 together with other researches and narratives relating to the author's primary employment as an educator in that system. Bruner in the Culture of Education poses a question:

> *'What, in fact, is gained and what lost when human beings make sense of the world by telling stories about it – by using the narrative mode for construing reality?' (Bruner, 1996 p.130)*

A number of the teaching and learning examples quoted in this thesis involve online interfaces and computer mediation and it is interesting to note that autoethnography has been identified as an important methodology in Human Computer Interaction (HCI) *'by casting the investigator as both the informant 'insider' and the analyst 'outsider'.' (Cunningham and Jones, 2006. p1)*

However, autoethnographic quality criteria for a thesis require that the author's voice be validated in the text through evidence from other sources. Duncan confirms this approach: *'Autoethnographic accounts do not consist solely of the researcher's opinions but are also supported by other data that can confirm or triangulate those opinions' (2004, p5).* Lincoln and Guba point to important aspects of credibility in naturalistic inquiry such as *'prolonged engagement in the field', 'persistent observation', 'triangulation' and 'peer debriefing' (1985 p.219)* and these aspects have also influenced the content of the thesis. The ten-year context of this study confirms prolonged engagement in the field. The historical approach to the higher education context, case studies and peer-

reviewed publications provide evidence of persistent observation throughout the journey. To foreground triangulation the blue triangle-based ellipsis code already mentioned '▲▲▲' is used where appropriate within the text to signify published acknowledgements, peer reviewed work, video clips, contributions to reports and other examples that are either included in appendices, the accompanying DVD or online drive.

Research Questions

The combination of research questions and an autoethnographic retrospective approach brings benefit to both. The research questions were a guide in exploring the designated period of an autoethnographic study that extends some five years prior to the PhD candidature. The research questions have also informed the literature research together with the structure and content selected as evidence for the thesis.

Question 1. What are the contributing contextual factors that inhibit improvement and change in higher education?

Question 2. Why is a focus on assessment design and graduate attribute development important for higher education?

Question 3. What are the benefits of design and design thinking to the field of higher education?

The following brief explanations of the questions serve to locate the motivations and experiences that have driven the author's journey and continue to do so:

Question 1. What are the contributing contextual factors that inhibit improvement and change in higher education?

It could be said that there are obvious answers to this question. It could also be said that unfortunately they have continued to inhibit change during the ten year delimited period of this study, or indeed much longer. But through observation of change-inertia in the academic realm that has persisted despite good intentions and well-funded projects, there have been pressures in the system that were not taken into account. This research question guided the design thinking approach to the literature studies in Chapter 2 that exposes the

pressurised context that has been familiar to the author as a daily working experience over the ten-year period. These pressures are increasing rather than diminishing and whilst many of the references in the chapter are retrospective and related to the author's journey the following quote from the Higher Education Research and Development journal in 2012 gives substance to the claim that pressures are increasing:

> *'... we are in a period now where the pace, nature and demands of change exceed what has been previously experienced in human history. Higher education institutions face increased competition coupled with fiscal challenges, increasing demands for accountability, expanding student bodies with diverse needs and the possibilities as well as challenges associated with pervasive new technologies.' (Austin, 2012. p.57)*

The first research question serves to clarify through the research examples and anecdotes included why excellent educational theory and research do not automatically lead to important changes in education practice.

Question 2. Why is a focus on assessment design and graduate attribute development important for higher education?

The notion of 'assessment design' is an important concept in this thesis based on the research that reveals the *'backwash effect'* of assessment on student learning *(Haynes, 2004, p.159)*. In other words the processes and methods of assessment drive much of what students actually learn. This concept foregrounds potential for criteria-based assessment. For example if the criteria relate closely to categories of graduate attributes this backwash effect can engage students in their own development of graduate attributes or abilities.

> *'Given the challenges we face now, the most profound shift has to be in how we think about our own abilities, and those of our children' (Robinson, 2011 p.7)*

It became clear to the author through many years of undergraduate teaching that assessment criteria are an important *'fulcrum of engagement'* between teachers and students *(Thompson, 2009, p.403)*. This realisation gradually

emerged from work on a previously published book chapter *(Thompson, 2006)* that explored evidence of suicide and other side-effects of examination-based assessment.

■■■ ***A personal anecdote relating to designing and aligning assessment to graduate attribute development****: There was a lecturer who had been teaching for many years. As the years wore on he began the practice of locking the lecture room door 5 minutes before the lecture was due to begin, and refused to mark any assignments that were late. This resulted in very poor student feedback and low attendance at his lectures. On being questioned by the author about this teaching and learning strategy he strongly held his ground 'these students are in a professional degree, if they are not prompt or on time delivering their work they will not get paid by clients... I am determined that they will learn this lesson'.*

The lecturer was attempting to develop a graduate attribute but perhaps his strategies were ineffective and certainly the value of the attribute was not being communicated successfully to students. In searching for the appropriate words the author identified the attribute: 'A professional approach to timing and deadlines'. On hearing these words the lecturer was delighted and it was agreed that in order to foreground this to students it could be one of the assessment criteria for a revised assignment that also involved students interviewing design professionals.

In order to fairly mark the new criterion, instead of locking the lecture theatre doors he used a classlist taken in 15 minutes after the lecture began to penalise repeated lateness. He added a penalty of 10% per day for late assignments and informed students how the marking of the criterion would be calculated and applied.

This anecdote and other experiences and research synthesised in Chapters 2 and 3 were pivotal in the concept of graduate attribute development and integration becoming a design-thinking focus for the author's educational initiatives during the period investigated in this thesis.

Question 3. What are the benefits of design and design thinking to the field of higher education?

This question comes from an attempt to clarify the aspects that account for the author's success in applying the design principles, processes and practices implicit in the term design thinking. Practical applied examples provide evidence through Government funded projects in Chapter 5, the learning designs together with visual interpretations in Chapters 3 and 4 together with the software interfaces and assessment systems described in Chapters 4, 6 and 7.

The teacher, philosopher, mathematician and physicist Alfred North Whitehead wrote a great deal about education and refers to a method often used by designers *'In order to acquire learning, we must first shake ourselves free of it.' (Whitehead, 1938 p. 7)*. Given the persistence of exam-based systems during the last hundred years this particular assessment regime remains largely unshaken despite its detrimental effects on student engagement:

> ★★★ *'In my own work at universities I have been much struck by the paralysis of thought induced in pupils by the aimless accumulation of precise knowledge, inert and unutilised.' (Whitehead, 1967 p.58)*

Design and design thinking often involve trial and error application to both define problems and develop solutions. The benefits of this approach have informed the learning designs and assessment initiatives in chapter 4 and beyond. This third research question has also led the author to do a research project on assessment in high-school education and one of the future possibilities to extend this is mentioned in an anecdote in the final chapter of the study.

Ethical considerations

The author's role in the design and development of the two online systems mentioned (*ReView* and *SPARK*) was due to personal initiative with the motive of the application of important educational theory and research, and ultimately improvement in educational systems. There has been no financial remuneration for this work and the design and development of the software has not been allocated as part of the author's workload as a teacher / lecturer or other roles such as Course Director and Director of Teaching and Learning.

The author's research results referenced in this thesis conducted during the designated period are fully acknowledged and covered by human research ethics codes as part of the studies or journal articles they came from. No real names are used for individuals mentioned in research results and comments from academic staff and students have been de-identified. Video clips and animations are included in the DVD accompanying this thesis with permission from those concerned.

Chapter 2

THE LITERATURE: an overview of the Australian Higher Education context

Foreword

This chapter is devoted to an analysis of pressures in the Australian higher education context particularly related to the first research question, *1. What are the contributing contextual factors that inhibit improvement and change in higher education?*

The chapter uses the design concept of six pressurised dynamics to explore the factors that may inhibit change within the system. Literature from the designated ten-year period between the years 2002 and 2013 is used to explore these pressures on the basis that educational change is likely to suffer inertia unless some of the pressure is released or at least taken into account.

Developing a framework for analysis

This chapter explores the Australian higher education context through a framework that focuses on the pressures within it. The intention is not to provide the most up to date analysis but rather to use literature references that relate to particular parts of the author's journey, and thereby to the autoethnographic influence in this study.

The development of the framework first considered various models of analysis to assess their potential as a basis for this overview. The first 'Political, Economic, Social, Technological, Legal, Environmental' referred to as PESTLE analysis *(Huczynski and Buchanan, 2007)* is normally used for organisational planning and producing reports that guide organisational change. Whilst aspects of the six PESTLE domains are important, and did inform the eventual framework that was developed, they were too broad in a thesis that focused on the author's specific experience. The second, 'Strengths, Weaknesses, Opportunities, Threats' referred to as SWOT analysis is also popular across many sectors and was well known to the author. However, in usage it had been effective in analysis of smaller projects but vague when used to analyse broader domains. This view was supported in a study of its effectiveness:

> *All the applications showed similar characteristics—long lists (over 40 factors on average), general (often meaningless) descriptions, a failure to prioritize and no attempt to verify any points. But the most worrying general characteristic was that no-one subsequently used the outputs within the later stages of the strategy process. The continued use of the SWOT analysis, therefore, needs to be questioned (Hill and Westbrook, 1997).*

Whilst this method is clearly still being used and was also useful in formulating the framework for this thesis it seemed laborious in application to the various aspects of the environment being considered and tended to cause a segmentation rather than synthesis. The other two are more educationally focused. The third, Biggs' 3-P Model of learning (Presage, Process and Product) was considered pertinent as it does relate to the basic dynamics of the learning

environment shown in Figure 2. but takes only minor account of the surrounding pressures that may be inhibiting change in the learning environment that the model describes:

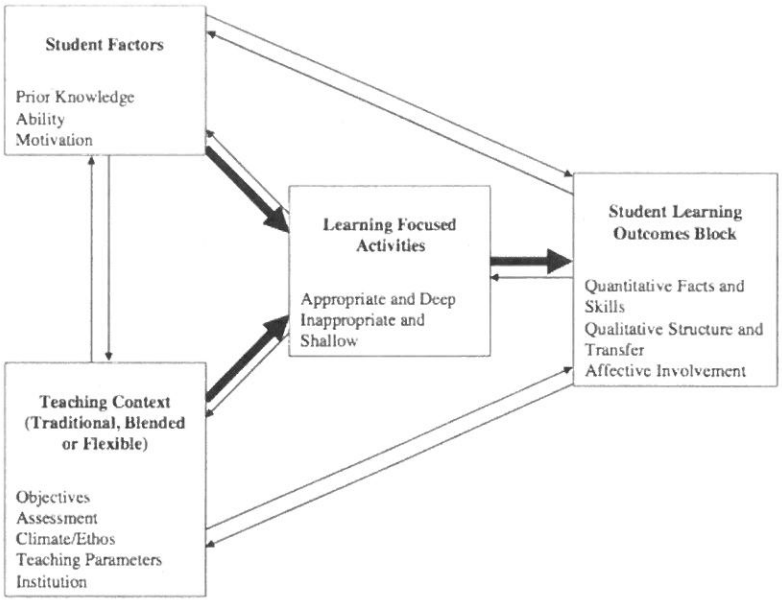

Figure 2: The 3-P model of learning (Biggs, 2003. p.19).

The fourth, Urie Bronfenbrenner's model was the most useful as it can be shown to position universities as part of a complex ecosystem with students at the centre. It also values many of the developmental theories including socio-cultural approaches that are vital in the consideration of engagement and motivation in the learning environment. The diagram in Figure 3. shows an educational interpretation of the Macrosystem, Exosystem, Mesosystem and Microsystem. These were interesting to explore and highlighted that university policy and structure as an Exosystem is often remotely engaged with the student experience at the Microsystem level.

There is another level often added as an external level not shown in this particular version of Bronfenbrenner's model in Figure 3. the Chronosystem referring to the transitions and environmental changes that happen over time. This concept encouraged the author to take an autoethnographic approach that encompasses a journey that explores changes over a substantial time period.

There are literally hundreds of interpretations and diagrams relating to Bronfenbrenner's environmental systems concept but the following diagram is designed to relate generally to the higher education context. *(http://www3.uakron.edu/schulze/610/lec_bronf.htm checked 15.1.2015).*

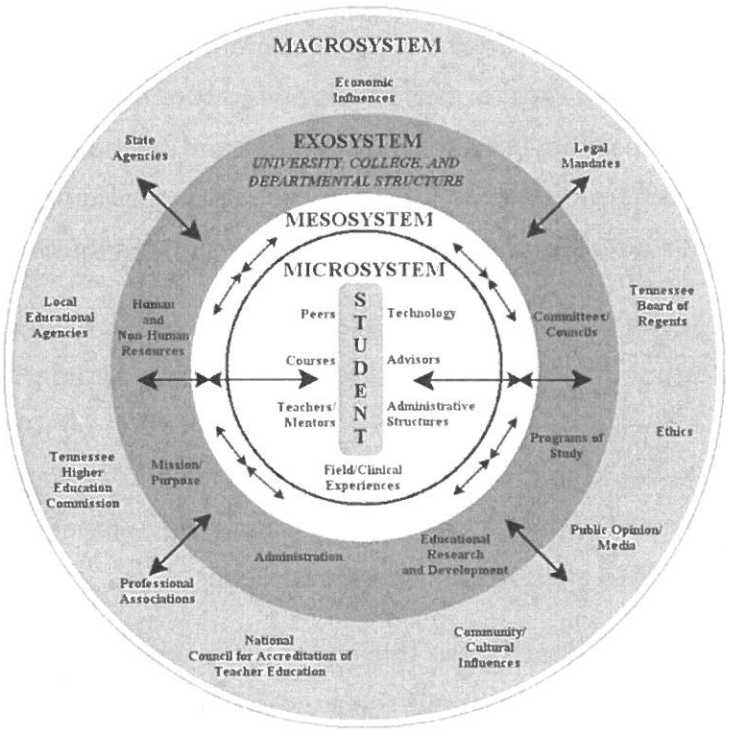

Figure 3: Urie Bronfenbrenner's educational model from Lecture Notes (checked 15.1.2015)

The last two models considered are educationally focused. Bigg's model was rather too simple to embrace the dynamics that have been part of the author's experience. Bronfenbrenner's model was rather too detailed and complex in the five individual systems and the application of this model to the Australian context could alone constitute several theses. However Bronfenbrenner's Mesosystem that is concerned with engagement, communications and interactions between the microsystems (students, courses, teachers, peers etc.) and the Exosystem (university, college and department structures) highlighted the positioning of the domains in which the author has applied design practice and design thinking. It was important in considering models to relate the interpretation of literature to the author's experience. The visual metaphor of pressures impacting a box discouraging thinking outside of the box served to perhaps explain the lack of change in systems, particularly exam-based

assessment. These ideas also related to deep rather than surface engagement *(Marton & Saljo, 1976. Ramsden, 1992)* and intrinsic motivation balanced by internalised extrinsic motivation *(Ryan & Deci, 2000)* that were key to the author's early engagement with educational theory. Experience of the inappropriate use of high-stakes exams also harmonised with an ongoing interest in graduate attribute development and assessment processes. The author resolved that for this thesis a literature exploration that focused on the pressures that may inhibit improvement and change would be more appropriate than existing models in explaining the rationales behind the educational initiatives developed on this particular designer's journey.

The following framework titled 'a pressure-sensitive view of higher education' was designed by the author based on literature and personal experience to explore pressures impacting the higher education context in Australia. The rationale being that design practice and design thinking that targets improvement and change would need to relieve pressure or at least take these pressures into account for change to occur.

The pressures identified in this chapter are possibly exerted globally on many educational institutions, but the examples and references in this chapter focus on the Australian context that includes 37 publicly funded universities with some specific references to the system that operates in New South Wales, one of the 6 Federated States of Australia.

A pressure-sensitive view of higher education

In order to gain an appreciation of the complex pressures acting upon higher education in Australia, the diagram in Figure 4. is offered as the author's interpretation. The titles in each circle were resolved after an extended search of literature and a review of the author's personal experience in both teaching and leadership roles within an Australian higher education context. Each title is explored through literature with some references to personal experience in the text.

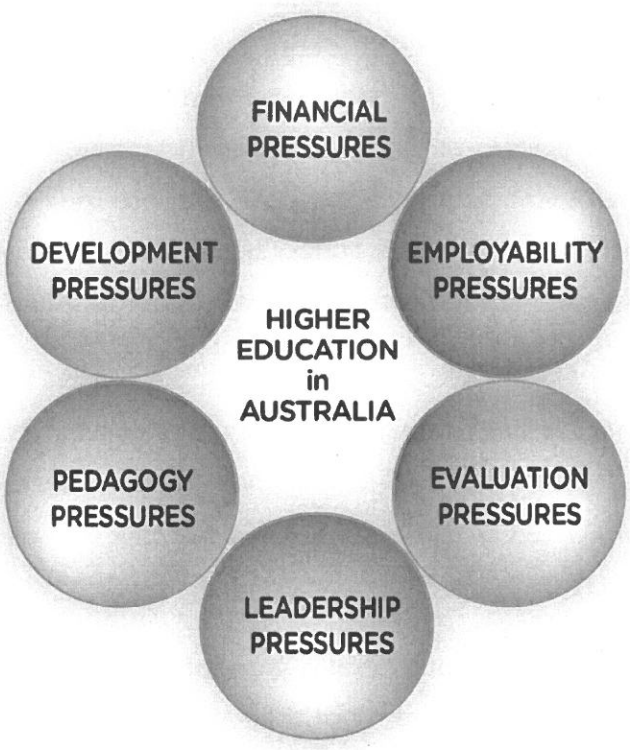

Figure 4: The author's diagram of six pressure domains used to explore the factors influencing educational change in the Australian higher education context.

Development pressures

The term development used here is intended to encompass the pressures implicit in both curricula and teaching responses to rapid social and technological change. This section includes the pressures involved in the provision of a learning environment designed to encourage the development of lifelong learners. The pressures on students are also an important factor considered here.

> *'Being a student in an Australian university involves more pressure, and makes more demands on that student and his or her support networks than ever before'. (Mitchell, et al. 2008 p44)*

Twenty years earlier Boud *(1988)* was also exploring the demands on students and the responsibility of university environments in the development of students' autonomy. Boud's interpretation highlighted the university's central

and pivotal role in the development of mature academics and professionals, and contains an implicit shift in modes of learning. The university learning environment must reduce students' school-teacher dependency, encourage independent self-directed learning and develop the collaborative and professional skills vital for an inter-dependent working life. Whilst it could be argued that some schools attempt to prepare their pupils for independent learning, the various higher school certificates focus Australian schools on producing examination results that will yield high university entrance scores. ★★★

> *'Such testing has created a siege environment in schools where administrators, teachers and parents believe that teaching must occur principally so that students pass these high stakes tests'. (Petrosky, 2006. p 83)*

In the State of New South Wales students take their Higher School Certificate (HSC) examination in year 12 of their studies (17 - 19 year age range) and these results are used to calculate an Australian Tertiary Admission Rank (ATAR) previously known as the University Admissions Index (UAI). It is interesting to note that this ranking process scales down results in subjects that foreground collaborative inter-dependent approaches such as art, music, drama and the social sciences and reduces the variation of student development to the calculation of one number.

The effects of the Australian Tertiary Admission Rank (ATAR)

The development pressures exerted by a ranking system on school principals, school teachers, students and parents can not be overstated and this pressure flows on into the higher education context. The Higher School Certificate examination results constitute a hurdle that has enormous impact on young lives, and data about HSC-related youth suicide became part of the author's rationale for designed interventions explored in Chapter 3.

As early as the nineteen sixties educators were feeling that high school secondary education *'had become an auxiliary to the examination system instead of the examination system acting as an adjunct and servant to the secondary education program' (Connell, 1962, p73)*

During the period 1967 to 1975 the calculation formulas for entrance rankings gave an advantage to students taking the highest levels in particular subjects. Due to changes in 1976, the new calculation gave a better score to students taking the lower levels, except for the highest level Math course. It was little wonder that these High School Certificate examinations were seen to be the *'tail that wagged the educational dog' (Cooney, 2001. p.3).*

At the Australasian Curriculum, Assessment and Certification Authority (ACACA) Conference in Sydney, 2001 Professor Cooney actually questioned the survival of such systems in a paper titled 'The Tertiary Entrance Mark - an Endangered Species?':

> *The Universities Admission Index (UAI) and controversy seem to be inexorably linked, and each year brings its own story... a Tertiary Entrance Rank (TER) has a dominant role in university admission of school leavers in Australia. This paper examines its role and the likelihood of its survival into the twenty first century. (Cooney, 2001)*

Despite condemnation from educators and the stress caused to students and parents these high stakes ranking systems persist. In 2009 the Australian Government introduced changes towards rationalising education systems across the different states *(UAC, 2009).* During June 2009, the Federal Minister for Education announced the removal of the previous systems, for example the Universities Admission Index (UAI) used in New South Wales and the Australian Capital Territory and introduced the Australian Tertiary Admission Rank, or ATAR, for all Year 12 students in 2009 for the Australian Capital Territory and New South Wales, and for the rest of the country, excluding Queensland, in 2010. The ATAR was introduced to unify the university entrance system in Australia, where previously there were three different systems used. Queensland is the only State not to adopt the ATAR system but uses conversion tables to or from its own scheme.

The ATAR follows the same principles as its predecessors. The rank gives an overall position of the student in relation to the student cohort for that year across the State. An ATAR qualifies a student to compete for a place on a course in a university of their choice, and the ATAR ranking of a course relies on the number of places available and the ATAR rankings of the applicants. The

ATAR is used by: the Universities Admissions Centre (UAC) in New South Wales and the Australian Capital Territory; the South Australian Tertiary Admissions Centre (SATAC) in South Australia and the Northern Territory; Victorian Tertiary Admissions Centre (VTAC) in Victoria; and Tertiary Institutions Service Centre (TISC) in Western Australia. These bodies then allocate positions for the tertiary institutions in their relevant states *(UAC, 2013)*.

The ATAR calculation method is a complex six-step process that firstly ranks the position of a student against all other students taking the same subjects and then produces an average position across all subjects using 'percentiles'. These are based on the scaled mean for each subject and there is an increased weighting for core subjects such as English, maths and science. It is this number rounded to the nearest 0.05 that gives a position ranking against all students in a cohort independent of the actual subjects they studied at Higher School Certificate (HSC) level.

Extensive school statistics are published by the Australian Curriculum and Assessment Reporting Authority (ACARA) providing student results in a variety of subject areas (http://www.myschool.edu.au/). Whilst it was not intended to act as a school ranking system, given that these statistics factor in applications for Government funding, it is in schools' interests to be strategic in guiding the subject choices of their students. Consequently there may be a warping effect in the development of university entrants that were encouraged to select their school subjects based on ATAR score potential rather than individual preferences, abilities and orientations.

The ATAR system also has an influence on university enrolments for popular courses. Courses have a limited number of places and if a course is particularly popular the ATAR 'cut-off score' elevates accordingly. The perception that a course is of high quality due to the high rankings required for entry is misleading for both parents and students. The high entry rankings of courses are actually due to their popularity and lack of available places. Compounding this effect, students and their parents want to use high ATAR scores to apply for the highest-ranking courses, possibly warping their selection of discipline area.

There is a more subtle effect of the ATAR calculation method from the developmental standpoint when considering student applications to popular

courses. For example, in the early part of the 21st century, design courses at university became very popular. ■■■ In 2002 the author was Course Director for the Bachelor of Design in Visual Communications at the University of Technology, Sydney. This undergraduate degree had become very popular and due to the number of enrolments offered the cut-off admission ranking was 94.3 (out of 100), only surpassed by courses in Medicine and Law. Unfortunately, for many potential designers the high school HSC subjects appropriate for this course, namely Visual Arts and Design and Technology were taken by students whose highest scores only reached 85.4 and 84.8 respectively that year due to the scaling down of those subjects in the ranking calculations. Student achievement of higher scores relied on their choice of 'A-Grade' weighted subjects. As an example, in 2002 the only A-grade subjects apart from English (compulsory) that contained students who reached the score of 94.3 were: Maths, Maths Extension 1, Maths Extension 2, Physics, Biology, Legal Studies, Economics, Engineering Studies, History Extension, Religious Studies 1 and Religious Studies 2. *(http://www.uac.edu.au/mya/admin/uai.html#uai Table a1, accessed 21.4.04).*

Therefore, using this one case as an example, students intending to apply for a University of Technology design course and other similar university courses are required to take high-scoring school subjects to obtain the ATAR scores commanded by such courses. This situation has caused a division in which those with an aptitude for the arts at school are restricted to places in the Technical and Further Education (TAFE) system or private colleges. Taking a broader social perspective on this situation, it could be argued that the ATAR system appears to encourage a form of 'inadvertent social Darwinism' mentioned by some philosophers as the effect of the 'social dualisation' accompanying the information revolution *(Flecha, 1999, p.66).* The differentiation between TAFE and the university system raises some important issues with regard to the separation of 'technical' and 'academic' education. Prior to the Flecha's commentary on the information revolution the philosopher Alfred North Whitehead also propounded the importance of combining these two vital aspects of learning:

> ★★★ *The antithesis between a technical and a liberal education is fallacious. There can be no adequate technical education which is not*

> *liberal, and no liberal education which is not technical; that is, no education which does not impart both technique and intellectual vision. .... This intimate union of practice and theory aids both. The intellect does not work best in a vacuum. (Whitehead, 1929a, p.74)*

Fortunately in universities many discipline areas are adopting Problem-Based Learning (PBL) approaches pioneered in medical education *(Barrows, 1996)* where there is integration between technical skills and theory associated with higher education studies. Unfortunately, at the same time, the increasing pressure on universities to differentiate themselves from the public TAFE system may lead them to diminish engagement in practical application. The developmental danger for universities in this context may arise from their reduced attractiveness to students and employers, as they tread a fine line in the development of 'work-ready' graduates.

Developing independent learning and inter-dependent approaches

The extrinsic pressure to obtain high scores in school exams is an unfortunate orientation for students that enter a university environment designed to deeply engage them with a particular discipline. Marks-driven attitudes tend to cause 'surface' or 'strategic' rather than 'deep' approaches to learning *(Marton and Saljo, 1976)*. One aspect of development pressure emerges when academics attempt to dissuade students from their prior focus on assessment marks and a 'spoon-fed' supply of information. Another emerges when critical thinking is valued beyond quoting references and challenging creative boundaries rather than following style. The need to develop students' collaborative approaches for employment and life long learning brings another development pressure as the persistent focus on independent study for exams tends to override these developments. These developmental issues require a focus for teachers on students' graduate attribute development and assessment explained in Chapter 3 in the section "The rationale for a focus on graduate attribute integration".

Overloaded curricula and the digital generation gap

The information overload that permeates society also acts as a development pressure on the system. It affects the content aspects of curriculum design and

assessment processes. As early as 1987 the idea of information overload was considered an issue:

> *The spread of information is dangerously entropic. It may lead to uncertainty and insecurity rather than confidence and self assurance. What we need from educational technology is forms of knowledge which may lead to understanding, rather than information overload and confusion. (Hart, 1987, p.172)*

Even before the rise of the Internet, information overload was a cause for concern. In July 1996, Reuters conducted the first ever study into information overload with 1,313 managers (36% of them female) from five countries including Australia. The report from this research called 'Dying for Information', revealed the significant extent to which information overload was becoming a problem.

> *'... More information has been produced in the last 30 years than in the last 5000. And, claims Reuters, a weekday edition of the New York Times contains more information than the average 17th Century man or woman would have come across in an entire lifetime. (Reuters, 1996, p.2)*

One of the conclusions in the Reuters report, which was conducted before the major Internet boom, suggests in the section on future predictions that Internet use would seriously increase the problem in the following two years. One disturbing aspect of the study was the respondents' unwillingness to admit there was a problem. The following extract from the methodology highlights this fact:

> *'In a number of questions, respondents were asked their views on how 'colleagues' acted in certain situations. By allowing respondents to talk in the third person, the research was able to limit the extent of socially desirable responses. Previous research has found that even those suffering extreme levels of information overload are reluctant to admit personally such sufferance for fear of being seen to fail in their job responsibilities'. (Reuters, 1996, p.5)*

This reluctance to admit there is an information overload problem can also cause stress in the relationships between students and teachers when it comes to the adoption of computer applications and new technologies. Teachers who reference out-dated content can now find themselves exposed due to the vast availability of information on the Internet. Plagiarism and the validity of source data are harder to ascertain causing further development pressure between academics and students.

Due to the phenomenally rapid and ubiquitous development of computer technology over a very short period, there is now a significant 'technological distance' between lecturer and student. Students who have experience with the use of computers from an early age may become frustrated with staff members less adept, or less interested in these developments. Ubiquitous computing and the advent of 'Big Data' *(Crawford, 2011)* are compounding this pressure differential between older teachers and students. The problem was identified as early as 1996 and *'bridging the digital generation gap' (Papert, 1996, p.i),* was identified as an important factor in parent-child, student-teacher relationships. In an educational management context this is also important where older staff members are often responsible for curriculum development and hardware/software purchasing decisions. Rapid changes in society require that education systems are adaptable and foster students' development in a lifelong learning context. Governments have identified maths and English literacy as an important aspect for funding. However, over twenty years ago, Alvin Toffler who popularised the term 'information overload' also challenged notions of 'literacy' in his book 'Powershift: Knowledge, Wealth, and Violence at the Edge of the 21st Century' ★★★ :

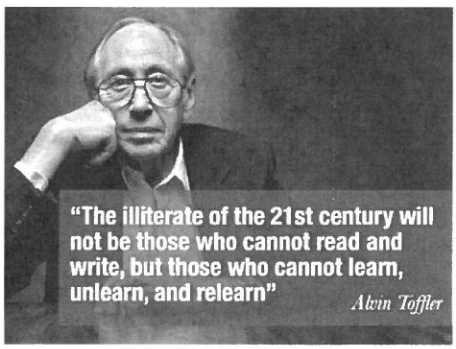

Figure 5. Possibly Alvin Toffler's most powerful insight about education in the 21st century (Toffler, 1990. Image retrieved 28.1.14)

The development pressures related to literacy can also be extended to those caused by the need to assist students with non-English speaking backgrounds. This does not just apply to their literacy with English language but also their understanding of subtle cultural nuances including metaphor and various 'western' concepts *(McWhinnie, 2008)*.

Further to the development pressures impacting the higher education context, statements about the quality of higher education institutions increasingly refer to the employment records and starting salaries of graduates. The following section on employability pressures explores factors that amount to further pressure on the university learning environment.

Employability pressures

Business organisations rely on universities to stay ahead of changing requirements and to provide graduates with appropriate attributes and skills for employment. However, because of their own increasingly pressured environment, employers are becoming more vocal in what they expect the university environment to deliver in terms of graduate employability. The pressure from student expectations of employment often drives enrolments in particular universities and specific courses.

> *'Recent shifts in education and labour market policy have resulted in universities being placed under increasing pressure to produce employable graduates'. (Bridgstock, 2009 p31)*

Whilst this quote refers to 'recent shifts' a study of engineering design graduates and their employers nine years earlier in the UK *(Garner and Duckworth, 2000, p.208)* revealed a deep dissatisfaction with current graduate profiles. In their study, the employers' criticisms of graduates 'attributes' included the following points:

- *they need greater ability to take other people's ideas on board*
- *they have a lack of resilience to criticism*
- *they have a weak ability to muster a reasoned defence of their contribution*
- *they need to improve listening skills*

- *they need higher quality written, graphic and verbal communication*
- *they need to be able to be critical of their own work and contributions.*

The following extract from the summary resonates with a need for versatility and diversity in employees and exerts an employability pressure on the university learning environment:

> ★★★ *"A breadth of skills and knowledge seems vital - as one manager put it, 'we can't afford specialists'. The desired profile seems a broad one: creative and analytical; practical and academic; numerate and literate; able to exploit both divergent and convergent thought processes; sensitive and strong!" (Garner and Duckworth, 2000, p.211)*

Further reading of Garner and Duckworth's study revealed that employers actually do need specialists, but also need them to be meta-specialists with the ability to handle a vast range of tasks, situations and responsibilities.

Whilst this was a UK study, and the terms 'employability skills' and 'key skills' are more popular in UK literature, the Australian industry associations and governments have also produced employability reports. As early as 2002, the Business Council of Australia issued an 'Employability Skills Framework' in a report about employability skills for the future *(DEST, 2002)*. They listed a number of 'skills' that seemed to match well with the Garner and Duckworth study: initiative and enterprise, communication, teamwork, problem solving, self-management, planning and organising, technology, and life-long learning. In educational research literature in Australia the term 'graduate attributes' is used rather than key skills or employability in the UK context.

Graduate Career Survey in Australia

The continuing focus on these attributes in the business community led to a 2008 Graduate Careers Australia survey of 27,500 university students indicating that students themselves have high expectations of the employability skills they are developing in their courses. The following chart in Figure 2 shows their own self-assessments of nine employability skills at different stages in their courses.

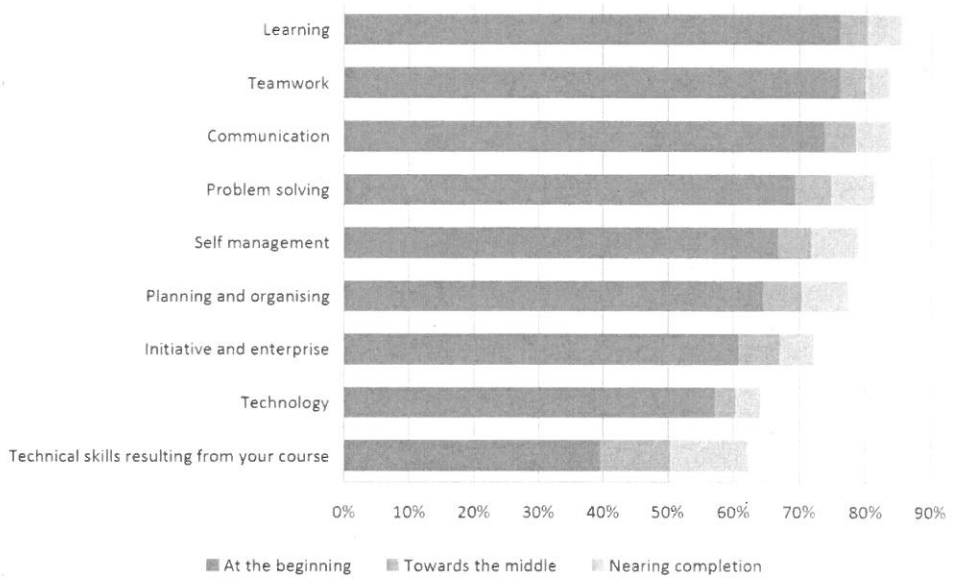

Figure 6: Self ratings of students core employability skills at different stages of their course (GCA, 2008)

Figure 6 shows that students are concerned about their technical skills development. This echoes the earlier point made about the differentiation between universities and the Technical and Further Education sector. However, the study also showed that employers significantly rated students' core skills lower than their self-ratings (except in the area of technology) and generally overrated the importance that students place on salary when evaluating job opportunities. In the same report, 69.1% of students were very confident or extremely confident about obtaining a job on graduation and 52.5% thought that ongoing training and development was more important than salary. However, only 19.6% of 64,648 students graduating in 2008 were undertaking further full time study by December that year *(GCA, GradStats, 2008)*. This figure was very similar in 2012 at 20.8% *(GCA, GradStats, 2012)*.

The survey taken during university enrolment was used as a basis to assess whether three years of additional employment and life experience had changed graduates' perceptions of their employability skills. Full-time employed bachelor degree graduates were asked to provide a self-rating of their employability skills immediately after course completion and again three years later, 2008 to 2011. Eight aspects repeated from the student survey were investigated using a different five-point response format: very low, low, moderate, high and very

high. The proportion of graduates who rated their skills as being either 'high' or 'very high' is presented in the following Figure 7.

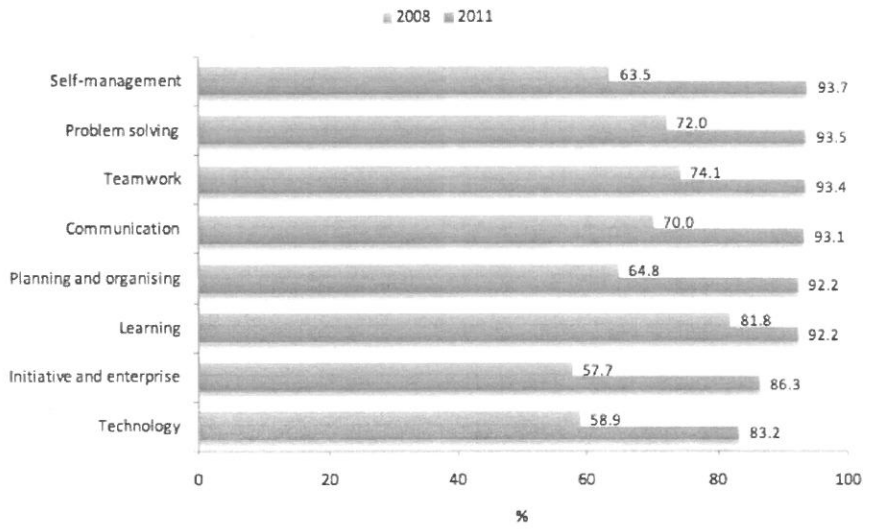

Figure 7: Self-rated employability skills, high/very high, bachelor degree graduates in full-time employment, by broad field of education, 2008 and 2011 % (GCA, 2012)

The two surveys are not comparable and the 2008 ratings are derived when students were asked in 2011 to reflect about their skill level at graduation. The survey conducted three years after graduation shows the extensive gaps between the numbers of students who self-rated highly or very highly as a result of their workplace engagement, perhaps implying that the university context was not developing their employability.

Another important Australian report on graduate employability skills from the Business and Higher Education Council *(BIHEC, 2007)* made three recommendations that directed targeted university teaching and learning strategies:

> *2. To explicitly identify employability skills in all university curriculums*
>
> *4. To enhance teaching and assessment of employability skills*
>
> *5. To offer students self-assessment options for employability skills*
>
> *(BIHEC, 2007 p.5)*

The academic discourse at university level in Australia mostly uses the term 'graduate attributes' rather than employability skills and there is a mismatch of

views between academia and the business sector explored in the next paragraph and later in the section on Pedagogy Pressures.

The balance between employability and a broad education

The focus on employability is clearly an international issue and since the earlier Garner and Duckworth 2000 reference from the UK the same issues are being foregrounded in a 2011 report from over 1000 hiring decision makers in the USA:

> *'Only 7% believe the higher education system does an "Excellent" job preparing students, while 54% say it does a "Good" job and 39% say "Only Fair" or "Poor."45% of decision-makers believe that most students would be better served by an education that specifically prepares them for the workplace. 55% prefer a broad-based education that helps them choose their best career path.' (ACICS, 2011 p.1)*

The latter statistic here reinforces the point made in the Development Pressures section that universities have a pivotal role in developing the collaborative and professional skills vital for an inter-dependent working life together with independent self-directed learning.

In a news conference announcing the Accrediting Council For Independent Colleges and Schools report *(ACICS, 2011)* Rep. Virginia Foxx, the North Carolina Republican chairwoman of the U.S. House of Representatives higher-education subcommittee, urged institutions to heed employers' calls by suggesting that colleges and universities are pandering to the students and giving them what they want, instead of what the employers want and that education needs to do both.

The increasing pressure on academics to focus on funded research rather than teaching compounds pressures from this employability domain. There is also pressure from an intellectual position in which some academics are opposed to 'employability' in an educational context where there is a need for students to develop in broader ways:

> *We should not attempt to give the provincial employer everything he expects of an applicant if it contradicts the needs of our students, society, and the profession. (Salchow, 1994, p.221)*

These factors have often led to inertia in changes to teaching and learning approaches at university level and in particular the development of graduate attribute initiatives *(Barrie, 2004)*. It is recognised that graduate attributes, whatever the terminology, often become the deciding factor when an employer is faced with many degree-qualified applicants.

There is clearly a requirement from industry to define and make explicit the qualities, knowledge and skills (attributes) developed in the higher education curricular context but there is still a great deal of resistance to the changes in teaching and learning strategies that would facilitate such development.

Taking Salchow's point there is also the longer-term responsibility to think more broadly about lifelong learning needs in a rapidly changing world and workplace. Those studying the natural worlds have defined the qualities needed for survival in periods of change. Suzuki in his book Earth Time *(Suzuki, 1998)* suggests that the two most important qualities of a sustainable life form are 'versatility' and 'diversity'. He also implies that these qualities may equally be necessary for the sustainability of both business organisations and individuals in society. It is no longer acceptable for graduates to gain the knowledge content 'examined' in an undergraduate degree. Universities are under pressure to ensure that students have well developed employment potential and the 'independent' and 'inter-dependent' skills already mentioned.

Pedagogy pressures

The pressures in this section relate specifically to academics' lack of exposure to concepts, theory and research related to teaching and learning. This lack of exposure is prevalent in the Australian university sector and constitutes a pressure when initiatives are introduced based on educational concepts, theories and research. At high school level teachers are required to have an undergraduate initial teacher training degree with teaching certification usually taking four years to complete. However the higher education sector requires no teaching and learning qualification as a condition of employment.

Teaching and Learning Qualifications

A survey of 32 universities commissioned by the Australian Department of Education, Science and Training *(Dearn et al. 2002)* showed that there was

minimal support for the teaching role of academic staff, and that 25% did not have teaching preparation programs for new staff. It is not possible to ascertain the proportion of university academic staff with teaching qualifications, survey data only includes the level of qualifications as specified in The Australian Qualifications Framework (AQF). The framework was launched in 1995 but significantly updated with a new approved version in 2011 shown in the following Figure 8.

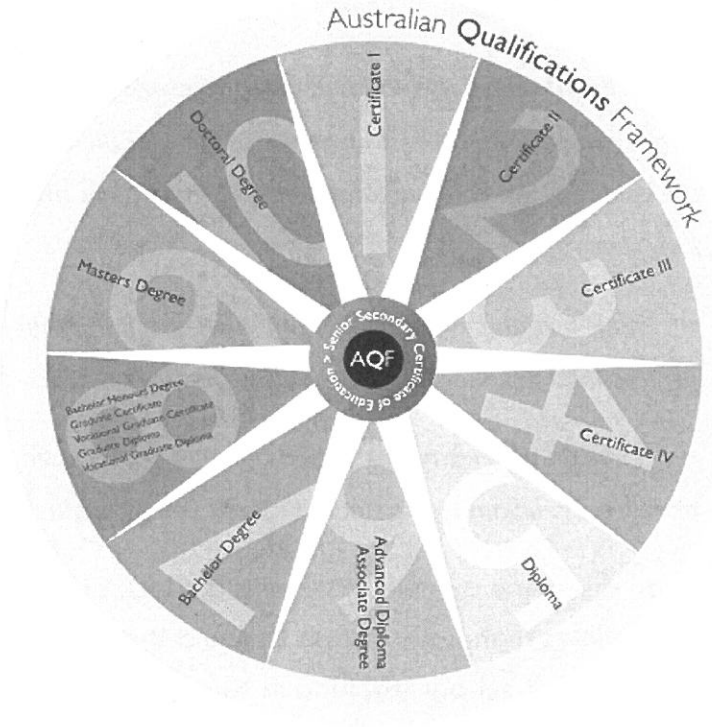

Figure 8 Australian Qualifications Framework (AQF) approved in 2011 (AQFCouncil 2nd Ed.,2013)

There is mounting pressure in Australia for university teachers to have a qualification one step higher than the students they are teaching but there is no mandated requirement for the acquisition of a teaching and learning qualification. Applicants with a PhD, Masters or Bachelor degree in a specific content area can be accepted for a university teaching position having had no exposure to the underpinning conceptions that are the foundation for successful teaching and learning. Academic staff may have the opportunity to enrol in an in-service Graduate Certificate of Education, but given the low status of the qualification and no mandatory requirement the uptake of these qualifications

relies upon initiatives such as the Tertiary Education Quality and Standards Agency (TEQSA) Act 2011 and the Higher Education Standards Panel who administer the Higher Education Standards Framework. This standards framework makes two relevant recommendations: *(http://www.comlaw.gov.au/Details/F2013C00169/Html/Text#_Toc330548933 accessed 15.1.2015)*

> *4.2 The higher education provider ensures that staff who teach students in the course of study:*
>
> - *are appropriately qualified in the relevant discipline for their level of teaching (qualified to at least one AQF qualification level higher than the course of study being taught or with equivalent professional experience);*
> - *have a sound understanding of current scholarship and/or professional practice in the discipline that they teach;*
> - *have an understanding of pedagogical and/or adult learning principles relevant to the student cohort being taught;*

The focus on discipline qualifications and the lack of a qualification mandate in these points allows higher education to avoid the teaching qualification required for all other levels of school teaching in Australia.

This situation highlights a core dichotomy between the value that Australian universities place on research compared with the value of teaching. Understanding conceptions of teaching and learning with exposure to educational theory and research should be considered a pre-requisite of employment for professionals with significant teaching responsibilities. Given this context, didactic lecture/tutorial teaching and exam-based curricula are often prevalent with minimal intellectual pressure for change. A more recent study of Australian universities states:

> *'Business lecturers do not value the development of their students' profession-specific skills or knowledge creation capacity as highly as the development of their theoretical knowledge. Therefore they are probably*

less motivated to adopt social constructivist teaching methods.' (Hanson and Sinclair, 2008 p183)

This quote highlights the difficulties experienced in the initiatives intended to deliver graduate attribute based teaching and assessment in the higher education sector. It further reveals the complexity of contexts in which the focus on research and teaching is highly variable and in this case, specific to the business disciplines.

The consequences of university teachers without teaching qualifications may lead to a host of conceptual misnomers in their approaches to teaching. For example, university teachers often load the curriculum with excessive and complex documentation and reading material, yet this is identified in the literature as a major factor in students' adoption of a 'surface approach' to their learning *(Ramsden, 2003)*. Without exposure to teaching and learning theory and research, academics can often be unaware of the enhancement to learning that can be accomplished with reduced content and improved strategies.

The concept of graduate attribute integration

Edicts directed at academics from business, government and education hierarchy seem unable to stimulate the actual practical integration of graduate attribute teaching and assessment. There has been a decade of educational rhetoric about the shift in higher education to the development of graduates' capabilities rather than the delivery of content *(Leckey and McGuigan, 1997)*. Literature on graduate attributes and the rationale behind the importance of their integration in curricula will be discussed in the following chapter. However in this overview of the pressures that act against change it would seem that lack of pedagogical awareness has had an impact on the many implementation attempts.

★★★ *'A key shift in the nature and purpose of teaching in higher education has been the shift from content delivery to capacity building. One important aspect of this shift is the imperative to direct our assessment practices towards evaluating the development of a much broader range of graduate attributes than disciplinary knowledge acquisition, reproduction and dissemination.' (Erica McWilliam - QUT*

abstract from a presentation to USyd 16 June 2006 'From Content to Capacity-building: What challenges for assessment?')

Although McWilliam is assumptive here in the implication that there *'has been'* a shift toward capacity building this presentation to a large audience of academics in an exam-based assessment culture was significant. ■■■ The importance of assessment mentioned in this statement was a validation in the author's design thinking approach that acknowledged the culture of 'teaching to the test' and 'cramming for exams' by resolving to move forward in attempting to change the assessment system within and beyond the discipline of design.

There is also evidence that assessment drives learning or more subtly: *'The backwash effect of assessment on learning is widely acknowledged' (Haynes, 2004, p.159).* Given the weight of evidence it would be reasonable to assume that university subjects would integrate the assessment of graduate attributes. It is interesting to note that educational research now affirms that student involvement in assessment and self-assessment is a powerful driver of learning and can substantially improve curricula *(Falchikov, 2006).* However, although these approaches to assessment are known to develop important graduate attributes the author found no examples of the explicit and systematic integration of graduate attribute assessment.

In a university education system that does not foreground exposure to these concepts it is understandable that graduate attribute initiatives tend to languish in curriculum documentation with minimal practical impact. Whilst many lecturers had 'ticked the boxes' in mapping subjects to graduate attributes a survey of staff conducted by the author *(Thompson, 2007)* showed minimal penetration despite concerted efforts to promote a graduate attribute framework.

Survey: ReView1

Question 1

Did you know that UTS has documented statements about the development of its graduates' attributes known as the UTS Graduate Profile Framework?

78 Responses

- Yes	43	%55	1
- No	35	%44	2

Mean= 1.4, Standard Deviation= 0.50

Question 2

Have you ever seen this Graduate Profile Framework document?

78 Responses

- Yes	25	%32	1
- No	53	%67	2

Mean= 1.7, Standard Deviation= 0.47

Figure 9: Survey with 78 academic staff respondents (Thompson, 2007, p.3.).

Further investigation of this data showed that respondents included 65 full time and 13 part time academic staff. The large majority of full-time staff respondents is indicative of the difficulties of introducing educational change.

The professionalism of university teaching

The need for the translation and application of important teaching and learning concepts constitutes a pedagogical pressure given the lack of teaching and learning qualifications in the higher education profession. The following quote first published in 1992 and echoed in the 2003 edition of the same book was a significant motivator in the author's educational journey:

> ★★★ *'For too long we have relied in higher education on teaching that is essentially an amateur affair. A professional approach to teaching should be seen in the same light as a professional approach to law, medicine or engineering...' (Ramsden, 1992, p.8)*

In Australia, many university lecturers enter education from industry, but an enthusiastic professional is not necessarily an effective professional educator. The critique by Ramsden highlights the reasons for some fundamental pedagogical problems in course design.

There are serious implications for student learning and attribute development when responses to these pressures include increased use of tests and exams that foreground trivial procedural knowledge, unfair groupwork strategies, repetitive learning activities, assessment systems that cause anxiety and too much content in the curriculum. These features of the learning environment have a tendency to cause students to adopt a surface, rather than a deep approach to their learning *(Marton and Saljo, 1976, Ramsden, 1992, Biggs, 1999)*.

The Australian Government continued to add pressure with strong statements about the professionalism of teaching in higher education:

> *Most importantly, teaching needs to be accorded a much higher status in universities. It is necessary to take a broader conception of academic work and the validation of alternative career paths to improve the status of teaching. The quality of teaching is absolutely central to the learning experience. There needs to be a renewed focus on scholarship in teaching and a professionalisation of teaching practice.*
> *(DEST report 2002, p.x)*

The formulation of the Carrick Institute for Learning and Teaching in 2004 was a Government initiative then renamed and substantially funded as the Australian Learning and Teaching Council (ALTC). A number of academic development projects were funded by these organisations but the variation in the staffing of Academic development units varied greatly between universities. Ryan, Fraser, Bryant and Radloff *(2004)* argued that academic development is still a complex and evolving area of professional practice and needs significant investment by universities that may be low in their budget priorities. The following extracts from a 2012 'Good Practice Report: revitalising the academic workforce' indicate both university culture and socio-cultural factors.

> *'Universities have traditionally conferred more status and reward on research achievements, and teaching in universities is acknowledged to have a lower status and therefore less access to rewards and recognition in comparison (Chalmers, 2011, p. 34). The status of teaching in higher education is not a static attribute of culture. Vigorous and targeted intervention can make a big difference. Finland, for example, raised the*

social status of teaching to a level where "university professors are the most highly regarded of all professions and even the word teacher is the same for school teachers as for university professors ... teaching [is] one of the most sought after professions" (Schleicher, 2011, p. 11)'. (Southwell, 2012. P.14)

The second point in this quotation is unrealistic given that the Finnish culture has a long-standing history of valuing teaching and Australia does not. Attempting to counteract the fact that academics in Australia are mostly rewarded for research Brew *(2012)* proposed that research and teaching can be drawn together through inquiry-based learning where academics can incorporate their research into their teaching and involve students in the process. However, habitual teaching delivery patterns, inflexible academic management systems and academics already struggling with the development of a research profile have led to minimal implementation of this idea.

Casualisation of the teaching role

Another aspect that is included here is the increasing casualisation of the teaching role in Australian universities.

> *"... The growth in this employment has grown over 130% in the past 2 decades. In 1991, there were 7,475 casual/sessional staff in the sector. Today there are over 17,400," Matthew McGowan, NTEU National Assistant Secretary (NTEU, 2011)*

A more recent article shows that the casualisation in the higher education sector has risen further than most other sectors of employment:

> *One of the highest users of casual employees is the higher education sector, where casual academics (referred to as sessionals in the Australian context) are estimated to account for 50% of the overall teaching load. (Ryan et.al, 2013, p.161)*

This increase in the proportion of casual staff teaching at university level causes a great deal of pressure in the system and the related problems are subtle and complex. For example, casual academics, either lecturers or tutors, are usually unpaid for meetings in which they are briefed on topics or the broader

curriculum. In some cases they are asked to write and conduct lecture series and coordinate subjects with little understanding of the way that a subject or unit relates to others in a program of study. The timing of casual contract allocations also causes great difficulties for the staff attempting an academic career with a level of financial uncertainty that mitigates against their continued commitment:

> *It is very stressful and difficult to commit to an academic career when as a casual we face 24 weeks a year without work contracts and therefore no income. Then up until a number of days before the beginning of each semester it is completely uncertain as to how much work we will be offered, which subjects, etc. You are completely at the whim of whoever is coordinating the course that year, e.g. days before semester this year my hours were cut due to staffing/enrolment issues - this after I turned down offers of other subjects due to thinking my timetable was full. It is a very stressful process to go through every semester. (NTEU, 2012, p.4)*

A report on Recognising, Enhancement, Development *(ALTC, 2008)* conducted for the Australian Learning and Teaching Council found that in the sixteen Australian universities involved systemic sustainable policy was rare, formal employment policies were rare, academic management of sessional teachers was not well understood, professional development was rare and that many sessional academics felt that their contribution is undervalued. The report also commented that:

> *"The Project found that the management and support of sessional teachers remain similar to the situation reported by the AUTC Report (2003a) despite the increasing contribution that sessionals have made to teaching and learning"(p.11)*

The updated ALTC organisation known as the Office for Learning and Teaching (OLT) have recently funded the BLASST report: Benchmarking Leadership and Advancement of Standards for Sessional Teaching *(OLT, 2014)* that has produced a very useful and comprehensive BLASST framework as a guide for Australian institutions with regard to their sessional teaching staff. The report states: *The BLASST Sessional Staff Standards Framework presents criteria and*

standards for evaluating current practice in quality learning and teaching, management and administrative policy, procedures and systems affecting sessional staff. (p.3),

This is a very encouraging development, however, full-time academics are also under pressure because of casualisation. Added to the increasing demand for research output and ongoing teaching commitments they are often expected to inform and supervise large numbers of casual tutors. Casual academic employment requires administration for contracts and other procedures that are increasingly passed on to the incumbent full time academic staff.

> *...there needs to be a reduction in the administrative duties required of academic staff. Addressing this issue requires, wherever possible, removing tasks that can be more efficiently and effectively completed by professional staff (Bexley, 2011, p.xiii)*

Overall the hidden costs of casualisation seem to be borne by the reducing number of full time academic staff, usually with minimal administrative support offered to those below Head of School level. It is not surprising that teaching and learning initiatives directed at staff under these pressures are met with resistance.

The pressures regarding the quality of teaching discussed in this section were made more difficult when the Australian Federal Government was reducing funding with the expectation that universities would find other sources of income and charge increased fees to both local and international students *(Yielder and Codling, 2004)*. In an economic context that was also characterised by the tripling of enrolled university students in Australia from 1984 to 2008, there were and still are enormous ramifications that are explored in the following section on financial pressures.

Financial pressures

A report on International Goods and Services Trade Data by the Australian Bureau of Statistics *(ABS, 2008)* revealed that education was Australia's third largest export industry behind coal and iron ore. Education exports increased from $12.2 billion in 2007 to $15.5 billion in 2008. This positioned education ahead of tourism as Australia's largest service export industry. Given this

contribution to the economy universities have been consistently pressured to deliver improved economies of scale with subject content delivered to increasingly large numbers of students, reduced face-to-face contact, at no cost to learning outcomes.

Funding issues in the Australian university sector

In Australia, the development of the university sector is relatively recent compared to other countries in the **Organisation for Economic Co-operation and Development (OECD)**. From the mid eighties enrolments began to increase fuelled in the late eighties by the conversion of 'Institutes of Technology' to university status. For example, university enrolments more than doubled from 357,373 in 1984 to 726,418 in 2001 *(DEST, 2002)*. A report of OECD change in expenditure on tertiary education shows that Australia was the only OECD country to reduce its funding during this period *(OECD 2006)*. Figure 10 on the following page shows that Australia reduced its funding by 7% whilst all others increased their funding. Considering the doubling of enrolments there were clearly concerns for the quality of education that resonated through the academic community.

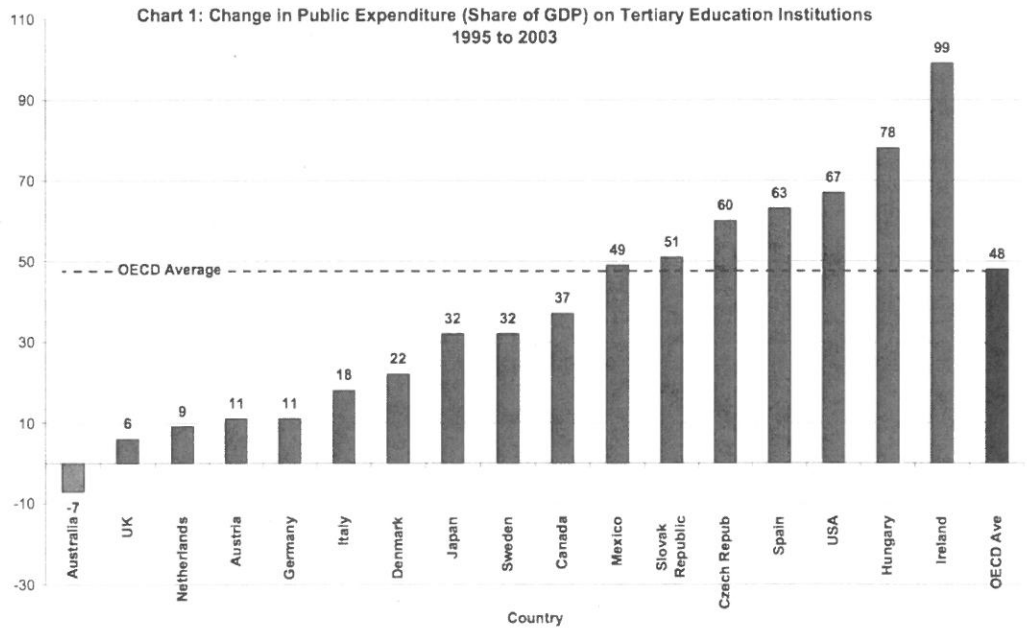

Figure 10: OECD chart showing Australia's 7% reduction in funding of the tertiary education sector compared to other OECD countries during the same period.

The lack of resources to fund increased enrolments and staff was expressed by many academics at the time.

> *What was commonplace in a three-year undergraduate degree can no longer be sustained without a substantial injection of resources. We are unlikely to see such an injection to support all students and all courses. (Boud et al., 2001, p.173)*

The justification for reduced funding can be discovered in reports from a previous Federal Minister for Education, Dr Brendan Nelson. In his report 'Higher Education at the Crossroads' released as a discussion paper on 26 April 2002 there is a strong indication of the reasoning behind the financial pressures brought to bear on the system.

> *There are some perceived inadequacies in the internal operations of universities. These include variable teaching loads of staff, non-productive research, inflated course offerings, cumbersome administrative systems and process inefficiencies. (Nelson, 2002, para.121)*

> *Universities need to take hard decisions to increase their output and to reduce the costs of their inputs while maintaining quality. (Nelson, 2002, para.122)*

This rhetoric appears to have set the scene for Federal Government attitudes that continued despite changes of Government. OECD Figures from the year 2006 showed that Government funding of tertiary education was a smaller percentage of GDP than all the OECD countries except for Korea, Japan and Chile. The US Government spent a higher percentage of GDP on education even though the majority of universities are private.

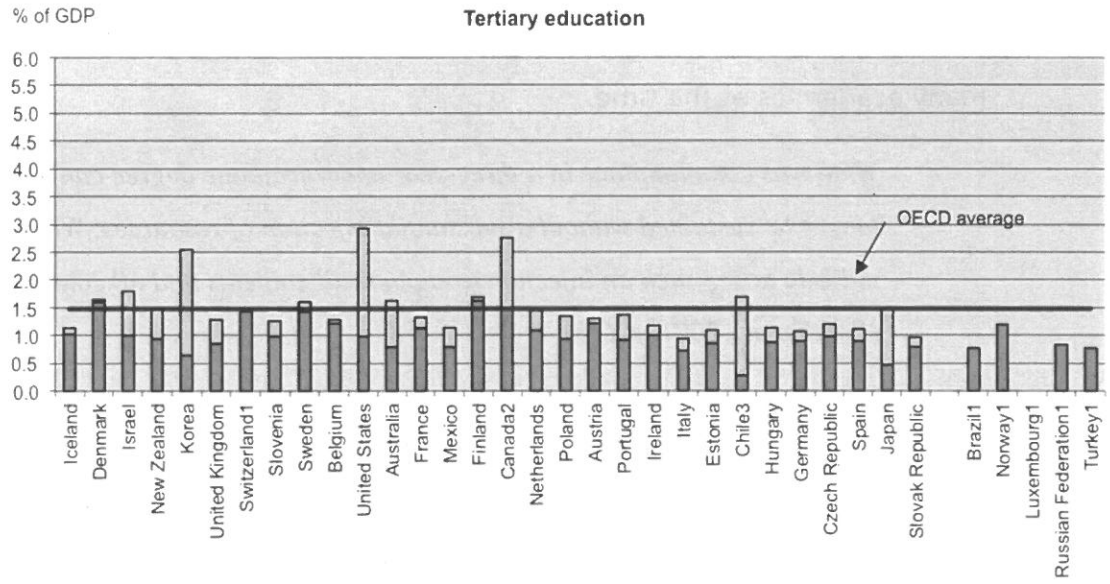

Figure 11: In 2006 Australia's public expenditure was 0.77% of GDP, (OECD, 2006)

Chart B2.3. Expenditure on educational institutions as a percentage of GDP (2006)

Key:

- Public Expenditure on educational institutions
- Private Expenditure on educational institutions

Figure 11 shows the state of Australia's expenditure on education in 2006 but recent OECD figures for Australia show that public expenditure on tertiary education as a percentage of GDP has risen from 0.77% in 2006 to 1.10% in 2010. However, this is still short of the 2010 OECD average of 1.40%. The latest OECD reports available show that Australia is still ranked 23rd in expenditure on education compared with the 34 OECD countries *(OECD, 2010)*.

The number of students at Australian public universities in 2008 had now almost tripled from 1984 figures to 1,002,003 with a further 66,092 at private higher education providers *(DEEWR, 2008)*. Given the Government directives about efficiency it is clear, from the earlier quoted 2008 ABS figures about education's contribution to the economy, that the higher education system has responded, but at what cost to the quality of student learning experiences?

Reduced funding impacts on Teaching and Learning approaches

Universities Australia uses datasets to compile a student to teacher ratio, according to the number of full-time equivalent (FTE) enrolled students as a ratio of FTE staff with a "teaching" or "teaching and research" function. The following chart shows an increase from approximately 13 students per teacher in 1990 when the author was first beginning teaching part-time, to 20 (onshore) students per teacher in 2008. There are no reports available covering the following years to 2012.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 *
All students	12.9	13.9	14.3	14.2	14.2	14.6	15.6	17.2	17.9	18.3	18.5	19.3	20.2	20.8	20.6	20.3	20.5	20.8	21.1
Onshore only												18.5	19.3	19.8	19.4	19.1	19.3	19.5	19.8

Source: DEST Higher Education Student and Staff Statistics 1990 to 2000 and DEST/DEEWR Unit Record Files 2001 - 2008
Bond University Management Report August 2008. * The University of Notre Dame Australia included from 2008

Figure 12: Student to staff ratios increasing in Australia.

In response to reduced funding and larger student-to-staff ratios many academics began to use automatically marked multiple choice exams that have the tendency to encourage a surface approach to content 'cramming'. The resultant of examinations based on the reproduction of memorised content has not changed for more than 100 years. 'The Curse of Education' published in 1901 states:

> *"as long as education is synonymous with cramming on an organized plan, it will continue to produce mediocrity."(Gorst, 1901 p.5)*

The author's experience of increased student-to-staff ratios brought the realisation that course directors may have used group assignments to save on

the costs of face-to-face teaching and assessment. In other words, groupwork was being adopted as an exigent strategy rather than a careful, well-researched and implemented change to the curriculum intended to develop the important attributes that well-designed group learning can yield.

One of the biggest problems encountered by academics using group-based assessment has been the students' perception of fairness. Too often, those who worked hard in a group project were demotivated through lack of acknowledgment, and those with minimal involvement received the same grade as other group members. However, groupwork is an important part of developing team skills and learning to work with others, both of which are vital graduate attributes. It was no surprise that the use of assessment that did not adequately address this problem has also been a major source of dissatisfaction in student satisfaction surveys *(Freeman and McKenzie, 2002)* and prompted the author's engagement with development of self and peer assessment systems and processes.

The financial pressures have been compounding in a context where underfunding has been continued by successive Governments, but there has been a refinement in approaches to funding allocation methods. For example the Government has followed England's lead in establishing independent bodies to examine the mismatch or otherwise between university documentation and actual practice. Although this was a welcome initiative it added perhaps an unforeseen financial burden on higher education institutions.

The hidden costs of documentation for quality agencies

The Australian equivalent of the Quality Advisory Agency (QAA) in England was called the Australian Universities Quality Agency (AUQA) and was formed in March 2000. There was also a Learning and Teaching Performance Fund (LTPF) established in 2006 by the Department of Education, Employment and Workplace Relations (DEEWR) that delivered $300 million to Australian universities based on 'outstanding performance' in learning and teaching. It was discontinued in July 2009 but the burden of proving an outstanding performance was onerous and expensive. This burden is increasing due to de-regulation in the sector and the introduction of a new Government body in 2011 the Tertiary Education Quality and Standards Agency (TEQSA). In parallel with

these the financial burden of documentation requirements include compliance with the Australian Qualifications Framework (AQF), for the national regulation of all education and training qualifications.

Whilst the focus of this thesis is on teaching and learning rather than research, it is interesting to note the increasing amount of documentation and reporting that all academics are involved in, together with the major expense of recording and reporting systems, staff and software to collect, analyse and report the data. All academics had to continually contribute to reporting for the Government initiative called the Research Quality Framework (RQF). The focus of this framework has now been expanded and is known as Excellence in Research for Australia (ERA).

This reporting, important for university funding is administered by The Australian Research Council (ARC), a statutory agency within the Australian Government's Industry, Innovation, Science, Research and Tertiary Education (IISRTE) portfolio. The ARC advises the Government on research matters, manages the National Competitive Grants Program, a significant component of Australia's investment in research and development, and has responsibility for the Excellence in Research for Australia (ERA) initiative. ERA came into effect after a 2009 trial in 2010.

Governments have used these various reports through key performance indicators to make Federal funding competitive between universities. However, the reporting systems needed in order to apply for both research and teaching funds has radically increased in recent years and there has been a substantial increase in the costs involved. The Bradley Review of Higher Education in Australia *(Bradley et al, 2008)* recommended that the Government would need to invest $6 billion in the education sector just to sustain the system. The report recommended that the Government increase Commonwealth funding per student for teaching and learning by 10% from 2010 and also reported that:

> *"Australia is the only OECD country where the public contribution to higher education remained at the same level in 2005 as it had been in 1995," (p 146 – 147)*

The amount of Commonwealth funding per subsidised university place fell 13% in real terms from 1989 to 2008, whilst - "costs of teaching and research have risen sharply" (p 149).

The Australian Financial Review reported that the Government only responded with $2.7 billion over a five-year period to cover the complete spectrum of tertiary education, research and innovation *(AFR, 2009).* There followed a budget cut that effectively removed the performance fund and negated the associated staff and systems developed to apply for the funding.

Then in the Higher Education Base Funding Review, 2011, Dr Jane Lomax-Smith reported that Australian Commonwealth Government funding per student place had fallen by 23% in real terms from 1995 to 2010 from $11,400 per student per annum to $8,800 per annum. *(p4).* It was recommended that *'the average level of base funding per place should be increased to improve the quality of higher education teaching and to maximise the sector's potential to contribute to national productivity and economic growth.' (p xix).*

Combined with reduced funding from both left and right political parties over a number of years the Government has also increased further accountability measures that have been brought to bear through a plethora of evaluative processes governed by the agencies already mentioned. These processes underpin another significant pressure in the system beyond the financial cost of compliance that is explored in the following section.

Evaluation pressures

Universities ought to value evaluation processes but the added documentation requirements can exert a significant workload pressure at many levels of the institution. England's Quality Advisory Agency (QAA), http://www.qaa.ac.uk/ completed audits of all Higher Education Institutions (HEIs) in England and Northern Ireland by the end of 2005. The results of these audits were then used to inform funding levels and profiles for all HEIs. Australia was already following suit in 2000 with the formation of the Australian Universities Quality Agency (AUQA) *http://www.auqa.edu.au/.* AUQA Audits have been conducted for all Australian universities and other self-accrediting institutions over a five-year period between 2002 and 2007 *(AUQA, 2007).* A second cycle of reviews that

will incorporate other higher education providers and the Technical and Further Education sector (TAFE) is currently in process through a new body replacing AUQA in 2011, the Tertiary Education Quality and Standards Agency (TEQSA) *http://www.teqsa.gov.au/.*

Dr David Woodhouse, CEO of AUQA at its inception in 2000 said in a press interview with The Australian newspaper that:

> *It is actually a tribute to Australian universities that they have run so long with such a high reputation internationally without an independent checking body.*
> *(Illing, 2001 p.4)*

In the Education Minister's report the following year there was also a call for more rigorous quality systems:

> *The recurring question of academic standards must be addressed. Questions have been raised about whether the current quality assurance framework is sufficiently rigorous to assess the quality and standards of educational outcomes'.*
> *(Nelson, 2002 para.100)*

It is interesting to note that although the AUQA audit process was formulated to be consultative, and process-based, there was an emphasis on measuring actual outcomes and not just looking at processes and documentation:

> *AUQA emphasises process-based audit, with outcomes providing information on the effectiveness of the processes.. Although processes are more than documentation, institutional practice and knowledge must be sufficiently formalised that it does not reside solely in the minds of individuals .... the audit covers not merely what the auditee is doing (the processes) but the consequences of what it is doing (the outcomes). The audit is also concerned with the auditee's self-monitoring to identify the need for and consequences of doing things differently*
> *(AUQA, 2007, p.18)*

Universities in Australia were continuing further cycles of AUQA audits until the process was suspended and the organisation replaced with the Tertiary

Education Quality and Standards Agency (TEQSA). The formation of TEQSA was recommended in the Bradley review and in the 2010-11 Budget, the Australian Government allocated $70 million over four years to establish TEQSA as the new national body for higher education regulation and quality assurance. Unlike the previous agency AUQA the new body has powers to refuse the accreditation of an education provider at any level and is intended to regulate and assure the quality of Australia's large, diverse and complex tertiary education sector.

TEQSA will register and assess the performance of higher education providers against the Higher Education Standards Framework. The Standards Framework comprises five domains: Provider Standards, Qualification Standards, Teaching and Learning Standards, Information Standards and Research Standards. The Provider Standards and Qualifications Standards are collectively the Threshold Standards, which all providers must meet in order to enter and remain within Australia's higher education system. TEQSA undertakes compliance assessments and quality assessments. Compliance assessments involve assessing a particular provider's compliance against the Threshold Standards for registration as a higher education provider.

Whilst this will bring some welcome regulation to a sector that was on the verge of deregulation, the pressure to provide documented evidence of outcomes has placed a further heavy workload burden on both administrative and academic staff.

Local and International university league tables and ranking systems

The growing number of national and international ranking systems constitute an evaluation pressure, demanding that universities spend a great deal of time and money documenting their educational 'performance'. The UK universities have managed to avoid some of the detrimental effects of categorisation due to the 1988 Education Reform Act that disallows the making of grants to an individual institution. This is not the case in Australia and university management have necessarily become focused on data that proves the standing of the university according to a shifting and diverse range of criteria.

AUQA did not publish rankings during its audit period but the provision of the AUQA audits online promoted the proliferation of ranking comparisons by other organisations and the national press (http://www.australian-universities.com/rankings/). The competition for students will undoubtedly increase in a deregulated expanding system due to responses to the Review of Australian Higher Education recommendations in the Bradley Report *(Bradley et al, 2008)*. As higher education faces competition from private providers the Government has the opportunity to use evaluation pressures equitably to improve the quality of higher education across all sectors.

There were essentially five groupings of Australian universities that Government used in their Institution Assessment Framework (IAF):

1. Group of Eight,
2. Innovative Research Universities,
3. Australian Technology Network,
4. Regional Universities,
5. New Generation Universities
(DEST, 2004)

However, with deregulation of the HE sector the IAF was replaced in 2009 with the Institution Performance Profile (IPP). There is now a much broader range of recognised higher education institutions that are categorised as Table A, B, or C providers. Each of these tables is a listing of institutions that have different reporting requirements and access to specific Government grants. These are listed in a continuously updated Higher Education Support Act document *(HESA, 2010)*. This is a 368-page document outlining complex reporting and application systems and processes.

Apart from the workload involved in these evaluation processes, there is evidence of increasing concern about the educational issues arising from the associated requirements of evaluative studies.

★★★ *Locally, nationally and internationally teachers have experienced increased use of national tests and examinations to meet the accountability demands of governments. (QUT, 2009)*

Evaluation pressure can tend to reduce the notion of quality to test results and can make misleading comparisons through superficial readings of ranking profiles. For example, the Singapore education system is embedded in a highly competitive educational culture where exam scores are the major criteria for educational and social mobility. Their focus on this aspect gives them high ratings in international ranking scales. The National University of Singapore ranks 30 in the Times Higher Education rankings beyond all but one of the Australian universities. However, the lack of creativity and innovation of graduates has been an issue of concern because of this academic test-based culture and the school ranking system has been strongly criticised as 'unfair' in their own government reports *(Tan and Gopinathan, 2000)*.

In certain states in Australia with highly competitive university entrance the temptation for schools to 'teach for the test' is inevitable as the Australian Government introduces a National Assessment Program (NAP) from primary levels leading to the new Record of School Achievement (RoSA) together with the hurdle of the Higher School Certificate. Ranking of both schools and universities has a direct impact on enrolment and sometimes on Government funding.

The evaluation pressures exerted by various 'league tables' such as the Times Higher World University Rankings, are important to all universities due to competition for international student enrolments. The more subtle pressure from a documentation standpoint is that each of the rankings uses different criteria. The Times was the first to use peer review alongside various other parameters including staffing levels. The Shanghai Jiao Tong University Ranking is popular in Australia and includes a broader range of measures of quality. There is even a ranking based on web presence that is likely to be attractive to the connected generation of students. It bases rankings on size, visibility, popularity and the number of 'rich files' available on the university websites. *(http://www.socialcapitalgateway.org/eng-cybermetrics.html)*. Other ranking systems include QS World, Macleans and US News & World Report.

The variety in ranking criteria may be seen to be beneficial but a deeper analysis of so-called world class university rankings *(Salmi and Altbach, 2011)* reveals that traditional research measures are still paramount. This makes little sense in a culture that is moving to much more collaborative approaches. Sir David

Watson, Professor of Higher Education and Principal of Green Templeton College, University of Oxford reports on the misunderstandings created by attempts at categorisation:

> *Despite Herculean efforts everything reduces to peer-reviewed research and, as suggested above, even that is problematic because of the inexorable rise of collaborative outcomes at the very highest levels of achievement. (Watson, 2012. p.6)*

In Australia the Tertiary Education Quality Standards Agency is making international links with other quality agencies and hosted the 2012 Forum for the International Network for Quality Assurance Agencies in Higher Education (INQAAHE). Hopefully the improved conversations through this network will lead to a more considered approach to ranking systems both locally and internationally.

Given the many Government directives in the last decade and the dangers of reducing quality to a measure of test scores it is important that educational leadership in Australian universities is informed about educational theory and research in advising Government effectively. The following section addresses the pressure that arises from the ways in which educational leadership is conceptualised and fostered in the Australian context.

Leadership pressures

The process by which academics arrive in university faculty or school administration and management roles generally requires no business or management degree or qualifications in teaching and learning. Leadership pressures to be considered must therefore relate to academic leadership at all levels including Subject Coordinators, Program Directors, Heads of Department, Heads of School, Associate Deans (Teaching and Learning), Deans and Pro Vice -Chancellors with teaching and learning portfolios. The Vice-Chancellors role is also significant due to their work on Government committees, advising on teaching and learning directives.

At the higher levels from Head of School and above there is generally a salary package and authority that acknowledges the leadership task:

> *It is the task of academic leaders to revitalise and energise their colleagues to meet the challenge of tough times with eagerness and with passion. We have seriously underestimated the power of leadership in higher education. (Ramsden, 1998 p3.)*

There have been studies about academic leadership but these have been directed at the Head of School level and above *(Ramsden, 1998 and 2012, Askling & Stensaker, 2002. Yielding and Codler, 2004)*. However, it is recognised that much of the vitality and energy Ramsden refers to is essential at the lower levels in those without substantive payment or the authority to implement plans or new ideas *(Vilkinas et al. 2007)*.

It is interesting to note that the introduction of Ramsden's book 'Learning to Lead in Higher Education' in both the 1998 and 2012 editions focuses on growing pressures from governments, students and employers that are unlikely to *'abate'* or *'become any easier in our lifetime'*. The two editions written more than a decade apart are testimony to the change inertia that higher education suffers. Ramsden states in the introduction to the 2012 edition *'...these changes and uncertainties must be managed through the medium of an academic workforce whose confidence and spirit have been severely degraded.' (p.1)*

The Head of Department role

Heads of department play a key role. They have to manage and support academic and technical staff whilst reporting to senior management. They must also deal with industry and professional bodies and develop a clear vision of the future in rapidly changing times. They are also expected to fulfil research agendas and be experts on the concepts of teaching and learning.

The Head of Department role also carries a strong requirement for financial and business skills in that budget responsibility covers both capital expenditure and day-to-day running costs. Academics with many years experience in higher education, and good research reputations may have no experience of the processes involved in strategic planning, managing staff budgeting or even how to work with a secretary or assistant. Academics are not renowned for managing their own workload let alone that of academic colleagues, technical and administrative staff. The academic experience, publishing records and teaching success that often lead to Head of Department or School

appointments are not necessarily a good training ground for a management role.

Ramsden conducted an e-mail survey of Heads of Departments from the UK, Hong Kong, Singapore, New Zealand and Australia, the priority issues were:

> *'• maintaining quality with diminishing resources*
> *• management and leadership of academic people at a time of rapid change*
> *• turbulence and alterations in the environment of higher education*
> *• student numbers and responding to new types of students*
> *• balancing home academic work with the demands of being and academic leader'. (Ramsden, 1998. p 7)*

The managerial systems of higher education seem not to be keeping up with its 'massification'.

Academic accountability and the pressures of management

■■■ In the author's eighteen years experience as a full-time academic accountability mostly referred to one's role as researcher and scholar with scant deference to subject feedback and student surveys valuing the student voice. On the one hand academics claim there is less time for core tasks due to increased administrative loads. On the other management claim that academics are self-indulgent, have inefficient meetings and are unwilling to take responsibility. Academics feel that management are interfering with their right to work autonomously whilst management are concerned with lack of accountability, both in teaching and research. Generally the complaint from academics is that university systems do not take account of academic imperatives. The measurement of key performance indicators (KPI's) purveyed by planning and quality units can seem alien to the academic mind and reporting systems often use unfamiliar non-academic corporate language and terminology. Business management approaches clearly have a difficulty in appreciating the notion of academic freedom and autonomy.

Academics' perceptions about the lack of academic leadership seem to be leading to dissatisfaction about academic life. For example in a 2007 study there was widespread dissatisfaction with university management and in a

question about satisfaction with their job as academics, the Australian response was lower than that of 24 other countries *(Harmand & Meek, 2007)*. It was also stated that 5000 academics were likely to retire in Australia in the following decade with average academic salaries falling below the general average wage. This was not encouraging for the Australian Governments with targets of increasing degree-level qualifications in the 25 to 34 year age range. Casualisation of the academic workforce also rose to 22 percent in 2007 and in a 2009 survey Australian academics were found to work longer hours than those in Britain, the US, Germany and China *(Trounson, 2009)*. By 2013 sessional staff in Australia were *'estimated to account for 50% of the overall teaching load'. (Ryan et.al, 2013, p.161)*

University and business sector management approaches and styles

The requirement for fiscal efficiency has led to a significant push, over the past decade, for the public sector to also adopt private sector corporate governance processes and structures *(Edwards 2002, p.52)*. The alternation of centralised management systems with decentralised approaches can often be a source of academic cynicism. However, it may be better characterised as part of a loosening and tightening effect. After a period of unregulated academic freedom, there is an impetus to tighten controls. McNay *(1993)* looked at the tightness and looseness of policy definition and compared it with the control of implementation of those policies. He found that looseness in both led to increased collegiality and tightness in both led to the corporate managerialism prevalent in Australian universities today.

Leadership is sometimes characterised as an esoteric art and management as a simplistic localised procedure. The distinction between leadership and management was a central theme of John Kotter's book 'A Force for Change' *(Kotter, 1990)*. He conceptualised leadership and management as the directing and mobilising of people. In his model leadership is about movement and change, and management is about the planning and organisation of that change. Kotter nonetheless acknowledges that the two roles may be split in a university context but that they need to be complementary.

There have been many thousands of books written about leadership. Leaders in politics and industry have been studied ad infinitum. For example Kouzes and Posner *(2007)* derive types of behaviour from studies of successful leaders, including 'challenging processes', 'inspiring a shared vision', 'enabling others to act', 'modelling the way'. Four different approaches in relation to how leadership is determined are identified and although their study involved business leaders their work is particularly interesting when considering the way in which academic leadership positions are decided:

> *1. The trait approach maintains that a person either does or does not possess the particular traits that are considered to be the determinants of leadership.*
>
> *2. The situational approach assumes that certain situations call for certain types of leadership and that the leaders will be those who best fit the requirements of a situation. The situational characteristics are viewed as the determinants of leadership.*
>
> *3. The follower approach holds that the needs of the group members determine who will lead. Leadership, then, is a coincidence between the needs of the membership and the abilities that a person happens to possess. The members' needs are assumed to be the key determinants of leadership.*
>
> *4. The contingency model maintains that personal styles and situational characteristics combine to determine leadership. A proper match between styles and situations determines who will lead the group. (Kouzes and Posner 2007 p.13)*

Pressures relating to leadership in teaching and learning contexts arise from the way that any or all of these four approaches may be at play. There are few formal processes that acknowledge the determining factors, leaving academic colleagues unsure or even sceptical, as to the reasons for a particular individual being nominated for a leadership role.

Models of academic leadership

Given the differences between university and business contexts it would seem from the Ramsden 1996 study that academics want an academic version of a business leader, possessing all the qualities required for both domains.

Whilst there are many models of business leadership and lists of attributes there are a few that relate specifically to the educational domain. For example Ramsden *(1998, page 124)* suggests three levels of academic leadership: Self-leadership: to do with personal leadership development, Department leadership: leadership for academic work, and System leadership: the University and beyond. He also provides the following model (Figure 13) for the domains of academic leadership:

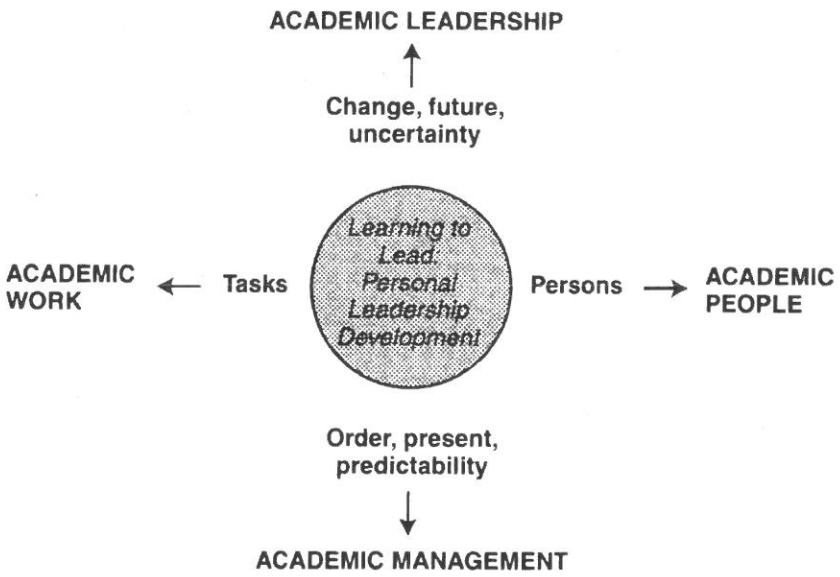

Figure 13: The domains of academic leadership (Ramsden, 1998 p.125).

Concerning the principles of academic leadership, Ramsden identifies six. The first principle relates to the creative management of opposing forces, such as the tensions between tradition and change, executing tasks and looking after people. The second is having an outcomes-focused agenda. The third relates to his previously stated three levels. The fourth is concerned with relational approaches and encouraging collegiality. The fifth is about the leader's own

learning, and the sixth is to do with having a transformative approach in terms of vision.

In 2006 the Carrick Institute for Learning and Teaching in Higher Education (later renamed the Australian Learning and Teaching Council, ALTC, and now the Office of Learning and Teaching) held a leadership colloquium with the aim of understanding and defining effective leadership for learning and teaching in higher education. A leadership program ran from 2006 to 2008, and in 2009, the ALTC completely revised their Teaching Fellow and National Teaching Fellow schemes to focus on leadership development. In a review of this program by Emeritus Professor Lesley Parker *(ALTC, 2008)* it was suggested that successful fellows should focus their activities on teaching and learning leadership development at all levels. They promoted in their literature a model of academic leadership based on the Integrating Competing Values Framework (ICVF) developed and refined *(Vilkinas & Cartan, 2006)* from an earlier study by Quinn *(1984)*.

The following illustration in Figure 14 is similar to the Ramsden model but characterises academic leadership as one in which opposing competing values are vying for attention.

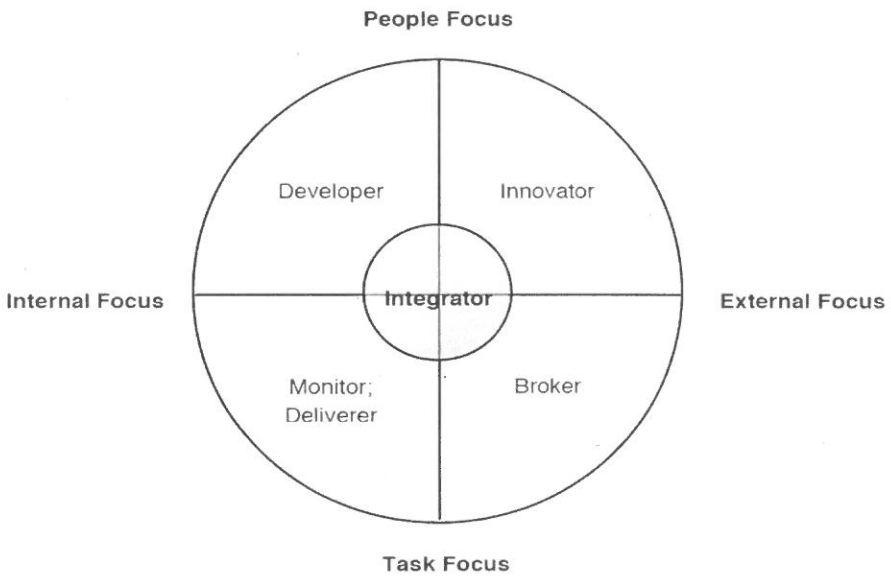

Figure 14: The Integrating Competing Values Framework (ICVF) model of academic leadership (Vilkinas and Cartan, 2006).

It is useful to compare the Vilkinas and Cartan's model with that of Ramsden. They both retain the idea of a people versus task focus but, rather than focus on the distinction between management and leadership, Vilkinas and Cartan nominate five operational roles that deal with the competing values framework. The five roles offer an interesting perspective regarding the academic context. The Innovator role is creative, sees the need for new courses and teaching approaches. The Broker role is a networker inside and outside the University with a focus on resources. The Deliverer sets clear teaching and learning goals, schedules and coordinates, solving issues on the run in practical and viable ways. The Monitor role is the one that seems to take on more corporate aspects when compared to Ramsden's model, with a vast increase in evaluation strategies, reporting and distribution of information. The Developer role, in teaching and learning terms, has often been attributed to central academic development units. However, it could be argued that there is a clear need in most situations for discipline-specific mentoring and staff development.

Vilkinas and Cartan characterised their sixth role as the integrator, designated as a form of behavioural control room for the other five roles. This role had two parts, firstly as critical observer and secondly as reflective learner. Putting reflection as part of a central role would seem to be vital to good leadership. Rogers suggests that reflection allows individuals to *'integrate the understanding gained into one's experience in order to enable better choices of action in the future as well as enhance one's overall effectiveness' (Rogers, 2001. p.41).*

However, more than a decade later the following is an extract from a Government commissioned report *(Southwell, 2012. p. 43):*

> *Most curriculum leaders are not prepared for their roles and learn through trial and error in (and by surviving) their leadership and management experiences. Despite the need to include the broader perspective and to understand the complexity and the need for leadership in this area, when the Australian Learning and Teaching Council (then Carrick Institute of Learning and Teaching in Higher Education) first came into being, there appeared to be few programs specifically designed to develop the leadership skills of university staff with*

> *responsibility for teaching and learning. Most training models came from the management literature and were based on executive coaching and management models. (p.43)*

The longstanding scholarly reference in this area points to the fact that continuing difficulty and systemic pressures resulting from this situation have not abated.

Chapter 3

RATIONALES & FOCUS DECISIONS

Foreword

This chapter draws together and makes explicit the rationales and experiences that have led to design interventions described through case studies in Chapter 4, Government funded projects in Chapter 5 and the software design and development for *ReView* and *SPARK* assessment systems in Chapters 4, 6 and 7.

The chapter begins with a summary of the pressures discussed in Chapter 2 and the reasoning and decisions that provide some answers to ***Question 2. Why is a focus on assessment design and graduate attribute development important for higher education ?***

The chapter includes examples of the author's visual information design to illustrate the contribution that this can make to understanding graduate attribute development, pedagogy concepts and models for leadership.

The chapter ends with four rationales and six points developed as a result of the issues explored and used as a guide during this designer's journey of educational change.

A brief summary of the pressures

Through a review of literature, and to some extent personal experience, chapter 2 explored a synthesis of six identified pressures acting upon the higher education system in Australia and possibly generalizable for systems in other countries. Whilst there is clearly overlap between the pressures mentioned, it is nonetheless a useful exploration in differentiating the complexities that compound and act upon the Australian higher education system. The important underpinning for this thesis was the recognition through literature and personal experience that there has been significant inertia against change when educational initiatives are introduced.

In the section **Development Pressures** the issues of rapid social and technological change were explored. For example, the pressure of developing school students away from a reliance on dependent learning, fostering their independent study skills and preparing them for the interdependent collaborative workplace. These pressures are enormous taken together with student overload, information overload, the digital generation gap and the need for lifelong learning approaches.

Sadler suggests that students should develop means of evaluating the quality of their own work through moving beyond 'teacher-supplied feedback to learner self-monitoring'. He proposes that the course in which they operate needs to 'make explicit provision for students themselves to acquire evaluative expertise' (Sadler, 1989, p. 143). This aspect together with the rationales in this chapter formed the basis for the design of self-assessment in the author's ReView software described in Chapter 4.

The **Employability pressures** section refered to the expectations of employers for an ever-increasing range of graduate attributes, together with the career aspirations of students themselves that highlighted significant requirements for educational change. This led to a decision to focus on graduate attribute integration through rationales developed further in this chapter.

Lack of understanding of teaching and learning concepts, together with a diminishing support for academics' teaching roles, exerts more subtle

Pedagogical pressures when it comes to the introduction of changes in teaching and learning strategies. To illustrate this the chapter includes some of the author's attempts to engage academics in discourse using visual interpretations of educational research.

The section on **Financial pressures** gave a well-substantiated account of a gradual and consistent reduction in government funding for public higher education in Australia. Together with various government bodies that now administer those funds, the pressure is increased as more and more funds are allocated on a performance basis.

Evaluation pressures are also enormous, both internally within university management systems and externally through government bodies and professional accrediting institutions. International rankings are also playing a significant part in emphasising tests and examination results.

The **Leadership pressures** section indicated that the lack of management qualifications and an 'ad hoc' approach to leadership appointments at all levels of Australian higher education may lead to inefficiencies in the increasingly commercial university context. The subsequent corporate terms and processes used by university administrations have also contributed to academic dissatisfaction.

The following diagram in Figure 15 illustrates a summary of the pressures investigated through literature. It is clear that the adoption of new educational initiatives or interventions would be enhanced if some of these pressures were relieved in the process.

Whilst there are no global solutions offered in this thesis there are a number of examples where design and design thinking have made a recognised, documented and substantive contribution. The rationales underpinning this designer's journey of educational change evolved over time and the following sections on resolving the pressures aim to bring clarity to the motivations and values espoused.

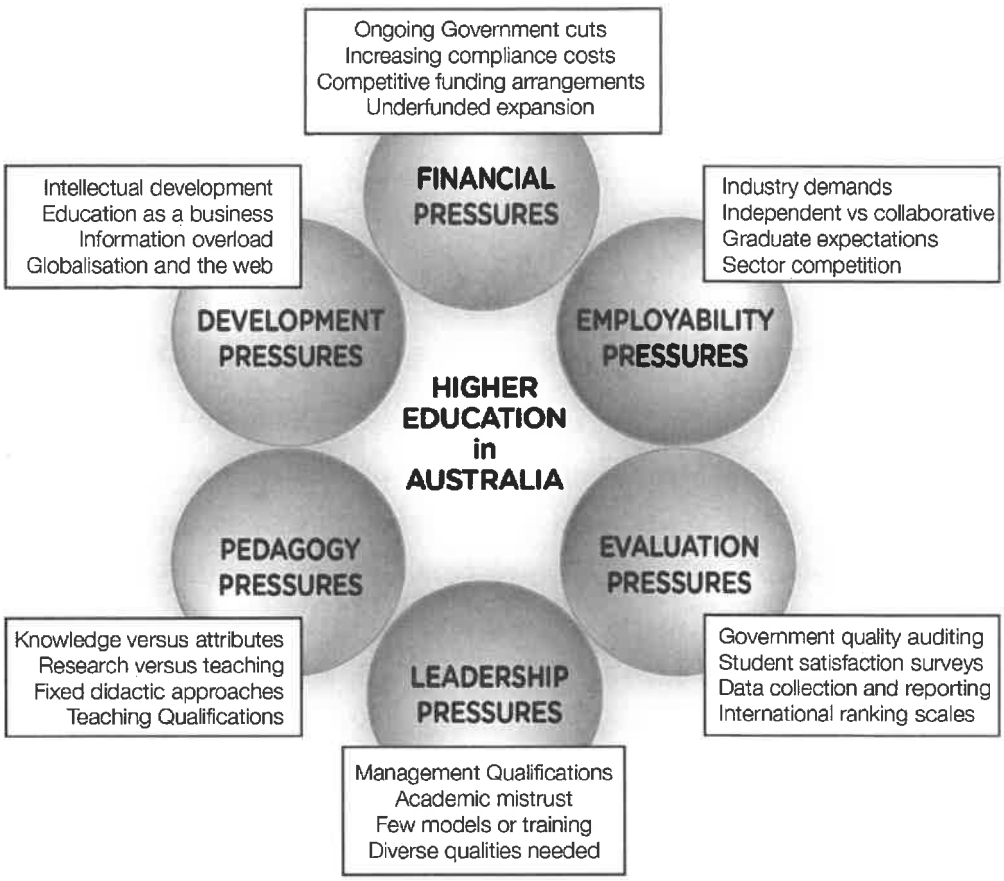

Figure 15: A summary of the contents of pressures discussed in Chapter 2.

Resolving the pressures

Reflecting on Chapter 2 and the pressure-sensitive interpretation of the Australian Higher Education system there are vast and complex challenges in attempts to cause improvement and change within such a pressurised context. However this thesis proposes that design and design thinking can contribute and provides evidence from the author's attempts. Ten years have been designated to delimit the period of this study but the attempts are nonetheless ongoing.

The following sections in this chapter begin to make explicit the rationales and experiences that underpin various motivations together with some visual

solutions arising from expertise developed as an educator, designer and design thinker.

The main educational interventions, research and case studies that arose from these motivations are described in further chapters 4,5,6 and 7. Together with conventional research approaches the examples include curriculum design, visual information design, interface design and software architecture.

The rationale for a focus on graduate attribute integration

Given the argument that universities need to validate the qualities and employability of their graduate output the notion that graduate attributes could be aligned with assessment criteria for student work seemed obvious. However, in the author's design education context alignment between learning activities and assessment criteria was rare and 'constructive alignment' minimal (Biggs, 1999). There also appeared to be a degree of scepticism surrounding the introduction of graduate attributes and very disparate attempts to clarify the relationship of comparable terms used in the higher education sector. The term 'graduate attributes' described briefly in Chapter 2 in the section on pedagogy pressures is used in this study to include a broad range of personal qualities and professional skills, together with the ability to understand and apply discipline-based knowledge. In developing a case for a focus on graduate attributes it is first appropriate to discuss the background and reasons for adopting this particular term.

There are a number of terms used in different countries and levels of education such as *'key skills' (Drew et al., 2002), 'generic attributes' (Wright, 1995), 'key competences' (Mayer, 1992), 'transferable skills' (Assiter, 1995)* and the terms *'employability skills'* and *'soft skills'* that are increasingly popular in the business sector *(BIHEC, 2007)*.

In academic contexts, the term 'competencies' in Europe relates to the broader idea of graduate attributes (Cross et. al., 1994), but in Australia the term is used in relation to the Technical and Further Education (TAFE) 'tick list' against very specific skills. 'Employability skills' and 'key skills' are more common in the UK literature and in 2006 the UK Higher Education Academy (HEA) and the Council

for Industry and Higher Education (CIHE) published a directory of skills employers can expect from graduates. The companion directory 'Student Employability Profiles: a guide for Higher Education Practitioners' listed 52 different degree programmes and details the specific employment skills that graduates will develop during their study *(HEA, 2006).*

In considering the various terms and descriptions it is clear that the use of the word 'skills' is inappropriate for some personal, ethical and social abilities. The word 'generic' is also problematic as it tends to imply separation from a field of study whereas educational research shows that generic attributes or skills need to be developed within the context of a field of study *(Barrie, 2004).*

In Australia the term graduate attributes was defined as early as 1992 *(Higher Education Council, 1992, p. 20):*

> *'The skills, personal attributes and values which should be acquired by all graduates regardless of their discipline or field of study'.*

Eight years later a project of the Australian Technology Network (ATN) of universities defined graduate attributes as:

> *. . . the qualities, skills and understandings a university community agrees its students would desirably develop during their time at the institution and, consequently, shape the contribution they are able to make to their profession and as a citizen (Bowden et al., 2000).*

As a result of this report Australian universities were encouraged to include statements of their graduates' attributes in documentation. An important article in the Higher Education and Development Research Journal *(Barrie, 2004)* highlighted the need for a focus on graduate attribute development and three years on from the article Barrie led a significant Australian Learning and Teaching Council (ALTC) funded project, the National GAP (National Graduate Attribute Project 2007-2008), hosted by the University of Sydney *http://www.itl.usyd.edu.au/projects/nationalgap/introduction.htm*. To combat many of the conceptual understandings the project produced a typology that also aimed to address the key barriers to the embedding of attribute assessment *(Barrie, Hughes & Smith 2007).* The National GAP project as it became known has had a significant impact and fostered funded projects in a

number of institutions including the author's (refer to the $3.1m UTS GAP project mentioned in the last chapter of this thesis).

Lists of attributes from 29 universities can be found in the Business Industry and Higher Education Council report on the DVD included with this thesis. ***Filename: BIHEC_EmployabilitySkills.pdf*** *(BIHEC, 2007, pp.68-73).* In regard to the visibility of graduate attributes in university policy the author has included at Appendix 2 of this thesis the results of his search for the Graduate Attribute policies of 39 Australian universities with website url's and policy dates where possible.

The author has developed and published a definition of Graduate Attributes within the candidature of this thesis:

> *Graduate attributes are the skills we want students' to develop, the qualities we want them to acquire and the knowledge literacies and conceptual frameworks we want them to construct, through a progressive program of discipline-based assessment tasks. (Thompson, 2009 p 402)*

However, a much more concise, generalisable and updated 2013 version of this definition is included in the last chapter of this thesis.

Reluctance in the integration of graduate attributes

Despite many attempts over the sixteen-year period since the Higher Education Council definition in 1992 the integration of graduate attributes into teaching and assessment has met with responses ranging from reluctance and refusal to enthusiastic adoption *(Rust, O'Donovan & Price, 2005).* Student reluctance is understood in terms of their central focus on practical and technical skills for entry into employment rather than so-called 'soft skills'. Academics' resistance is understood in terms of their expectations that assessment is based only on discipline-specific content and that assessment of 'additional' attributes is a distraction or unnecessary extra work. Additionally, lack of awareness about graduate attribute development across a whole degree program further reduces the concern to integrate graduate attributes at the individual unit of study level *(Harvey & Kamvounias, 2008).*

The Australian Government is nonetheless serious about holding universities to account in regard to their graduate attribute statements and graduate profile frameworks. They attempted to impose external validation of graduate attribute development in the Higher Education sector by introducing a Government funded Graduate Skills Assessment test commissioned in 1999 and developed by the Australian Council for Educational Research (ACER). The resulting instrument comprised of a two-hour multiple-choice test and one-hour essay to be taken by students at entry and exit from their degree programs. This initiative was unsuccessful for a number of reasons explored by the author in a book chapter ▲▲▲ *(Thompson, 2006)* but did add to the pressure upon universities to take a more serious approach to the validation of their development of graduates' attributes. The poor feedback about this testing instrument has caused the Government not to recommend it as one of their testing instruments in a discussion paper on assessment issues *(Universities Australia 2011, 2012)*.

The Australian Council for Educational Research (ACER) was also commissioned by the Organisation for Economic Co-operation and Development (OECD) to manage an international feasibility study: Assessment of Higher Education Learning Outcomes (AHELO). The categories included one for generic skills and Australia's participation was in the category of Civil Engineering. On October 27, 2011 participating universities and key stakeholders gathered in Melbourne to discuss Australian participation in AHELO. Phase 2 of the project that involves trialling testing instruments was completed in December 2012. At the time of writing there are no reports available regarding the generic skills category of testing, but in the 2011-12 Budget, the Government released details of its Advancing Quality in Higher Education (AQHE) initiative. This provided information on the new performance measurement instruments being developed for use in funding decisions including a University Experience Survey (UES), and an Australian modification of the Collegiate Learning Assessment (CLA) test used in the United States to test generic skills.

The attempts to engage with graduate attributes made by a majority of Australian universities involve 'mapping' the attributes that are 'covered' by various subjects or units of study. However, institutional support for the integration of graduate attributes in teaching, learning activities and assessment

processes has been patchy and not without problems *(Hoban et al., 2004).* Educational research supports the integration of these attribute developments with existing curricula rather than a 'bolt-on' approach through the addition of extra units of study *(Barrie, 2004).* Barrie also claimed that:

> *It is apparent that Australian university teachers charged with responsibility for developing students' generic graduate attributes do not share a common understanding of either the nature of these outcomes, or the teaching and learning processes that might facilitate the development of these outcomes (Barrie, 2004 p.261).*

Graduate attributes are often mentioned in curriculum documentation but the effective integration of these into developmental approaches in the classroom has been somewhat elusive. Steven and Fallows *(1998)* concluded that *'students are concerned that success in a university course may not connect well with employment chances' (in Nunan, 1999, p. 3)* and that *'there are two recurring arguments for the emphasis on (generic) skills: students need these skills to succeed in their academic work, and graduates need these skills to get jobs' (in Nunan, 1999, p. 8).* However in an educational paradigm where didactic lecture / tutorial teaching methods prevail, and exams constitute the largest percentage of assessment, there is minimal validation of universities' development of graduates' attributes.

In a scenario where attributes constituted the core framework, tests and exams would automatically diminish in importance due to their limited attribute development potential. For example, if a test or exam can be passed with memory skills, and practice with past papers and standard answers, this should clearly be stated and weighted in the assessment of learning goals accordingly. But if students were intended to develop written communication and the ability to critically analyse concepts, then these attributes also ought to be explicitly highlighted in results and assessment criteria. Whatever the assessment regime there is the problem of misalignment between learning objectives, learning activities and assessment criteria. Biggs *(2000)* makes the point that lack of alignment is often 'self-inflicted' by institutions needing a summative percentage grading for all assessments. Business faculties and schools have traditionally used high pressure, high percentage exams and multiple-choice

tests as the main method of assessment. These methods of assessment perpetuate extrinsically motivated reward systems that can encourage surface approaches to learning.

Students often enter university from school 'marks-driven' and motivated by the author's slightly provocative reframing of the three R's; Reading, Remembering and Reproducing. The university context may often reinforce those skills but for a rapidly changing world and workplace they will probably need different attributes, perhaps; Reflection, Risk-taking and Responsiveness.

Calls from industry for universities to focus on graduate attributes are clearly evident in a Business Council of Australia report 'New Concepts in Innovation: The Keys to a Growing Australia' *(BCA, 2006).* The report suggests that universities should be teaching critical thinking and ethical approaches together with the practical skills needed for employment. Further, the report suggests that such development become a core focus for both university undergraduate and postgraduate courses, noting:

> ★★★ *Companies were concerned that education and training systems were not providing people with appropriate skills in areas that were increasingly vital in creating the type of workplace culture in which innovation thrives. In particular, a number of companies noted that management education was focussed on finance and marketing but was not providing graduates with the 'soft' skills such as teamwork, that enabled innovative use of these capabilities (BCA, 2006 p. 25).*

An Australian Industry Group report *(2006)* describes the outcomes of a survey of over 500 employers, stating:

> *They [employers] are demanding higher levels of skills, frequent updating of skills and excellent 'soft' skills as well as technical skills. Over 90 per cent [of employers] look for people who are flexible and adaptive, willing to learn on the job, team workers, technically competent and committed to excellence (AIG, 2006 p. viii).*

In particular, the need for communication skills and teamwork skills that contribute to productive and harmonious relations, and problem-solving skills are highly sought for productive business outcomes.

In addition, many Australian Business schools have obtained, or are seeking, international 'Assurance of Learning (AOL)' accreditation such as EQUIS (European Quality Improvement System) or AACSB (Association to Advance Collegiate Schools of Business). The quality assurance process of AACSB, for example, requires each degree program to specify learning goals and demonstrate the students achievement of learning goals for key management-specific qualities, knowledge and skills (attributes).

Design thinking applied to the problems of graduate attribute integration

The foregrounding of graduate attribute development in assessment would value this aspect and render it visible to all concerned, notably the students intending to graduate. Assessment beyond exam-based approaches is problematic in any educational institution and the implementation of standards-based and criterion-referenced assessment appears to have experienced difficulties in most discipline areas (Sadler, 2005). Add to this the notion of assessing graduate attributes and the difficulties compound.

The National Graduate Attribute Project (National GAP) led by Professor Simon Barrie and funded by the Australian Learning and Teaching Council provided research resources with a specific paper devoted to the exploration of assessment issues. The paper highlights the important potential for graduate attributes as an agent of change in exam-based assessment:

> *'Graduate attributes offer a way of refocussing learning on the achievement of complex capabilities and developing dispositions and ways of thinking in preference to conceiving of learning only as the accumulation of disciplinary 'facts'.' (Hughes and Barrie, 2008 accessed 20.1.14)*

However having concluded this extensive national project the significant difficulties of graduate attribute integration are foregrounded in their 2010 article for the journal Assessment and Evaluation in Higher Education. A brief

extract is reproduced here as it sums up the range of concerns they encountered:

> *'In addition to the problematic nature of applying traditional assessment approaches to graduate attributes, it has also been argued that difficulties concerning their assessment include their translation into discipline-specific forms, the necessity to focus on programme-level assessment, the maintenance of standards across programmes, the complexity of tracking student progress in programmes that permit diverse electives choices (Hager and Holland 2006), resourcing implications, for example, the technology and workload demands of ePortfolios, the competing priorities of research and the inertia that can characterise large institutions or departments (Drummond, Nixon, and Wiltshire 1998).*
>
> *It is therefore hardly surprising that academics have sometimes found the exclusion of graduate attributes from their assessment plans the most rational response to these problems (Clarke and Burdett 2007).'*
> *(Hughes and Barrie, 2010. p.326)*

These difficulties were synonymous with the author's experience and despite significant clarification of the issues in this 2010 paper and the National GAP study it was clear that the pressures described in Chapter 2 of this thesis were continuing to avert educational change in regard to graduate attribute assessment.

The design of the ReView online criteria-based assessment system described in Chapters 4 and 6 was intended to relieve a significant pressure in regard to time-saving, management and the monitoring of assessment whilst clarifying the relationship between assessment criteria and graduate attributes *(Mentkowski 2006).* The software also addressed the issue that if there is no inclusion or reference to graduate attributes in assessment both students and teachers will not take them seriously, these complex achievements need to be 'warranted' *(Knight, 2007).*

■■■ Designers often think visually and in order to explain the relationship between assessment criteria and graduate attributes there were two steps in

the process. First to group graduate attributes into categories that were differentiated enough to maintain clarity in categorisation but not over simplified or too complex to serve as generic domains of formative assessment feedback. Second to facilitate the discipline-specific formation of learning goals and assessment criteria whilst foregrounding a clear connection with the graduate attributes developed. To convey these aspects the author developed some graphic images as part of this the thesis journey, reproduced here with some explanation to underpin the rationales in this chapter and some of the designed interventions that follow.

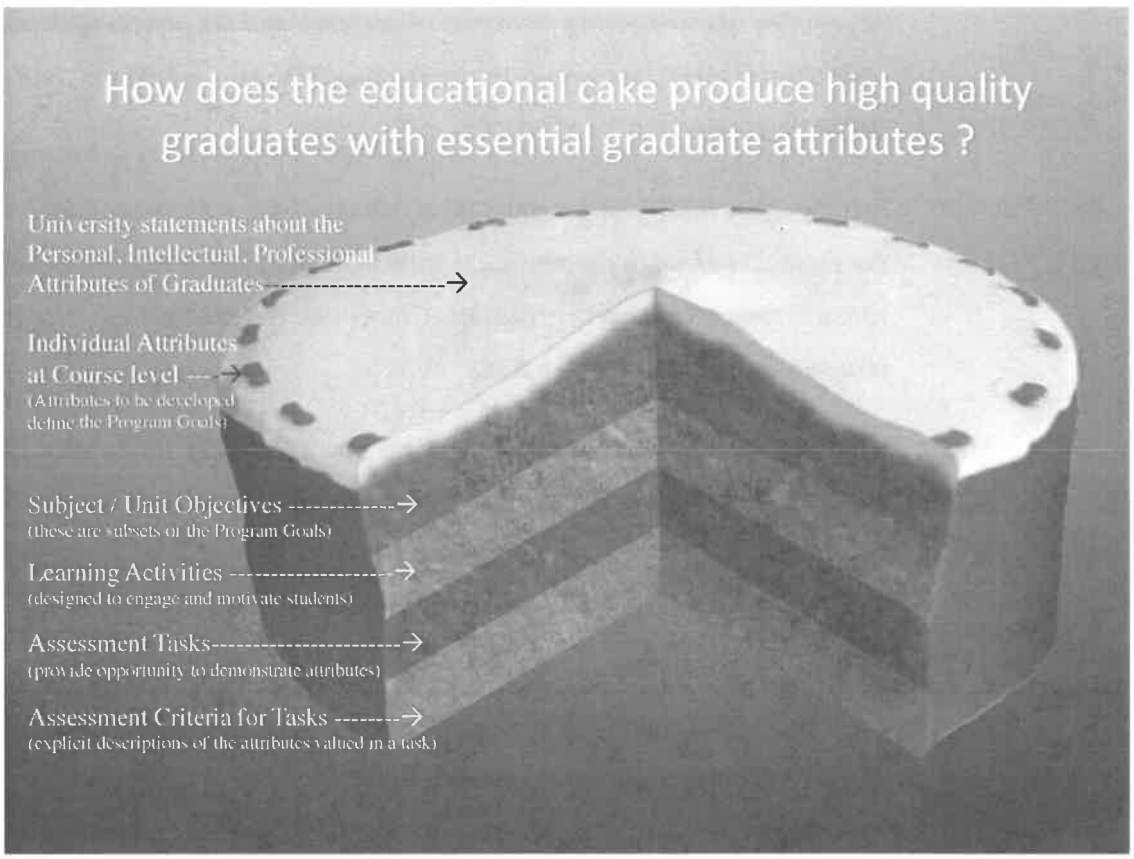

Figure 16: The author's first illustration that revealed potential flaws in constructive alignment and formed the basis for a designed intervention

The Figure 16 above is part of the author's attempt to describe to academic staff and students the relationship between the various layers that link the progress of assessment tasks to the university's general statements about their

graduates' attributes and the individual attributes sometimes described at course or program level in learning goals. These are characterised as the icing and cherry pieces on the cake as they form part of the outward public face of a university with no requirement to be directly substantiated.

There were some realisations about the potential and actual lack of constructive alignment in the cake that emerged from this simple metaphor:

- University graduate attribute statements are of a very different nature to the supposedly nourishing educational teaching and learning layers that support those statements.

- There is every reason to attempt to ensure that every layer of the cake aligns with the 'icing and cherry' statements, even assessment criteria for assessment tasks, to give some validity at least for the formal learning activities that the university is providing.

- In the author's institution the university centralised documentation about its teaching and learning mostly resided on one layer of the cake, that of the subject or unit objectives. Course aims or program goals were also defined in general terms but often not directly mapped to each subject or unit objective.

- The lower three educationally important layers of the cake were centrally undocumented and variable according to the academic employed to teach or coordinate the subject or unit of study.

- The assessment criteria layer of the cake was essentially unmonitored and often individually personalised by the academics teaching the subject or unit of study to the extent that the relationship with subject objectives was tenuous.

The following Figure 17 illustrates one of the purposes for the design of the ReView criteria-based assessment system in that it provided a built-in colour-coded link between assessment criteria and a series of graduate attribute categories as a first step towards graduate attribute integration in assessment and the constructive alignment of the layers in the educational cake.

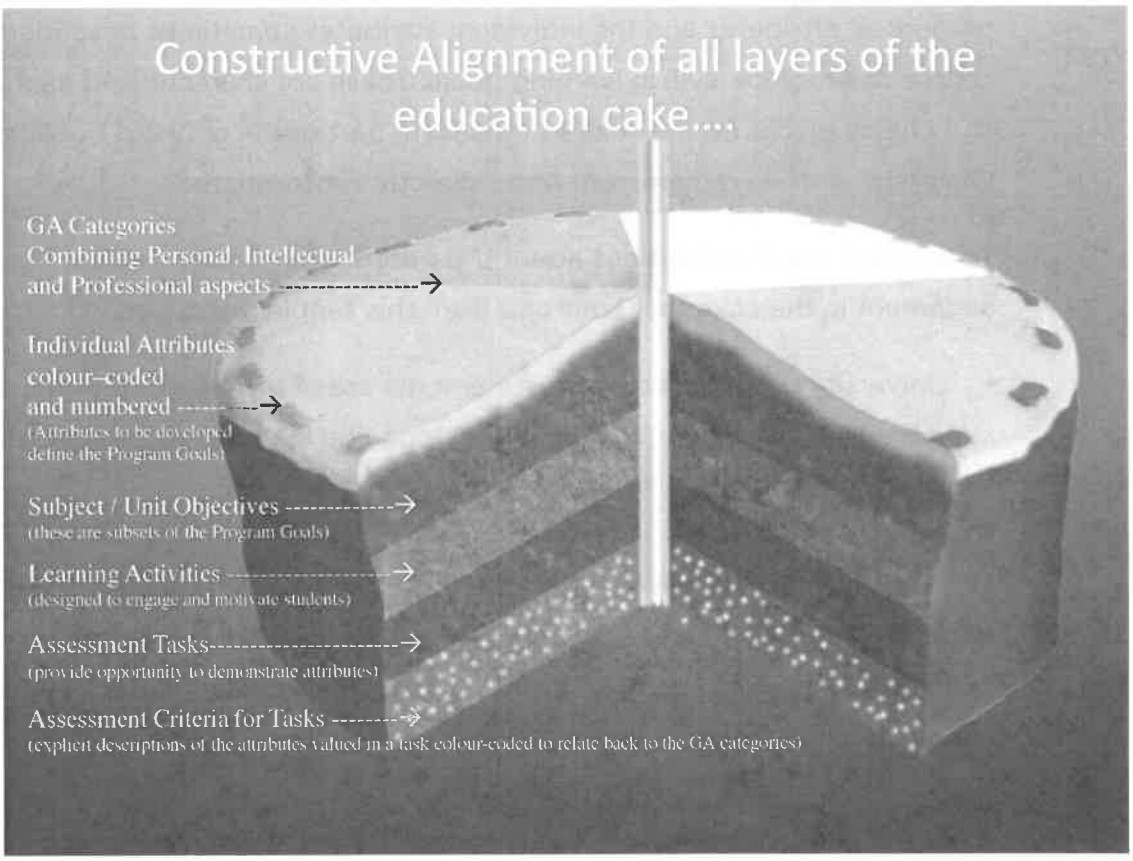

Figure 17: The author's illustration of the categorisation of attributes and the colour-coded link with assessment criteria that formed the basis for constructive alignment with graduate attributes.

If the reader imagines looking down from above the cake one can visualise that different subjects would have different portions of the 'cake chart' ascribed to the categories of graduate attributes due to the weightings of included assessment criteria that were colour-coded to the categories. This is clearly visible in the 'pie chart' of graduate attribute categories later described in a description of the author's ReView assessment software in chapter 4.

The rationale for a reduced focus on exams

A focus on graduate attribute development that highlights the range of attributes described foregrounds the issue that exam-based assessment only covers a minor portion of the 'cake' shown in Figure 17. This section draws upon updated text and references from the author's previously published book chapter: 'The Demise of Exams and the Rise of Generic Graduate Attribute Assessment for Improved Student Learning' *(Thompson, 2006)*. It argues that

exam-based approaches to assessment do little to promote the development of attributes that are essential for a rapidly changing world and examines the case for a reduced focus on this predominant feature of the assessment landscape.

> *'Assessment is the single most powerful influence on learning in formal courses and, if not designed well, can easily undermine the positive features of an important strategy in the repertoire of teaching and learning approaches' (Boud et al. 2001. p67)*

There is evidence that as teachers are often judged by the number of exam passes their students obtain, the extended use of past papers and rote learning techniques is becoming a focus in the classroom. A study in the UK (Bloom, 2007) showed that deliberate repetition of facts is the key to achieving high exam marks. The article about the study was titled 'Half a years work in 8 minutes' and described a science teacher's revision session that compressed half the years work into a PowerPoint presentation and used a game similar to Simon Says to repeat the presentation.

> *'It's based on the same principle as rote learning. We always knew that repeating something makes it sink in ... Normally exit results won't be as good, but we saw a significant rise. The average exam results were higher in the second exam than in the first'. (Bloom, 2007 p.30)*

However, in another study of science education Northen *(2005)* presented information about the development of understanding in science students. The research concluded that stimulating learning experiences trigger the development of many resilient synapses in the brain. Exams and rote learning on the other hand lead to only temporary memory connection *(Northen, S. 2005 p.18)*.

Thorough research on the effects and consequences of surface/atomistic approaches and deep/holistic approaches to learning are readily available in many published works by Marton, Hounsell, and Entwistle *(1984)*, Ramsden *(1992)*, Ramsden and Entwistle *(1981)*, and others:

> *Surface approach and the motive of fulfilling demands raised by others (i.e., [sic] extrinsic motivation) seem to go together. (Marton & Saljo in Marton, et al., 1984, p. 51).*

The following quote from a student in a study by Ramsden in the same book 'The Experience of Learning' is just one from hundreds of similar studies:

> *I hate to say it, but what you've got to do is have a list of the facts, you write down ten important points and memorize those, then you'll do alright in the test.... If you can give a bit of factual information - so and so did that, and concluded that, for two sides of writing, then you'll get a good mark (Ramsden in Marton et al., 1984, p. 144)*

This quote from Ramsden's research is from a student who received a first-class honors degree (ironically in Psychology), and reveals a surface approach to learning even though they "hate to say it." This comment implies that the student is uncomfortable with achieving success through a memory-based formulaic approach that gives them good marks every time.

The highly complex issue of what is actually being assessed in the psychology student's essay is not addressed here but it could be argued that the psychology student is actually showing a certain degree of synthesis. However the point being made is that the assessment method itself is adversely affecting the students' approach to and value for their study. This impact is supported in many specific researches, for example Biggs *(1995),* Marton and Saljo *(1976),* Ramsden and Entwistle *(1981),* and Steinberg *(1997).*

The exam has become an event where training in answering past papers and memorising texts govern the attributes developed. If these attributes were important for innovative and collaborative working environments and life-long learning then perhaps the predominance of high-stakes exams could be defended. Another current anomaly with most exam practice is the need for handwriting skills as one of the criteria for success. Students who have been typing and submitting electronic essays since childhood are expected to develop fast and legible handwriting skills, an attribute that may only ever be useful in an exam context.

Dr David Walker, an advocate of high quality e-learning principles and policies, and founder of the well-known e-assessment Scotland conference has expressed concern that whilst *'E-assessment represents an attractive option for institutions looking to address the logistical problems associated with increase*

in student numbers entering higher education', 'Students' expectations and perceptions of e-assessment are under-researched and their learning strategies are often unclear' (Walker et.al, 2008, p.221).

Accompanying the increase in e-assessment for the formative purposes studied in David's article there has been a large increase in the popularity of multiple-choice questioning (MCQ exams), easily ported to online websites and with the added advantage of automated marking. These have been criticized for their bias toward memory testing and the design of these tests and exams has been identified as a major area for concern by educational researchers due to the difficulty of providing MCQs that do not cause the selection of the correct answer to be too easy, too difficult or just plain ambiguous *(Pritchett, 1999).*

The main issue centres upon the institutions' and lecturers' responsibility to design courses that encourage deep student engagement and their development of qualities and attributes essential for lifelong learning and continuing employment. Exam-based assessment systems do not fulfil these responsibilities.

The earlier assertion that exams have become like an athletic event and given the drug-induced enhancement that has been exposed in many sports in 2012 and 2013 it is interesting to consider this aspect in relation to exams. The viability of exams has not yet been challenged by the availability of memory-enhancing drugs. But as early as February 2000 an article appeared in the Times Educational Supplement, titled *'Spectre of Exam Drug Test Looms", that showed successful results with mice and reporting that "according to scientists brain-boosting drugs may soon hit students' (Bunting, 2000, p.3).* By 2004, the economic potential for pharmaceutical companies had expanded the drive for further research and development:

Harry Tracy, publisher of Neuro Investment an industry newsletter based in Rye, New Hampshire reported that *'At least 40 potential cognitive enhancers are currently in clinical development'.* James McGaugh, Director of the Centre for the Neurobiology of Learning and Memory at the University of California at Irvine predicts a growing interest in such drugs: *'Next in line could be executives who want to keep the names of customers at the tips of their tongues, or students cramming for exams'. (Economist, 2004, p. 27)*

Apart from the problems associated with these advances in drug development, there are also the rapid advances in communication and computing technology. The integrity of exam submissions has been challenged by the miniaturization of digital technology and wireless communication systems. For example in China in 2007 10 million Chinese high school students sat an exam competing for 5.7 million university places. This situation has caused multiple instances of high-tech exam cheating. The following extract is from a Reuters agency report Fri Jun 8, 2007 1:21PM EDT:

> *Police in Jiutai, in the northeastern province of Jilin, became suspicious when a mini-bus remained parked outside a school hosting the exam Thursday. Inside, they found three people, "two of them staring at a computer screen and talking into a walkie-talkie," Xinhua said. A student in the examination hall used a wireless microphone to read out the questions and received the answers from the van, Xinhua quoted their confessions as saying. The three had charged the student 12,000 yuan ($1,500) for the service, it added.*
>
> *Security for the exam is tight and exam papers are considered state secrets before the tests. Authorities in neighboring Liaoning province spent 100 million yuan fitting over 8,000 exam halls with metal detectors and cameras to prevent tech-savvy students from cheating on national university entrance tests. Police had found some 42 pairs of so-called "cheating shoes" with transmitting and reception ability, selling for about 2,000 yuan each, in a flat in Shenyang, the provincial capital, state media said Thursday, adding that they -- along with "cheating wallets" and hats -- had proved popular this year.*
>
> *Three men in the southwestern province of Sichuan received suspended jail terms of 8-12 months last year for using pinhole cameras to send out images of the entrance exam papers to be worked out by "hired guns" for 19 students. (Reuters, 2007)*

To highlight the extent of this problem and the difficulties in detecting future cheating attempts it might be worth considering the following extract from US

patent no. 6,754,472 applied for on April 27, 2000, and granted to Microsoft® on June 22, 2004.

> *The human body is used as a conductive medium, e.g., a bus, over which power and/or data is distributed. Power is distributed by coupling a power source to the human body via a first set of electrodes. One or more device to be powered, e.g., peripheral devices, are also coupled to the human body via additional sets of electrodes. (Williams, Vablais, & Bathiche, 2004)*

Whilst there may be concern about health issues arising from electronic data transfer using the human body, the recent history of technological development has shown that the rate of technology adoption has been exponential and inevitable. Devices that transmit and receive data using human skin conductivity and human eardrums instead of headphones may soon become the technology that makes all information invisibly and undetectably available.

If the core educational challenge for young people at school or university is to pass an exam, Microsoft® and the drug companies could provide students the means to overcome that challenge, unless examinees are drug tested, strip-searched and conducted to a specially designed radiation-proof room. Design thinking would suggest that it would be much better and less expensive to encourage them to have a deep approach to their own learning and personal development using assessment processes that encourage and facilitate that approach.

Another reason for reducing a focus on exams is their potential to encourage the "fee for degree" commercialization of education. Massachusetts Institute of Technology (MIT) began a trend by putting their course content free online but charging large fees to take the exam. Given the focus on short-term memory and problems of invigilation already mentioned this may be financially beneficial for those institutions but may not fulfil the developmental needs of young people for survival in this new millennium. A cynical interpretation could be that the institutions have realised that those who can afford the large exam fees are likely to have socio-economic backgrounds that already guarantee survival.

Requiring fees for exams may be a strategy that only the high profile "brand name" universities can apply. As early as 1996, evidence was emerging in the media about virtual universities *(New York Times, 1996)* followed by a plethora of expansion in the following three years:

> *Large for-profit corporations like Jones International University and the University of Phoenix have entered the huge and growing 'virtual university' market to claim their share... indications are that virtual higher education will surely become a large enterprise. According to John Chambers, CEO of Cisco Systems, the company that makes routers that direct traffic on the Internet, education is the next big 'killer application.' Chambers believes that 'Education over the Internet is going to be so big it is going to make e-mail usage look like a rounding error! Chambers warns, 'Schools and countries that ignore this will suffer the same fate as big department stores that thought e-commerce was overrated.' (NYT Education, 17 November 1999)*

As a predictive statement this has had variant success. The South Australian government announced that Carnegie Mellon opened a new university in Adelaide in 2006, offering American undergraduate and postgraduate degrees with private students receiving government loans on the same basis as local students. The recent and rapid rise of Massively Open Online Courses referred to as MOOCS may give substance to the 1999 prediction with the Ivy League U.S. universities leading the way. If all universities try to follow this approach the education 'industry' may echo developments in the car industry, where larger numbers of small manufacturers have been replaced by a few large corporations. However, it is yet to be seen whether the educational value of free content (Online Educational Resources) and fee for exam models provided by these collaborations will be sustainable. The author's view, having participated in two MOOC courses in 2012 and 2013 remains unconvinced that this massively open online education will improve the quality of learning outcomes or graduate attribute development.

Whilst these strategies may garner large exam fees for the larger institutions a further factor in the case against exams is in evidence that high-stakes assessment can cause physical illness, depression, and youth suicide.

■■■ This is perhaps the most tragic yet powerful reason for reducing the focus on exam-based systems. The following research references that reveal a definite documented link between an assessment system and the death of young lives was a major motivator in the author's attempts to promote educational change.

New South Wales (NSW) in Australia has a Higher School Certificate (HSC) exam, which is used to determine admission to university through a University Admission Index (UAI) that is now termed the Australian Tertiary Admission Ranking (ATAR). A report commissioned by the NSW Commission for Children and Young People (Sankey & Lawrence, 2003) studied the population of all deaths of children and young people in NSW by suicide or risk-taking, over a 5-year period (January 1996 to December 2000). The upper age limit for this study was 17 years 11 months, which suggests that its findings could be an underestimate of the number of HSC-related deaths, as many taking the exam were over 18. From 187 young people in NSW committing suicide in this period, 38 students were reported to have committed suicide as a result of school-related problems. Ten of these were directly related to HSC stress, and a further eight from related learning difficulties.

Previous research had not documented a link between HSC stress and suicide in NSW, however Smith and Sinclair *(2000)* found that more than 40% of Year 12 (HSC) students in their study reported symptoms of depression, anxiety, and stress that fell outside normal ranges. These effects from the implementation of an exam-based assessment system continue to be reported:

> *The Higher School Certificate (HSC) and similar tertiary entrance examinations are a source of real stress for students in a society that places a premium on academic achievement and competition…. Georges River College in New South Wales found that the pressure for high achievement had become a major risk factor for the mental and physical health, academic integrity and school engagement of its Year 12 students. Surveys revealed the presence and causes of stress and anxiety in students particularly in relation to the HSC. (O'Brien and Wright, 2007. p.32)*

The effects continue into the university age range and the Australian government in 1997 allocated $31 million to a National Youth Suicide Prevention

Strategy aimed at reducing youth suicides between the ages of 15 and 24 by June 1999 *(Australian Government Publishing Service, 1997).* The following extracts are from a subsequent report conducted in New South Wales and are typical studies in other countries with exam-based systems *(Sankey & Lawrence, 2003):*

> *The young people whose records indicated significant stress levels associated with their impending HSC exams all appear to have suicided in a state of acute stress and in close proximity to an event relating to their exams. (p. 67)*
>
> *Of the 8 young people experiencing learning difficulties... When Chris told his father that he was at the bottom of his year, his father said that he didn't mind, he just wanted him to complete his HSC. A few weeks prior to his death, Chris told a friend that he felt "dumb" and was finding it very difficult to cope with this. He further said that he would rather be dead, in heaven where it was more peaceful. (p. 57)*
>
> *Of the 10 young people who experienced significant levels of HSC-related stress, all died by suicide. As a group, these were successful students, with records indicating that they set high standards for themselves and worked extremely hard. Documentation also showed that the period leading up to their deaths was typically characterised by feelings of overwhelming pressure to succeed, coupled with an intense fear of failure. (p. 55)*
>
> *The finding of an association between HSC stress and suicide warrants urgent investigation of how to support young people during this stressful period and how to work with parents and the community to provide realistic guidance to students. The Child Death Review Team (CDRT) considers that there is a need for the Strategy to address this important issue. (p. 114)*

Dr. Anthony Kidman, director of the UTS Health Psychology Unit, conducted a study in 2004 in which an average of two out of five teenagers believed that the HSC exams would affect the rest of their lives. In an article about the study he said, *'There is significant anecdotal evidence to suggest burn-out in a large*

number of students as well as sleeplessness, suicidal ideas and anxiety' (Sydney Morning Herald, 2004). Dr. Gary Galambos in the same article commented, *'You have to take that really seriously in a student population because the risk of suicide in teenagers is very high in Australia'.* Dr. Kidman and his team took a positive approach to the situation and designed a 'psycho-educational' program for teenagers studying the HSC. The program is called: 'Taking Charge! A Guide for Teenagers, practical ways to overcome stress, hassles and other upsetting emotions.'

The pressure exerted on students by themselves, parents, relatives, peers, and the institutions involved, to achieve good exam results is clearly intense. It has become common practice for students to be advised to choose particular subjects to gain high university entrance scores. This extrinsic motivation overrides the intrinsic motivation to follow a natural inclination or interest.

Few would argue that stresses have not increased and burgeoning plagiarism and cheating in exams have become major concerns for many educators. Test anxiety and exam stress are now common terms and inevitably some students who cannot cope with these pressures can become reliant on prescribed antidepressant drugs. Selective Serotonin Reuptake Inhibitors (SSRIs), are one of the new popular group of drugs that are supposed to have fewer side effects than previous Tricyclic drugs.

Speaking at the 11th Annual Suicide Prevention Australia National Conference in October 2004 in Sydney, director of the Australian Institute for Suicide Research and Prevention, Professor Diego De Leo warned that SSRIs may not be a cure-all for depressed kids. He reported that prescriptions for the drugs were increasing, with some given to children presenting signs of suicidality as young as 10 or 11 years old. His concern was that no studies have been done with children in Australia, but that recent investigations in the United States urged extreme caution in the prescribing of these inhibitors.

There has also been a link made between physical illness and exam stress. Dr. Lin Ying Liu and associates at the University of Wisconsin, Madison studied 20 college students with mild allergic asthma, the percentage of sputum eosinophils was 10.5% at 6 hours and 11.3% at 24 hours following an antigen challenge during final exam week—significantly higher than the 7% level during

periods of low stress. The study concluded that the psychological stress of school exams can increase the severity of asthma by increasing airway inflammation response *(Ying Liu, 2002, p. 15)*.

■■■ It is clear from these studies that young people do not need an assessment strategy that adds aggravation and stress to the other socio-cultural pressures during these important developmental periods. Given the evidence described exams have become a stressful hurdle biased towards those who can cleverly regurgitate information within a time constraint. As we face a future of increasing pressures there is a greater need to include students in partnership rather than treat them as customers *(Pitman, 2000, Lomas, 2007)*. In an article on the future of higher education teaching and the student experience over the next 10-15 years Paul Ramsden suggests:

> ★★★ *Government and agencies should be ready to introduce funding models and quality systems that will realise a vision of higher education as an engaged partnership between students and providers.*
> *(Ramsden, 2008, p.1)*

This quote serves to emphasise the need for universities to configure the educational experience to develop graduates' attributes in preparation for work and life in a rapidly changing world and workplace. For students to engage in such a partnership, the relevance of these developments needs to be made explicit to students throughout their curriculum.

It was in this context that the author embarked upon a range of initiatives and researches about the development of attribute-based education with a particular focus on the facilitation of assessment processes through software design and development.

Resolutions for Pedagogy Pressures

In response to the issues foregrounded in the Pedagogy Pressures section, a value for educational theory and research prompted the author to submit a journal article for peer review: ▲▲▲ 'Educational Concepts for Design Lecturers' *(Thompson, 2003)*. The article explained with quotes and references three important educational concepts with visual diagrams to assist in the dissemination of useful approaches to teaching and learning. The diagrams are

reproduced here as examples of the author's attempts to use design in the furtherance of improved pedagogy.

The following Figure 18 is based on Ramsden's work highlighting detrimental common practices *(Thompson, 2003)*. It illustrates a selection from Ramsden's research findings about the factors that can cause students to adopt a surface rather than a deep approach to their learning.

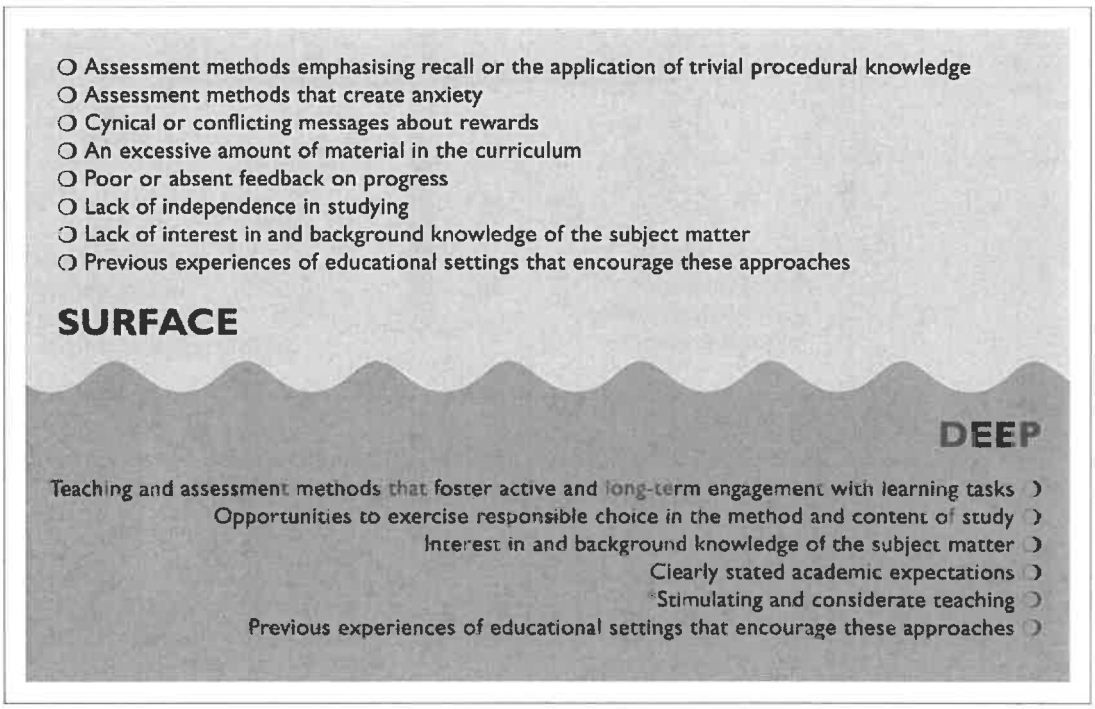

Figure 18: The author's design to illustrate a selection of Ramsden's characteristics of the learning environment that encourage students to adopt a deep or surface approach to their learning, (Thompson, 2003 p.83).

The following Figure 19. is related to Kolb's work on learning styles and was designed by the author to encourage academic design staff to design learning activities that engage students in a broader range of dimensions, namely thinking, feeling, doing and watching. In Kolb's work thinking relates to 'Abstract Conceptualisation'; feeling to 'Concrete Experience'; doing to 'Active Experimentation', and watching to 'Reflective Observation'. The visual diagram foregrounded the basic dimensions and suggested examples of learning

activities related to the dimensions. It also related these to the benefits for students with different learning styles identified by Kolb, such as 'Converger', 'Diverger', 'Assimilator', 'Accommodator' *(Thompson, 2003).*

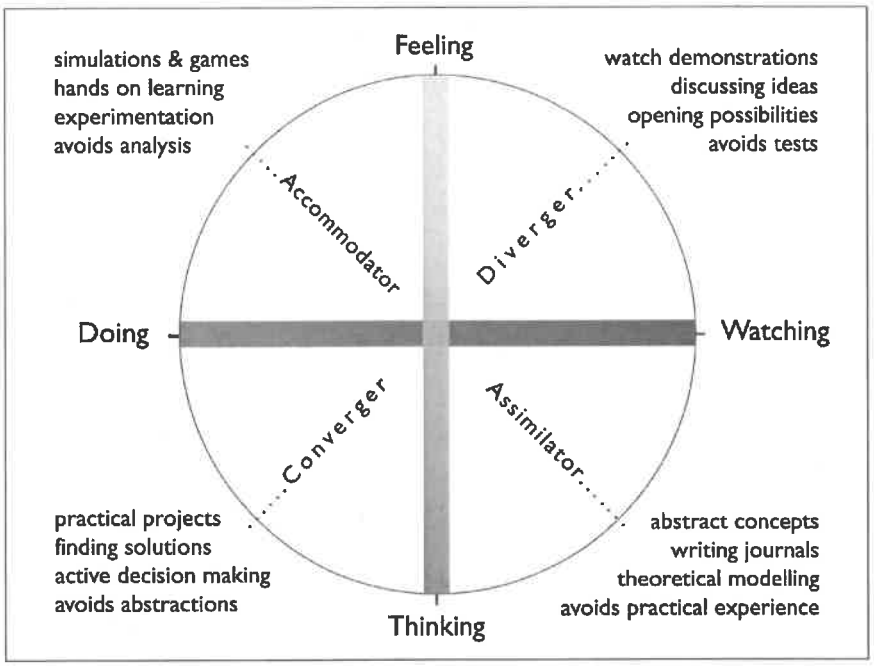

Figure 19: The author's interpretation of Kolb's learning cycle and learning styles with students preferred activities (Thompson, 2003 p.84).

The following Figure 20. was part of the author's attempt to engage design staff in conversations about the level of learning they valued when giving certain grades or grade descriptors. This is a rather simplified linking of Biggs' work on the structure of observed learning outcomes that identified 'Prestructural', 'Unistructural', 'Multistructural', 'Relational' and 'Extended Abstract' features. It prompted lecturers to think about their assessment criteria in the grading processes and the specific terms used in defining unit or subject requirements, learning activities, assessment criteria and feedback (Thompson, 2003).

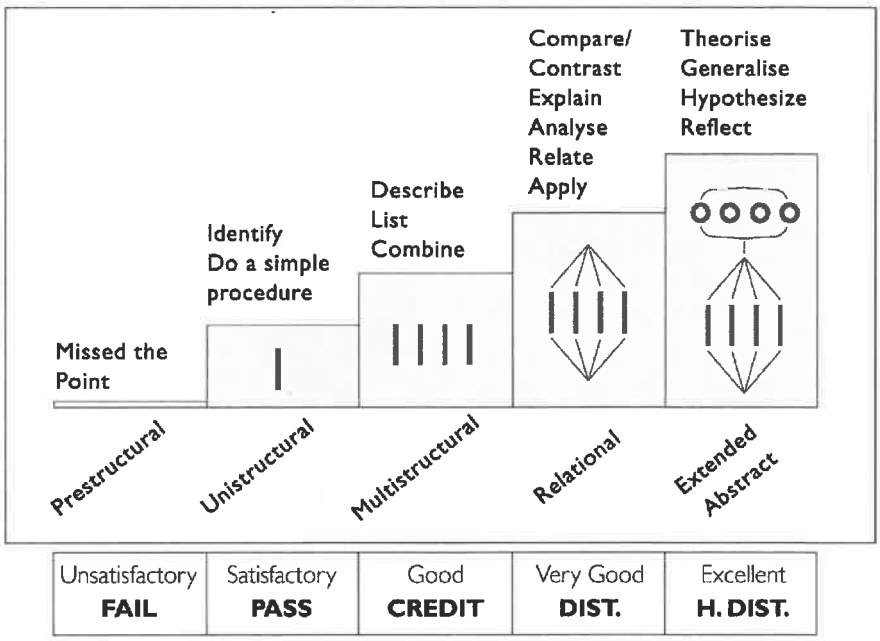

Figure 20: The author's illustration of Biggs' Structure of Observed Learning Outcomes (SOLO taxonomy) with added indicators relating to levels of learning, (Thompson, 2003 p.86).

Leadership Pressures: A refined model of academic leadership

The complex pressures identified in the Leadership Pressures section are beyond simple solutions. However, design and design thinking can make a contribution to the refinement of a model of academic leadership.

The model posed by Vilkinas and Cartan in Chapter 2 Figure 14 is rather confusing when considering the four quadrants. They place 'Monitor' and 'Deliverer' in the same 'Internal Focus' section but this is problematic as both these roles need to have a strong external focus. Whilst this model seems much more appropriate and sophisticated than Ramsden's, it perhaps needs some refinement to clarify the relationships between the five roles and that of the integrator role. For example design thinking would propose that integration is a central feature then rather than focusing on 'competing values' and it may be better to conceptualise the roles as a set of functions addressing a highly complex context. Therefore, if all six roles were considered functions of academic leadership, then these functions, with an integrated set of responsive

values, work together to give both a 'people and task' focus and an 'internal and external' focus. The author's reconceptualisation of Vilkinas and Cartan's model is illustrated in the following Figure.

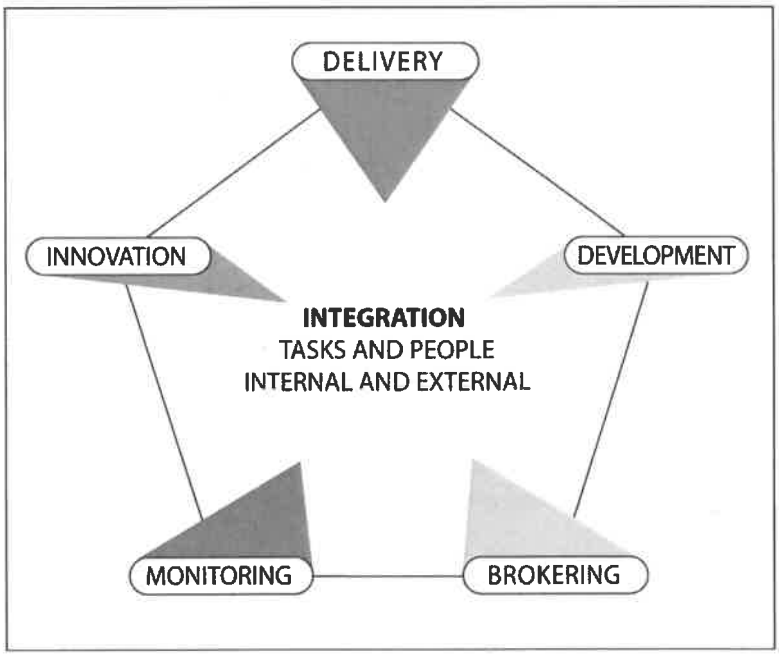

Figure 21: The author's reconceptualisation of The Integrating Competing Values Framework (ICVF) model of academic leadership (after Vilkinas and Cartan, 2006).

This suggested update to the ICVF model removes the idea of five roles and replaces them with the integration of five leadership functions. The leader's integration function is central in addressing the complex issues involving tasks and people, both within and beyond the university context. If the leader, using this model, set up systems to fulfil these functions, rather than feeling the need to occupy multiple and competing roles, then perhaps some of the pressures could be assuaged.

The author's model is as yet unpublished but has served to guide many projects notably the Government funded projects described in Chapter 5 where complex contexts beyond the bounds of the institution had to be considered.

Summary of rationales and points

The following four rationales and six points underpinned by the work in Chapters 2 and 3 summarise the motivations and views that have been guiding values and principles in the author's journey.

Rationale 1: To be able to cope with the rapidly changing world of work higher education students should be encouraged to engage in a long-term approach to their development of a broad range of graduate attributes rather than focussing on percentage marks or passing exams for particular subjects.

Rationale 2: In order to ensure ongoing relevance and funding support, universities should be required to validate the quality of their graduates to government, employers, parents and the students themselves through assessment processes that relate to the development of graduate attributes.

Rationale 3: In a context where teaching academics are rarely exposed to the practical application of educational theory and research, teachers need to be encouraged to understand and use educational concepts to underpin their strategies. (eg 'problem based learning', 'constructive alignment', 'self and peer assessment', deep/surface approaches, learning cycles / styles, exposure to variation, taxonomies of levels of learning etc.)

Rationale 4: The higher education system is subject to significant internal and external pressures and will continue to be resistant to change unless some pressures are relieved through improved learning designs, well-designed accessible online systems and greater alignment with assessment processes.

• The term 'graduate attributes' is appropriate but needs clear definition / explanation for both academics and students.

• The integration of an attribute-based approach requires a shift in the design of learning activities and the assessment that informs learning achievement.

• Schools and universities have a responsibility to focus on their developmental role rather than rely on certification as their main function in society.

• Governments have attempted to impose attribute-based approaches at university whilst still supporting high-stakes examination systems at school level for university entrance.

• Whilst universities have formulated lists of 'graduate attributes' they have not made these explicit in the assessment marks, grades and feedback that students receive.

• Industry bodies and professional associations have consistently suggested that universities focus on the development of graduates' attributes and it is clear that most of these cannot be achieved through didactic lecture-tutorial exam-based approaches.

The clear need for change and the combination of these points and rationales led to the understanding that both policy and curriculum development are important dynamics in the higher education learning environment. However the potential for both staff and student engagement was greater if the focus for change was on the design of learning activities and the design of assessment systems that gave explicit feedback about graduate attribute development. The case studies in the following Chapter 4 and the online systems development in Chapters 6 and 7 are examples of the author's development in these areas.

Chapter 4
LEARNING DESIGNS: Case Studies

Foreword

Chapter 4 begins with a brief description of two online assessment systems. Namely the *ReView* (online criteria-based assessment) system designed by the author and *SPARK* (Self and Peer Assessment Resource Kit) that was a joint project in which the author played a major design and development role. There are new versions of these systems in development but the descriptions of current versions are relevant to the case studies of the learning designs. The *ReView* system description also assists in understanding the issues explored in one of the Government projects in Chapter 5 funded by the Australian Learning and Teaching Council (ALTC).

The aim of these descriptions is to provide background understanding to underpin the case studies that follow in which both these systems are used:
LEARNING DESIGN 1: A Learning Design for an unpopular topic
LEARNING DESIGN 2: A Learning Design involving external client organisations

Note: The Case Studies for the Learning Designs 1 and 2 were conducted in a particular format and for this reason are presented in tabular form to aid understanding of the complex learning designs in context.

A brief introduction to *ReView* (online criteria-based assessment)

The *ReView* online criteria-based assessment system was designed by the author and developed as a research prototype over a ten-year period together with the academic processes that accompany the software. ▲▲▲There is now a commercial version of *ReView* known as *REVIEW 3* due to be released in 2014, but not illustrated in this PhD.

ReView offers students criteria-based feedback relating to their progressive development of 'graduate attributes' (qualities, knowledge and skills). It is not intended to replace official university systems for informing students of their results, but provides extra formative feedback and where necessary percentage marks can be exported to gradebook systems (eg Blackboard Learning Management System) or Excel spreadsheets. The *ReView* system is a process combined with web-based software that together facilitate the alignment of assessment tasks, learning objectives and assessment criteria with graduate attribute categories. The process acknowledges that every assessment criterion for every task is contributing in some way to the development of definable categories of student attributes. The relationship between assessment criteria and attribute categories is colour-coded in the software as an aid to curriculum development and student feedback using pie-charts and bar-chart result profiles. The design and development of the *ReView* process and software is explored in Chapter 6.

ReView gives visual and written criteria-based feedback related to students' ongoing development of graduate attributes in an attempt to reduce their focus on percentage marks and foreground the pattern of feedback against criteria. The link between criteria and attribute development is made by course coordinators at the *ReView* task setup stage. Marking criteria are colour-coded to various attributes (eg ethics, critical thinking, communication skills etc.), using a simple dropdown menu. Attribute categories are usually developed at discipline level. The following colour-coded categories are used in the University of Technology, School of Design developed from 26 specific attributes in collaboration with academic staff and design professionals with some student

input. The resultant 5 category titles, descriptions, colours and symbol codes were also informed by the author's broad research into design, personal development and psychometric testing systems:

CREATIVITY AND INNOVATION

This category is to do with inventiveness, versatility, thoughtful risk-taking, imagination, creative problem-solving, natural curiosity, creative experimentation, innovative uses of materials and technologies etc.

COMMUNICATION AND INTERPERSONAL SKILLS

This area of development is to do with the quality and clarity of such things as oral presentation, written essays, explanations and visual presentations. Also the development of functional team roles and abilities to negotiate in group interactions etc.

ATTITUDES AND VALUES

This aspect is to do with the ethical, personal and societal dimensions of students' capabilities. Responsible approaches to citizenship and one's place in society, care and consideration for others' points of view, respect, self-discipline, taking positions etc.

PRACTICAL AND PROFESSIONAL SKILLS

This is to do with computer skills, craft skills, manufacturing or printing processes, formulating briefs, design processing, professional letter writing, financial skills, drawing, visualising or rendering skills, understanding the profession etc.

CRITICAL THINKING AND RESEARCH

This important aspect is to do with the development of critical and reflective thinking and research skills in diverse and multiple ways. Assessment criteria relate to researching, fact-finding, literature surveys, research methodologies, analysing, synthesising, evaluating, documenting, concluding, etc.

In the setup process academic staff enter tasks and criteria colour-coded against these five attribute categories. This process is explained in Chapter 6 as part of the development trace of the *ReView* process and online software.

Prior to submitting work students are encouraged to 'self-assess' using *ReView* and the criteria specified for a particular task. Over time throughout a program of study using the system, students can view their 'Results Profile' tracking their development of categories of attributes considered by tutors to be evident in their submitted work.

The following screenshot (Fig. 22) shows the main staff screen after login to the online system. Students see the same screen but with fewer buttons on the right

and fewer subjects in the listing. The pie chart display shows by sector the weighting of attribute categories intended to be developed in any particular subject. Using this visual method both students and staff are focused on the attributes as they view the assessment of a subject, and the percentage weighting is also displayed numerically for further aggregated analysis.

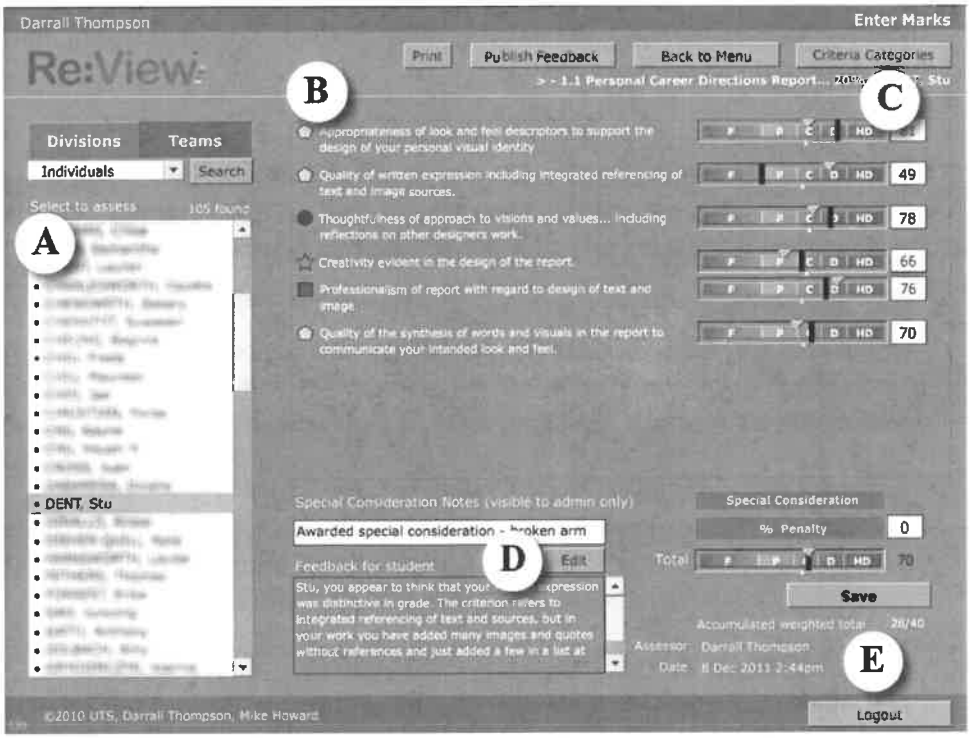

Figure 22: Screenshot of the ReView marking screen used by staff to assess student work with criteria colour-coded to categories relating to a broad range of attributes.

KEY to Figure 22: STAFF VIEW OF *ReView* MARKING SCREEN

A – student lists in divisions or teams within divisions with sample student 'Stu DENT' selected (other student names obscured for privacy)

B – assessment criteria developed from learning objectives and specific to the task within a subject or unit of study. The criteria shown are colour coded with one of the previously described five categories of attributes for the School of Design.

C – 'data sliders' that automatically calculate a percentage when the black bar is dragged by the tutor or marking lecturer (the turquoise triangles showing student self-assessment before they submit their work appear after staff have marked and saved)

D – feedback comments for the student are informed by the distance between the students' self-assessment and the tutor's own grading against criteria. In this example the student and tutor agree on the Total but there is considerable variation

E – The Total slider black bar can be dragged and moves all the other criterion marks in proportion to allow for holistic marking and benchmarking adjustment

The following screenshot in Figure 23 shows the student version of this screen after the subject coordinator has 'published feedback'.

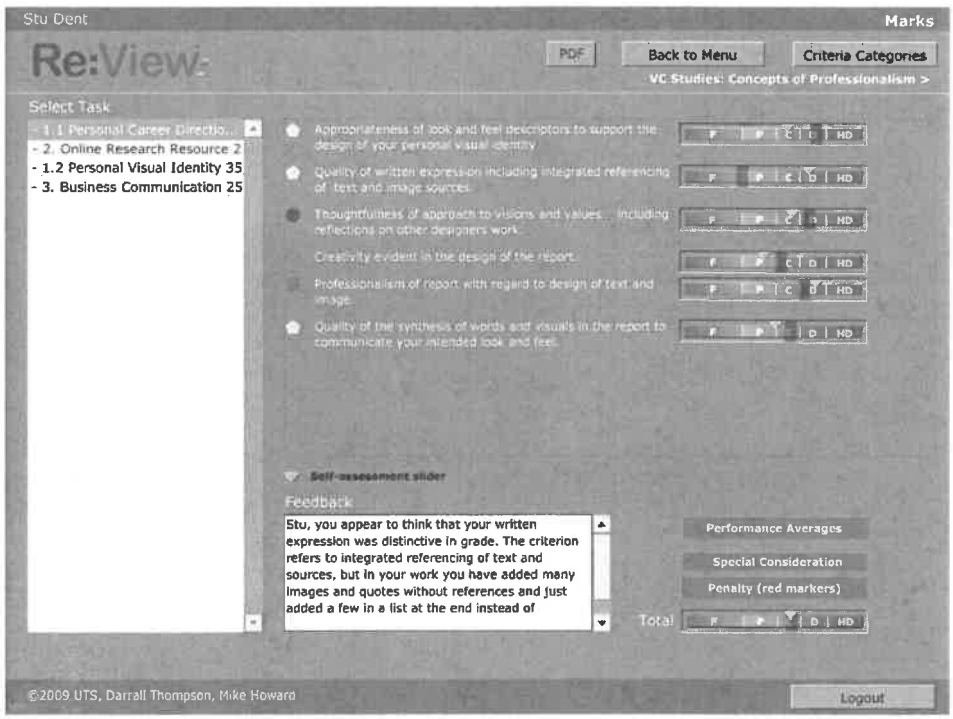

Figure 23: Student view of the ReView student feedback screen

This student screen shows the tutor's grade against each assessment criterion as a pale grey bar and the student's own grading as a turquoise triangle. There are no percentage marks shown to students in order to focus their attention on the pattern of criteria-based feedback.

Each criterion for each task is colour coded to the meta categories of graduate attributes here termed 'Criteria Categories'. This means that the student is able to monitor their progress over time and across subject or unit boundaries.

The following screen in Figure 24 shows that 'Stu Dent' is not doing well in critical thinking and research skills but is doing well in the other categories. By selecting different groupings of subjects the student can follow their progress throughout the years of a course of study.

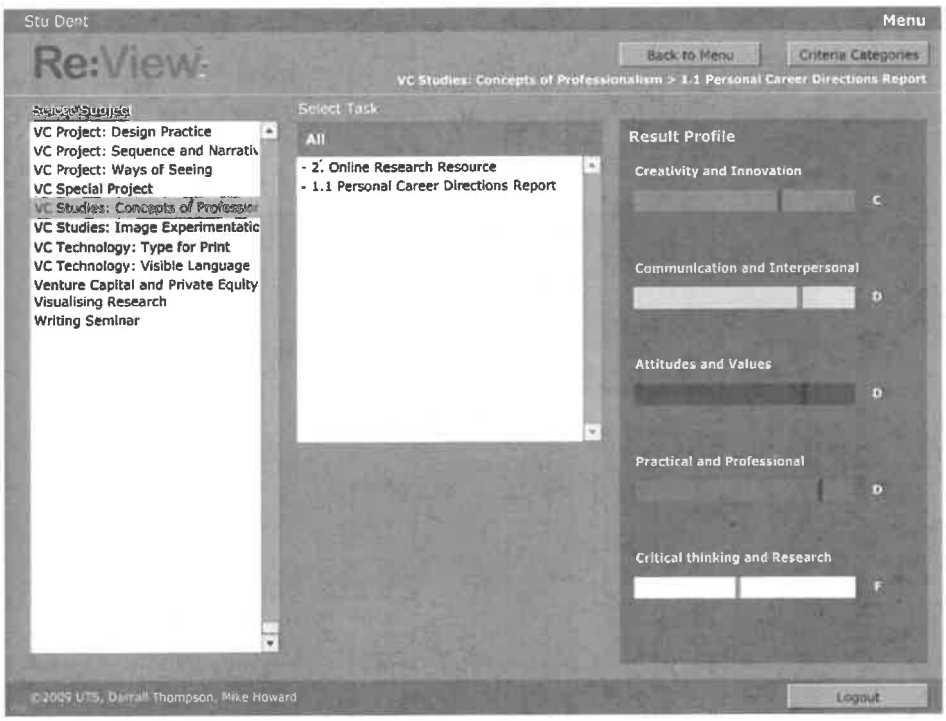

Figure 24: Student view of ReView Results Profile screen showing the students aggregating grades against the five colour-coded bars relating to categories of attribute development.

The ReView web-based system was used in the case studies of Learning Designs 1 and 2 described in this Chapter together with the Australian Government funded learning and teaching project described in Chapter 5.

A brief introduction to *SPARK* (Self and Peer Assessment Resource Kit)

SPARK (Self and Peer Assessment Resource Kit) was developed by a research team. The author was part of the team with a major design and development contribution. The latest version of *SPARK* known as *SPARK* Plus is now being developed by a colleague and may also result in a commercial application.

SPARK is a web-based system for improving the fairness of group assignments where all members of the group are attributed the same mark for the assignment. It is designed to give students anonymous opportunities to reflect on their group process and rate themselves and other group members based on agreed group assessment criteria. The averages of these ratings produces a '*SPARK* Factor' that is used to modify the group's total mark into an individual mark for each group member.

The subject or unit coordinator sets cut-off dates for group formation and the entering of ratings by students and also enters criteria for the self and peer assessment process. Assessment criteria vary according to the group task and the intended development of group skills. The following criteria are the ones used in the Community Project case study that is the focus of chapter 5:

Category: Client contact
1. Clarity in understanding the client's needs
2. Quality of contribution to client engagement

Category: Final presentation
1. Help in preparing material for the presentation
2. Involvement in planning or presenting on the day

Category: Group function
1. Helping the group function well as a team
2. Versatility in what was required

The following screen shows one of the staff screens and result options for a group assignment.

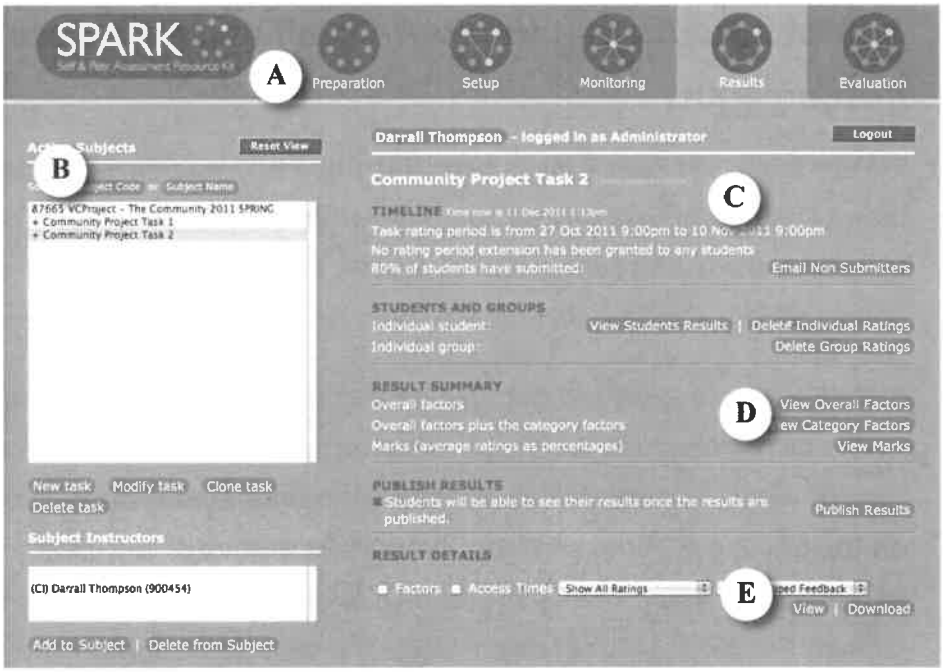

Figure 25: Screenshot showing the staff view of the SPARK interface

Figure 25 shows a SPARK screenshot and the author's design for the staff view of the main interface. The key for these interface elements is in the text below.

KEY to Figure 25: STAFF VIEW OF *SPARK* RESULTS SCREEN

A – *SPARK* logotype with linked symbols designed by the author to indicate the progress through a group assignment for staff to engage with at Preparation, Setup, Monitoring, Results and Evaluation stages.

B – subject listings with tasks that have been designated for group assessment. There can be different sets of criteria for group projects within a subject.

C – the timeline can vary according to the individual academics teaching and learning requirements but a definite task rating period is required so that results can be applied to group marks.

D – staff can monitor results from each group and view all the comments and factors. Individual groups can be given an extension outside the rating period if necessary.

E – the data is downloadable for analysis and evaluation by coordinating staff and tutors to check on anomalies or instances of group difficulty. This is particularly useful if *SPARK* is used as an interim assessment.

The student screen shown in the following Figure 26 is much simpler and foregrounds the specific sections and group criteria to rate themselves and their group members.

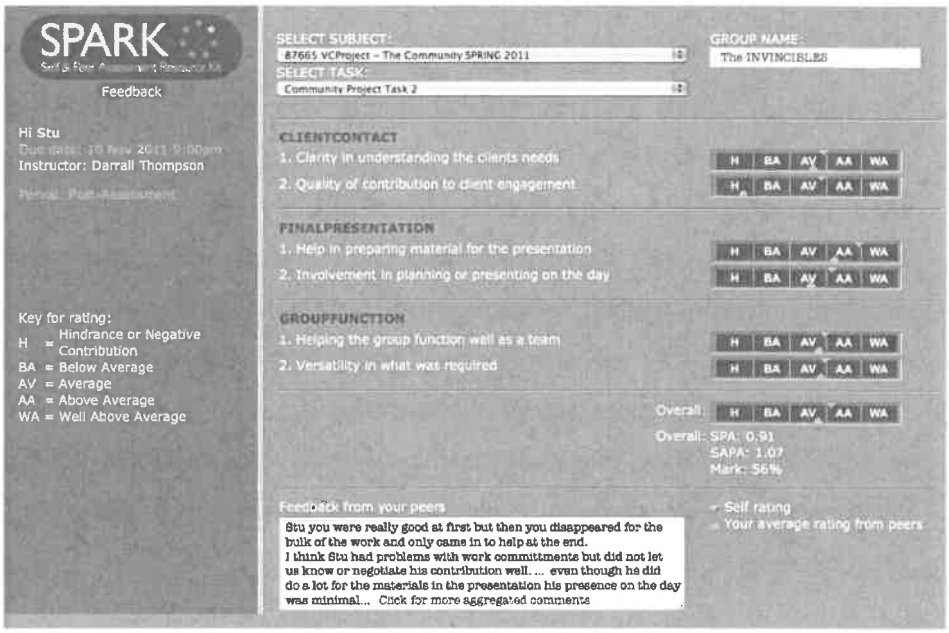

Figure 26: Student view of the SPARK feedback screen showing both self ratings (blue triangles) and peer ratings (orange triangles).

This student screen shows a student's self-rating (blue triangle) compared to the average of four peer ratings (orange triangle) against a scale relating to average contribution against six criteria. In this example the student has made a contribution average for the group but in one criterion was felt by colleagues to have been a hindrance (H). He has also overrated his own contribution in all criteria. The SPA factor of 0.91 would in this case be multiplied by the group mark to provide his or her individual mark. Some members of the group would receive considerably higher marks due to their peers' feedback.

The *SPARK* web-based system was used in the learning design examples that follow together with the *ReView* online criteria based assessment system described earlier in this chapter. ▲▲▲ There is a **video interview** with the author filmed as part of a 2007 Australian Government funded Carrick project (lead institution the University of Canberra) that explains ReView and SPARK. **See the attached DVD** *Filename: CarrickInterviewDT.mov*

LEARNING DESIGN 1: A Learning Design for an unpopular topic (Case Study Format)

The four rationales developed in Chapter 3 and those that followed concerning graduate attribute development together with the determination to reduce the focus on exam marks have been a guide in the author's development of learning activities and assessment processes. The following case study focuses on one learning task taught and coordinated by the author but drawing on data from several instances of the subject using the learning design outlined. It illustrates the application of the *ReView* and *SPARK* assessment systems together with a 'design thinking' approach to the learning activity. It concludes that students exhibited a deep engagement and reflective approach in the traditionally unpopular topic of design history often taught through a chronological series of lectures and tutorials.

The case study format is used to clarify the various aspects of the design of the subject. It reflects on the subtle dynamics of a learning design in the unpopular topic of design history. The lecture and tutorial subject was usually taught by art history lecturers disassociated from the practical design subjects that students were undertaking in parallel with this topic. The decision by the Head of School Associate Professor Jenny Wilson (retired) to change the subject from a generic historical perspective to one that linked closely with specific design areas was innovative and resulted in a successful approach that has been refined by the author over a number of years. The case study covers the learning context, learning design and assessment processes with a discussion of results and conclusions. The specific case study was initially conducted in 2003 but is modified in this chapter to include reflections and content from other iterations of the subject in later years.

CASE STUDY FORMAT

Visual Communication Honours Degree (2nd year):
Design History in the Introduction to Typography Core Design Studies subject
Responsible Academic:
Darrall Thompson, Senior Lecturer and Director of Teaching and Learning

Section	Descriptions
The Learning Context	Design history had mostly been taught through a series of chronological lectures and tutorials but because of the unpopularity of this approach and lack of academics wanting to prepare updated and relevant courses a decision to distribute the subject through specific learning areas was made. The author was given responsibility for the design history component built into a Typography course on the retirement of a colleague. The following case study refers to one iteration when the subject moved from 2nd Semester in first year to the first semester of the 2nd year of the BDesign Visual Communication degree course. The subject 'Introduction to Typography' was designed to accommodate a 20% learning task relating to design history. It is referred to as the 'Online / Live Debate' project and runs in parallel between two other learning tasks in the subject. In this study there were 90 students enrolled for the subject completing the Online Debate learning task. 61% were local high school entry students with a Higher School Certificate, 18% were mature age local students (over 23yrs old), 12% were international full fee paying with English as a second language, 9% were local students entering through a foundation course with only basic English skills. Although the entry level for the BDesign Visual Communication course was very high for local students, mature age students (entering through written application and portfolio interview) and foundation course students were not required to comply with the university entry ranking. In this group 64 were female and 26 male. Although these demographic factors were deidentified in this study, the background information is useful when viewing the analysis of student comments.

This Online/ Live Debate learning task has been evolving over a ten-year period, and was initially conducted 'offline'. Due to the popularity and efficiency of the learning design it continues to be conducted currently (as of 2012).
The progress of the development and refinement of the task is not described here but rather the major features of the learning design using online systems and teaching concepts to improve dynamics and engagement not possible in the 'offline' context. The development and refinement of this specific learning task relates to the concept that 'learning designs' need to be efficient vehicles for journeys of learning. In the context of this thesis the design of this task and the assessment processes reflect the author's design thinking approach to education.

The Learning Design

The learning task was designed to incorporate the concepts of Kolb's (1976)'cycle of learning' (thinking, feeling, doing, watching). Account was also taken of Ramsden's (2003) 'Deep and Surface learning' research and Bigg's (1991) 'SOLO taxonomy'. Refer to the Chapter 1 Conceptual Pressures section for the author's visual design interpretations of these three concepts under the heading "The 'professionalism' of university teaching".
The following bulleted paragraphs highlight a number of important features that underpin the dynamics involved in the learning design for this assessment task. It is suggested at this point that the reader views the 7 minute video from an interview with the author from a University of Canberra study on group work.

Video footage** explaining ReView and SPARK with examples from this Subject in an interview with the author as part of a 2007 Australian Government funded Carrick project (lead institution Canberra University) see the attached DVD* ***Filename: CarrickInterviewDT

• The online / live debate learning task attempted to engage students in a dynamic learning experience in the topic area of typography and design history characterised by groupwork, online submissions and a live videoed performance. Groupwork was mentioned in the learning objectives for the subject and online self and peer assessment was used to alter group assessment to reflect individual contributions to this learning task. Refer to the description in Chapter 3 on the Self and Peer Assessment Resource Kit (*SPARK*).
• The task represented 20% of the marks and was the only group task together with two individual tasks representing 30% and 50% of the total assessment in the 'Introduction to Typography' 2nd-year subject.
• Students were randomly formed into 18 'learning groups' of 5 students each for the task at the beginning of semester as a method for managing tutorial and

studio sessions throughout the thirteen week period.

• The online / live debate ran whilst the other two tasks were being undertaken and spanned a period of six weeks in the middle of semester. There were two online submission deadlines on Sundays at midnight to stimulate online activity and also to avoid other interim deadlines within the subject. The first online submission was a first-person 1000 word opening statement written from the standpoint of the persona that the group had been given to study, the second was a challenging statement targeting the views of a designer / artist they had been given.

• An extract from the briefing document gives an indication of the briefing given to the students:

> 'Scenario:
>
> Imagine we have just been joined on our UTSOnline website by eighteen famous typographers / artists / designers. They represent strong views about both the expressive and functional approaches to typography and design.
>
> Some of them are in disagreement and want to have a discussion / argument about their approaches.
>
> However quite a few of them are dead and the others not here in Australia so we have arranged for this to happen using your learning groups as champions of their points of view and philosophy.' (from the online debate brief 2003)

• The student groups were encouraged to 'become' a specific typographer / designer / artist using three devices;

a) a photograph of each learning group posted online with their new persona's name that was then juxtaposed with a photograph of the group that represented their opposing debate partner at the time when they needed to submit an online challenging statement;

b) an instruction that all online written submissions and the live debate at the end were to be written or spoken in 'first person' style; and

c) that the group had to research their given persona through five holistic research questions, which the author designed, to broaden the information that informed the debate submissions:

> **1. Propositions** - What did they believe and what were they trying to do?
>
> **2. Influences and connections** - Where did they draw their influences from and who were they connected to eg. artistic movements etc?
>
> **3. Principles and ways of working** - How did they go about their work and what did they consider important in the way it

was done ?

4. Character / Personality - What were they like as a person and why do you think they did what they did ?

5. Facts and Figures - What interesting facts can you find as well as the usual birth / death / education that is available.

• Students were also encouraged through video clips of previous iterations of the live debate to be creative in costume and drama in making their points in the live debate at the end of the task.

• The author designed the online / live debate to foreground the opposing orientation of the individuals from history (or living) in reference to a spectrum ranging from 'functional', 'problem-solving' approaches to design at one end to 'self-expressive', 'artistic' approaches at the other. The student groups were instructed that they would have to locate their given persona on a spectrum line between these polarities and reflect on their own personal orientation as part of the task.

The Spectrum intended to reveal variations in approaches to design :

FUNCTIONAL <----------> EXPRESSIVE

Note: The full instrument used to gather students reflections about this is included in **Appendix 4**

The use of this spectrum relates to the phenomenographic educational concept of 'revealing the variation' (Marton and Booth, 1997. p.133). The students completed paper-based spectrum forms during the live presentations in the lecture theatre.

There is **further video footage on the DVD** included with this thesis of students engaged in the live debate aspect of the task in a brief video clip showing student groups representing particular designers from history. **Filename: 'Functional vs Expressive movie.mov'**

Given that this topic was running alongside other practical design tasks in typography and type design there was minimal time to allocate to this 20% task. The sequence of the task was:

1. Week 3 of Semester: 30 minute introduction by the author about the task as part of a normal lecture period for the subject outlining the timing for the two online submissions and the live debate and the spectrum between functional and expressive approaches to design and typography.
2. Sunday Midnight Week 6: First online submission 1000 word Opening Statement addressing the five guided research questions in first-person written form.

3. Week 8 of Semester: 20 minute introduction to the live debate sessions with encouragement to use theatre and costume using video from previous iterations. Displays of the Challenging Statements submitted the previous Sunday at midnight begins to engage debate dynamics.
4. Week 10 and 11: Live Debate presentations. Debating pairs of students were required to provide visual powerpoints/music/dramatic interpretation of their given persona followed by a debating session between opposing persona.

It was clear that the students were having difficulty understanding the task when it was run in 2003 as it had changed slightly from the 2002 iteration. Three students from a group of five came to the author's office to ask questions about the task and it was decided to put the conversation online to assist other students in their understanding of the subtleties of the learning design. The following is the gist of the conversation added to the online Blackboard Learning Management System with an email sent to students urging them to 'check out' Marinetti's questions.

■ ■ ■ The conversation is reproduced here as the author found it interesting to reflect that the depth of detail was easier to communicate in a question and answer form than in the briefing document. Comments like 'So why are we doing this anyway?' and 'So it's not really a debate' allowed the students to engage with the communication:

Marinetti (3/5ths of the group): Can we ask you about the challenging and live thing?

Darrall: What do you need to know? (thinks - Trust Marinetti to be the group asking all the questions!!!)

Marinetti: Well with the challenging statements do we challenge the individual sentences of each of the other group?

Darrall: No just pretend you are Marinetti and challenge El Lissitsky's opening statement as a group, in which you might find you agree on some things and disagree on others... but you put into that forum only one 500 word statement done by your whole group and pasted together, or written by one person as a weave of four other contributions...

Marinetti: So what are we being assessed on?

Darrall: There are only two criteria in this online subject (20% of your total) and

they are in the brief:

1. The depth of research in substantiating points of view

2. The cogency with which arguments and rebuttals are developed

These apply to the Opening Statements, the Challenging Statements and the Live Presentation. The group mark will then be converted to an individual mark according to your feedback on *SPARK* (instructions on this will be put up after Thursday).

Marinetti: So do we just read the challenging statement in the live presentation?

Darrall: No, the live presentation is an opportunity for you to (creatively) make a few points from your position as Marinetti, relating to your position as an EXPRESSIVE designer/typographer/philosopher - but not mentioning Lissitsky (this is different to last year shown on the video)

Marinetti: So why are we doing this anyway?

Darrall: Well I tried to explain it in the lectures and in the brief... The idea of this project is to help your understanding of three things:

1) That famous designers/typographers from history (and some still alive) had points of view about design that stretched from "design is all about expressing yourself' to 'design is all about the function of solving a communication problem' (EXPRESSIVE versus FUNCTIONAL)

2) That by trying to 'get inside' who they were and how they were, and what they were trying to do and how they did it (as per the FIVE questions that guided your research and Opening Statement)... you can 'experience' another person's position and therefore be able to reflect and question your own position on that sliding scale of expressive approaches or functional solutions.

3) That design history is not a dead subject that you can study and remember as lists of dates... it is a live engagement with people who lived or are living, and who became well known as designers or typographers or even philosophers (as in the case of Marinetti).

Marinetti: OK ... it would be good if all the groups could hear this...

Darrall: Yeah, well because I'm on study leave and not assessing, and actually researching these online systems I'm trying to cut down on face to face explanations and put it all online.... By the way there will be a couple of online questionnaires for you to fill in so we can see what you think is working or not working and what can be improved...

Marinetti: So in the live presentation it's not a debate rebutting the other 'person's' challenging statements?

Darrall: No, that became a bit too messy last year, there were more groups than previously and students complained they didn't have enough time to make their points (it also became a bit of a slanging match)... so this year you will be making points in a creative or theatrical manner with something visual (either PowerPoint or plain paper which can be projected or a transparent overhead transparency)....

Marinetti: Do we all have to speak?

Darrall: No, the way it will work is that I will choose groups to make their points in random order ... (approximately 7 minutes for each group). They can be read as a statement by one person or you can tell a Marinetti joke or do a mime or whatever (remembering the assessment criteria)... I will also be asking you to put Marinetti's name in a position on the spectrum scale from EXPRESSIVE TO FUNCTIONAL... Obviously all members of the group need to contribute in some way, like finding the visuals or dressing up or whatever...

Marinetti: So it's not really a debate?

Darrall: Well the online submissions (Opening statements and Challenging Statements) are what's called an asynchronous debate, and the live performance should feel a bit like a debate as points will be made from these different important people from history (some of which will conflict with each other)... So is that OK....???

Marinetti: Yeah that feels much better having talked to you... yeah it's a pity the other groups can't hear this too....

Darrall: Yeah well they know my email... (thinks - maybe I can put it online... hmm...)

Assessment processes

As this was a group learning task the assessment was in two parts. Students were consulted about the criteria for the group self and peer assessment and these have varied over time in different iterations of the task.

1. The group submissions

In this particular 2003 iteration of the learning task there were only two assessment criteria to cover all three parts of the task (Opening Statements, Challenging Statements and Live Debate). The criteria related to the two learning objectives for Research and Process:

a) RESEARCH - Depth of research in substantiating the points of view, and

b) PROCESS - The cogency with which arguments and rebuttals are developed. Online criteria based software (*ReView*, described in Chapter 3) was used by the lecturers and tutors to mark and give feedback on this task and the other two tasks in the Introduction to Typography subject. Students logged on to see their group's assessment and feedback online. It is interesting to note that in the 2011 iteration of the task the assessment criteria are expanded and colour-coded to match graduate attribute categories as follows:

- Thoroughness of research in on-line submissions. This particularly in regard to a deeper approach to finding out about your given typographer / artist / designer. (Critical Thinking and Research)
- Cogency of argument developed in on-line submissions. This particularly in regard to the clarity and impact of points made. (Communication and Interpersonal Skills)
- Critical reflection apparent in the live debate. This particularly in regard to the depth of engagement with the issues raised. (Attitudes and Values)
- Effectiveness of visual presentation in the live debate. This particularly in regard to the creative use of drama and imagery. (Creativity and Innovation)

2. The group self and peer assessment process

The live debate was videoed and stills from the video were put online as a reminder of the process whilst group members had ten days within which to rate each other and themselves using the online *SPARK* (Self and Peer Assessment Resource Kit) software (described in Chapter 3).

The factors produced from *SPARK* ratings were then used to change the group marks to individual marks based on the self and peer ratings against the nine criteria listed:

Category	**Criteria**
Online Submissions	Contributing to the cogency of written submissions
Online Submissions	Doing research and finding references
Efficient functioning	Helping the group to function well as a team
Efficient functioning	Level of participation in the online debate project
Efficient functioning	Performing tasks efficiently
Quality of engagement	Suggesting ideas
Quality of engagement	Understanding what was required
Leadership	Helping decide who does what and when
Leadership	Bringing things together for a good team result

It is interesting to note that whilst these were the criteria in the 2003 case study,

the 2011 iteration of the task now allows the student groups to negotiate their own criteria for this group task. The student groups each present these as numbered lists 1 to 6 so that when entering ratings they refer to their own list against each number in *SPARK*.

Together with numerical rating factors the students were encouraged to provide written anonymous aggregated feedback for each other through the *SPARK* online system.

The self and peer assessment factors were used to calculate individual marks reflecting the contribution of students to the listed criteria.

Discussion of Results

The results discussed here relate to several iterations of the learning task described.

▲▲▲From 180 forms (**sample at Appendix 4**) collected during the live debate/presentation sessions 102 showed a very significant shift in the students' own position on the Functional vs. Expressive spectrum compared to that position prior to the online debate task.

The following is an example from one of the groups who had identified their typographer as positioned at the functional end of the design spectrum:

"Why, Neville, do you blatantly break all conventions, going out of your way to be different purely for the sake of it? You say your work 'typifies your sense of self, and it is through typography that your identity is personified.' A nice idea, but where does your viewer enter the equation? As Bayer rightly stated, typography is 'a service art not a fine art'. It is there for both the designer and the viewer, a means by which a message is not only given but also received and understood. To use typographic design in a way that is expressive to the point of inhibiting the viewer from grasping the original meaning is surely nothing more than egotistical self-indulgence. Be bold, be daring, but remember your audience!

(from the student group 'being' Laszlo Moholy Nagy to the group 'being' Neville Brody, online)

The following is part of the response from the Neville Brody group:

"I do not agree with your philosophy of uniform lettering and elimination to detail. Type must be visually engaging in order to attract and maintain attention. With expressive type, the end interpretation is always left up to the audience, and

to the designer, successful design is one that creates a mixture of reactions. I strongly believe that in order to make changes to what already exists in the design world we have to find the courage to risk being different. Originality is the key to distinction."

There were many more positive than negative comments but the following are representative of reflections from three iterations.

Positive:

"I actually really enjoyed it in the end. I must admit I thought it a very strange project to begin with, but the whole concept of taking on their identity and finally acting out their role really brought their ideas to life. Group work was stimulating - I was fortunate to have great people to work with".

"It's an interesting way of learning about a particular designer's take on design. It's better than writing a 1500 word essay on him/her... allowed a certain amount of freedom in terms of midnight deadlines, group work via email, fitting into already busy schedule. Was great because I live so far away from uni that deadlines were very easy to comply to without the stress of travelling".

"Since we have to 'be' the person and discuss it with three other people online as well as in person, I think we learn more through it than just a plain essay"

"It was great fun, very engaging and just hilarious to see everyones presentations".

Negative:

" I didn't like the group work... this is surprising seeing that I had a brilliant group of friends to do it with. but i am not a fan of group work because the end product is always a compromising of different peoples ideas which in my opinion affects the quality and potential of the final product".

"I found communication difficult, as I often have problems getting onto the net at home and had to go a few days without important info because I couldn't access the web. If some info is vital it could be presented on Thursdays in class, and not posted online less than a week before it's necessary for hand in etc."

"Trying to communicate with non-english speaking international students was difficult. Often when one on one with them from their facial expressions and body language you can understand what they are trying to communicate, however online this was rather difficult. I have never caught onto the smiley or emoticon thing, and consequently one of my fellow group members and I really struggled to communicate. As I acted as the kind of facilitator bringing all of our debates together (very late on Sunday nights!) it was important for me to

communicate one on one with everyone in the group and then to reply back to everyone at once".

" I hate group work".

This last comment is important as many students who come to university from school have already experienced difficulties working in groups. The use of *SPARK* described in Chapter 3 was intended to allow students to engage with group work knowing that contributions would be acknowledged. The following two comments from focus groups relating to this task and the *SPARK* program highlight the subtlety of managing group work issues:

"OK. Well, it was interesting because before I used SPARK, when I thought about this particular group experience, I just kind of thought some of us did a lot of work and some of us didn't. And then I looked at it and I tended to be more in the 'did a lot of work' group, and then I looked at and there were all the questions and I went through them, and it made me think about different angles of the group work. Like the one question, one of the questions down the bottom – how did everyone work at structuring the team and making sure that the team was ....do you know what I mean...And I sort of had to give myself a really low mark for that because I just sort of agreed to take on all this work without saying maybe we should share it around and try to make an effort to get the team involved. And just sort of taking it all on myself. And so I found that question really made me think about the way I work in groups..."

The following comment led to a change in the *SPARK* software to use phrases instead of numbers and allow students to make anonymous comments that each student received.

"With the SPARK assessment for the group, I would have liked to be able to write a comment about overall how I felt the group worked as a whole, rather than just giving everyone a number. Because one of my friends was in a group – she was the only Australian in the group and everyone else was an international student and she had heaps of trouble doing it because she was doing most of the actual group work. She didn't think it was fair enough because of taking that into consideration. Maybe it should have comments or something after each thing or question for each person.

Conclusions

Analysis of the paper-based reflections described in the Learning Design section exposed a variation in students reflections about the spectrum between purely functional and self-expressive views of art and design. This design thinking approach to a history subject was instrumental in causing students to reflect on the work and philosophies of many significant figures both current and historical. Further analysis showed that students had shifted their own position as a designer on the spectrum having studied a particular figure themselves and witnessed the debates and student presentations of the work and philosophy of many others. The tutors monitoring the process also needed to encourage the students to engage with the work of their groups' designated typographers/designers during the classes where students were engaged with the practical tasks being attempted in parallel with this online debate.

■ ■ ■ On reflection, subtle changes have happened to this task as a vehicle for student learning and attribute development over a number of years. The dynamics of this learning activity are intricate and require an engaging introduction supported by 'just-in-time' explanations using online systems. The design interface and ease of access of the online systems ReView and SPARK used in this engagement were vital to its success. This case study is testament to the value of design and design thinking when applied to the unpopular subject Design History. The use of role-play with an intricate approach to student motivations and dynamics supported by online systems were the factors that warranted its inclusion in this thesis.

This learning design still continues as of 2012 and is currently being further developed by another academic staff member.

LEARNING DESIGN 2: A Learning Design involving external client organisations (case study format)

Problem-based learning has many advantages over its more frequently used project-based approaches where a specific brief directs students and supplies relevant research and resources. The author was the main designer of the following learning design that continues to be refined and developed as a core third year subject in the Bachelor of Design, Visual Communication at the University of Technology, Sydney. The subject is important in this undergraduate degree as the purpose of subjects in the third year is to develop students' broad understanding of the design professions and their role as a designer in society. Student engagement with clients is difficult to manage and the scaffolding of the experience relied heavily on careful use of the author's two software systems described together with the University's learning management system. The case study originally conducted in 2008 but modified in this thesis to include data and comments from other iterations of the subject describes a learning design that harnesses the design skills of third-year design students for the benefit of charities, social services, indigenous and ethnic communities and a variety of not for profit institutions.

▲▲▲ 1. Refer to the **animation** developed to introduce the Subject to 3rd year students included on the DVD attached to this thesis. **Filename: CommProj.mp4**

2. Refer to the **Australian Learning and Teaching Council published report** on Case Studies of Effective Practice *(Thompson, D.G. 2009, p.19-28)* on the DVD attached. ***Filename: STP Report Vol 4.pdf.*** The following learning design was selected and presented as a best-practice exemplar of effective practice by a team of studio teaching practice researchers.

3. Refer to the certificated **Human Rights and Equity Award** on the attached DVD. ***Filename: HumanRights.jpg.*** The award was given to the development of this subject in 2003, and constitutes evidence of longevity of engagement as the author is still currently teaching, coordinating and developing the subject.

CASE STUDY FORMAT	**Visual Communication Honours Degree (3rd year):** **Core Subject: VCProject – The Community** **Responsible Academic:** **Darrall Thompson, Senior Lecturer and Director of Teaching and Learning**
Section	**Descriptions**
The Learning Context	Community Project is a Core Subject, run in Spring Semester (13 weeks) August – November, carrying 6 credit points out of 24 required for a student full time load in the semester. It is conducted through 3 hours tutored per week plus occasional lectures. The author has developed the subject over a number of years since 2000, but more recently has introduced online systems to support the process and cope with increasing student numbers and projects. (Spring 2007, 70 students completed 14 community projects) (Spring 2008, 80 students completed 15 community projects) (Spring 2009 85 students completed 16 community projects) (Spring 2010 105 students completed 20 community projects) The theme of the third year of the Visual Communication four-year honours degree is 'professionalism' with a focus on industrial experience and the design profession. Community clients have ranged from Non-Government Organisations, aboriginal communities, aboriginal organisations, ethnic organisations, Government funded agencies, peak bodies, large charities, local council groups, local community groups, lobby groups etc. The theme of the third year of the course relates to concepts of professionalism and individual career orientation. Academic tutoring staff (all with professional design expertise and current practice) worked with approximately 20 students (in groups of 5) and three hours per week contact time. Students worked on given projects and were formed into groups according to expertise needed for the project and a mix of academic levels (averaged from previous years' results). The groups worked in different a studio context sometimes meeting with the clients on-site or in the University café.

The Learning Design

The author and other tutoring staff acted as guides and coaches through the various phases of this problem-based learning design. Students engaged in a research phase followed by design-brief development, budget and timeline management, design and presentation, and technical specification and costing. The tutors employed were also practising designers and gave the benefit of their experience in client liaison and encouraged students to try different team roles throughout the project (eg minute writer, project manager, resource finder, client contact, presenter etc).

The live client scenario meant that students had to learn a variety of qualities, knowledge and skills vital for a professional designer. They also had to develop project management and client liaison skills; research a community context that was often outside their normal range of experience; design appropriate cost-effective solutions within tight budgets; and understand the viability factors of the communication strategies proposed for the community clients. There was the added challenge to learn or collaborate on the technical skills of production in print, web or video that may not have been part of their previous elective pathways.

This problem-based approach utilised four online systems to facilitate the process:

- BaseCamp project management system, an online system for keeping track of project documents, minutes, milestones etc.
- UTSOnline (Blackboard learning management system) was used to communicate Subject information and provide background resources, readings etc.,
- *ReView* online criteria-based assessment for online feedback related to the attributes developed in the Subject .
- *SPARK* (Self and Peer Assessment Resource Kit) for reflection on individual contributions to the group projects.

Groups of 3 to 5 students (depending on project complexity) first met their clients in an informal University café context for a general discussion towards the eventual development of a design brief. Students then researched the clients' communication objectives and needs, visiting premises, talking to

	volunteers and recipients of the charity/service and searching online for context. Having developed an approved design brief that was appropriate to the clients' deliverable needs and the students' capabilities, an interim presentation together with tutor guidance and monitoring of client communications and research processes kept the projects on track. The final presentations are generally done in a professional presentation space with four or five student groups and their clients together with all the tutors. In this session students are given anonymous forms with detailed criteria for presentation feedback, whilst clients receive a more open question feedback form about different aspects of the project processes and final productions.
Assessment processes	Students were invited to self-assess against criteria using the *ReView* online criteria-based assessment system prior to being marked by academics. This was not obligatory but approximately two-thirds of the students used the system. The SPARK Self and Peer Assessment Resource Kit was used at both interim presentation and final presentation stages and the SPARK factor was used to produce an individual mark for each student in each of the groups (a process described in chapter 3). A whole day of client presentations in a University lecture theatre at the end of semester garnered comments and feedback from community clients and academics not directly involved with particular projects. Students had to present both their process and product highlighting rationales for strategies employed and difficulties encountered.
Discussion of Results	Comments from community clients, paper-based student subject feedback surveys and staff/tutor focus groups have been used to gather feedback about this learning design over a number of years. In one particular survey of students: 89% of respondents agreed that the project was relevant to their personal development. 98% of respondents agreed that the project work was relevant to their

professional development.

19% of respondents valued the project most for their feelings of 'helping' and 'doing something worthwhile' and 13% felt it was a 'rewarding personal experience'. 6% liked 'experiencing a different cultural context'.

Some representative comments from various iterations of the subject include:

"It was really interesting researching and experiencing aspects of the disabled community."

"In regard to communicating with an Indigenous audience, this was a really good experience, because I hadn't done anything in that vein before and found the attitudes really interesting."

"Working for a not-for-profit organisation gave a different spin on the design project; there was a sense of wanting to keep giving and help out, and I became very motivated and supportive of the cause that [my Client] was promoting."

★★★ *"I liked partaking in this project because it was a taste of dealing with a real life client, and attempting to solve/resolve their actual requirements. Working voluntarily for a community initiative made toiling towards a personal academic record for a university subject seem less futile. The group effort was satisfying as well, due to the amount of work and collaboration involved for the end result."*

"In day to day student life, working for marks and kudos from lecturers is fine. However, having a project applied to the real world is invaluable (to students, and I would also presume to clients)."

The following comments from students about the use of the *ReView* software came from paper based subject feedback surveys administered by the University.

"The software was useful in encouraging me to critically analyse the quality and standard of work I had submitted. My final score in self-assessment was very similar to the actual score I received".

"I found it very useful to be aware of the specific attributes that graduates have to develop and the areas they have to be applied in.

"Make it compulsory that all Tutors must use it!".

"Makes clearer what is required for a good mark and what results in a poor mark".

- Students who self-assessed using the *ReView* system seemed to do so thoughtfully (less than 2% rating themselves against the assessment criteria did

so at the very top of the grade scale. Almost half the criteria self-assessed (47%) were underrated compared to the tutor's assessment.

Conclusions

The motives and values of the learning design need to be repeatedly discussed with academic staff and students prior to and during the learning activity. Explaining to students and staff the reasons for the method of group formation and project allocation is vital to the success of this learning design.

The use of the *ReView* and SPARK online systems to support learning activities has time-saving advantages in marking and feedback, but as there were four web-based systems used to facilitate this subject there needs to be a central access point for all of them. In this case the learning management system UTSOnline (Blackboard) was useful.

The dynamics of this Community Project core subject gave multiple opportunities for attribute development and the following points have been made by academic staff about this learning design:

- Students had to address a real-world problem working with clients who didn't understand design and were often volunteers;
- Groups formed on the basis of expertise and a mix of academic levels had the benefit of students often finding themselves in groups that had not worked with each other before;
- The projects often challenged the students' views about other racial or socio-economic groups (for example the Jewish student who worked on a project for the Muslim Women's Association commented that this was the best educational experience she had encountered);
- The projects often gave insight into ethical issues that students may have not previously considered (for example only using original aboriginal artists' work and getting elders' permission for the inclusion of content in websites etc);
- The use of the online systems was a great relief for academics and students and also community clients who could stay in touch with projects without having to visit the University (some projects were for Northern Territory communities);
- The *ReView* online system directly linked these attribute benefits to graduate attributes used across other School of Design subjects and students could see a coloured pie chart of the weighting of attributes this subject was intending to develop.

On reflection the major values of this particular learning design are:

- The development of mutual commitment to outcomes for students, community groups, academic staff and universities.
- Encouraging respect for others' knowledge and cultural contexts.
- Students and staff accepting and acknowledging that discomfort and tension often accompany new and important learning experiences.
- Utilising university resources for community development in delivering real assistance to marginalised and under-resourced communities.
- Engaging staff in identifying the graduate attributes developed by this core subject and coding each of the assessment criteria to those attributes designated in the *ReView* software.
- Offering students the opportunity to self-assess their own performance against attribute-related criteria, and to self-and-peer assess contributions to a group activity.

The design of this subject is an ongoing research project. For example the approach to assigning students to groups and then projects to groups has been changed over time. In one iteration the Community Project subject students were assigned to groups randomly and could not choose the community project for the group. The next time the groups were based on interest in the chosen project. Feedback prompted the improvement applied recently, that students would be allocated to projects according to the skills likely to be needed for the community project, but to maintain the opportunity for individual students to apply for inclusion in a particular project group. Given the need for balance in the random assignment of students to groups, they are now allocated on the basis of academic performance (previous two semesters work), gender and ability in particular aspects of design potentially required for the project (eg information design, graphic design, illustration, web design, photography, video, animation, etc).

Further improvement in the Client Briefing Proforma now gives specific help to the community clients concerning the frequency of meetings, content required and dates for academic deadlines that the students were required to meet during the process.

Chapter 4 Reflections

The learning design described in this case study format fulfils a number of the rationales identified in Chapter 3 and reiterated at the beginning of this chapter. There is clear evidence of students' adoption of a deep approach to their learning in the context of an unpopular subject outlined in Learning Design 1. To engage students deeply with their learning is difficult when the topic appears not to be immediately relevant to the skills of the core discipline or employment prospects. Given the rationales referred to the author needed to take into account a broad range of parameters in the design and refinement of this engaging learning activity and assessment process.

The case study for Learning Design 2 also uses role-play but taken to a different level for 3rd Year student engagement/development using the introduction of live external clients as one of the learning design components. The success of this learning design is evidenced by its selection as a studio teaching exemplar and a Human Rights award (refer to STP Report Vol 4.pdf and HumanRights.jpg on the attached DVD).

■■■ These external acknowledgements gained publicity in the University and highlighted the author's software that supported the integration of graduate attribute development. This publicity alerted the Associate Dean of the Business Faculty at UTS and after a presentation to her staff by the author (described as part of the following chapter) she recognised the ReView software's potential for assurance of learning and external course accreditation that was becoming a crucially important factor for Business Faculties world wide.

The following chapter firstly explores the author's involvement as a co-project leader engaging with the Associate Dean of the Business Faculty in a subsequent Australian Learning and Teaching Council funded project for business education and secondly his involvement as co-investigator with the Dean of the Business Faculty for a Government funded scoping study where design and design thinking shaped both the process and the outcome.

Chapter 5

EDUCATION PROJECTS: Government funded

Foreword

Chapter 5 explores two very different Australian Government funded projects with the purpose of exploring the author's educational change journey in a broader context. The first project funded by the Australian Learning and Teaching Council (ALTC) involved the author as Co-Project engaging with the Business Faculties at four universities. The chapter begins with an anecdote explaining the reason for the author's involvement beyond the discipline of design but is directly related to an educational change facilitated by the ReView online criteria-based assessment system.

The second project commissioned by the New South Wales Board of Vocational Education and Training (BVET) involved the author as Co-Investigator leading a complex scoping study attempting educational change through engagement with broad sectors of the community in a specific part of the Sydney Central Business District. This project required a complex use of design and design thinking to foster the engagement of those concerned.

Example 1. Government Funded Project from the Australian Learning and Teaching Council (ALTC)

The case studies in chapter four indicated how design thinking was used to integrate the dynamics of student engagement supported by the author's *ReView* and *SPARK* software solutions. However, these examples involved design students in a design school where problem-based learning, design and design thinking are supported in teaching and learning approaches. The ALTC project here described involved a close engagement with business academics at four universities where the teaching, learning and assessment culture was very different.

The following anecdote formed the basis for the ▲▲▲ author's invitation to be Co-Project Leader in a project beyond his own discipline and for highly accredited Business Faculties in four Australian Universities.

■■■ *On 20th June 2006 the author was invited by the UTS Business Faculty Associate Dean Teaching and Learning to present his ReView software to the Heads and Deputy Heads of Program. The invitation was due to a growing concern, supported by survey evidence, that few of the Business Faculty staff were aware of graduate attributes and their supposed curriculum integration. More than twenty senior staff attended the event and given the survey data it was no surprise to the author that the reception of the ReView presentation was hostile. However, the following reasons were probably involved:*

• *The majority of subjects taught in the Business Faculty used didactic lecture/tutorial methods and between 60 and 80% exam assessment components, in some cases exams constituted 100%.*

• *Prior to the presentation the participants had been given the author's published book chapter titled 'E-Assessment: The Demise of Exams and the Rise of Generic Attribute Assessment for Improved Student Learning' (Thompson, 2006)*

• During the presentation the validity of high stakes exams and lecture/tutorial approaches was questioned by the author with evidence and examples from educational research literature.

At the end of the presentation the Associate Dean announced that she would like to support a pilot scheme using ReView and asked for volunteers. There were none forthcoming. She then offered two hours per week teaching release and one member of staff agreed. This was clearly disappointing for the Associate Dean, but after agreeing to assist it was clear that this would not be an easy exercise. In our early conversations he admitted that marking was very painful for him. For example he often asked for a minimum of 5 references in an essay but then had to write feedback 'do not just bolt on your references at the end, they need to be integrated into text with quotes to support your argument.' The author's suggestion was that when developing assessment criteria they could mention the detail of this as one of the aspects he valued in the assessment process. The assessment criteria he finally used was, 'quality of references used to support your argument using quotes within the text (rather than just bolted on the end)'.

Including this as part of the assessment criteria together with the other criteria we developed made the marking process far easier and more explicit for both his tutors and the students. Having used ReView for one of the subjects he then made a presentation to his colleagues to illustrate the improved clarity and time saved in marking. The accounting academic was also responsible for the internships of students in major companies in Sydney. He decided to use ReView for the assessment criteria marked by on-site supervisors to provide feedback to himself as coordinator and for the students involved.

This small beginning and subsequent successful pilot study with more staff eventually led to our application for an Australian Learning and Teaching Council (ALTC) Large Project Grant. Due to a change in Government this organisation is now known as the Office for Learning and Teaching (OLT).

Summary of the ALTC Project:

The title *'Facilitating staff and student engagement with graduate attribute development, assessment and standards in Business Faculties'* involved four Australian universities and focused the project on developing an approach to

embed graduate attributes in the Business curriculum using the author's online system, *ReView*, to assist with the process.

Graduate attributes were often mentioned in curriculum documentation but the effective integration of these into developmental approaches in practice had proven to be somewhat elusive. The consistent alignment of graduate attributes with assessment processes has not been widespread across the higher education sector *(Chalmers & Thomson, 2008)* and this was particularly the case with business faculties. The apparent lack of viable processes with which to engage staff in linking assessment to attributes initiated the development of a design thinking approach that embraced social constructivism where assessment processes have been shown to enhance student learning *(Rust, O'Donovan & Price, 2005).* In a social constructivist approach knowledge about assessment processes, criteria and standards is developed through the active engagement and participation of both students and their educators *(Kember & Leung, 2005).*

However, the main driver for academic staff and the Associate Deans involved in the project was the accreditation or maintenance of accreditation from international bodies, such as EQUIS (European Quality Improvement System) and AACSB (Association to Advance Collegiate Schools of Business). These accreditation organisations require institutions delivering Business education to be able to demonstrate a process for ensuring that students achieve designated learning outcomes. The process developed, implemented and evaluated as part of this project was trialled as a mechanism for providing evidence to assure that certain standards of student learning and graduate attribute development are met. The fact that the institutions were already AACSB accredited gave substance to the benefits of dissemination to other institutions.

The embedding of graduate attribute development and assessment evolved from the innovative approach originated by the author in Faculty of Design, Architecture and Building that was being used to assess and give feedback to students on their work. This method of assessing and tracking graduate attributes via assessment was incorporated into a pilot project at The University of Sydney, where the online assessment system was successfully implemented. The initial pilot led to a further implementation at UTS business and subsequently to the ALTC project proposal which aimed to further develop the

integration of graduate attributes, with both staff and students using the existing online system, *ReView*, in the implementation *(Thompson & Treleaven, 2008).* The author's previous use of student self-assessment for engagement in the attribute-based assessment process was also designed into the approach.

The evidence from this ALTC project has shown that students and academic staff perspectives do differ at the beginning of a unit of study but the process of self-assessment and receiving feedback related to assessment criteria can assist students to gain perspectives more closely aligned to those of the teaching staff. This increased understanding was also evident in data that indicated students' self assessment became closer to the tutors' marks as they progressed through a unit of study, showing that expectations were getting more accurate as a result of this process of engagement. This evidence can be triangulated from a number of sources. In the transcripts of the project team's reflections it is possible to see how the *ReView* online software system acted as a catalyst in this capability development and the alignment of graduate attributes with intended learning outcomes, teaching and learning activities, assessment tasks and assessment criteria.

▲▲▲ The study of student self-assessment became an important area of research and led to a research relationship together with ongoing journal articles *(Boud, Lawson and Thompson, 2013).*

The project involved 18 units of study across the four universities engaging 78 academic staff responsible for 9,529 students, with pre and post surveys and analysis of intended, actual and unintended outcomes. The surveys indicated that direct links to graduate attributes and the self-assessment mechanism assisted the students to gain a better understanding of both what was expected of them in their assignments and how the assignment could demonstrate their graduate attributes. The students also reported they were able to clearly see how the assessment criteria linked to the graduate attributes (79.6%) and that this meant that the criteria being applied for assessing were easier to understand (76.4%).

The academics' perspective was largely captured through interviews conducted by a Professor on the project advisory panel and the following two questions and responses give a snapshot of staff responses.

Interview Question: *Do you think the students have learnt more about graduate attributes than they might have done under previous ways of teaching or assessing?*

Interviewee Response:

> *Yes, without a doubt. lt makes you talk about them so much more. When they say to me, I don't need clear writing; I want to be a stock broker... (laughter) and I say, a stock broker needs to write reports... That's what I would say about the graduate attributes, you've got to link it all in and make them connect the dots.*

Interview Question: *How have your criteria for evaluating or assessing these graduate attributes changed as a result of being part of this project? Have they changed?*

Interviewee Response:

> *They did for me. I thought about this post going through the ReView process. Where in the past you'd build your course outline by thinking about what the subject terrain involves -so you slowly build it about how you're going to develop the course so you can deliver what the students need to learn. With ReView, it made me work backwards. So from the assessment tasks back into what the course involves. lt really made me think about, what is it that I'm getting these students to do? Beyond answering an interesting question and going into that research and inquiry phase that we get all students to go through. lt made me focus on, what does this task involve and how is it really honing in on particular graduate attributes? I did that implicitly and it forced me to think about it explicitly. lt really broke them down without discounting what the whole meant. lt didn't sort of splice it up and break it down into a meaningless set of components. lt really made me think about what I'm getting each student to evaluate in what they're doing and what I'm assessing as the result of that.*

The reflection about ReView from this staff member that 'it made me work backwards' is significant in that the design thinking built into the software was

encouraging a much more thoughtful engagement about 'what it is I'm getting these students to do'.

▲▲▲ There is a video interview of one of the staff members from Queensland University of Technology who had a very large class in the Business Faculty during her involvement in the study. This is included with the DVD attached to this thesis. ***Filename: AbbyCathcart.m4v.***

The process, objectives and outcomes of the project have been presented to a variety of audiences at both national and international conferences, for example AACSB International Conferences and the Australian Business Deans Council (ABDC) National Conferences. Each presentation included an evaluation to garner feedback and suggestions for the project. The majority of comments from colleagues in the Business Education sector were very positive with responses including the following quotes:

• *Very innovative*

• *I will use this presentation as the basis of making changes in T&L at my university*

• *The bottom up approach and involving student self assessment is inspiring. Thankyou*

• *This initiative is really innovative and is particularly interesting because it goes beyond AACSB requirements*

• *Proactive and informing presentation, will be very useful to teaching & learning development at my university*

• *Would be keen to experiment with this tool.*

The final detailed Australian Learning and Teaching Council report (ALTC) *'Facilitating staff and student engagement with graduate attribute development, assessment and standards in Business Faculties'* is included as a pdf file on the DVD attached to this thesis. ***Filename: ALTC Final Report.pdf***

Example 2: Government Funded Project from the New South Wales Board of Vocational Education and Training

▲▲▲The author was Chief investigator for a previous funded report to the New South Wales Board of Vocational Education and Training titled: 'Improving Systemic Approaches to Innovation Skills Integration in the Creative Industries' August 2009, and as a consequence was invited by Professor Roy Green, the Dean of Business at the University of Technology, Sydney to be co-investigator on a much larger scoping study commissioned by the same body. The reports produced are included as pdf files on the DVD included with this thesis.
Filenames: NSW_InnovationResearch.pdf and NSW_CreativeHubReport.pdf

The scoping study was commissioned to encourage change in the educational provisions of the Higher and Vocational Education Sector by exploring the possibility of the development of a creative hub in part of the Sydney Central Business District.

The co-investigator function included the design of the study and associated events, ethics clearance, interview processes and budgeting together with the design, compilation and written presentation of the final report. Description and reflections about this process are included here to illustrate the author's application of design and design thinking to a broad context that takes into account aspects that analytical studies would not embrace.

Summary of the scoping study

The study had its starting point in the gathering of creative businesses and community activity in Sydney's vibrant, multi-cultural area around southern parts of its Central Business District. This activity encompassed digital media and advertising, film and television, architecture and planning, fashion and design reinforced by the development of social networks and collaboration. The Board asked what could be done to facilitate the growth and diffusion of this activity, including the opportunities for collaboration, and how could education and skill providers best contribute to build innovative potential and capability in firms and organisations.

The design thinking aspect began with developing an overview of the interacting and overlapping dynamics and orientations of the organisations affected with a view to engaging them in a design thinking event. The aim of this first process was to introduce key people from those organisations to the issues faced by each other and the various perspectives and motivations involved.

There are two main education sectors in the Australian system, the University sector for Higher Education and the Vocational Education and Training (VET) sector that commissioned the study.

There are three main levels of Government in Australia, Federal, State and Local, but only two levels were to be included in this scoping study. Sydney is controlled by the New South Wales State Government together with the local City of Sydney Council. In order to clarify the holistic approach to the overlapping stakeholder domains, the author formulated four broad categories and then conducted research to identify key personnel in each.

Developing the Categories and the Design Thinking Event

Given that the scoping study concerned particular types of businesses the category 'Business and Creative Industries' was used to emphasise this distinction. The two sectors of Education and Government were clear, but the remaining sector was also very important and was characterised with a three-part title: 'Arts / Culture / Community organisations'. The author proposed that the future needed a new conductivity that integrated education with business, government, arts/cultural and community sectors

The four sectors to be addressed were:

- Education (University and VET Sector)
- Businesses and Creative industries
- Government (Local and State)
- Arts / Cultural / Community Organisations.

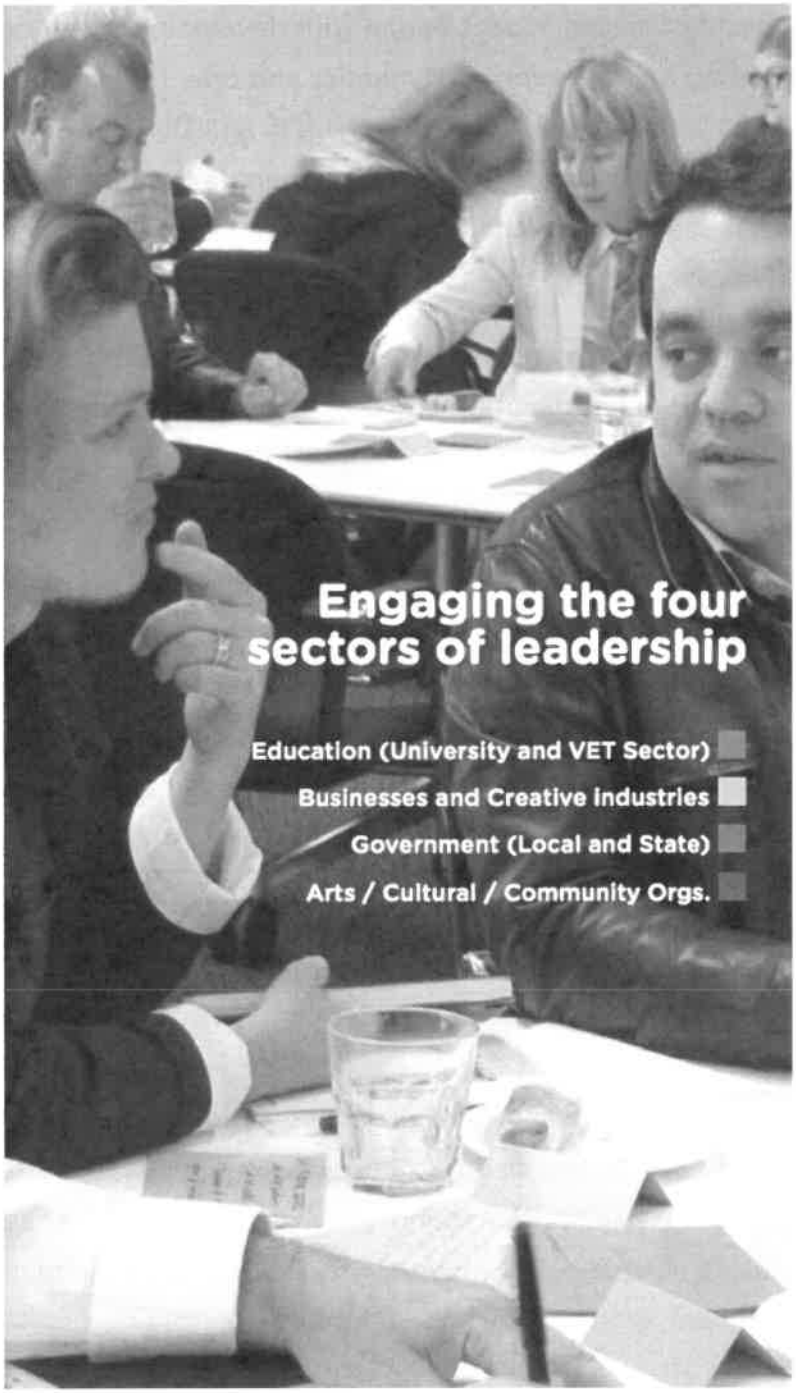

Figure 27: Design Thinking event participants from the four sectors in workshop role-play exercise

It was important that these four sectors viewed themselves as equal partners in leadership and logical that education could act as broker in bringing together an engagement between them.

The design of the Design Thinking Event

This event brought together 47 participants with an interest in the creation of a 'Sydney Business and Education Creative Hub' from the four sectors identified. The idea was to engage individuals in two key aspects of design thinking. Firstly to reduce the silo mentality between sectors by de-signing participants (they did not have name badges or their sectors identified). Secondly, to 'put oneself in another's shoes' through being challenged to address and discuss a range of presented scenarios from the viewpoint of a sector different from their own. The invitation to the event used the concept of 'de-signing' to create a fluid state between participants. The idea that a fluid was also a solution was used to justify the removal of participants' identity for an event targeting solutions to problems. To enhance the fluid nature of contributions an illustrator was engaged to draw ideas and participant feedback projected live on two large screens from a digital drawing tablet.

Objectives

The idea behind the design thinking workshop was to adopt a problem-solution approach to explore the issues around learning, training and working in the creative industries in Sydney. The role-play exercises aimed to start defining visions for the hub, defining its key activities, possibilities for its structure and physical expression in the built environment.

Findings

The event participants provided feedback on the existing issues surrounding the consolidation and expansion of the emergent creative cluster around the designated area. The participants were asked to categorise the issues by the specific sector issue referred to on colour-coded cards: education (green), business (yellow), arts and culture (red) and government (blue).

In summary, the findings indicated that a Creative Hub should operate at three different levels:

1. **At the level of a coordinated organisational framework** between government and partners such as local major cultural institutions, educational institutions, local creative businesses, and students focused around learning and innovation

2. At the level of a virtual network, where casual connections with the hub can be made by individuals, businesses, schools and cultural institutions to strengthen its activities through a ubiquitously accessible free wifi web platform.

3. At the level of a spatial network of social, exhibition and work spaces, as well as through a central space that makes the creative activity of the hub visible and perceptible in the urban environment.

Ethics and Interview processes

The project spanning diverse domains required in-depth interviews with key leaders within the four categories with full ethics clearance. The author conducted a total of eight in-depth interviews. Then due to possible conflict of interest a further six were conducted by consultants employed for the purpose.

The interviews conducted in June/July/August 2010 were structured around three themes: Understanding the current activities in the Broadway/Ultimo area at large, discussing the possibilities of the hub and finally identifying motivators for involvement.

Discussions around each interviewee's experience of working in and around the creative industries in Sydney revealed a fuller picture of the creative industries in Sydney. The interpretations of the constitution of a creative hub naturally diverged from person to person. Some focused on the organisational aspect of a hub whilst others were concerned with spatial and urban expressions that would have societal impact.

One of the immersive characteristics of design thinking is the consideration of motivations for engagement in all the sectors involved. Whilst there was general consensus that a hub would be beneficial, the interviewees' motivations for engagement were summarized as follows:

• **Connectivity:** the hub could enable like-minded professionals and people to build relationships / partnerships.

• **Engagement:** the hub could provide a platform for entering the current design debates and being able to influence the education space.

• **Status by association:** endorsement by the hub would be the hallmark of quality and reinforce credibility from all four sectors Government, Education, Business, Cultural.

• **Profile raising:** the hub could be a place to access advertising budgets from large companies but there would need to be valued / measurable outcomes.

• **Practicality:** the hub could be a one stop shop for inspiration and production that is education-based, media-based, design-and-innovation-led.

In order to foreground the results of the study the author designed a high-profile 'Roundtable Event' facilitated by a well-known TV journalist from the Australian Broadcasting Corporation. This brought together some of the interviewees and important Government and Education decision-makers

Implementation Models and the Final Report

The design of an implementation strategy required definite commitment from all four sectors identified and colour-coded throughout the study.

- **Education (University and VET Sector))**
- **Businesses and Creative industries**
- **Government (Local and State)**
- **Arts / Cultural / Community Orgs.**

The author proposed three diagrams for the architecture of the hub organization to illustrate how the four sectors could practically work together, and it is interesting to briefly describe these and reflect on the choice made by the funder of the study, the NSW Board of Vocational Education and Training.

The Organisational Architecture

The author proposed that the hub would operate as a coordinating mechanism for already existing activities and priority projects. The hub would then also be a network of dynamic and serendipitous connections that were maintained through both a digital and physical presence. The organisational architecture needed to sustain the hub's existence well into the future. The following three

models were offered as suggestions with approximate indications of funding and resource implications.

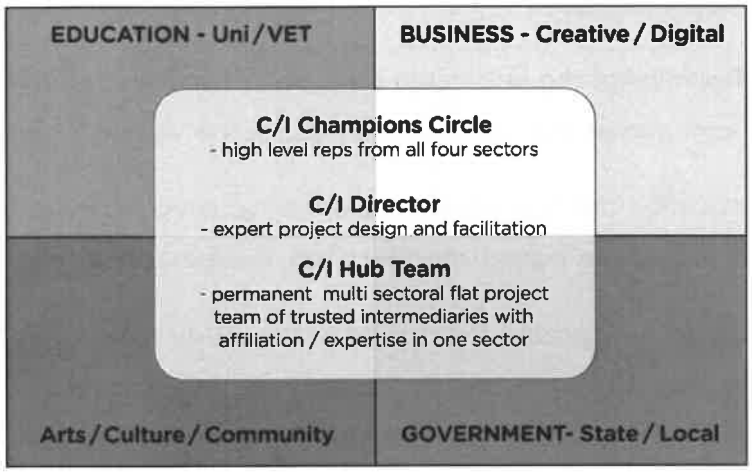

Figure 28: Suggested model relating to the appointment of a trusted intermediary

1. Trusted intermediary model

This approach would entail each of the four lead sectors contributing a secondment of staff, possibly part-time, to a combined working team. The director of the team would report to a high level group – 'champions' circle' – representing the four sectors. Projects and activities would be agreed by the high level group and implemented by the working team in cooperation with others in the fours sectors.

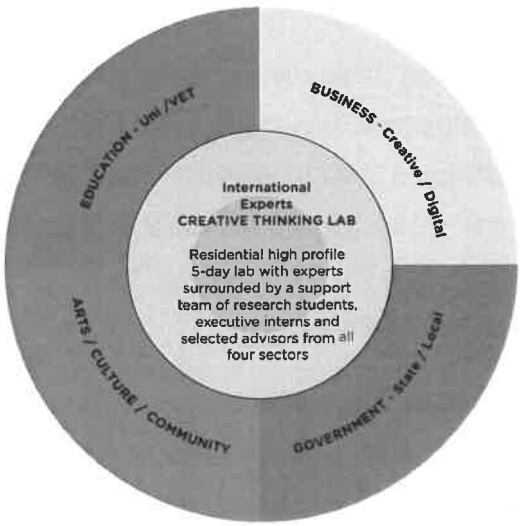

Figure 29: Suggested model relating to the gathering of international experts

2. Creative lab model

This approach would bring together key individuals from the four sectors with international thought leaders and advisers to work on projects sponsored by business and other organisations with an interest in the development and commercialisation of ideas, with structured support from collaborative, multi-disciplinary teams of students, academics and interns. Again the model would be guided by a high level group from the four sectors.

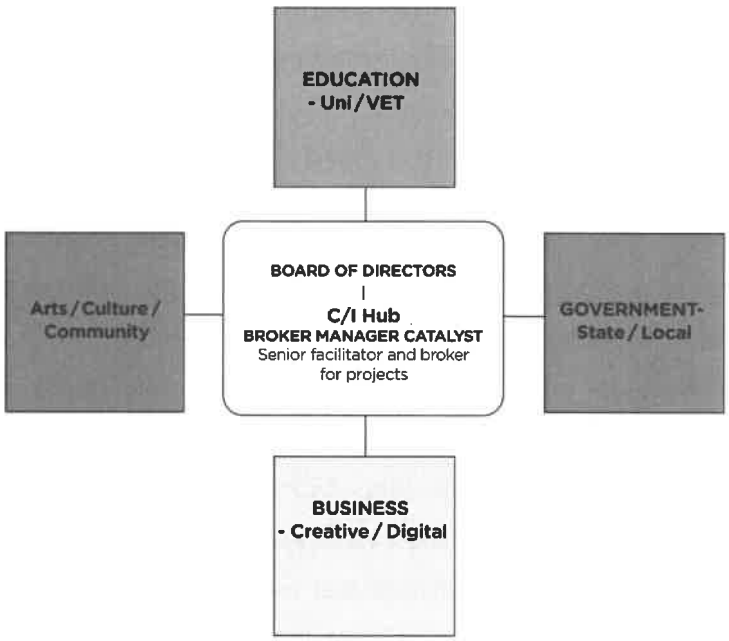

Figure 30: Suggested model relating to the appointment of a Board of Directors

3. Network broker model

This model would combine the trusted intermediary concept with the creative lab in the appointment of a skilled and trusted broker to work with individuals and organisations in the four sectors, again under the guidance of a high level executive group or advisory board. The group would identify projects and activities, with input from thought leaders and practitioners, which would gain added value from collaboration among the four sectors and from the contribution of carefully prepared but self-directed student teams.

Staging the Implementation

The Government funding categories, procedures, timescales and cycles imposed a subtle dynamic on the various aspects of the project that had to be taken into account to ensure a sustainable process of implementation. Although the NSW Board of Vocational Education and Training's brief required viable models for the hub, the author recommended that efforts be channeled into exploring how the strategy could be deployed in two stages.

To begin anything significant with the high calibre people required a first stage of 3 years was recommended. This proposed a reasonable commitment period and had the effect of lowering the engagement threshold for the sectors involved. Moreover, if successful, the first stage would secure support and additional funding for the second stage.

Stage 1 would revolve around the soft infrastructure of the hub, such as policies, partnerships, agreements, communication systems and educational initiatives. In stage 2, the already established 'soft hub' would seek to develop its spatial functionalities drawing on the ideas suggested.

The report was received with accolades from the New South Wales Board and an offer was made to a high profile individual to take up the role of Creative Innovation Director in the Trusted Intermediary model outlined above. Unfortunately a change of Government and uncertainty of funding caused the model not to be pursued. However the report continues to be used as a basis for the support of many projects from the 17 suggested ideas that had broad support from all four sectors (included in **Appendix 3**). Please note that the ideas are only briefly described but included to show the range of creative output that resulted from a design thinking approach to an educationally funded scoping study.

Chapter 6

REVIEW SOFTWARE: Development & Published Journal Article

Foreword

This chapter traces the early design concepts and ongoing development of the *ReView* online criteria based assessment system. The chapter includes a peer-reviewed refereed journal article published within the enrolment candidature of this thesis. The article serves to reveal the subtle pedagogical design thinking and design aspects that have contributed to the growing adoption of this software system in the preceding ten years and beyond. Email archives together with diaries, meeting notes, grant applications and curriculum documentation were used as a source for this chapter.

This chapter is reflective about the author's early design and ongoing development of the *ReView* system including the subtle aspects that have contributed to its success. Emails together with work diaries (2003 – 2012 inclusive), meeting notes, grant applications and curriculum documentation were used in tracing the development of both the process and the product. ▲▲▲The system has now been commercialised by the author's University and the new version will be accessible on all mobile devices with the company concerned licensed to provide a web hosted version to any educational institution in Australia and New Zealand *(refer to http://www.review-edu.com/ accessed 20.04.2014).*

The first version of *ReView* designed by the author was called Online Criteria-Based Assessment (O.C.B.A) and did not incorporate the tracking of graduate attributes developed in later versions.

The description of O.C.B.A from a diary entry in 2003 was as follows: *An online database driven web application browser accessed from any internet connection featuring secure online data entry by staff against criteria with written feedback and secure individual viewing by students of assessments and progress charts.* It is interesting that the word 'secure' is mentioned twice whereas today there is less suspicion of internet use in the education domain.

The development of the software was not part of the author's University work and was attempted as an experimental project initially using design thinking, programming and design skills. As the complexity increased it was essential to involve a programmer to assist in the development. Whilst some of the programmer's work was paid for through small research grants the programmer made a significant contribution above and beyond programming contracts. The software progressed from FileMaker Pro to Adobe Flash as the need for a customised interface with ease of data entry became important.

▲▲▲Educational encouragement for the approach using categorised criteria with an online marking system came from then Professor of Educational Technology at the Open University in the UK, Dr Robin Mason. In a personal

interview with the author recorded in his University office on 15 November 2003 she stated about the O.C.B.A. system:

> *"... there are many aspects of this that are brilliant not just for staff but students also, if they can see their development over time in a range of subjects this would be very satisfactory feedback" (from transcripts of a personal interview with Dr. Robin Mason, 2003)*

In the early days of development there was categorisation of the assessment criteria but related to the stages of a design process, namely Research, Concept, Process, Communication and Professionalism.

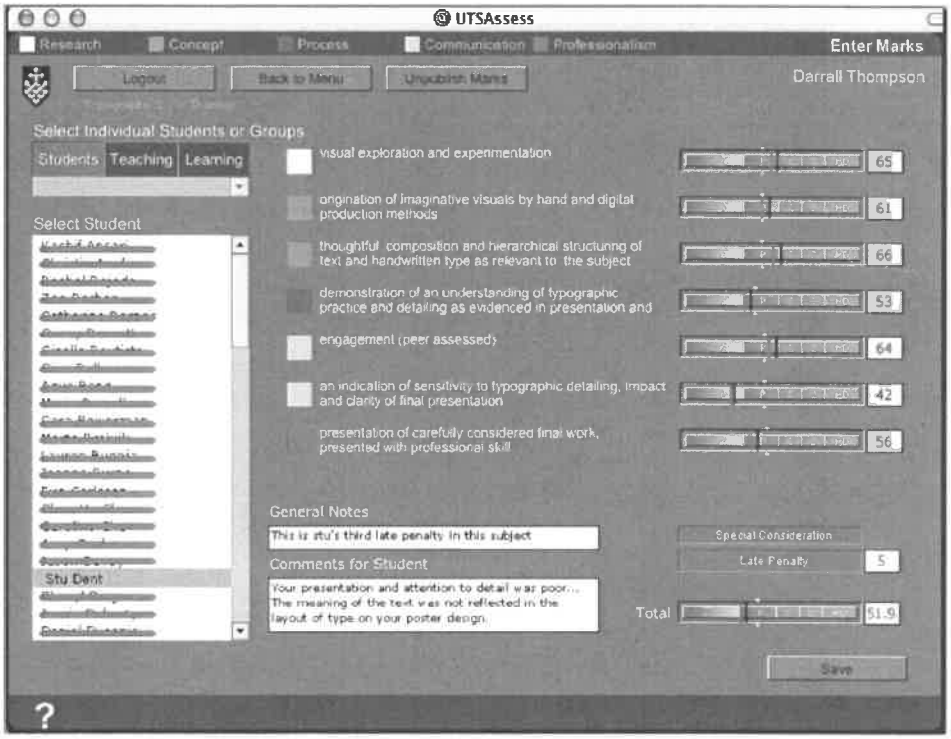

Figure 31: O.C.B.A. marking screen showing visual 'data-sliders' for marks entry and colour-coded categorisation of criteria relating to design process.

The major innovation that seemed to cause early take-up by the author's colleagues was the automatic calculation of percentage marks by dragging a visual bar across the grading scale that came to be known as 'data-sliders'. The option of marks and feedback online was also attractive to both staff and students with instances of students suggesting to their lecturers that they ought to use the system.

The staff screen displayed percentage marks but the other major innovation in the system was to remove those from the student display. The following screenshot of the student interface shows a broad grade indicator on the data-slider and has: a 'special consideration' button for situations where late submission had been agreed; a 'late penalty' button that indicated a red marker showing the level of reduction in marks for lateness, and a 'class average' button that displayed a small white triangle marker on all criteria and the total grading slider.

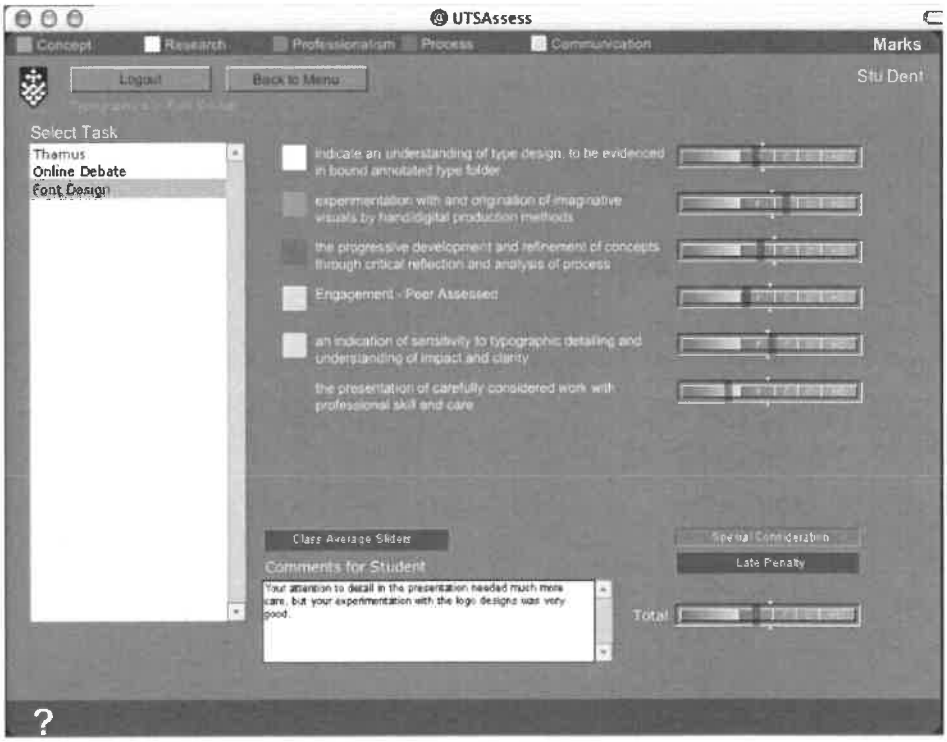

Figure 32: OCBA Student screen showing a broad grade indicator rather than percentage marks to focus student attention on the pattern of feedback against criteria.

This early interface did not relate to the development of graduate attributes and there were a number of flaws in the interface design, for example colour coding did not differentiate between categories for colour-blind users. In the following years the interface was refined and began to incorporate graduate attribute initiatives.

▲▲▲The following pages are from a peer-reviewed journal article published within the candidature of this autoethnographic PhD [Ref: Thompson, D.G. (2009). Successful engagement in graduate attribute assessment using software, *Campus-Wide Information Systems, (26)* 5, p. 400-412]. It is included to inform some of the development that occured in the subsequent years and consolidates the rationale underpinning the O.C.B.A (Online Criteria Based Assessment) initiative describing the renamed *ReView* program that continues to be developed by the author at the University of Technology, Sydney.

The inclusion of this journal article in the text brings context to the application of design thinking and teaching practice over a period of many years. For example under the heading '**A 'bottom-up' process to overcome 'academic inertia'** the author's five arguments reveal the subtle design thinking behind the *ReView* software. A further example can be found in the conclusion to the article where it is mentioned that there is early evidence that 'the act of self-assessment in *ReView* against criteria, is informing students' judgment of standards'. The author has pursued research into this aspect together with colleagues and is in the process of publishing further articles investigating this, one of which is mentioned in Chapter 8 'Reflections and Conclusions'.

Chapter 7

SPARK SOFTWARE: Development & Published Journal Article

Foreword

This chapter traces the early design concepts and ongoing development of the *SPARK* (Self and Peer Resource Kit) assessment system. The chapter includes a peer-reviewed refereed journal article published within the enrolment candidature of this thesis. The article serves to reveal the subtle pedagogical design thinking and design aspects that have contributed to the growing adoption of this software system in the preceding ten years and beyond. Email archives together with diaries, meeting notes, grant applications and curriculum documentation were used as a source for this chapter.

The development of the Self and Peer Assessment Resource Kit (referred to as *SPARK)* was the result of a range of concerns and frustrations expressed by both staff and students in several Faculties at the University of Technology, Sydney about the fairness of group work assessment. It was considered that web mediation of the self and peer assessment process may address some of the problems experienced with paper-based attempts to improve assessment. The need for solutions prompted a successful application for research funding from the then Australian Committee for University Teaching and Staff Development (CUTSD) that has transformed through several iterations to become the Australian Office of Learning and Teaching (OLT). An aspect of the grant involved the development of generic templates and databases capable of adaptation to a wide range of group work assessment processes. The research team developing this system was multidisciplinary and included academics and technical staff from the Faculties of Business, Education, Law, Engineering and the author as a representative of the Faculty of Design, Architecture and Building with expertise in web design and information design. The design of the *SPARK* logotype shown in the following figure together with the interface system was a result of some of the author's work in this team. The logotype symbolises a group of seven (students) in a circle with one highlighted in a lighter shade to represent the self and peer aspect. This circle was used later to update the software interface with six different symbols representing the progressive stages of a self and peer assessment process using *SPARK*.

Figure 33: The author's design for the SPARK (Self & Peer Assessment Resource Kit) logo adopted by the research team

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The early description of *SPARK* from 2002: *An online database driven web application, browser accessed from any internet connection, featuring secure rating by students of themselves and their peers for the fair distribution of*

group work marks according to the contributions of each group member against a range of agreed criteria.

Whilst much of this work was outside the period of this autoethnographic study *SPARK* has progressed since this early description and is included in this thesis because of subsequent work by the author. The main functions employ a database accessed through a web interface with subject set-up operated by a lecturer batch enrolling students into groups. Students can also form their own groups without the lecturer's intervention if this is advantageous to the particular project or learning situation (e.g. for distance education scenarios). The lecturer sets cut-off dates for group formation and the entering of ratings by students and also enters criteria for the self and peer assessment process.

A sample set of criteria is available in *SPARK* but the author developed further samples for staff and suggested that unique relevant criteria could also be developed in negotiation with students according to the learning objectives and with particular attention to the group formation process.

Once criteria have been negotiated and set up in the database students can practise entering ratings with the knowledge that they can be re-entered up to the cut-off date. The students log in to *SPARK* where they can view frequently asked questions and comments from other students about their experience with the system. When entering ratings they can view a practice form or try a 'live' entry that can be revised later.

The following peer-reviewed journal article published within the candidature period of this PhD study is reproduced in text here to illustrate the widespread problem of effectively using paper-based methods of self and peer assessment. The article illustrates the effective use of the *SPARK* system and shows an earlier version of the author's interface design that was later updated to the design shown in Chapter 3. In the context of this autoethnographic study it constitutes peer-reviewed evidence beyond the author's discipline as a result of introducing a colleague in the Business Faculty to the SPARK process and software. ▲▲▲*Thompson, D.G. & McGregor, I. (2009). Online self and peer assessment for groupwork, Education and Training, (51) 5/6, p. 434-447:*

■■■ There was a pivotal anecdote behind the author's development of the PowerPoint™ slide presentation with apples illustrated in the above journal article. In searching through diaries and emails as part of the autoethnographic method there was a notation and an extract from nine email exchanges with a student who was one of the first to use *SPARK* in a design subject. It was noted that in conversation the student had mentioned that his father was a lawyer and his mother was a mathematics teacher. The student was emailing the author about lodging an appeal about his mark due to the fact that he had a less mark than his friend in another group and felt that his work and contribution were far greater.

The email exchange revealed the problem with exam-based systems that focus students on marks. These systems clearly cause students to rely on only themselves and tend to produce an approach to group work where the task is divided into individual items. The design of a groupwork task normally encourages working together, but with the marks-driven student this is difficult to achieve. The invitation to produce a group result rather than individual portions and explore team roles as a development opportunity did not impress this particular student. It took some time for the author to derive from these the source of confusion but it was summed up in the following brief extract from one of the student's emails:

> *In swimming, we can easily see who swam a record time. But how can you tell if student-x worked harder than student-y, if they are from different teams? By looking at the SPA [factor calculation]". But the SPA is an internal-team assessment.*
>
> *For example: Can you solve this problem?*
>
> *All the members of Team X think that JohnnyX did a really good job and pulled it all together. All the members of TeamY think that SusieY did a really good job and pulled it all together.*
>
> *So: who did the better job?*

The student was assuming that *SPARK* was giving a mark based on comparison between students' performances rather than producing individual factors from students' criteria-based self and peer assessment of their own and each others contribution to their own group's submission of work. This factor was only intended to allow them to share the mark given by the teacher against different criteria assessing the group's submission. The realisation that this intelligent student had misunderstood the intent of SPARK led to a face-to-face appeals interview in which the author produced two large green apples (one much bigger than the other) and placed them on the table in front of the irate student). The explanation that his group had submitted work that was assessed by the teacher against criteria for the group submission at a lower mark than his friends group explained why his mark was smaller due to the fact there was less 'apple' to share.

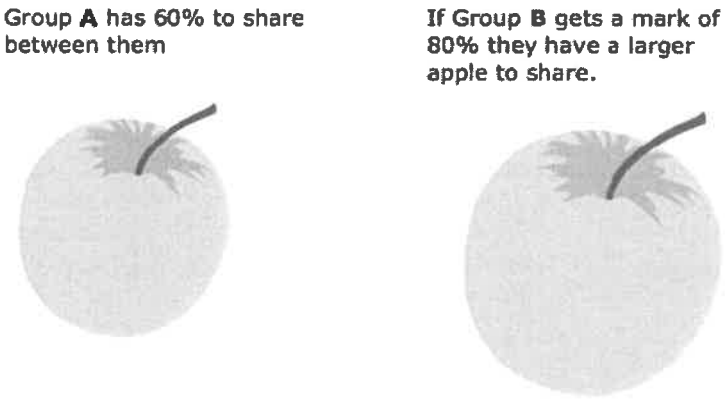


Figure 35 : The author's apple illustrations used to explain the Self and Peer Assessment factoring process for modifying group marks to individual marks

The extract from the student's email also reveals that their criteria for a group member 'doing a good job' was whether they 'pulled it all together', discounting the range of contributions that were actually used in the group's negotiated self and peer assessment criteria.

These email exchanges and the appeals interview were really valuable as a learning experience and were the prompt for the author to design the apple PowerPoint™ slide that was then used to explain the *SPARK* process to both staff and students in the years to follow. Similar exchanges with students and

staff caused the realisation that software can facilitate change in assessment processes but needs well-designed graphic explanation of the aims, reasons and principles involved. Foregrounding again the ways in which design and design thinking can assist in educational change.

Chapter 8 : Reflections and Contributions

This thesis is a contribution from the field of design motivated by the lack of educational change despite the plethora of educational research demanding it.

This chapter brings together some developments, anecdotes and responses to the guiding questions for the study. It also informs the current situation and future directions of this 'designer's journey' of educational change as of the date of thesis submission.

Two definitions and a statement

The final chapter of a partially autoethnographic thesis that already includes research and teaching examples, and reflective anecdotes threaded throughout the text, needs to highlight the author's significant reflections and contributions from the designated ten-year research period between the years 2002-2013 used as a source for the study.

Firstly a definition of design thinking that emerged from the last ten years of experience and engagement in the field to contribute to others quoted in the introduction to this thesis that tend to be focused on design practice or commercial intent.

Design Thinking is a meta-cognitive creative problem solving process that takes into account the subtle dynamics of any context using trial and error solutions in the service of improvement and change.

Secondly a definition of the term 'graduate attributes' updated for publishing in this thesis from a previously published 2009 version to be found in the refereed journal article included as part of Chapter 6.

Graduate Attributes are the qualities, conceptual frameworks, knowledge literacies and skills valued and made explicit in a course of study.

Thirdly a statement about assessment criteria focusing on their function as a vital fulcrum of engagement between teacher and student in any educational context. This statement encourages academic staff to elucidate and make explicit to students the value of the attributes that are available for their development by engaging in a particular task:

Assessment Criteria need to be richly descriptive feedback statements including task context, content and process, explicitly linked and relevant to the broader goals of graduate attribute development.

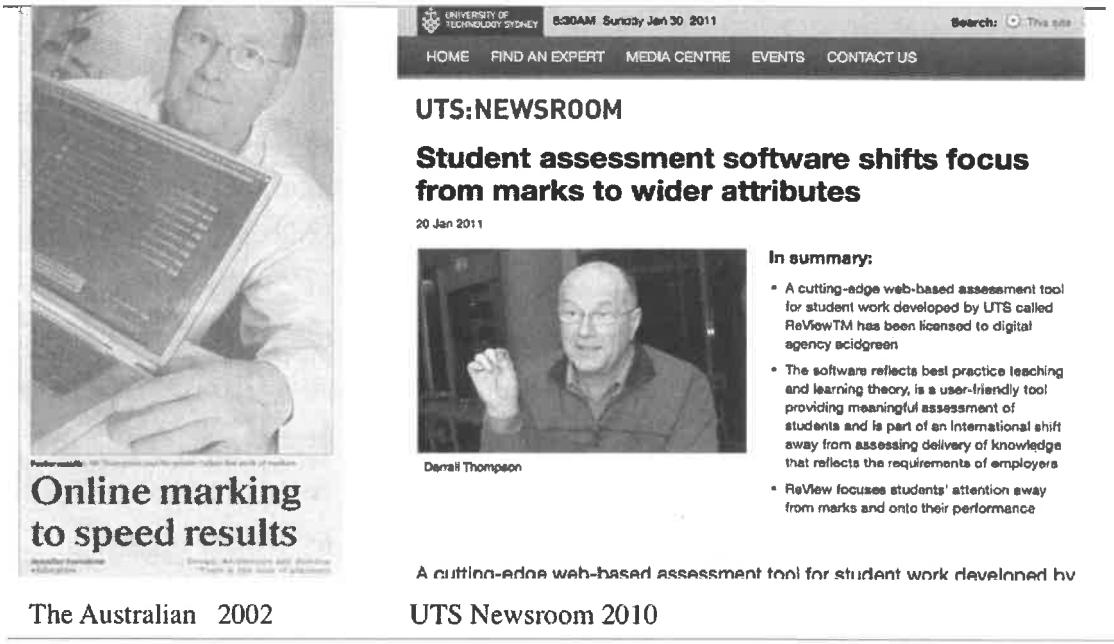
The contribution of assessment software

A further contribution from design and design thinking is in the form of software and the pedagogy embedded within it. I assigned intellectual property for the *ReView* online criteria-based assessment system to the University of Technology, Sydney and that institution has licensed it to an educational software company for commercial application and production release in 2013/14.

REVIEW™

The new software referred to as *REVIEW* is designed to expose the value of attribute development through coded descriptive assessment criteria and provide opportunity for students to engage with these through self-assessment. The overlapping W symbol in the logotype is a visual reference to the combination of tutor assessment and student self-assessment grading arrows used within the software itself. The software is also designed to expose the variation in student achievement using visual tracking of attribute development in a range of categories across subject boundaries.

However the contribution of any software is minimal if its use is solely for time-saving or cost-saving rather than improved student development. The national press reported on an early version of ReView when the software's name was OCBA (Online Criteria-Based Assessment). The newspaper report focused on the potential to speed up the marking of student work with the headline **'Online Marking to Speed Results'**. Speed of marking was not my intention or motivation although in a design thinking approach time-saving would be a vital feature to drive the adoption of any solution. However, eight years later another article appeared that was much closer to the pedagogical intention: **'Student assessment software shifts focus from marks to wider attributes'.** The following comparison between the two press cuttings illustrates a small win for educational change in that the author was not involved in writing either of them.



Online marking to speed results

The Australian 2002

UNIVERSITY OF TECHNOLOGY SYDNEY 6:30AM Sunday Jan 30 2011 Search:

HOME FIND AN EXPERT MEDIA CENTRE EVENTS CONTACT US

UTS:NEWSROOM

Student assessment software shifts focus from marks to wider attributes

20 Jan 2011

Darrall Thompson

In summary:

- A cutting-edge web-based assessment tool for student work developed by UTS called ReViewTM has been licensed to digital agency acidgreen
- The software reflects best practice teaching and learning theory, is a user-friendly tool providing meaningful assessment of students and is part of an international shift away from assessing delivery of knowledge that reflects the requirements of employers
- ReView focuses students' attention away from marks and onto their performance

A cutting-edge web-based assessment tool for student work developed by

UTS Newsroom 2010

Figure 36: Comparison of two newsclips spanning an eight-year period

The main contribution from the design and functional features of *ReView* evidenced in the case studies (Chapter 4) and journal article (Chapter 6) include:

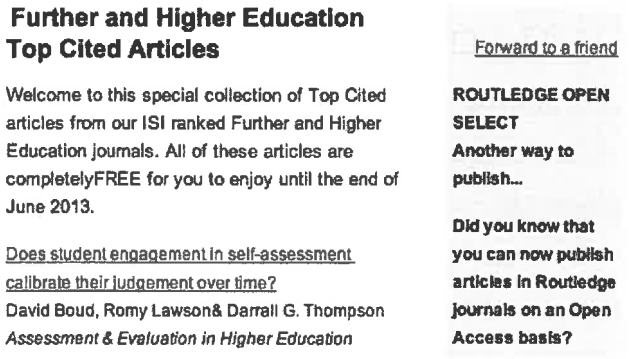
- Increased staff capability in writing criteria for assessment, relating them to graduate attributes and aligning them with appropriate teaching & learning strategies.

- Reduced student focus on percentage marks whilst improving their awareness of attribute development across subject boundaries and throughout the years of a program of study.
- Improved students' ability to make criteria-based judgements of their own work using the self-assessment option in *ReView*.
- Improved facilitation of marking and benchmarking comparisons between academic coordinators, tutors and between subjects and courses of study.
- Facilitation of complex 'Assurance of Learning' reports for accrediting bodies at university, professional and government level.

The Self and Peer Assessment Resource Kit (*SPARK*) explored in Chapter 7 is now led by a colleague in the Faculty of Engineering and Information Technology and may also result in a commercial application.

The importance of engaging beyond one's own discipline

On reflection many of the developments explored in this thesis are a result of the author extending beyond the discipline of design. For example Emeritus Professor David Boud a renowned international educational researcher became interested in the self-assessment aspect of the ReView approach through one of the author's conference presentations. There were several conversations about the educational potency of this feature and the author decided to extract data on students criteria-based self-assessment activity in the School of Design. It became clear that students voluntarily engaging in self-assessment during the normal submission and assessment of tasks in the design program were improving in judgments of their own work over time. The author decided to involve another researcher to study the statistical evidence in the data and invited Associate Professor Romy Lawson a National Teaching Fellow (conferred by the Office of Learning and Teaching 2013). The resultant papers and conference presentations were well received. A jointly authored article 'Does student engagement in self-assessment calibrate their judgement over time?' in the Assessment and Evaluation in Higher Education Journal was a top-cited article for Routledge/Taylor Francis in 2013 ▲▲▲:



Further and Higher Education Top Cited Articles

Welcome to this special collection of Top Cited articles from our ISI ranked Further and Higher Education journals. All of these articles are completelyFREE for you to enjoy until the end of June 2013.

Does student engagement in self-assessment calibrate their judgement over time?
David Boud, Romy Lawson& Darrall G. Thompson
Assessment & Evaluation in Higher Education

Forward to a friend

ROUTLEDGE OPEN SELECT
Another way to publish...

Did you know that you can now publish articles in Routledge journals on an Open Access basis?

Figure 37: Notice from Routledge about Top Cited Article

This has been followed by another article, this time in the Higher Education Research & Development journal, titled: 'The calibration of student judgement through self-assessment: disruptive effects of assessment patterns' also authored by Boud, Lawson and Thompson *(2014 in Press).*

A further example of engaging beyond my discipline came from an invitation by the University of New South Wales to give an extended seminar on graduate attribute development to staff in The Australian School of Business. Following this their learning and teaching coordinator asked for help with a pilot scheme using the ReView software and a video of his interview with one of the staff is an interesting example of an academic's use of the software outside the author's field and in a different institution: *http://www.youtube.com/watch?feature=player_embedded&v=xf-KlzkYZ_w (checked 16.1.15).* This interview by Danny Carroll of the University of New South Wales is also included on the DVD attached to this thesis. *Filename: DannyCarrollUNSW.mp4.*

One conclusion that has emerged from this reflective study, albeit delimited to a ten-year period is that assessment and ranking systems applied to both institutions and individuals need to take into account a much broader range of attributes and values. The extensive research on pressures in Chapter 2 relating to **Question 1: What are the contributing contextual factors that inhibit improvement and change in higher education ?** can largely be applied to the high school system both public and private. The following reflective account of the author's attempt to conduct research on attribute-based assessment in a

private high school contains an important example of a pressure exerted from parents and one of the author's failures in design thinking.

■■■ *Given that many of the marks-driven attitudes to assessment are developed in the high school context, the author decided to explore attribute-based approaches using the ReView software at a high school in Sydney where a colleague had previously taught. After a long series of meetings with staff and a final presentation to the Principal, a pilot study with six teachers was proposed using the ReView software and a questionnaire conducted with the teachers before and after (to gauge response and effectiveness). In conversations the teachers expressed the sense of restriction that the exam-based ranking system for university entry imposed. For example the maths teacher had stated that 'ticking and crossing right and wrong answers' was very unrewarding and was not valuing the attributes he really wanted to develop in the students. We came to a range of assessment criteria that were reflective of his deeper values but also met the requirements of his subject area. For example we identified together that he did need to let students know that 'accuracy of calculation' was an important attribute and assessment criterion. But rather than ticking right and wrong answers he graded against a criterion that simply said, 'Accuracy of calculation evident in your workings for questions 6 to 21'. Other criteria valued higher level learning, for example: 'Appropriate use of formulas in addressing the complex problems in questions 3 to 6, with acknowledgement of creative approaches' and 'Clarity of layout in your working notes for the 10 set exam questions' etc.*

The pilot study was well received and teachers enjoyed marking using the ReView system. The students were not surveyed but teachers reported that through informal enquiry the students seemed to find it an interesting way of receiving feedback.

The anonymous teacher survey responses were presented in a meeting with the Principal of the school with a discussion about extending the pilot scheme. The Principal was due to leave the school at the end of the term, but was keen to pass on this initiative to her replacement. She suggested that a meeting with some of the parents would be important if the ReView software was to be used more extensively to give feedback about variation in students' broad ability across subject boundaries.

Four of the mothers of some of the high achieving students attended a lunch and presentation without the Principal in case this influenced their feedback. After the presentation of the system a discussion ensued about the possibility of extending the pilot study. The parents were positive about the general idea of assessment that valued different aspects of student learning. However, there was a pause in the conversation and one of the mothers said 'but you're not going to use it here are you?'. This comment was a shock to the author given the tenor of the conversation so far, and the comments that followed were rather disappointing from the educational standpoint.

Apparently, their daughters were often the highest scoring students in the school. The parents explained that they were able to find out what the content of their daughter's tests would be in various subjects. They then made sure that their daughters revised and studied the content for at least two weeks prior to the test. They then tested their daughters before the test and checked the results themselves. They remarked, 'We know the mark that our daughters will get before they actually take the test, and we complain to the teachers if the marks received are less than expected'. The Principal left the school as planned and the author withdrew to consider the situation.

The realisation emerged that I had failed **to apply one of the core aspects of design thinking**, namely a subtle appreciation of the motivations involved in the context. Another factor on reflection was that the selection of location for a pilot study was based on the easy availability of access through a colleague rather than the appropriateness of the context. The useful result was a greater understanding of the dynamics involved and a resolve to try again but perhaps involve the parent teachers association and careers advisors with students at a much earlier stage of schooling. The author has had a meeting in June 2013 with the Principal of a public primary school to begin a much slower long-range approach to the possible improvement of school assessment systems.

These and other experiences related in earlier chapters reinforce the view that software, no matter how well it is designed, is impotent without the design thinking that takes into account the educational theory and motivational dynamics of the practical context.

Attribute-based Education for all?

Throughout my engagement with education systems both as recipient and researcher, there persists a tragic and hypnotic obedience to funnelling high school children through a ranking system that reduces the diversity of individual attributes to one number.

Students normally pass subjects and courses with a percentage mark or grade and it is not surprising that they focus on the mark rather than the criteria that were assessed to arrive at that result. In many cases students do not have appropriate descriptions of criteria to be used in the assessment process let alone how those criteria relate to the development of important attributes. It is worth repeating here a quote used in Chapter 1 that foregrounds the developmental role of education beyond the certification role of such systems:

> ★★★ *'I am not talking about the implementation of isolated curriculum activities, but rather, the creation of a new culture of schooling that has as much to do with the cultivation of dispositions as with the acquisition of skills.'... 'The public's perception of the purpose of education supports the current paradigm. We need to sail against the tide.' (Eisner, 2002, a quote from his John Dewey Lecture 2002 http://www.infed.org/biblio/eisner_arts_and_the_practice_of_education.htm (checked 16.1.2015)*

There appears to have been minimal change in exam-based assessment for many decades but this thesis provides evidence of small successes achieved by providing well-designed time-saving software that focuses assessment on the attributes developed.

A misaligned metaphor

Reflecting on the relationship between students and the institution there has been a significant shift in the financial arrangements of higher education in Australia. Students are now required to pay substantial fees for the Subjects or Units of study that they have to accumulate in order to gain a degree. Academics do not usually observe students as they enroll online in subjects for their courses of study. On one occasion where I asked a student for such an observation opportunity it was a shock to me that the cost of the Subjects was

very prominently displayed on the web enrolment page with a very brief descriptive paragraph.

This customer metaphor in a higher education context foregrounds a shift in the student-teacher relationship and seems misaligned with the educational relationship that requires mutual trust and engagement over time. It also seems untenable if the business terms of that relationship are considered. The message to the 'customer' would perhaps read: *If you try to buy this Subject you have to pay in advance and may fail to be good enough for us to give it to you, and if this is the case there are no refunds. Your teachers, most of whom have no teaching qualifications will also make the product very challenging with a great deal of self-motivation required from you in order for you to actually receive it. Furthermore you may be disappointed with the Subject and may not appreciate the value of it for five years or thirty years or perhaps not at all.*

This business model approach to education may further encourage students' surface engagement with their learning and is also an inappropriate metaphor for a situation in which the students' depth of engagement is pivotal to the quality of the result. The metaphor for a student / institution / staff relationship could perhaps instead be similar to a Gymnasium: a member pays for a course in a supportive ecology with the guidance of experts but only gains benefit according to exercise within the motives underpinning the course and their self-determined wish to learn.

The journey continues toward Graduate Attribute Integration

Chapter three focused mainly on the guiding research question: ***Question 2. Why is a focus on assessment design and graduate attribute development important for higher education ?*** The rationales surrounding this focus have been pivotal in both this thesis and the continuing journey of engagement with the field of higher education. It should be noted that the four rationales and six points in the Summary at the end of Chapter 3 are a contribution to knowledge that would not have been possible without the autoethnographic method, practice-led enquiry and the long-term approach to this study.

In 2012, towards the end of the ten-year period addressed in this study the author accepted an invitation to lead the Faculty of Design, Architecture and Building in its approach to graduate attribute development and integration

including all three Schools as part of a $3.1 million University initiative known as the UTS GAP (Graduate Attribute Project) echoing the earlier 2007 National GAP led by Professor Simon Barrie. This University appointment leveraged many years of endeavour, much of which is explored in this thesis. The reader is encouraged to view an animation produced as part of this UTS GAP on the attached DVD. It uses design and design thinking to explain to students in 1 minute 39 seconds the core value of a graduate attribute based approach to education ***Filename: GAP_Student.mov***. This is accompanied by a short video designed by the author working with design graduates targeting academics engagement with graduate attribute development in the Faculty of Design, Architecture and Building. ***Filename: GAP_Staff.mov.***

Finally, as a reflection about the holistic approaches that are synonymous with design and design thinking, Adams proposes a generalised view:

> *Holism will finally be recognized as the key fundamental philosophy that underlies health, science, religion and even consciousness. (Adams, 2013. p1)*

Perhaps with the need to make well-designed responses to societal complexity there will be a trans-disciplinary adoption of design thinking beyond the higher education sphere. It is hoped that this thesis makes a contribution with practical examples that may inspire others in their own journey of much-needed educational change.

REFERENCES

Adams, M. (2013) 'Ten civilization-shaping trends for 2013 that are driving us into social and spiritual crisis' (http://www.naturalnews.com/040137_spiritual_crisis_trends_consciousness.html#ixzz2aNkn0fyR accessed 29.7.2013)

ACICS (2011) 'Summary of Findings from Survey of Hiring Decision-makers'. Accrediting Council For Independent Colleges And Schools. http://www.acics.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=4745&libID=4784 (PDF retrieved 13.12.2011)

AFR (2009) Australian Financial Review - Financial Review of Higher Education Conference Update, 9 November 2009, Sydney. http://www.afr.com/home/events/higher-education/ (accessed 15.10.09)

AIG report (2006). World class skills for world class industries: employers' perspectives on skilling Australia, Australian Industry Group, Sydney

ALTC (2008) Review of ALTC Leadership Program 2006-2008. Emeritus Professor Lesley Parker and Dr. Elizabeth Macdonald. http://www.altc.edu.au/resource-altc-leadership-program-review-altc-2008 (retrieved 14.10.09)

ALTC (2008) **The RED Report, Recognition-Enhancement-Development: The contribution of sessional teachers to Higher Education.** http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1139&context=asdpapers **(checked 15.1.2015)**

Askling, B. & Stensaker, B. (2002) Academic Leadership: Prescriptions, Practices and Paradoxes. Tertiary Education and Management. Volume 8, Issue 2, pp 113-125

Assiter, A. (Ed.). (1995). *Transferable skills in higher education.* London: Kogan Page.

Austin, A. E. (2012) Challenges and visions for higher education in a complex world: commentary on Barnett and Barrie. Higher Education Research and Development. Vol. 31. No.1 , February 2012

AUQA (2007) Strategic Plan 2007-2012 ISBN 978 1 877090 75 2 © Australian Universities Quality Agency 2007.

Barrie, S.C. (2004) A research-based approach to generic graduate attributes policy. Higher Education Research & Development. Volume 23, Issue 3, 2004. Special Issue: Generic Graduate Attributes: Citizens For An Uncertain Future

Barrie, S.C. Hughes, C. & Smith, C. (2007). Integration and Assessment of Graduate Attributes in Curriculum. National Carrick Scoping Study. http://www.itl.usyd.edu.au/projects/projects_nat.htm (rechecked 26.4.2014)

Barrows, H. S. (1996). 'Problem-based learning in medicine and beyond: A brief overview'. New Directions for Teaching and Learning 1996 (68): 3.

BCA (2006). Business Council of Australia Report: New Concepts in Innovation: The Keys to a Growing Australia. pdf report retrieved 7.02.2007 http://www.bca.com.au/Content.aspx?ContentID=100408 (new link checked 28.4.14: http://www.bca.com.au/publications/new-concepts-in-innovation-the-keys-to-a-growing-australia)

Bexley, E. (2011) 'The Australian academic profession in transition: Addressing the challenge of reconceptualising academic work and regenerating the academic workforce'. Centre for the Study of Higher Education, The University of Melbourne, September 2011.

Biggs, J. (2003). Teaching for quality learning at university (2nd ed.). Berkshire, UK: Open University Press, 2003

Biggs, J. B. (1999) *Teaching for Quality Learning at University.,* Buckingham, UK, SHRE and OU Press.

BIHEC (2007) Business, Industry and Higher Education Collaboration Council. Graduate Employability skills report. Downloaded October 17, 2007 from http://www.dest.gov.au/sectors/higher_education/programmes_funding/programme_categories/key_priorities/documents/graduate_employability_skills_pdf.htm

Bloom, A. (2007), 'Half a year's work in 8 minutes', The Times Educational Supplement, Jun 29 London.

Boud, D., Lawson, R., Thompson, DG. (2013). Does student engagement in self-assessment calibrate their judgement over time? Assessment & Evaluation in Higher Education. 38(8) 941-956. Routledge. UK.

Boud, D., Cohen, R. & Sampson, J. (Eds.) (2001) *Peer Learning in Higher Education.* London: Kogan Page.

Boud, D. (1988) Moving towards autonomy. In Boud, D. (Ed.) *Developing Student Autonomy in Learning.* 2nd ed. London, Kogan Page.

Bradley, D., Noonan, P., Nugent, H., Scales, B. (2008) Review of Australian higher education: final report (Bradley review). Canberra, Australian Capital Territory: DEEWR, 2008. xxix, 271 p.

Brew, A. (2012). Teaching and research: new relationships and their implications for inquiry-based teaching and learning in higher education. Higher Education Research & Development Volume 31, Issue 1, 2012

Bridgstock, R. (2009) 'The Graduate Attributes We've Overlooked: Enhancing Graduate Employability through Career Management Skills'. Higher Education Research and Development; Feb 2009; 28(1).

Bronfenbrenner's, Urie, model from Lecture Notes http://www3.uakron.edu/schulze/610/lec_bronf.htm (retrieved update 1.3.2012, checked 15.1.2015)

Brown, T. (2008). "Design Thinking." *Harvard Business Review*, June 2008. p. 86.

Brown, T. (2009). Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation . Harper Collins, New York.

Bruner, J.S., (1996). The Culture of Education. Cambridge, Mass: Harvard University Press.

Bunting, C. (2000) Spectre of exam drug tests looms. Times Educational Supplement, 4364, 3. February 18.

Buzard, D. (2003) TheYale Journal of Criticism, volume 16, number 1. pp 61-91 Yale University and The Johns Hopkins University Press

Cohen, L., Manion, L., Morrison, K. (2008) sixth Ed. Research Methods in Education. Routledge, Taylor Francis Group, London.

Connell, W.F. (1962) The Foundations of Secondary Education. Australian Council for Educational Research, Melbourne.

Cooney, G. (2001) 'The Tertiary Entrance Rank : an endangered species?' ACACA conference Sydney 2001 : 'Bringing assessment and curriculum issues together'. Sydney : ACACA, 2001

Cross, N., Christiaans, H., Dorst, K. Design Expertise Amongst Student Designers. Journal of Art & Design Education, Volume 13, Issue 1, pages 39–56, June 1994

Crawford, K. (2011). Six provocations for big data. Oxford Internet Institute's "A Decade in Internet Time: Symposium on the Dynamics of the Internet and Society" on September 21, 2011

Cunningham, S. J., Jones, M. *Autoethnography: a tool for practice and education.* In proceeding of: Proceedings of the 6th ACM SIGCHI New Zealand Chapter's International Conference on Computer-Human Interaction: Making CHI Natural, 2006, Auckland, New Zealand, July 7-8, 2005.

Dearn, J. Fraser, K. Ryan, Y. (2002) Professional Development for University Teaching in Australia: A Discussion Paper. October 2002. DEST commission ISBN 0642 77300 9 .

DEST (2002) Department of Education Science and Training: *Employability skills for the future: A report by the Australian Chamber of Commerce and Industry and the Business Council of Australia*. Canberra.

DEST (2004) Performance indicators and statistics used in the institution assessment framework. Canberra: Department of Education, Science and Training.

Doloriert, C, & Sambrook, S. (2009). Ethical confessions of the "I" of autoethnography: The student's dilemma," *Qualitative Research in Organizations and Management: An international journal, 4*(1), 27-45.

Doloriert, C, & Sambrook, S. (2011). Accommodating an autoethnographic PhD: The tale of the thesis, the viva voce and the traditional Business School, *Journal of Contemporary Ethnography, 40*(5), 582-615.

Dorst, K. (2011) The core of 'design thinking' and its application, Design Studies, Volume 32, Issue 6, November 2011, Pages 521-532,

Duncan, M. (2004) Autoethnography: Critical appreciation of an emerging art. International Journal of Qualitative Methods Vol.3 No.4. Edmonton, Canada.

Drew, S., Thorpe, L. and Bannister, P. (2002) Key skills computerised assessments, Guiding principles, Assessment and Evaluation in Higher Education 27 (2) 175-186

Dyson, M. (2007). *My story in a profession of stories: auto-ethnography: an empowering methodology for educators.* Australian Journal of Teacher Education. v 32, n.1, p.36-48

Economist, (2004). Supercharging the brain. Vol. 372 Issue 8393, special section 9/18/2004,

Edwards, M., (2002) Public Sector Governance – Future Issues for Australia, Australian Journal of Public Administration, 61(2), pp. 51 - 61

Eisner, E.W. 'What can education learn from the arts about the practice of education?' John Dewey Lecture 2002 http://www.infed.org/biblio/eisner_arts_and_the_practice_of_education.htm (accessed 7 December 2011)

Ellis, C., Adams, T.E., Bochner, A.T. Autoethnography: An Overview. *Historical Social Research / Historische Sozialforschung* , Vol. 36, No. 4 (138), Conventions

and Institutions from a Historical Perspective / Konventionen und Institutionen in historischer Perspektive (2011) , pp. 273-290

Falchikov, N. (2006) Improving Assessment through Student Involvement. Routledge Falmer, London.

Flecha, R. (1999) New Educational Inequalities in Critical Education in the New Information Age, Boston, USA, Rowman and Littlefield.

Freeman, M. & McKenzie, J. (2002). SPARK, a confidential web-based template for self and peer assessment of student teamwork: benefits of evaluating across different subjects. British Journal of Educational Technology, Volume 33, Issue 5, pages 551–569, November 2002

Garner, S. & Duckworth, A. (2000) The employability of design graduates: A study of competencies achieved through undergraduate design education. IN SWANN, C. A. Y., E. (Ed.) Re-inventing Design Education in the University. Perth, West Australia, Curtin University of Technology.

GCA (2008) University and Beyond 2008 Snapshot Report http://www.graduatecareers.com.au/content/view/full/3088 pdf retrieved 29.09.2009

GCA GradStats (2008) Report Number 13, December 2008 http://www.gradsonline.com.au pdf retrieved 30.09.2009

GCA GradStats (2012) December 2008 http://www.gradsonline.com.au pdf retrieved 12.03.2013

GCA (2012) Beyond Graduation Report 2008-2011, GCA http://www.graduatecareers.com.au/ accessed 1.6.13

Geertz, C. (1973) 'Thick Description: Toward an Interpretive Theory of Culture' in The interpretation of cultures Selected essays (1973) Volume: 5043, Publisher: Basic Books, Pages: 3-30

Gorst, H.E. (1901) *The Curse of Education*. London: Grant Richards

Grundy, S. (1987) Curriculum: Product or Praxis. Lewes, Falmer

Hallman, R.J. (1981) 'The necessary and sufficient conditions of creativity' in Creativity: Its educational implications. Gowan J C. (Ed.) 2nd Edition. Kendall Hunt Pub Co

Hanson J.M. & Sinclair K.E. (2008). Social constructivist teaching methods in Australian universities – reported uptake and perceived learning effects: a survey of lecturers. Higher Education Research & Development, Volume 27, Issue 3, 2008 pages 169-186.

Harman, G., & Meek, L. (2007). Australia: adjustment to the new management and entrepreneurial environment. In W. Locke & U. Teichler (Eds.), The changing conditions for Academic work and careers in select countries (pp. 127-146). Germany: International Centre for Higher Education Research (INCHER), University of Kassel.

Haynes, A. (2004) Examination and learning: an activity-theoretical analysis of the relationship between assessment and educational practice, in Assessment & Evaluation in Higher Education, Volume 29, Number 2 / April 2004, 159-176. Routledge

Hart, A. (1987) The political economy of interactive video in British higher education. In Laurillard, D. (Ed.) *Interactive Media: Working Methods and Practical Applications.* Chichester, Ellis Horwood.

HEA, (2006) 'Student Employability Profiles: a guide for Higher Education Practitioners' The Higher Education Academy, September 2006. ISBN 1-905788-17-7

HESA Higher Education Support Act 2003 (2010) No. 149 published 19.07.2010. Office of Legislative Drafting and Publishing (OLDP) Australia.Hill, T. Westbrook, R. (1997). SWOT Analysis: It's Time for a Product Recall in Long Range Planning Vol 30; No. 1, pages 46-52, Pergamon ISSN 0024-6301

Higher Education Council (1992), Higher Education: Achieving Quality. October, 1992 AGPS Canberra

Hill, T. & Westbrook, R. SWOT analysis: It's time for a product recall, Long Range Planning, Volume 30, Issue 1, February 1997, Pages 46-52

Huczynski, A., Buchanan, D. (2007) Organizational Behaviour, Financial Times Prentice Hall ISBN: 9781405887717

Hughes, C., Barrie, S. (2008) National GAP Issue Paper 5: Assessment. http://www.itl.usyd.edu.au/projects/nationalgap/resources/discussionpapers.htm (accessed 1.6.2012, checked 27.4.2014)

Hughes, C., Barrie, S. (2010) Influences on the assessment of graduate attributes in higher education. Assessment & Evaluation in Higher Education. May 2010, Vol. 35 Issue 3, p325-334.

Illing, D. (2001) The new Australian Universities Quality Agency. The Australian. Sydney.

Jones, S.H. (2005). Autoethnography: Making the personal political. In N. Denzin & Y. Lincoln (Eds.), Handbook of qualitative research (3rd ed., pp. 763–791). Thousand Oaks, CA: Sage Publications.

Johnston, D., Strong, T., (2008) Reconciling Voices in Writing an Autoethnographic Thesis. International Journal of Qualitative Methods. Vol.7 No. 3. pgs 47-61. Edmonton, Canada.

Kapitan, T. (1992). Peirce and the Autonomy of Abductive Reasoning , Erkenntnis, 37:1 (1992:July)

Kember, D. & Leung, D.Y.P. (2005) The influence of active learning experiences on the development of graduate capabilities. Studies in Higher Education Vol. 30, Iss. 2, 2005

Kimbell, L. (2009) 'Beyond design thinking: Design-as-practice and designs-in-practice' CRESC Conference (Centre for Research on Socio-Cultural Change), Manchester, September 2009

Kincheloe, J.L. (2003) Teachers as Researchers: Qualitative Inquiry as a Path to Empowerment. London. Routledge Farmer

Knight, P. (2007). Grading, classifying and future learning. In: Boud, David and Falchikov, Nancy eds. *Rethinking assessment in Higher Education : learning for the longer term.* UK: Routledge, pp. 72–86.

Kolb, D. A. (1976) *The Learning Style Inventory,* Boston, MacBer.

Kouzes, J.M. and Posner, B.Z. (2007) 'Leadership is in the eye of the follower' in The Pfeiffer Book of Successful Leadership Development Tools. (ed. Gordon, J.) Wiley books. San Francisco.

Lawson, B. (2005) How Designers Think. Architectural Press. 4th Ed. Elsevier. UK

Leckey, J.F. and McGuigan, M.A, (1997). Right Tracks—Wrong Rails: The Development of Generic Skills in Higher Education, in Research in Higher Education, Issue Volume 38, Number 3 / June, 1997. Pages 365-378.

Lomas, L. (2007) Are Students Customers? Perceptions of Academic Staff. Quality in Higher Education. Vol. 13, Iss. 1, 2007

Martin, R. (2009) The Design of Business: Why Design Thinking is the Next Competitive Advantage (Harvard Business Press, USA).

Marton, F. & Booth, S.A. (1977) Learning and Awareness. Lawrence Erlbaum Assoc. Inc. New Jersey USA.

Marton, F., Hounsell, D., & Entwistle, N. (Eds.). (1984). The experience of learning. Edinburgh, Scotland: Scottish Academic Press.

Marton, F. & Saljo, R. (1976) Qualitative differences in learning I: outcome and process. British Journal of Educational Psychology, 46.

McNay, I. (1995) 'from the collegial Academy to the computer and enterprise: the changing cultures of universities', in T. Schuller (ed.) The changing university? Buckingham: SRHE & Open University Press.

McWhinnie, Louise J. I., (2008) An inquiry into the study of visual communication by international asian students within the context of an Australian university. PhD Thesis in Art History & Art Education, College of Fine Arts, UNSW.

Mayer, K. (1992) (chair) Key Competencies, Report to Ministers of VEET, AEC Australia

Mentkowski, M. (2006). Accessible and adaptable elements of Alverno student assessment-as-learning: Strategies and challenges for peer review. In *Innovative assessment in higher education*, ed. C. Bryan and K. Clegg, 48–63. London: Routledge

Mitchell, J., Maher, J., Brown, K. (2008) 'Keeping Up and Keeping It Together: Tertiary Arts Students Managing Health, Family and Self Esteem'. Issues in Educational Research; 18(1).

Nelson, B. (2002) Higher Education at the Crossroads Overview discussion paper. Canberra, Australia, Commonwealth of Australia.

New York Times (1996) Virtual Univerisities http://www.nytimes.com/1996/06/25/us/virtual-university-will-offer-authentic-degrees-by-e-mail.html (rechecked 28.4.14)

NYT Education Supplement (1999), November 17. NYT Education Supplement article (accessed 10.2.2004 no longer accessible).

Norman, J., (2001), Design as a framework for innovative thinking and learning: how can design thinking reform education? (pp. 90-99) IDATER International Conference on Design and Technology Educational Research in Curriculum Development, Loughborough University, UK.

Northen, S. (2005), 'Enjoy an intellectual orgasm', The Times Educational Supplement, Feb 25 London.

NTEU (2011) University Employment Shouldn't Be A Casual Affair http://www.nteu.org.au/article/University-Employment-Shouldn't-Be-A-Casual-Affair-11849 (accessed 05 September 2011)

NTEU (2012) Casual Teaching & Research Staff Survey 2012: Summary of Key Results, May 2012. pdf. downloaded 1.5.2013

Nunan, T. (1999). Graduate qualities, employment and mass higher education. HERDSA Annual International Conference, Melbourne, 12-15 July 1999. http://www.herdsa.org.au/wp-content/uploads/conference/1999/pdf/Nunan.PDF (rechecked 2.4.2014)

O'Brien, T. and Wright, K., (2007) 'Helping students with HSC stress and distress' Australian Educational Leader; v.29 n.2 p.32-35; 2007

OECD (2006) Education at a Glance report. Section Table B2 http://www.oecd.org/document/52/0,3343,en_2649_39263238_37328564_1_1_1_1,00.html retrieved 1.10.09

OECD (2013) Education at a Glance report. Section Table B4.1. Total public expenditure on education, www.oecd.org/edu/eag.htm. Retrieved 5.7.13

OLT (2014) BLASST report: Benchmarking Leadership and Advancement of Standards for Sessional Teaching. Office for Learning and Teaching. http://www.olt.gov.au/resource-blasst (checked 15.1.2015)

Owen, C. (2006) 'Design Thinking: Notes on Its Nature and Use' Design Research Quarterly 1:2 Dec.

Papert, S. A. (1996) The Connected Family - bridging the digital generation gap, U.S., Longstreet Press.

Petrosky, A.R. (2006) 'Inquiry teaching and learning in an environment shaped by behavioural standards and high stake tests' in Only connect : English teaching, schooling and community, eds. B Doecke, M Howie and W Sawyer, pages 83-98. Wakefield Press; Australian Association for the Teaching of English.

Pitman, T. (2000) Perceptions of Academics and Students as Customers: A survey of administrative staff in higher education. Journal of Higher Education Policy and Management Vol. 22, Iss. 2, 2000

Pritchett, N. (1999). Effective question design. In Brown S, Race P and Bull J (eds.), Computer-Assisted Assessment in Higher Education, London, Kogan Page.

Quinn, R. (1984). Applying the Competing Values Approach to leadership: Toward an integrative framework. In J. G. Hunt, D. Hosking, C. Schriessheim & R. Stewart (Eds.), Leaders and Managers; International Perspectives on Managerial Behaviour and Leadership (pp. 10-27). New York: Pergamon press.

QUT (2009) Assessment Issues and Practices workshop: 'The Changing Climate of Assessment: Issues and Practice', 10 September 2009 - 11 September 2009 . http://www.ed.qut.edu.au/news/news-event.jsp?news-event-id=29709 (accessed 1.10.09)

Ramsden, P., & Entwistle, N. J. (1981). Effects of academic departments on students' approaches to studying. British Journal of Educational Psychology, 51, 368-383.

Ramsden, P. (1992) Learning to Teach in Higher Education, London, Routledge

Ramsden, P. (2003). Learning to Teach in Higher Education, Routledge Farmer. London UK.

Ramsden, P. (2008). The future of higher education teaching and the student experience. http://webarchive.nationalarchives.gov.uk/20100304122451/http://www.bis.gov.uk/wp-content/uploads/2009/10/HE-Teaching-Student-Experience.pdf (Checked pdf file 16.1.2015)

Razzouk & Shute, (2012). What is Design Thinking and Why is it Important? Review of Educational Research September 2012, Vol. 82, No. 3, pp. 330–348

Renner, P.G. (2001). Vulnerable to possibilities: A journey of self-knowing through personal narrative. Unpublished doctoral dissertation, The University of British Columbia, Vancouver, Canada. Retrieved 24 October 2011 from http://m1.cust.educ.ubc.ca:16080/Artography/data/phd/Renner.pdf

Reuters (2007). Three detained for high-tech exam cheating. http://www.reuters.com/article/2007/06/08/us-china-exams-idUSPEK18155920070608 (Accessed 23.1.2012, rechecked 28.4.14)

Reuters (1996) Dying for Information - An investigation into the effects of information overload in Australia and Worldwide. *Reuters Report.* London, Reuters Limited.

Robinson, K., (2011) Out of Our Minds: Learning to be Creative. Capstone Publishing, Sussex, UK.

Rogers, R. (2001). Reflection in higher education: a concept analysis. Innovative Higher Education, 26(1), 37- 57.

Rust, C., O'Donovan, B & Price, M. (2005) A social constructivist assessment process model: how the research literature shows us this could be best practice, Assessment and Evaluation in Higher Education, 30(3), 233-241

Ryan, R.M., Deci, E.L. (2000) Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. Contemporary Educational Psychology, Volume 25, Issue 1, January 2000

Ryan, Y., Fraser, K., Bryant, L., & Radloff, A. (2004). The multiple contexts of higher education and academic development. In L. Elvidge (Ed.), Exploring Academic Development in Higher Education: Issues of Engagement. Cambridge: Jill Rogers Associates.

Ryan, S., Burgess, J., Connell, J., Groen, E. (2013). 'Casual Academic Staff in an Australian University: Marginalised and excluded'. Tertiary Education and Management Volume 19, Issue 2, 2013

Sadler, D.R. (1989). Formative assessment and the design of instructional systems. Instructional Science, 18(2), 119–144.

Sadler, D.R. (2005) Interpretations of criteria-based assessment and grading in higher education, Assessment & Evaluation in Higher Education Vol. 30, Iss. 2, 2005.

Salchow, G. (1994) Two Myths about Design Education (1981). In Bierut, M. (Ed.) Looking Closer 1: Critical Writings on Graphic Design. New York, Ailsworth Press.

Salmi, J. and Altbach, P. (2011) New World-Class Universities: cutting through the hype. Chronicle of Higher Education. October 20.

Sambrook, S., Stewart, J., & Roberts, C. (2008). Doctoral Supervision: Glimpses from Above, Below and in the Middle, Journal of Further and Higher Education, 32(1), 71-84.

Sankey, M., & Lawrence, R. (2003). Suicide and risk-taking deaths of children and young people. Sydney: New South Wales Commission for Children and Young People, Child Death Review Team, & Centre for Mental Health.

Smith, L., & Sinclair, K. E. (2000). Transforming the HSC: Affective implications. Change: Transformations in Education, 3(2), 67-79.

Southwell, D. (2012) 'Good Practice Report: revitalising the academic workforce'. Australian Learning and Teaching Council Limited. Published: 2012

Steinberg, R. J. (1997). Thinking styles. New York: Cambridge University Press.

Suzuki, D. (1998) *Earth Time,* Toronto, Canada, Stoddart Publishing Co Ltd.

Sydney Morning Herald, (2004). 'Stress put to the test' Teen Wellbeing supplement. Sydney Morning Herald, Oct 28, 2004 p 3.

Tan J. and Gopinathan, (2000) S. Education Reform in Singapore: Towards Greater Creativity and Innovation? The NIRA Review. http://www.nira.or.jp/past/publ/review/2000summer/tan.pdf retrieved 1.10.09

Thompson, D.G. 2003, 'Educational Concepts For Design Lecturers', *Form/Work*, vol. 6, pp. 81-90.

Thompson, D.G. 2006, 'E-Assessment: The Demise of Exams and the Rise of Generic Attribute Assessment for Improved Student Learning' in Tim S. Roberts (ed), *Self, Peer and Group Assessment in E-Learning*, Information Science Publishing (an imprint of Idea Group Inc.), USA, pp. 295-322.

Thompson, D.G. 2007, 'Integrating Graduate Attributes with Student Self Assessment', ConnectED: International Conference on Design Education, Sydney, Australia, July 2007 in Proceedings of ConnectED 2007, International Conference on Design Education, ed Zehner, R. and Reidsema, C. (Eds), 2007, University of New South Wales, Sydney, Australia, pp. 1-6.

Thompson, D.G., Treleaven, L., Kamvounias, P., Beem, B. & Hill, E. 2008, 'Integrating Graduate Attributes with Assessment Criteria in Business Education Using an Online Assessment System', Journal of University Teaching and Learning Practice, vol. 5, no. 1, pp. 34-48.

Thompson, D.G. (2009), 'Engaging staff and students in an explicit and integrated approach to the development of graduate's attributes in a School of Design' in Curriculum Development in Studio Teaching, Vol.4 STP Case Studies of Effective Practice. p.19-28

Thompson, D.G. (2009). Successful engagement in graduate attribute assessment using software, Campus-Wide Information Systems, (26) 5, p. 400-412

Thompson, D.G. & McGregor, I. (2009). Online self and peer assessment for groupwork, Education and Training, (51) 5/6, p. 434-447

Toffler, A. (1990) 'Powershift: Knowledge, Wealth, and Violence at the Edge of the 21st Century'. First published hardback October 1st 1990 by Bantam.

(http://31.media.tumblr.com/tumblr_m5ofsxXq9h1ryei2ko1_1280.jpg Image retrieved 28.1.14)

Trounson, A. (2009) 'Universities face academic exodus as corporate culture takes hold' The Australian Newspaper. 2 October 2009 http://www.theaustralian.news.com.au/story/0,25197,26153706-12332,00.html retrieved 13.10.09

UAC, (2009) What Happened to the UAI? Report on changes to the UAI system June 2009. http://www.uac.edu.au/international/atar/what-happened-to-the-uai.shtml (retrieved 15.10.09)

UAC, (2013) http://www.uac.edu.au/documents/atar/All-About-Your-ATAR.pdf. Retrieved 6 February 2013.

Universities Australia, (2011. 2012) Assessment of Generic Skills, Discussion Paper December 2011, AQHE Performance Indicators Discussion Papers Submission February 2012. Downloaded 5.6.13 http://www.universitiesaustralia.edu.au/resources/701/1364

Vilkinas, T., & Cartan, G. (2006). The integrated competing values framework: Its spatial configuration. Journal of Management Development, 25(6), 505-521.

Vilkinas, T., Leask, B., Rogers, T. (2007) Developing the leadership capability of academic coordinators. in Enhancing Higher Education, Theory and Scholarship, Proceedings of the 30th HERDSA Annual Conference [CD-ROM], Adelaide, 8-11 July.

Walker, D.J., Topping, K., Rodrigues, S. Student reflections on formative e-assessment: expectations and perceptions. Journal of Learning, Media and Technology, 33(3), 221-234

Watson, D. (2012). Misunderstanding Modern Higher Education: Eight "category mistakes. Higher Education Policy Institute, UK. Date: 29 Feb 2012

Whitehead, A.N,, (1938) Modes of Thought, The Macmillan Co., New York.

Whitehead, A.N., (1967) The aims of education and other essays, New York USA, The Free Press Paperback.

Williams, L., Vablais, W., & Bathiche, 5. (2004). US. Patent No. 559746. Washington, DC: U.S. Patent and Trademark Office.

Wright, P. (1995). Canberra, Australian Capital Territory: The Higher Education Quality Council, Quality Enhancement Group.

Yielder, J., & Codling, A. (2004). Management and Leadership in the Contemporary University. Journal of Higher Education Policy and Management, 26(3), 315-328.

Ying Liu, L. (2002), August 1. In Family Practice News, 32(15).

APPENDICES

Appendix 1: DVD and Googledrive INDEX

The following items listed in alphabetical order are referred to in the text of the thesis and stored on the DVD that is included with the thesis. These items are also accessible on Googledrive in a folder named 'PhD DVD items' only by using following internet link:

https://drive.google.com/folderview?id=0B1BdFof4_9sbUktaVVlIR3FKcWc&usp=sharing

Video approvals have been obtained where necessary and other items have unrestricted access.

Filenames:

_DarrallThompsonPhD.pdf

AbbyCathcart.m4v

ALTC Final Report.pdf

BIHEC_EmployabilitySkills.pdf

CarrickInterviewDT.mov

CommProj.mp4

DannyCarrollUNSW.mov

Functional vs Expressive movie.mov

GAP_Staff.mov

GAP_Student.mov

HumanRights.jpg

NSW_CreativeHubReport.pdf

NSW_InnovationResearch.pdf

STP Report Vol 4.pdf

Appendix 2: Australian University Graduate Attribute policies

The following list is compiled from the author's research to find references to Australian universities graduate attribute policies. Website url's with dates of publication or revision are included where possible.

1. Australian Catholic University
http://my.acu.edu.au/__data/assets/pdf_file/0003/93693/Graduate_Attributes.pdf June 13 2007.

2. Australian National University [ANU]
http://policies.anu.edu.au/guidelines/commentary_on_the_code_of_practice_for_teaching_and_learning_relevant_anu_policies_examples_and_explanations/guideline August 2008

3. Bond University http://www.bond.edu.au/tls/context/gradatt.html 2006

4. Central Queensland University Not Found

5. Charles Darwin University [CDU]
http://www.cdu.edu.au/graduateattributes/index.html September 2008

6. Charles Sturt University
http://www.csu.edu.au/division/landt/policy/documents/gradattrib2006.doc 2006

7. Curtin University of Technology
http://policies.curtin.edu.au/policies/viewpolicy.cfm?id=a339b6d7-f566-11dc-8b33-f162796bb42f September 2006

8. Deakin University http://www.deakin.edu.au/itl/pd/tl-modules/curriculum/grad-attrib/grad-attr-02.php 2008

9. Edith Cowan University [ECU]
http://www.ecu.edu.au/GPPS/policies_db/policies_view.php?rec_id=0000000248 2004 to be reviewed in 2011

10. Flinders University
http://www.flinders.edu.au/shadomx/apps/fms/fmsdownload.cfm?file_uuid=C430EC02-0660-38B2-38AD-08D5052FD0CB&siteName=flinders 2008

11. Griffith University http://www62.gu.edu.au/policylibrary.nsf/

12. James Cook University
http://www.jcu.edu.au/policy/teaching/teaching/JCUDEV_007031.html 2004

13. La Trobe University
http://www.latrobe.edu.au/health/teachlearn/graduate_attributes/Grad_attributes_Final_2007.pdf

14. Macquarie University
http://www.mq.edu.au/provost/planning/landt_plan_low_res.pdf Mentions graduate capability

15. Monash University http://www.policy.monash.edu/policy-bank/academic/education/management/monash-graduate-attributes-policy.html October 2008

16. Murdoch University http://www.tlc.murdoch.edu.au/gradatt/attributes.html 2004

17. Queensland University of Technology
http://www.yourfeedback.qut.edu.au/graduate/graduatepath/

18. RMIT University In summary, RMIT graduates will be: • work-ready • active learners • life-long learners • global in outlook and competence • culturally and socially aware • innovative • environmentally aware and responsible
http://mams.rmit.edu.au/fhzh0sqvnz48.pdf

19. Southern Cross University http://www.scu.edu.au/support/index.php/2/ March 2008

20. Swinburne University of Technology
http://www.swinburne.edu.au/corporate/spq/planning_plans.html#ltp 2009

21. University of Adelaide http://www.adelaide.edu.au/clpd/online/current/gradattrib/ April 2009

22. University of Ballarat - Not found

23. University of Canberra https://guard.canberra.edu.au/policy/policy.php?pol_id=3030 2007

24. University of Melbourne http://www.unimelb.edu.au/about/attributes.html 2007

25. University of New England http://www.une.edu.au/gamanual/ Introduced 1998, revised 2005 and 2007

26. UNSW
http://learningandteaching.unsw.edu.au/content/userDocs/grad_attributes.pdf 2000

27. University of Newcastle http://www.newcastle.edu.au/policy/000836.html August 2007

28. University of Notre Dame - Not found

29. University of Queensland http://www.uq.edu.au/teaching-learning/index.html?page=7421 2007

30. University of South Australia
http://www.unisanet.unisa.edu.au/careers/GraduateQualities/whatare.asp October 2007

31. University of Southern Queensland http://www.usq.edu.au/qualgrad/ October 2008

32. University of Sydney http://www.itl.usyd.edu.au/graduateAttributes/statement.htm 2004

33. University of Tasmania
http://www.utas.edu.au/tl/orientation/docs/GA_developing_and_tracking.pdf mentioned on page 3

34. University of Technology
http://www.uts.edu.au/work/coursedevelopment/links/documents/graduateprofile.pdf November 2005

35. University of the Sunshine Coast
http://www.usc.edu.au/University/LearningTeaching/About/Attributes.htm 2009

36. University of Western Australia
http://www.catl.uwa.edu.au/current_initiatives/obe/principles 2005

37. University of Western Sydney http://policies.uws.edu.au/download.php?id=189

38. University of Wollongong
http://www.uow.edu.au/about/teaching/qualities/index.html#P14_848 July 2008

39. Victoria University http://tls.vu.edu.au/SLED/QTIU/policies/cgas.htm 2005

Appendix 3: Ideas for the Creative Hub Scoping Study

1. Getting on the Map and Hub Branding

The idea of interactive mapping has gained a great deal of enthusiastic feedback during the scoping study. It would be accessible as part of the Hubs branded web presence and could contain selectable layers so that a vast range of hub features could be quickly found.

For example one could select a dropdown map menu that would allow 'view by':

- Educational provision (all courses from Uni and VET Sectors with details)
- Mentoring and Internships
- Current Exhibitions
- CI Businesses
- Find an Expert
- Arts Events
- Visiting Speakers
- Spaces for events
- Launches
- Empty Spaces project
- Creative Spaces project etc.

The incentive for engagement would be 'Getting on the Map' with obvious benefits for the cohesion and visibility of hub affairs.

2. 'Find an intern' web service

This hub project could be articulated as a type of social networking around the offer and demand for internships, where an updated online database of available positions are posted onto the hub's online forum. The maintenance and updating of this database would need to include feeds from other internship schemes and would require the development of relationships and agreements with universities, VET sector, professional associations, government bodies, centres, cultural and community organisations and companies.

3. Internship Kit for employers and interns

The Internship Kit would be a guide for both employers and interns including logbooks, insurance policies, assessment criteria, suggested activities and pay

arrangements. The kit would be available on the 'Find an intern' website but also presented as workshops for interested companies and interns.

4. Hi-Tech upskilling project
This project involves negotiating the supervised use of 'down-time' on high-tech equipment lying idle in companies, colleges and universities on evenings and weekends. It could be offered as a special upskilling for existing interns or prospective interns needing experience with 'difficult to access' hi-tech hardware or software.

5. Creative Student Mentoring
Coordination and matching of mentors and students in both university and VET sector similar to the Queensland University of Technology CareerHub project.

6. Creative Business Mentoring
Aimed at imparting business acumen to creative business individuals and SME companies that are too small for engagement with the Creative Industries Innovation Centre, Enterprise Connect initiative.

7. Problem-Based Learning Workshops
Aimed at developing awareness for both university and VET sector teachers of the differences between project-based learning activities and problem-based learning.

8. Creativity Assessment Project
Pilot schemes for schools, university and VET sector of the UTS online assessment system (ReView) that explicitly includes Creativity and Innovation in assessment criteria together integrated with other attribute development categories.

9. Mobile Experts project
'Find an expert' in any topic relevant to creative business activity (possibly through the Hub website) and book an on-site workshop for self-selected small groups.

10. Articulation Exchange Project

Negotiate exchanges to expand individuals exposure to educational experiences suited to their abilities or intended career development.

11. Creative Practice Firm

This could be staffed by creative educators, business people, artists or designers in residence and provide a training space for business staff and students from all levels and creative industries.

12. City of Sydney spaces project

Using the database that includes GIS data about use of spaces in the hub region there could be initiatives developed to provide spaces for creative business and activities for little or no cost. This database will be updated with the Census in 2011 and could be linked to the hub interactive map.

13. Free WiFi and power sockets

This would open up the creative work spaces and support an open knowledge infrastructure in the hub region.

14. Large LCD panels and building projections

Giving a visible display of hub activities as a constant 24x7 digital reflection of the many exciting activities happening in the hub region. Also providing a facility for art / informatics / history projects, temporary installations, way-finding projects and exhibitions.

15. Digital Open Library project

Foregrounding libraries as a major part of open knowledge infrastructure with digital indexing and access to creative content integrated across the hub region. Also provision of open specialised computer workstations with creative software and expert training available from volunteers or possibly interns.

16. Digital Culture project

The use of social networking media to encourage grass roots engagement across the hub region. Linking together and providing support to arts and community initiatives such as Vibewire and promoting them as an important

aspect of hub activity with access to all the facilities that the hub will embrace.... Getting them 'on the map'.

17. Pervasive work and social spaces

The hub should provide a series of networked and flexible spaces designed for a mix of social interaction and work-related activities. Study pods, stepped amphitheatres within open space, informal meeting spaces, exhibition spaces, workshop space defined by the knowledge transfer potential rather than a purely functional approach.

87333 - DEBATE SPECTRUM - Spring 2008 - (SEPARATE FORM FOR EACH GROUP MEMBER)

TYPOGRAPHERS / DESIGNERS NAME: _____

(PLACE A CROSS OR CROSSES WHERE YOU THINK / FEEL YOUR TYPOGRAPHER / DESIGNER FITS ON THIS SPECTRUM)

PURELY PROBLEM-SOLVING	FUNCTIONAL APPROACH	IN-BETWEEN	EXPRESSIVE APPROACH	VERY SELF EXPRESSIVE
•	•	•	•	•

GROUP MEMBER SPECTRUM

WHAT WAS YOUR INCLINATION BEFORE STUDYING YOUR GIVEN TYPOGRAPHER?
(PLACE A CROSS OR CROSSES WHERE YOU THINK / FEEL YOU FITTED ON THIS SPECTRUM)

PURELY PROBLEM-SOLVING	FUNCTIONAL APPROACH	IN-BETWEEN	EXPRESSIVE APPROACH	VERY SELF EXPRESSIVE
•	•	•	•	•

WHAT WAS YOUR INCLINATION AFTER STUDYING YOUR GIVEN TYPOGRAPHER?
(PLACE A CROSS OR CROSSES WHERE YOU THINK / FEEL YOU NOW FIT ON THIS SPECTRUM)

PURELY PROBLEM-SOLVING	FUNCTIONAL APPROACH	IN-BETWEEN	EXPRESSIVE APPROACH	VERY SELF EXPRESSIVE
•	•	•	•	•

COMMENT ABOUT HOW TO IMPROVE THIS DEBATE PROJECT AS A LEARNING EXPERIENCE, LIKES / DISLIKES Etc?:
