The assessment of graduate skills

Orientating students and standards for an uncertain future

Acknowledgements

This review has been prepared as part of 'The embedding the development and grading of generic skills in the business curriculum' project (www.graduateskills.edu.au), funded by the Australian Learning and Teaching Council. It is written by Brendan Rigby (Macquarie University), and revised by the project members: Marilyn Clark-Murphy (Edith Cowan University), Anne Daly (University of Canberra), Peter Dixon (University of Tasmania), Marie Kavanagh (University of Southern Queensland), Lynne Leveson (La Trobe University), Peter Petocz (Macquarie University), Theda Thomas (Australian Catholic University), Leigh Wood (Macquarie University), and Tori Vu (Macquarie University).

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Support for this project has been provided by the Australian Learning and Teaching Council, an initiative of the Australian Government Department of Education, Employment and Workplace Relations. The views expressed in this presentation do not necessarily reflect the views of the Australian Learning and Teaching Council Ltd.

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ISBN: 978-0-9805685-5-4

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1. Introduction

The purpose of this review is to examine the extant research literature on academic standards and assessment in higher education. In particular, it will focus on the location of graduate skills in the academic standards agenda and in the principles and practice of assessment in higher education. This extensive review, although not exhaustive, was completed as part of the Australian Learning & Teaching Council's (ALTC) project, *Embedding the Development and Grading of Generic Skills in the Business Curriculum*. This paper will: critically examine the concept of academic standards in the context of higher education reform; locate graduate skills in the standards agenda; review the extant literature on assessment in general, and on the assessment of graduate skills in particular; and define and examine the link between standards, assessment and student learning.

The reform agenda currently being negotiated within higher education in Australia, and indeed in the higher education systems in Europe, UK and the US, is seemingly driven by a concern for quality assurance and accreditation in an increasingly fluid and competitive global economy and student body (DEEWR, 2009). It is also representative of a paradigm shift in quality assurance from that based on 'fitness for purpose' to excellence and the achievement of academic standards. Student academic achievement, the measure for quality in higher education, is being located strategically at a national level: linked explicitly to national economic development and regional and global competitiveness within the education market (AUQA, 2009; James, 2003). At the same time, the process of developing and implementing academic standards for quality assurance is quite transparent and participatory. Academic standards have tremendous implications for accountability, public confidence and international competitiveness, but also for the shaping of effective teaching and learning processes and student autonomy and lifelong learning.

2. Academic standards

2.1 Driving academic standards

The European higher education system has recently undergone significant change, adopting the Dublin Descriptors under the Bologna Agreement. The process was underwritten by the Berline Communique (2003, p.4), in which:

> "Ministers encourage the member States to elaborate a framework of comparable and compatible qualifications for their higher education systems, which should seek to describe qualifications in terms of workload, level, learning outcomes, competences and profile. They also undertake to elaborate an overarching framework of qualifications for the European Higher Education Area".

The overall aim of the Bologna process was to create a common European higher education area (EHEA) to improve the competitiveness and attraction of the EHEA to other continents and countries. With 46 signatory states, and applying to 4000 institutions hosting 16 million students, the Bologna process has significant political support across Europe and has been highly influential across higher educations sectors worldwide. In a DEST (2006, p.1) report, it identified the Bologna process as presenting "challenges to, and opportunities for, Australia's relationship with Europe as well as Asia".

The Bologna process highlighted the critical place of student learning and assessment within the quality assurance dialogue. In particular, the process is concerned with identifying what students have achieved in terms of graduate skills. "If the 'transparency instruments' designed to clarify what students have achieved for their (comparable) degrees are to be effective then there needs to be some agreement of what is being assessed and how, and against what criteria" (Quality Assurance of Student Assessment, 2008 p. 5). The opening statement of the *Standards and Guidelines for Quality Assurance in Higher Education in the European Higher Education Area* recognises that "The assessment of students is one of the most important elements of higher education" (cited in QASA, p.4). Although this is a shared and well-established view in principle, tension exists when it comes to creating, implementing and taking responsibility for standards-based assessment (BIHECC, 2007; James, 2003; AUQA, 2009).

Over the past decade, the reform agenda around quality assurance and accreditation has witnessed the development of the concept of standards in higher education: as a means for measuring and reporting on student achievement and assuring quality higher education to all stakeholders. Indeed, the concept and global phenomenon of standards is the foundation upon which the reform agenda has evolved. Although there is mixed evidence as to whether academic standards are falling, governments, business and academics are clearly concerned and the drive towards conceptualising and implementing standards in gaining momentum (DEEWR, 2008).

The Australian government's concern with academic standards led to the establishment of the Australian Universities Quality Agency (AUQA) in 2000 as an independent national agency to monitor, audit and report on quality assurance. The National Graduate Attributes Project's (GAP, 2009) review of AUQA audits and available Course Evaluation Questionnaire (CEQ) data reveals two trends. First, that there does not appear to be significant improvement in graduate skill outcome indicators for universities with a curriculum focus on graduate skills. Second, that many staff and students still have a limited awareness of graduate skills. "Recent international developments in quality assurance are likely to have a significant effect on the integration and achievement of graduate attributes in Australia universities" (p.16).

Building on the foundation of AUQA, and reinforcing the government's commitment to and intervention in academic standards, is the establishment of the Tertiary Education Quality and Standards Agency (TEQSA) in 2010. It will act as the centre of the standards-based quality assurance framework, the Australian Qualifications Framework (AQF). The framework will seek to establish minimum standards for disciplines, a key foci identified by AUQA. The Australian Learning & Teaching Council, in a pilot project, is overseeing the establishment of minimum standards of achievement in Accounting needed for the AQF and TEQSA. Although it is unclear to what extent, the establishment of national standards in certain disciplines will have resounding effects on not only curriculum and course design, but on teaching, learning and assessment processes throughout higher education institutions, shaping the direction of student learning.

2.2 Defining academic standards

Despite this drive towards academic standards in higher education, the extant research on standards is minimal and under-theorised. A critical and often over-looked question is: what is a standard? Sadler (2005 pp.188-9) offers one of the few definitions of 'standard' that is broadly consistent with the range of meanings and appropriate to the notion of grading academic achievement:

> ***"standard*** n. A definite level of excellence or attainment, or a definite degree of any quality viewed as a prescribed object of endeavour or as the recognized measure of what is adequate for some purpose, so established by authority, custom, or consensus".

"This definition emphasises the twin ideas of a qualifying threshold for each standard, and of agreed-upon standards that are shared across a relevant community" (p.189). The developing, monitoring and reporting of academic achievement has been increasingly seen as an institutional and even national responsibility, linked to exclusively to standards.[1] This is in part to governments' increasing concern with national competitiveness in the international education market, economic development and the shifting role of higher education institutions (James, 2003; Rigby, et al., 2009). Synchronous with the development of the concept of standards has been the shift in higher education to outcomes-based teaching and learning (James, 2003). Outcomes-based teaching and learning allows for: students to demonstrate their learning through the achievement of unit and course outcomes; teachers to assess, measure and report against such outcomes; employer satisfaction of academic achievement; public accountability; and independent agencies' capacity to monitor, audit and report on quality assurance (OECD, 2008 in DEEWR, 2008). "Standards-based approaches emphasise what institutions should have in common, especially in terms of the nature and level of learning outcomes that students are expected to demonstrate in their university studies" (James, McInnis & Devlin, 2002),

At the centre of outcomes-based learning and standards of academic achievement is assessment. "Standards will be embodied in assessment practices and will be essentially outcomes-oriented; that is, standards will be more closely associated with the nature and levels of learning that students demonstrate during their university studies" (James, 2003 p.194). This is also a view shared by the Australian government, which states that "Rigorous processes for assessing student achievement are the most important safeguard of academic standards" (DEEWR, 2008 p.129). There is also international evidence that suggests the need for quality assurance be based on achievement of standards and a shift away from the 'fitness for purpose' approach (Martin & Stella, 2007 cited in DEEWR, 2008 p.133). This seemingly locates academic staff and higher education institutions as responsible for the development of academic standards. Indeed, DEEWR's *Transforming Australia's Higher Education System* (2009 p.32) states that, "Discipline communities will 'own' and take responsibility for implementing academic standards (working with professional bodies and other stakeholders where appropriate)". However, the BIHECC's (2007) report argues that it is the employer who must take responsibility for the assessment of a graduate's employability skills.

Academic standards are a very under-theorised and under-researched area in higher education. AUQA's (2009) definition of standards as a "big-picture concept that stands somewhat apart from particular assessment tasks and student responses" encourages conceptual and empirical research for the development of academic standards. However, this call has not been taken up by higher education institutions in Australia. "Few if any statements of desired areas of academic achievement and levels of achievement currently exist" (AUQA, 2009 p.9). There are a number of reasons offered for this lack of conceptualisation, development and implementation. First, as Sadler (2005) argues, the dominant focus historically in higher education institutions in Australia, and around the world, has been on criteria rather than standards. Although criteria-based assessment is clearly useful and valid, higher education institutions have differing conceptions of what it means in theory and in practice (Sadler, 2005; Woolf, 2004; Rust, et al., 2003). Sadler argues that rather than forming a definitive interpretation of criteria, it would be preferable to make a clear and consistent distinction between criteria and standards, followed by a shift to standards-based assessment.

[1] The Bologna process is essentially oriented towards developing a regional set of academic standards, the achievement of which can be measured, demonstrated and reported in a consistent and coherent manner. The US accreditation system has been criticised for a lack of accountability on higher education institutions and for the level of performance from their graduates. The recent increase in first and second-class honours for graduates from universities in the UK is interpreted as evidence of falling standards (AUQA, 2009). "Research suggests that institutions cannot report how well their students are, and hence the institution itself is, performing, and the sudden popularity of institutional rankings is due in part to their apparent (albeit spurious) ability to answer questions about level of achievement" (p.4).

> "To realise on the aspirations for criteria-based grading, a major shift in orientation is required towards 'standards-referenced' grading. Criteria-based grading begins with a focus on the criteria, leaving the standards to be implied or experienced incidentally. Criteria form an essential element of the evaluation and communication process, but ultimately it is the students' appreciation of quality, set against a background of external standards, that is of significance. A more appropriate approach would be to focus on the standards as the primary reference points against which student submissions are judged" (Sadler, p. 190).

Second, standards are under-theorised and underdeveloped because they are explicitly linked to assessment, which "is possibly one of the least sophisticated aspects of university teaching and learning" (James, 2003 p.197). The 2009 AUQA audit identified student assessment and grading, academic standards, assessment policy and methods, and alignment of learning outcomes as areas of risk. Increasingly, it is argued in the context of the reform agenda and conceptions of teaching and learning, that there is a need to develop adequate and quality assessment methods and corresponding standards (James, 2003; AUQA, 2009; QASA, 2008; GAP, 2009). Performance funding for higher education institutions from 2012 will be explicitly linked to academic standards. Thus, in this broad context, academic standards have materialised in the past decade as global public goods. "This is a grandiose way of saying that providing them is going to be problematic" (Collier, 2007 p.156). Sadler (2005) describes this problematic as four challenges: conceptualising standards; setting standards; communicating standards to students and academic staff; and becoming proficient in the use of standards. Adding another layer to this problematic is the lack of integration between assessment and the teaching and learning processes within institutions and faculties, a strong emphasis on summative assessment and non-use of assessment strategies to support, develop and motivate student learning.

AUQA (2009 p.7) argues that, "unless academic achievement standards become a definite focus, the value of grades as 'warrants' of demonstrated intellectual and professional learning cannot be substantiated". The very integrity of higher education institutions as sites of professional learning, intellectual autonomy, and student development is currently being challenged. However, the reform agenda around academic standards and outcomes-based learning has highlighted the underdevelopment of assessment practices in higher education and offers the opportunity to rethink and reorient assessment. In particular, for the effectiveness of student learning and student achievement of graduate skills, seen increasingly as the dominant outcomes of higher education (Rigby et al., 2009). "Australian higher education would benefit from greater exploration of the possibilities for using assessment not only as a mechanism for making standards more concrete and explicit, but also as a more sophisticated and strategic tool for helping shape effective teaching and learning processes" (James, 2003 p.198).

2.3 Graduate skills and academic standards

There is particular concern with academic standards pertaining to the development and assessment of graduate skills. AUQA (2009) states that one of the principle foci of academic standards should be the development of standards of achievement for generic (graduate) skills. Although most Australian universities have produced statements on the graduate skills they expect their graduates to develop, few if any have formalised academic achievement standards against which to measure students' achievement. A convergence of mapping graduate skills has taken place, as evident by the UK Quality Assurance Benchmark Statements, the European Tuning Process (Tuning Report, 2008), the consideration of a 'Bologna Process for US Eyes' (Adelman, 2009), and the development of the Australian Qualifications Framework. However, these processes do not currently specify standards of achievement. Indeed, only a few Australian universities have embedded

and make explicit reference to graduate skills in their assessment policies and fewer, if any, have developed standards of achievement for graduate skills.[2]

The conception and significance of graduate skills in higher education is a recent phenomenon. The Mayer Committee (1992) first recognised graduate skills, and the development and achievement of such, as indicators of employability. The concept of graduate skills now embodies notions of personal development for not only professional environments, but also for participation in the wider community through engaged citizenship (Rigby et al., 2009). Although the conceptualisation of graduate skills varies through interchangeable terms, there is a soft convergence amongst different stakeholders as to the key derivatives and dimensions of graduate skills (Rigby, et al., 2009; Barrie, 2004; Treleavan & Voola, 2008). Those are: the notions of lifelong learning and autonomy; the preparation of students for an uncertain future; the possession of core skills and competencies to participate in the work force; the need to promote active and engaged citizenry; and the implementation of learner-centred pedagogies. Graduate skills encompass skill components, attitudes, value, disposition, capabilities and competencies and reflect the contemporary concerns and agendas of a wide range of stakeholders in higher education.

However, research suggests that there is a lack of shared understanding on what graduate skills are, and when and how to integrate and develop such in the curriculum (Barrie, 2002, 2004; Sin & Reid 2005). Indeed, "a key weakness in the literature is the vagueness in the conception of generic skills and the proliferation of terms on the literature" (Sin & Reid, 2005 p.5). For example, the recent inclusion of sustainability and ethical practice in the concept of graduate skills or graduate attributes is problematic. They are difficult to conceptualise and capture as 'skills' or 'attributes'. While critical thinking and teamwork are clearly enabling skills, sustainability and ethical practice are perhaps better conceptualised as graduate dispositions (Reid & Petocz, 2006). As with the current negotiations on standards, quality assurance and accreditation, "The continual focus on graduate skills is really part of a bigger, as yet unresolved, debate about the purpose of university education and how to develop educated persons who are both employable and capable of contributing to civil society" (Business Higher Education Round Table, cited in James et al., 2004 p.175).

The extant research literature does suggest that the foundation for developing standards of academic achievement can be found in learning taxonomies (Boulton-Lewis, 1995; Chan et al., 2002; Green et al., 2009). Biggs & Collis' (1982) SOLO taxonomy is described as particularly useful in both shaping and assessing learning of different skills and forms of knowledge. The SOLO taxonomy represents five complex levels, non-content specific that describes the structural organisation of knowledge across three modes of knowledge: declarative; procedural; and conditional (Boulton-Lewis, 1995). Although there are loopholes and conceptual ambiguities within the framework, it is suitable for measuring the achievement of learning outcomes. The extant research literature suggests that the relationship between SOLO and other learning factors such as motivation, learning strategies, approaches to learning, and year of study is positive (Chan et al., 2002). "SOLO was shown to be useful in measuring cognitive attainment of students of different classes, subjects, levels and with different assignment requirements" (Chan et al., 2002 p.518). Green et al. (2009) argue that assessment criteria and standards based on Phillip & Bond's (2000) interpretation of SOLO could enable identification and feedback regarding the strength and weaknesses in students' academic development. Bloom's Taxonomy, which offers a clearer division of cognitive categories and developmental attainment is also useful, while Chan et al. (2002)

[2] The Association of American Colleges and Universities (AACU) have developed non-discipline specific assessment rubrics for a range of graduate skills, including critical thinking, teamwork and ethical reasoning. Although explicitly described as "not for grading", the rubrics give a clear, but weak, conceptualisation of each graduate skill and how each could possibly be assessed. For example, the teamwork rubric states that the assessment of teamwork can encompass sources: self-assessment, peer-assessment & an external assessor. The rubrics are useful for institutional-level evaluation and discussion around student learning, assessment and graduate skills.

found that the Reflective Thinking Model is more suitable for assessing students' critical thinking and evaluative abilities. Green et al. (2009) state that Bloom's classifications can be used to establish upper and lower sets of standards and criteria for achievement.

3. Assessment

3.1 Graduate Skills Assessment or assessing graduate skills

The Australian Business Deans' Council's report, *Business as usual* (Freeman et al., 2008), identifies the development of graduate skills in higher education as a salient theme. However, "there was little agreement about the degree to which generic skills were important…whose responsibility they were to teach…or how they should be assessed" (p.23). The increasing importance and development of graduate skills in higher education rests on a specific provision to foster them in the context of disciplinary learning. That is, "to go beyond curriculum mapping and embedding to the design and implementation of effective teaching and learning strategies that are shown to promote/enhance graduate attributes" (Rigby et al., 2009 p.7; Bowden et al., 2000). However, research suggests that academic staff do not share a common understanding of either the nature of outcomes related to graduate skills, or the teaching and learning processes that might facilitate the development of these outcomes (Rigby et al., 2009; Green et al., 2009). They hold qualitatively different views in terms of what is learned and how learning outcomes are achieved (Barrie, 2002).

This is evident not only in the conceptualisation of graduate skills, such as critical thinking and teamwork, but also in suggested 'best' practice activity designs for promoting graduate skills. The effectiveness of such practices is rarely measured qualitatively or quantitatively, and activities are rated as successful based on the researcher's own teaching experience (Rigby et al., 2009). Where the effectiveness of activities has been measured, it is the students' perceptions of achievement that are measured. Bath et al. (2004) argue that such measurements may be more effective in capturing student achievement than more traditional, metric measures. Overall, there is a lack of empirical evidence demonstrating the effectiveness of activities that can effectively promote certain graduate skills. This illustrates not only the problematic of designing activities, but also assessments that can accurately measure achievement and provide opportunities for students to enhance their learning and demonstrate their achievement of relevant learning outcomes. "The assessment of generic skills is uneven and far from fully integrated into assessment regimes" (James, 2003 p.197). Academic decisions about the assessment of graduate skills can reflect their understanding of graduate skills, and while there is a growing body of research literature on graduate skill development "the assessment of graduate attribute outcomes remains problematic" (GAP, 2009).

The Graduate Skills Assessment (GSA), designed by the Australian Council for Educational Research, is a standardised assessment of critical thinking, problem-solving, interpersonal understanding and written communication.[3] The GSA is conducive to reporting, certification and comparability in the context of quality assurance and accountability. However, such standardised assessment is ineffective in promoting student learning and has drawn widespread criticism (Pitman & Broomhall, 2009; Bath et al., 2004; Green et al., 2009). The GSA has low consequential validity, decouples the teaching and learning process from assessment, and has

[3] The OECD Assessment of Higher Education Learning Outcomes (AHELO) is an initiative to assess learning outcomes on an international scale by creating measures that would be valid and applicable cross-culturally. The foundation of this study is the OECD's call for the focus of quality assurance to be shifted to student outcomes. One of the four complementary strands of this feasibility study is that of generic skills. To determine to what extent generic skills can be measured across diverse institutions, languages and cultures, the OECD study is adapting the Collegiate Learning Assessment (CLA) developed by the Council for Aid to Education (CAE) in the United States. The CLA is summative, measuring performance authentically by presenting "realistic problems that require students to analyze complex materials and determine the relevance to the task and credibility. Students' written responses are evaluated to assess their abilities to think critically, reason analytically, solve problems and communicate clearly and cogently".

limited authenticity in promoting student learning. In particular, the reconceptualisation of graduate skills to include and articulate more abstract concepts such as ethical practice and sustainability does not lend itself to standardised metric assessment unlike the more objective skills such as literacy and numeracy. Indeed, the majority of universities do not support the GSA and therefore, do not administer it. In the context of quality assurance, "An alternative approach…to validating the achievement of graduate skills would be to rely upon the assessment protocols in place within classroom contexts" (Bath et al., 2004 p.314).

Beyond metric summative approaches, research indicates that there has been minimal alignment of graduate skills with formative and developmental assessment processes: particularly in the undergraduate business curriculum (Thompson et al., 2008). Few Australian universities explicitly articulate the assessment and grading of graduate skills in their assessment policies. In addition, a brief survey of randomly selected undergraduate business units in Australian universities that have embedded the teaching and learning of graduate skills demonstrates a dominant orientation towards summative assessment: that is, the final examination (see Appendix 1). Australian academics have not developed clear and effective strategies for promoting and assessing graduate skills within specific disciplinary contexts (Green et al., 2009; Barrie, 2004; Bath et al., 2004; de la Harpe, 2000).

Two case studies are both indicative and exceptions to this statement. In a study by Thompson et al. (2008), the researchers implemented a social constructivist approach to assessment in three units of study, integrating graduate skills with assessment criteria using an online system. Academic staff were engaged in the constructive alignment of learning outcomes, activities and assessment and students in self-assessment, both critical practices in the assessment process (Biggs 1999; Pitman & Broomhall, 2009). Only one cohort of students, who completed the online assessment system survey, responded with comments that suggest the system facilitated graduate skill development. However, the researchers report that improvements in aspects related to learning outcomes was achieved, demonstrated in the feedback from student surveys.

Treleavan & Voola (2008) report on the process of integrating graduate skills in a marketing strategy course through constructive alignment. The course was part of a Masters program offered at the University of Sydney. In each cohort of students in the three classes used in this study, approximately 70% of students were international. The course consisted of five assessment tasks: seminar and online discussion board participation; online reflective journal entries; team-based computer simulation game; a team-based written case study; and a final exam. The researchers were critical of case study methodology, which they term 'backward-looking' and highlight the need to go beyond the oft-used case study methodology in activity and assessment design. Quantitative and qualitative data was collected through Unit of Study Evaluations, a survey developed by Kember & Leung (2005), comments and feedback given by students and the researchers' own critical reflections. On the basis of a an increase in the mean scores on whether students felt the course had helped them to develop graduate skills over the courses, the researchers state that "the changes made in the second intensive course, including constructive alignment of the graduate attributes, supported students' focus on graduate attribute development" (Treleavan & Voola p.166). However, the evidence is predominantly subjective and experiential, as it is difficult to collect justifiable and quantifiable data that demonstrates whether or not students have developed, or whether activities have actively promoted, the targeted graduate skills. In addition, it was not stated how these activities accounted for the needs of the international students, which vary considerably to those of local students. Overall, the authors state that there is only evidence of increased 'awareness' exhibited by the students, and not a development of the graduate skills (p.169).

The assessment of graduate skills requires alternatives to and changes in current practice. The GAP project team argue that as the development of particular graduate skills is incremental, it is unlikely that they can be meaningfully assessed within the short semester-long time frames. "This suggests the need for alternative forms of assessment such as portfolios and capstone tasks that extend beyond or across traditional course

boundaries" (GAP, 2009 p.15). It is suggested that assessment be longitudinal, high impact and integrative. The cornerstone of graduate skills assessment, and of these alternatives, should be grounded in the notions of authenticity, self-regulated learning and student involvement (Green et al., 2009).

3.2 Assessment principles and practice

> "If we wish to discover the truth about an educational system, we must look into its assessment procedures" (Rowntree, 1977 p.1).

The current state of underdeveloped and ineffective teaching and learning strategies for promoting graduate skills in the business curriculum is reflected in the assessment of graduate skills. However, the two examples above do highlight elements of effective assessment practice that need to be incorporated into the reorientation and rethinking of assessment: that is, constructive alignment (Biggs, 1999) and self-regulated learning (Pitman & Broomhall, 2009; Nicol & Macfarlane-Dick, 2006; Luca & Oliver, 2003; Boekaerts & Cascaller, 2006). Therefore, in developing effective assessment practices for measuring graduate skill achievement and enhancing student learning requires a review of the more general literature on the principles and practice of assessment.

The shifting role of higher education institutions has also witnessed a parallel and complementary shift in the conception of teaching and learning pedagogies: from a knowledge-transmitting paradigm towards a constructivist model of teaching and learning. However, despite the principles and normative framework for constructivism present in university policy and curricula, research has shown that such principles are not always transmitted in practice (Tenebaum et al., 2001). This is particularly the case with assessment as conceptions and practice of assessment has lagged behind the theoretical development of teaching and learning pedagogy in higher education. This is not difficult to imagine as "Approaches to the assessment of students' work and achievements are traditionally rooted in the particular historical, legal, national and pedagogical context of the institutions in which they study. Practices vary widely between countries and regions, between institutions and between subject areas within institutions" (QASA, 2008 p.6).

Assessment has long been recognised as maintaining a pivotal position in students' learning (Ramsden, 1992; Biggs, 1999). "From our students' point of view, assessment always defines the actual curriculum" (Ramsden, 1992 p.187). Although there appears to be much truth to this statement, students are increasingly aware of more dimensions to their learning, and most particularly of their preparation for their future professional life (Reid et al., *forthcoming*). Students appear motivated to engage in tasks that are clearly part of professional preparation: and this applies particularly to graduate skills and dispositions such as teamwork and sustainability (Reid et al., 2008).

However, recent reports from the Quality Assurance Agency for higher education in the UK and AUQA (2009) in Australia have identified assessment as the practice most in need of improvement and at risk. "The main deficiencies identified in university courses were not related to teaching and learning, but to assessment practices" (Boud & Falchikov, 2006 p.402). According to Biggs (1999), the longer students study in higher education insitutions, the more their understanding is assessment related and approaches taken to learning are surface rather than deep. "Much assessment practice appears to reward retelling, retold knowledge eludes conceptual change and students lose 'ownership' over their learning and become alienated from it" (p.35).

3.3 Functions of assessment

One of the two functions of identified by Dahlgren et al. (2009) is that of enhancing learning and the potential for learning to be embedded in assessment. "There is convincing research evidence that assessment has a far-reaching impact on student learning" (Dahlgren et al., 2009 p.186; Soliman, 1999; Boud, 1995). However, assessment has also been referred to as a practice in disarray "where it has become a site of conflict or power

struggle, founded on an unequal relationship between two parties…and hampered by an in-built lack of clarity in the methods used to convey judgement on performance and grading" (Gillett & Hammond, 2009 p.121). Indeed, Boud (1995 p.35) goes so far as to state that, "There is probably more bad practice and ignorance of significant issues in the area of assessment than in any other aspect of higher education".

The relationship and link between assessment and learning is neither exclusive nor uniform. Student learning is also contingent upon a host of other factors including: the learning background and profile of the student; the number of students; affective factors such as motivation; teaching and learning strategies employed; student perceptions of such; learning environment; and course objectives and outcomes (ref?). The link between student learning and assessment is also not uniform, as it varies according to the design and implementation of a number of aspects of assessment: method; feedback; measurement; and reporting. The extant research presents a number of principles and practices that will support a positive and uniform link between student learning and assessment (Yorke, 2003; Boud, 2000; Gibbs & Simpson, 2004; Maclellan, 2004; Rust et al., 2005).

The other function of assessment is as a form on control: the measurement and reporting of intended learning outcomes (Boud, 1995; Gillett & Hammond, 2009; Dalhgren et al., 2009). This is rooted in the traditional and continuing conceptions of assessment in the absolute terms of norm-referenced or criterion-referenced, summative or formative assessment. "These conceptions of assessment run…almost exactly counter to the principles of good teaching" (Ramsden, 1992 p.185). Furthermore, the distinction between these terms is not always concrete. Biggs (1999 p.46) finds that criterion-referenced assessment practices in higher education are "muddled with norm-referenced assumptions". Similarly, the distinction between formative and summative assessment is "far from sharp" (Yorke, 2003 p.5). James et al. (2002) state that best practice in assessment involves finding a balance between criterion- and norm-referencing and that this balance should be "strongly oriented towards criterion-referencing as the primary and dominant principle". Biggs (1999) also argues that what academics should be doing is designing and implementing criterion-referenced assessment; a standards model of assessment.

> "…our function as teachers is to establish how well our students have learned what they are supposed to have learned. To find this out, we first need to be clear about what our students *should* be learning, in terms of qualities or performances that define the grading categories…and then to devise assessment tasks that tell us how well they have done so (p.148)".

The criticism of summative assessment in the extant literature is based on its negative effect on student learning and its impact of students' learning behaviours (Knight, 2002; Boud & Falchikov, 2006). Although summative assessment has a clear purpose and can satisfy public expectations of assessment, Knight (2002 cited in Boud & Falchikov p.401) suggests "that summative assessment in higher education is a practice in such disarray that it is difficult to know what grades or classifications mean and risky to treat them as reliable…the problems of summative assessment are so deep-seated that changes to assessment itself are insufficient and that a reappraisal of the nature of the curriculum of higher education is needed". However, assessment practices, particularly in the assessment of graduate skills, are still firmly situated for summative purposes. Summative assessment can act developmentally if students learn from the completion of such (Yorke, 2003).

"The essence of formative assessment is captured well by Wood…[who] puts forward the idea 'the tester/teacher and student *collaborate* actively to produce a best performance'" (Yorke, 2003 p.478). Formative assessment is more complex as a concept than it first might appear and can be both informal and formal, divergent and convergent. Although formative assessment is well established as being developmental in purpose, its integration as such into higher education curricula appears to be limited and under-theorised

(Yorke, 2003). Indeed, Yorke notices a decrease in the amount of formal formative assessments in UK higher education system. The increasing concern with academic standards has perhaps led to a greater emphasis on the summative assessment of learning outcomes. Other contemporary pressures on higher education threatening the use of formative assessment, and affecting the links between learning and assessment, include: increasing student numbers in class; the modularisation of courses; and the further demands placed on staff such as the need to be research active; and student diversity and differences in conception of skills, knowledge and learning (Yorke, 2003; Gibbs & Simpson, 2004). "To these must be added the legacy of the dominant paradigm of the 20th century, which Shepard (2000) sees as reflecting behaviourist theories of learning, social efficiency and scientific measurement…whilst approaches to learning have moved in the direction of constructivism, approaches to assessment have remained inappropriately focused on testing" (p.483).

3.4 Supporting the formative function of assessment

The increasing concern for academic standards and graduate skills offers the opportunity to rethink and reorient all forms of assessment: to embed learning in assessment, supporting the potential for students to enhance their learning through the mechanisms of the assessment process. The shift to outcomes-based learning fundamentally affects the link between any particular course and assessment. It also means that assessment will be a derivative and catalyst for the achievement of those outcomes. "Good assessment now is that which both closely reflects desired learning outcomes and in which the process of assessment has a directly beneficial influence on the learning process" (Boud, 1995 p.39). However, studies in Australia suggest a discrepancy between assessment principles and assessment practices (James & McInnis, 2001).

It is suggested that any approach to assessment must be holistic in its intention and implementation, and not simply fragmentary. That is, the assessment process must: be constructively aligned with the intended learning outcomes and learning activities of any given course; inclusive of students' involvement; be sustainable; use self- and peer-assessment strategies; promote self-regulated learning; embed frequent and effective feedback mechanisms; be authentic; and use multifaceted and a variety of strategies.

Constructive alignment

One of the most significant principles of effective assessment emphasised is the constructive alignment of the intended learning outcomes, assessment and learning activities in any given course (Biggs, 1999; Rust, 2002; Rust et al., 2005; Boud & Falchikov, 2006; Gillett & Hammond, 2009; Kember, 2009).

> "The fundamental principle of constructive alignment is that a good teaching system aligns teaching method and assessment to the learning activities stated in the objectives so that all aspects of this system are in accord in supporting appropriate student learning" (Biggs, 1999: 11).

According to Rust (2002 p.148), constructive alignment requires a shift in thinking about course design to the following three principles: clear identification of learning outcomes; design of appropriate assessment tasks that will assess whether each of the intended learning outcomes is met; and the design of appropriate learning opportunities for students to achieve at a certain level that will enable them to complete an assessment task. The *Curtin Business School Professional Skills Project* recognises that developing graduate skills requires the constructive alignment of course curricula and is associated with effective learning. The implication of constructive alignment is that the assessment process must be considered and take place during course design and review.

Student involvement

Research is also increasingly calling for greater openness and student involvement in the assessment process (Gillett & Hammond, 2009; Boud, 1995, 2000; Boud & Falchikov, 2006; Kember, 2009). The Quality Assurance of Student Assessment (2008) report identifies student involvement as one of the key principles governing the assessment review cycle, arguing that students must be involved in the amount, type and review of whether assessment practices are fair and effective measures. "Student involvement is relevant at the level of programme, department, faculty, institution and at national level" (p.12). This is particularly relevant and significant in the context of the realignment of the role of higher education to encompass such notions as lifelong and student-centred learning, and particularly captured in the increasing concern for graduate skills development. Furthermore, in an uncertain future of professional practice and future learnings, assessment can help prepare students to deal with supercomplexity (Barnett, 2000 cited in Boud & Falchikov, 2006).

Sustainable assessment

Boud (2000) posits the notion of 'sustainable assessment' arguing that "the purposes of assessment should be extended to include the preparation of students for sustainable assessment" (p.151). That is, assessment practices can contribute positively to the development of skills, knowledge and a disposition for learning beyond higher education. Research suggests that the key features of sustainable learning are underused in assessment practice (Gillett & Hammond, 2009). The incorporation of such a notion into higher education is difficult. In particular, learning in any setting , whether work or life settings, is socially constructed and situated in communities of practice; and it is not always clear what communities of practice students/graduates will be entering and moving between (Boud & Falchikov, 2006). Therefore, in order to bridge this gap there is the need to revise assessment practices: assessment can play an important role in the alignment of lifelong, sustainable learning and assessment. As a central feature, assessment for lifelong learning constructs students as active participants in the assessment process and develops their capacity to be assessors of learning through self- and peer-assessment practices.

> "…if students are to be encouraged to be lifelong learners, they must be weaned away from any tendency towards over-reliance on the opinions of others. Ultimately, in real world contexts, they must be able to judge or evaluate the adequacy, completeness or appropriateness of their own learning, so whatever assessment practices are used must be comprehensible to the learners so that they can be internalised as criteria for critical self-evaluation" (Candy et al., 1994 p.150 cited in Boud & Falchikov).

Self- and peer-assessment

The role of self- and peer-assessment is gaining more ground in the research literature on assessment (Ramsden, 1992; Biggs, 1999; Soliman, 1999; Falchikov & Goldfinch, 2000; Boud, 2000; Yorke, 2003; Sadler, 2005; Pitman & Broomhall, 2009). Self- and peer-assessment are particularly relevant to the notions of self-regulated learning and student autonomy (Luca & Oliver, 2003; Boekaerts & Cascaller, 2006; Nicol & Macfarlane-Dick, 2006). In 2005, the University of Sydney developed a web resource for graduates, 'Like Long Earning', that placed the responsibility for assessing graduate skills on the graduate, rather than on an external authority (Pitman & Broomhall, 2009). Furthermore, researchers suggest that, "along with the skills of life long learning go the skills of life long self assessment…as it is the employer that ultimately makes decisions about new employees, it is the individual who should be assessing his/her own development of skills" (p.450). As self-assessment avoids direct government accountability, it is argued that it provides an authentic opportunity for lifelong learning in practice. However, empirical evidence for the effectiveness of self-assessment is minimal and the results tentative. Rust et al. (2003) found that their intervention did not appear to make students any better or more accurate in their self-assessment. Although, the authors argue that the participating students underestimated their own work. Hanrahan & Isaacs (2001), in a qualitative study of 233 students at the University of Queensland, suggest major benefits of peer- and self-assessment processes on student learning. However, there were a number of practical and learning issues that were not overcome. In

particular, the authors felt that, "Providing clearer and more detailed standards may lessen students' uncertainty about the standards required" (p.66).

Self-regulated learning

Research also suggests that students' development of graduate skills is directly motivated and affected by their ability to self-regulate their learning (Luca & Oliver, 2003; Boekaerts & Cascaller, 2006). Boekaerts & Cascaller argue that it is essential to adopt an approach to teaching and learning that allows instructors to focus simultaneously on the students' self regulation of the learning and motivation processes, as well as on the environmental triggers that affect these processes. Therefore, it appears necessary for teachers to provide opportunities for students to not only develop their graduate skills, but also their self-regulation capabilities, which are considered to complement the development of any one graduate skill. Furthermore, empirical evidence suggests that students who are self-regulated are more effective in their learning and higher achievers through persistence, resourcefulness and confidence (Zimmerman & Schunk, 2001).

Feedback

Formative assessment is specifically intended to generate feedback on performance to improve and accelerate learning (Yorke, 2003). The extant research literature is clear that feedback is argueably the impost important aspect of assessment in its potential to affect future learning and student achievement (Hattie, 1987; Black & Wiliam, 1998; Gibbs & Simpson, 2004; Rust et al., 2005; Nicol & Macfarlane, 2006). Black & Wiliam's (1998) meta-analysis of over 250 studies on feedback reveals that feedback produces significant benefits for student learning and achievement across all content areas, knowledge and skill types and level of education. The analysis mainly focuses on studies from the primary and secondary levels of education and has been much less influential in higher education research. Indeed, some schools have adopted policies, in which all assignments should only have feedback and that no grade should be given (Gibbs & Simpson, 2004). Alverno College's 'assessment as learning' system is probably the most well-known higher education institutions that has an assessment system without grades.

Further research evidence demonstrates this link between feedback and student achievement. Hattie's (1987) meta-analysis of 87 studies found that feedback was the single most influential aspect of student achievement. Furthermore, Ramsden (1992) states that the single CEQ item that clearly distinguishes what students' perceive to the best and worst courses is the extent to which staff provide formative feedback on students' learning. "Without informative feedback on what they do, students will have relatively little by which to chart their development" (Yorke, 2003 p.483). However, Studies of undergraduate first year students demonstrate a sharp decline in the extent to which feedback in given (James & McInnis, 2001).

Sadler (1989), who identifies three conditions under which students can benefit from feedback, has been very influential on the research of Black & WIliam (1998) and Yorke (2003). He argues that students must know: what good performance is (the concept of a goal or standard); how current performance relates to good performance; and how to act to close the gap between current and good performance. "It cannot simply be assumed that when students are 'given feedback' they will know what to do with it" (Sadler p. 78). Although Sadler's observations encourages quality feedback messages and the need to focus on improving students' self-assessment skills (Ramsden, 1992), Gibbs & Simpson (2004) suggest that the conditions are too limited and do not account for the range of effects produced by feedback. The authors argue that, in the context of the shift to outcomes-based learning and quality assurance, standards will be raised by improving student learning rather than by measuring limited learning. Therefore, Gibbs & Simpson (2004 pp.12-25) describe a series of particular conditions that must be met to support assessment for student learning. The conditions fall into one of two categories: the influence of design and on how much students study, what they study and the quality of their engagement; and the influence of feedback on learning.

Feedback is of critical importance and a central aspect of the conceptualisation of learning and assessment as a process through which students can be actively involved in their learning. However, "In higher education, formative assessment and feedback are still largely controlled by and seen as the responsibility of teachers; and feedback is still generally conceptualised as a transmission process, even though some influential researchers have recently challenged this viewpoint" (Nicol & Macfarlane-Dick, 2006 p.200). Research suggests that feedback is not easily transmitted and neither is it controlled entirely by the teacher: students are already generating their own internal feedback (Nicol & Macfarlane-Dick, 2006; Higgins et al., 2001). Nicol & Macfarlane-Dick offer a sustainable and effective model of feedback locating the student as occupying a central and active role in all feedback processes. Based on the extant research, they offer seven principles of effective feedback, which facilitates self-regulated learning. Overall, "The literature on external feedback is undeveloped in terms of how teachers should frame feedback comments, what kind of discourse should be used, how many comments are appropriate and in what context they should be made" (p.209). This underdevelopment can be linked to: the decreasing use of formative assessment; the location of feedback as a transmission process; and underdevelopment of assessment criteria and standards for which both teachers and students are able to view and judge assessment against.

Criteria

A brief review of the extant literature reveals that there is a growing consensus about the importance of articulating, using and improving students' understanding of criteria for assessment (Rust et al., 2003; Woolf, 2004; Rust et al., 2005; Dahlgren et al., 2009). Assessment criteria, as a mechanism for grading, cannot be discussed separately from assessment, particularly as studies have shown the impact of a grading system on student learning. Rust et al. (2005) identify explicit assessment criteria as an essential prerequisite for assessment practices. An intervention in a large first-year undergraduate business module engaged students in a series of exercises that combined discussion of exemplars, marking criteria, marking exercises and self-assessment (Rust et al., 2003). Overall, from the perspective of the staff, the standard of student coursework improved and "had risen from standards prior to the introduction of the intervention" (p.161). The authors argue, on the basis of the results, that the emphasis on explicit articulation of assessment criteria and standards in insufficient and that "Socialisation processes are necessary for tacit knowledge transfer to occur" (p.162).

Rust et al. (2005) argues that many of the problems in current assessment practice could be overcome, and the learning experience of students enhanced, if a social constructivist approach is taken to the assessment process. The authors also argue that for students to achieve meaningful understanding, active engagement with criteria by both teachers and students is required (Dahlgren et al., 2009). This may involve students in the creation of original criteria, peer and self-assessment and engaged feedback. "[It] makes no sense for us to treat assessment any differently from learning" (Rust et al., 2005 p.237). Woolf (2004) examines assessment criteria for undergraduate history and business programs and makes several generalisations in terms of broad applicability. He argues that assessment criteria need to be developed through constructive alignment and with clarity of purpose. Criteria must also promote self-assessment, enhance student learning autonomy, justify awarded grade and increase the timeliness of feedback.

Although is it clear that criteria is essential to promoting not only effective assessment, but also effective learning, the understanding, conception and implementation of criteria are not well developed (Sadler, 2005). Sadler's survey of assessment policies from 65 universities in Australia, Canada, New Zealand the UK and US, complemented by internet-based research, reveals that there are various interpretations of 'criteria-based assessment'. This is described as confusing, with the level of applicability uneven and the meaning of 'criteria' that underpin each model differing. Sadler argues for a major shift in grading orientation towards standards-based assessment. "Criteria-based grading begins with a focus on the criteria, leaving the standards to be implied or experienced incidentally. Criteria form an essential element of the evaluation and communication

process, but ultimately it is the students' appreciation of quality, set against a background of external standards, that is of significance. A more appropriate approach would be to focus on the standards as the primary reference points against which student submissions are judged" (p. 190).

Authenticity

Authenticity has also become increasingly emphasised in the extant literature in defining learning and assessment (Biggs, 1999; Maclellan, 2004; Sadler, 2005). "The realisation that assessment is significant has been dawning in concert with reforms in assessment which shift the emphasis from an exclusive evaluation of declarative knowledge to include the assessment of procedural, strategic and conditional knowledge and understanding" (Maclellan, 2004 p.20). Assessment practices should essentially reflect the ways in which professional knowledge and skills are used in real world contexts. Although, the notion of authenticity can be difficult to accept and embed in learning/professional spaces defined by uncertainty, supercomplexity and student mobility across communities of practice.

Wiggins (1993 p.200) states that it is only when a student uses knowledge "wisely, fluently, flexibly and aptly in particular and diverse contexts" can he/she said to understand. Central to Wiggin's influential concept of authentic assessment are the notions of real world application, analysis and communication. The reproduction of knowledge and application of procedures is argued to not reflect understanding. Authentic assessment, in this respect, is also problematic as it discounts the assessment of lower-order, decontextualised skills. This immediately raises the question of whether authentic assessment can be embedded in an assessment framework that requires the measurement and reporting of minimal standards. On the other hand, Maclellan (2004) argues that authentic assessment could positively influence students' approaches to learning which promote deep learning and critical thinking. However, she offers no examples or evidence of such a proposition.

Portfolios

Although it is argued effective assessment practices have variety, the portfolio is seen as a dominant method both in diagnostic testing and in assessing students' achievement of learning outcomes: it can be used for both formative and summative purposes (de la Harpe et al., 2000; Edwards & Bruce, 2008; Buzzetto-More & Alade, 2006). Portfolios can require students to critically and continuously reflect on the culmination and development of their learning through a variety of artefacts contained within the portfolio (Buzzetto-More & Alade, 2006). Although portfolios appear to be an effective method for students to demonstrate their academic development and achievement, staff will need professional development in the use of portfolios as an assessment method (de la Harpe, et al., 2000). A study by Edwards & Bruce (2004) found that the ability and quality of teaching staff can have a significant impact on students' perceptions of the learning experience, particularly in regards to assessment.

Online portfolios are being increasingly emphasised as alternatives to paper-based portfolios. "Electronic portfolios are quickly becoming the primary means in academia for students to demonstrate and reflect on learning in a way that helps students build and apply information literacy skills" (Buzzetto-More & Alade, 2006 p.259). Online portfolios, through e-learning mechanisms and information technology, provide a new means to assess learning and can be embedded within the framework of constructivism, authentic learning and self-regulated learning. "The use of information technologies and e-learning strategies can provide an efficient and effective means of assessing teaching and learning effectiveness by supporting traditional, authentic, and alternative assessment protocols" (Buzzetto-More & Alade, 2006 p.251).

4. Conclusion

> "By pro-actively determining their own indicators of performance and shifting from concepts of employability and economic values to broader socio-economic ones, it becomes more difficult for the government to perform standardizing tests and quality audits upon the higher education sector. In this formulation, generic skills have transformed from a relatively universal, publicly-owned and measurable concept, to a personalized, unmeasurable asset" (Pitman & Broomhall, 2009 p.455).

In the context of the need to develop and implement academic standards and the alignment of graduate skills with notions such as lifelong learning, there is an urgent need to position assessment more strategically in the teaching and learning process. First, it will require the development of adequate academic standards for student achievement. Second, traditional approaches to assessment practice will not be able to address these issues satisfactorily. The standards against which students are assessed will need to be complemented by effective formative and summative assessment practices. Third, although it is widely acknowledged that assessment is a critical component of student learning, such realisations are not reflected in current assessment policy or practice. "The individualistic, norm-referenced orientation of assessment is still largely dominant, despite some moves to challenge it" (Boud & Falchikov, 2006 p.411). Assessment practices can promote and enhance student learning through innovative design and delivery that embeds and evaluates the principles in the extant research literature.

If graduate skills truly are "personalized, unmeasurable assets" owned by students, then greater student involvement at all levels of the assessment process will be required. "Peer assessment, self-assessment, authentic assessment and a heightened awareness of how high-quality feedback [are]…critical to the development of higher-order learning outcomes" (Sadler, 2005 p.185). As a starting point, it is useful to follow the three objectives for higher education assessment developed by James, McInnis & Develin (2002): assessment should guide and encourage effective approaches to student learning; assessment should reliably measure expected learning outcomes, in particular higher-order learning outcomes; and assessment and grading should define and protect academic standards. "[In] the view of a long chain of cause and effect relationships, grading systems are among the most influential factors in determining the quality of higher education, if not all kinds of education" (Dahlgren et al., 2009 p.192).

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Support for this resource has been provided by the Australian Learning and Teaching Council Ltd, an initiative of the Australian Government Department of Education, Employment and Workplace Relations. The views expressed in this (report/publication/activity) do not necessarily reflect the views of the Australian Learning and Teaching Council.