

# Software as a facilitator of graduate attribute integration and student self-assessment

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*The rhetoric about the benefits of an educational focus on graduate attributes has been in evidence in the educational literature since the early nineties. But an identified gap between attribute mapping in documentation, and the inclusion of graduate attributes in assessment, is a current concern for higher education, government and industry associations. In 2002 the author developed online criteria-based assessment software (\*ReView), together with a process involving a 'bottom-up' reconsideration of the constructive alignment of assessment tasks. This was part of a University of Technology Sydney (UTS) School of Design initiative to integrate graduate attribute development through the assessment of student work. The time-saving features of the online software and the engagement of students in self-assessment were significant parts of the success of this approach. Pilot schemes in a range of contexts using both the process and the ReView software led to an ALTC funded project with business faculties at four Australian universities. One of the aims of this project is to facilitate the practical integration of criteria-based assessment linked to graduate attributes. Another aim is to enhance awareness, of both staff and students, about graduate attribute development across subject boundaries and throughout the years of a program of study. This paper attempts to clarify some graduate attribute terminology issues and identifies problems with 'top-down directives' about graduate attributes. An outline of the process used in the aforementioned ALTC project is followed by a discussion of both positive and negative feedback from research results to date. The paper also describes the ReView online criteria-based assessment software used to facilitate graduate attribute integration and student self-assessment.*

*\* An article about the first version of ReView was published in The Australian, 10 December 2002 - IT Section 'Online marking speeds University Results'.*

*Keywords: graduate attributes, student self-assessment, online criteria-based software*

## Introduction

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.' (McWilliam, 2006)

The apparent shift in the aims and purposes of the higher education sector in Australia identified in this quote from McWilliam seems to resonate with a recent report to government, business and higher education (BIHEC, 2007). However the shift seems to be suffering in what she points to as an important aspect, that of the 'imperative to direct our assessment practices' towards 'a much broader range of graduate attributes'.

The problems and practicalities involved in the implementation of this assessment imperative are both subtle and diverse, with examples such as:

- Differences in the understanding of terms, definitions and conceptions subscribed to by academic staff (Barrie, 2004).
- The ubiquity of examination results that give minimal feedback about attribute development to students or employers (Thompson, 2006).
- The focus on percentage marks inculcated in students from an early age.
- Academics' resistance to extra workload from 'top-down directives' about the implementation of graduate attributes in curricula (Harvey and Kamvounias, 2008).

This paper will attempt to address some of these problems and practicalities, beginning with a clarification of the terminology issues and providing a brief trace of important documentation on graduate attributes issued in Australia over the last fifteen years. A 'top-down' approach will be critiqued and followed by a description of the 'bottom-up' process underpinning the aforementioned ALTC project. A description of the ReView software will then be followed by a discussion of some of the research data, and positive and negative feedback received to date.

### **Graduate attribute terminology and definitions**

There are a number of terms used in different countries and levels of education such as 'key skills' (Drew, Thorpe & Bannister, 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 (BIHECC, 2007). There continues to be difficulty with some of these terms in academic contexts. For example the term 'competencies' in Europe relates to the broader idea of graduate attributes (Cross et. al. 2004), but in Australia is used in relation to the Technical and Further Education (TAFE) system 'tick list' against very specific skills. 'Employability skills' and 'key skills' seem to be more common terms in the UK literature, but the use of the word 'skills' is rather too narrow to embrace personal, ethical and social attitudes and values. The word 'generic' is problematic in some of these terms, in that it tends to imply independence from a field of study. Whereas educational research shows that attributes need to be developed within the context of a field of study rather than 'bolted on' (Barrie, 2004).

In Australia, graduate attributes was defined as early as 1992 by the Higher Education Council of Australia (1992, p20) :

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

Later in the West Review (DETYA, 1998), a framework of generic attributes was provided that 'ideally every graduate should have':

- The capacity for critical, conceptual and reflective thinking in all aspects of intellectual and practical activity
- Technical competence and an understanding of the broad conceptual and theoretical elements of his or her fields of specialisation
- Intellectual openness and curiosity, and an appreciation of the interconnectedness, and areas of uncertainty, in current human knowledge
- Effective communication skills in all domains (reading, writing, speaking and listening)
- Research, discovery, and information retrieval skills and a general capacity to use information

- Multifaceted problem solving skills and the capacity for team work
- High ethical standards in personal and professional life, underpinned by a capacity for self-directed activity. (DETYA 1998, p. 47.)

In 2000, 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 their documentation. Lists of attributes from 29 universities can be found in the BIHEC report (2007, Appendix V, p68 to 73).

Graduate attributes seems now to be the most common term used in Australia, and several projects using this term have been funded by the Australian Learning and Teaching Council (ALTC). An important example being the National GAP (National Graduate Attribute Project 2008), hosted by the University of Sydney<sup>1</sup>. In support of the ubiquitous use of this term, perhaps the fact that graduate attributes mentions graduates, gives it a more student-centred focus.

### **Validating graduate attribute statements through formal assessment**

One of the ways that universities can validate their graduate attribute statements and policies is by including them in formal assessment processes. Formal assessment can only identify attributes evident in work presented as the result of an assessment task completed. Academics are therefore assessing an attribute of students' work that can clearly change over time. This highlights an important distinction between the student and their work. Students need to be encouraged to see assessment as one aspect of a developmental journey, rather than a grade 'label' they have to live with.

To facilitate staff engagement with ReView the author formulated a definition of graduate attributes aimed at criteria-based attribute assessment within assessment tasks:

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.

This definition was used as the basis for questions to guide staff in their reconsideration of assessment tasks facilitated by the ReView software. These questions later became part of the ALTC project process with business faculties that provides part of the data for this paper.

Whilst the problems with the terms and definitions mentioned earlier, may have had a negative impact on academics' engagement with the integration of graduate attributes, top-down directives and 'curriculum mapping' processes have also had a negative impact (Harvey and Kamvounias, 2008).

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<sup>1</sup> [http://www.itl.usyd.edu.au/projects/projects\\_nat.htm](http://www.itl.usyd.edu.au/projects/projects_nat.htm)

## Top-down directives to implement graduate attribute assessment

There have been a number of instances where academics have been required to ‘insert’ attribute related learning goals into their curriculum documentation, or to tick boxes against a list of graduate attributes ‘covered’ by the subjects or units they coordinate. However, the link with assessment has been tenuous for a number of reasons. The following step-by-step list follows a typical top down approach derived from academics’ previous experiences at two Australian universities. Academics’ responses to the top-down approach are described in Harvey and Kamvounias (2008). The text in italics reflects on some of the problems identified at each step. This is not the main focus of this paper and is not intended to be a detailed case study.

**Step 1:** University and Faculty committees produced lists of graduate attributes. Academics / coordinators were asked to ‘map’ the curriculum by ticking boxes linking the subjects they coordinated to the approved list.

*This was a very time-consuming process and often resulted in a surface ‘compliant’ approach or non-action, without changes to learning activities or assessment processes.*

**Step 2:** Academics were then required to add graduate attributes to their subject or unit outline from the approved list, relating them to existing learning goals or objectives.

*This was also a very time-consuming process. Whilst the outlines carried general statements about graduate attributes, these were often not linked to the assessment criteria used for assessment tasks.*

**Step 3:** Academics developed marking sheets for themselves, and for their tutors, and assessed the components of the assessment task. Marks were then either calculated on paper or entered into a spreadsheet for compiling. Feedback sheets were often attached to assignments.

*Marking sheets seemed to be personal to the academic in charge of the subject, with a variety of grading scales. They had inexplicit, or in some cases, non-existent criteria. At this stage the total mark was the main focus for students. Apart from exam marks, staff supplied written feedback attached to assignments for collection. The written feedback did not refer to graduate attributes, and assignments were often not collected (at one institution in the ALTC project analysis showed that 40% of business students in 2007 did not collect any of their assignments or written feedback in that year).*

Given the amount of time and effort involved in academics responding to top-down directives, and with minor impact at the student level, it was not surprising that there was residual academic resistance. This ‘inertia’ to graduate attribute initiatives was evident in all four institutions.

## A ‘bottom-up’ process to overcome ‘academic inertia’

Whilst top-down support and encouragement are essential for any curricular initiative, there needed to be another way of overcoming academic inertia and also engaging students in the process. Academics needed something that would save them time rather than adding substantially to their workload. They also needed a convincing argument that there were real benefits to their engagement. A bottom-up process, facilitated by web-based software (ReView), was devised by the author to engage academic staff in a developmental approach to graduate attribute development. It was also decided to give a small financial allowance to the academic coordinators engaging in the ALTC project, intended to facilitate some admin support, to compensate for additions to their role.

Five basic arguments underpinned the design of the ReView software, and the process used in pilot schemes, and later in the ALTC project:

- i) All assessment activities contribute to the development of attributes (even exams). Therefore all types of assessments can be marked using criteria explicitly linked to a range of attributes.
- ii) In criteria-based assessment two students can receive exactly the same total percentage mark for very different reasons according to the criteria. The mark gives minimal feedback to students about their development, and therefore strategies should be employed to focus students on attributes linked to criteria-based assessment.
- iii) Given that assessment drives learning, assessment criteria become an important fulcrum of engagement for both academics and students. Academics should therefore be encouraged to develop clear and explicit wording for assessment criteria and students should be encouraged to engage with them through self-assessment.
- iv) Many academics give serious consideration to the teaching aspects of their work and the assessment tasks they have devised mostly align with the aims and values they personally espouse. It is therefore essential that academics' views are respected and used as the basis for assessment criteria linked to attributes.
- v) Top-down directives about graduate attribute integration involving time-consuming documentation have had minimal impact at the student level. For improvement in attribute feedback to occur, busy academics need to be given time-saving strategies and support in developing their attribute-linked assessment criteria.

### **The ReView software and process**

ReView is essentially an online criteria-based aid to marking assessment tasks. As a facilitator in the ALTC project it has a number of features that save academics time. In pilot schemes in the School of Design, ReView saved enough marking and tutor management time to make it an attractive proposition. It also represented a non-threatening neutral space, aimed at academic benefits, with all the advantages of automatic calculation and web accessibility. In pilot schemes with academic staff the following question was used to prompt their reconsideration of assessment criteria for assessment tasks:

‘What *skills* do you want students’ to develop, what *qualities* do you want them to acquire and what *knowledge literacies and conceptual frameworks* do you want them to construct, by engaging in this particular assessment task that you have designed?’

Given the framework of learning objectives or goals already in place, and discipline-based attribute categories decided, many academics still need support in writing explicit criteria that describe the subtle aspects of learning they want to assess. Academics are also often unaware of the ways that their unit or subject assessments relate to others at different levels in a degree program. Particularly in relation to complexity of data, and levels of autonomy required from students, in different years or levels of a degree program (Moon, 2002 p.25).

The idea that these subtle relationships could be reflected in the wording of assessment criteria became important in some of the early pilot schemes using ReView. For example a School of Design criterion such as ‘An innovative approach to your design of the wheelchair control system ...’ could in a first year or entry level subject become ‘An inventive approach ...’ or ‘An exploratory approach ...’. However, all of these criteria would be coded under one

developmental graduate attribute category ‘Creativity and Innovation’. Four other categories were formulated for the School of Design context (Thompson, 2007).

The development of explicit criteria linked to attributes became an important fulcrum of engagement where academic staff could clearly communicate to colleagues, tutors and students the subtle aspects of learning that needed to be taken into account.

Whilst students may read learning goals in subject or unit outlines their attention is much more focused when it comes to assessment criteria. Student involvement with assessment is also strongly supported in educational research (Falkichov, 2006, Rust, et al 2005). One of the ways of engaging students was to encourage them to self-assess against criteria before handing in their assignments.

The ReView software enables students to self-assess their own work against criteria and monitor their own development of the discipline-specific attribute categories. The following screen shot in Figure 1 shows a marking screen from a School of Design subject after both the student’s self-assessment and the marker’s assessment have been completed for a task.

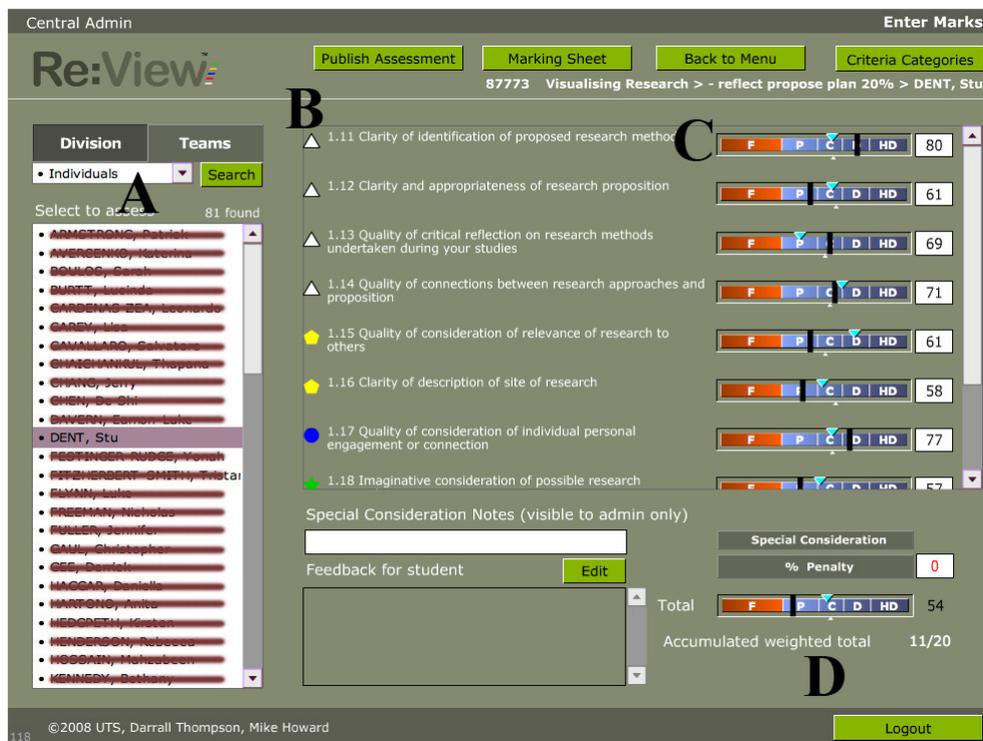


Figure 1: Marker's view of the marking screen from a School of Design subject<sup>2</sup>

<sup>2</sup> Key to Figure 1:

**A:** Selectable list of students (obscured here for ethics de-identification),

**B:** Colour-coded symbols next to the criteria represent one of five attribute categories in this particular university example,

**C:** Data 'sliders' with grading scales: The black bar is the tutor's slider that automatically calculates percentage marks. The turquoise triangles on the top edge of each data slider are from the students' own self-assessment (done prior to tutor marking and not visible until tutors have marked),

**D:** 'Total' data slider: the black bar can be dragged causing the marks and bars on the criteria to move in proportion for benchmarking purposes.

When tutors and subject coordinators have bench-marked their assessments and comments, they are ‘published’ for students to view online through a web browser. Figure 2 shows an enlargement of the student's view of data sliders, with grading scales against criteria, after the subject coordinator has published the assessment.

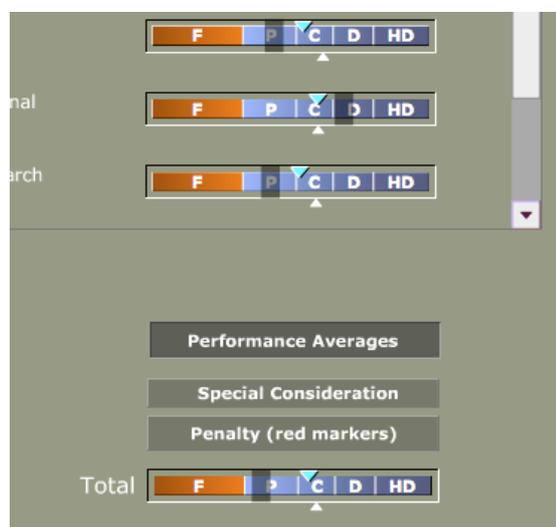


Figure 2 - Students view of a screen portion showing the tutor's feedback (broad translucent grey vertical bars on the grading scales) and the student's own self-assessment (triangles above the grading scales)<sup>3</sup>

Because the criteria are colour coded to an attribute category (*key B in Figure 1*), multiple criteria across a range of subjects can be monitored, and viewed as charts and graphs in ReView. This means that students can see graduate attribute ‘profiles’ of their own development, and of subjects, against attribute categories. Figure 3 is a screenshot showing the profile of a subject where the accumulated criteria weighting shows an attribute emphasis in Critical Thinking and Research Skills. This School of Design example reflects Creativity and Innovation, Communication and Interpersonal Skills, Attitudes and Values, Practical and Professional Skills, Critical Thinking and Research. Students can view their own profiles at task level, subject level, or across combinations of subjects, to show their progress in the different attribute categories.

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<sup>3</sup> Key to Figure 2: The white triangles on the bottom edge of the sliders are the averages of all other students taking the assignment. The student view does not display specific percentage numbers (however, percentage marks are visible in the lecturer/tutor view shown in Figure 1).

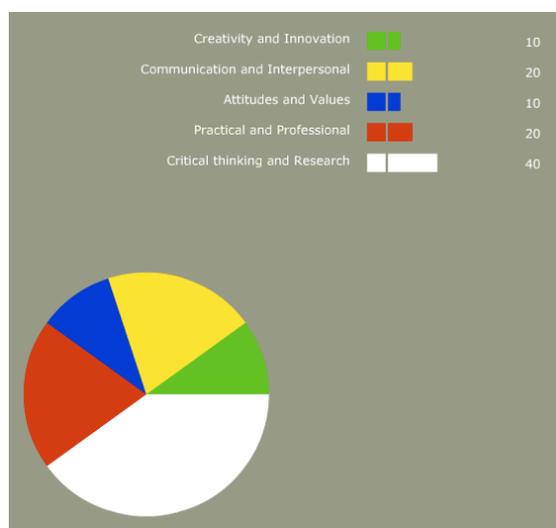


Figure 3: A subject profile allows staff and students to understand more clearly a subject breakdown of the assessment criteria in relation to the five attribute categories.

### Research findings and discussion

The following data is sampled from published and unpublished case studies from Australian universities. The first section discusses results from student self-assessment followed by positive and negative student comments and reflections. These have been compiled by researchers conducting interviews and focus groups from the ALTC project ‘Facilitating Staff and Student Engagement with Graduate Attribute Development, Assessment and Standards in Business Faculties’ (2007 - 2009).

#### Student self-assessment compared to tutor assessments

The grading scales (shown in Figure 2 above) allowed students to give themselves gradings against criteria prior to tutor assessment. The self-assessment feature was only enabled in a few subjects and was not obligatory or assessed as part of students’ marks. Data was collected on the number of criteria assessed by tutors and compared with those also self-assessed by students. In the following table it can be seen that in subjects with self-assessment enabled just over 30% of criteria that were marked by tutors were also self-assessed by students. In almost half the self-assessed criteria students had underrated their own performance compared to the tutors assessments.

**Table 1:** Students engaged in self-assessment (non-obligatory) with less than 2% rating themselves at the very top of the grade scale. Almost half the criteria self-assessed (47%) were underrated compared to the tutor’s assessment (Thompson, 2007).

Self-Assessment 2006 - School of Design		
Criteria assessed by tutors:	Criteria self-assessed by students:	Criteria underrated by students:
9,474	2,920	1,370

The following table shows an analysis of non-obligatory student self-assessment across three business faculty units of study with different size student enrolments. Unit 1 was a postgraduate subject and Units 2 and 3 were both undergraduate. The criteria rated by students were compared with those rated by tutors and were designated as overrated or underrated if they varied more than 5% from the tutors assessments.

Table 2 - Analysis of student self- assessment (non-obligatory) from three business units of study taken in the same semester by three different staff members in one institution.

<b>Self-Assessment 2007</b>			
<b>Faculty of Business Units of Study</b>	<b>Unit 1</b>	<b>Unit 2</b>	<b>Unit 3</b>
Students in unit #	Approx 20	Approx 60	Approx 160
Total number of criteria assessments made in this unit #	558	3546	1638
Self-assessed criteria #	359	538	954
Under rated >5 (%) compared to tutors assessments	39	20	25
Over rated >5 (%) compared to tutors assessments	21	31	33
Criteria assessed at $\geq 95\%$ (%)	1	1	3

In Table 2 the percentage of criteria assessed by students varied considerably for each unit. It is interesting that a greater percentage self-assessed in the postgraduate subject were underrated compared to tutors grading. Whereas, in both undergraduate units, there was a higher percentage of overrated criteria compared to tutors assessments. Very few students gave themselves 95% or higher as a mark on any criteria.

The following table is from a recent undergraduate economics subject again showing non-obligatory engagement of students with self-assessment. The student enrolment is larger than subjects in Table 2 but one third of the students underrated their own performance. This is an early analysis, but it was also found in this subject that there were only 24 (12.8%) of students who self-assessed any of the criteria at High Distinction level (a mark between 85% and 100%).

**Table 3** - Shows an early analysis of student self- assessment (non-obligatory) from a recent 2008 economics subject.

<b>Self-Assessment 2008</b>	<b>Number of students in subject:</b>	
<b>Faculty of Business</b>	<b>244</b>	
Criteria assessed by tutors:	Criteria self-assessed by students:	Criteria underrated by students:
2,440	1,870 (76.6%)	632 (33.7%)

The data from these tables comparing student self-assessment with tutor assessments seem to indicate that students were by majority engaging with the criteria in a thoughtful manner.

The following section explores some of the student comments drawn from student surveys.

### **Qualitative - Student comments - 2008**

Often the written comments on surveys are a rich source of data. The following three positive and three negative comments have been selected as being representative of a range of student

views. These were drawn from comments on surveys conducted with 1st year students in response to questions about self-assessment, online feedback and graduate attributes.

**Positive comments from online surveys with students having used ReView in one 1st year subject:**

‘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.’

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

**Negative comments from online surveys with students having used ReView in one 1st year subject:**

‘I saw I over-estimated the quality of my work. This was indicated to me visually. So what? How about a feedback comment for each of the criteria. A triangle here and a triangle there is not explicit feedback.’

‘We need to be able to see what the graduate attributes mean rather than just knowing that we’ve completed something which is related to one or all of them.’

‘This is the first time I have heard anyone use Graduate Attribute Development and seen the categories - and I have attended all the lectures and tutes for this subject.’

There is a communication issue with business students evident in a range of similar comments. It is clear that unless the linkage of criteria with attributes is embedded across a range of subjects (as it now is in the School of Design), then a focus on attribute development is unlikely to gain traction. The ALTC project with business faculties has now been running for one year, and there are an average of 5 subjects in each university using the process and the ReView software. Students accessing ReView as part of the ALTC project across the four institutions number approximately 7,600, with approximately 120 tutors and 25 academics.

Analysis of the student qualitative comments reveals that there is extensive variation in the explanations students are receiving from academic staff or tutors. Whilst there are indications of learning about graduate attributes occurring, as a result of the ALTC study, a more structured approach to the introduction of new methods, and processes, is clearly needed.

**Qualitative Staff comments - 2008**

The following comments are early notations from the research staff conducting video interviews and focus groups with business faculty academic coordinators and tutors from two of the universities participating in the ALTC project. Positive and negative quotes are followed in each case by three notations that highlight themes from interview and focus group transcripts.

**Positive feedback from researchers conducting focus groups and interviews with both academics and tutors (one quote and three themes):**

‘ It has been the most enjoyable marking experience I have had in 15 years of teaching.’<sup>4</sup>

*Constructive alignment* - ReView encourages staff to make explicit what was implicit in their thinking about learning goals, and writing criteria, and aligning them with graduate attributes.

*Attribute awareness* - staff and their students, were more aware of graduate attributes as a result of their participation in this project, and would use ReView again.

*Focus on criteria rather than marks* - ReView provided detailed criteria-based feedback that students read, independently of the process of collecting their marks.

The recognition in this last comment that students engaged with criteria as feedback independent of marks is important. This became highlighted in one institution when two students at one institution received exactly the same percentage mark (these were published three days after the feedback in ReView). The students realised, when checking their marks compared to the data sliders for each criterion in ReView, that they had received the same mark for entirely different reasons.

**Negative comments from research assistants conducting focus groups and interviews with both academics and tutors (one quote and three themes):**

‘How can students be expected to self-assess, when the teachers have different individual expectations for awarding HDs or Ds, C, etc.’<sup>5</sup>

*Technical issues* - If ReView had extra features it would be more likely to attract users.

*Weariness with online systems* - There are too many different online tools and students resented having to learn to use so many virtual bits and pieces (as do their teachers).

*Reliance on a tool* - Some staff thought ReView would solve all their problems but clearly needed to engage in a process not just the software.

The quote from the academic reflecting on the differing standards, and individual expectations, has perhaps not been exposed to benchmarking processes. But this quote does reveal the underlying problem of communicating standards to students, tutors and between academics themselves. There is evidence currently being collected that students who self-assess on a second assignment, are much closer to the tutors grading against criteria, than the gradings they gave themselves for their first assignment. This could be an important finding, in that through engagement with self-assessment, facilitated by the ReView interface, students were learning about standards relating to criteria.

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<sup>4</sup> Quote from an academic using ReView for the first time in a business subject, marking an exam and essay for 90 postgraduate students)

<sup>5</sup> Quote from an academic coordinator of a large undergraduate business subject

## Conclusions

In conclusion, the argument that top-down directives to academics can benefit from bottom-up practicality using software has been substantiated in research from the study so far. This is particularly evident in the gradual growth in staff take-up and the subsequent research approach endorsed by the award of an ALTC priority project grant.

On reflection, the most difficult aspect of the processes involved in engaging academic staff, has been the development of clear and explicit assessment criteria, at assessment task level. Academics often remain unclear about assessment criteria, after many years of teaching and marking. They *know* what a *good* assignment looks like, but may never have elucidated that clearly to others, including students. Those who have clarified what *good* or *well-written* means, are not necessarily then adept in forming the language that will make criteria clear, and explicit for students.

The more subtle use of wording in criteria to imply levels of learning, has been an unintended outcome of the project so far. It has been an iterative process where academics have been refining criteria through their own reflective process. The explicit inclusion of content and context, within the wording of criteria, was very important in engaging business academics. The mention of content within criteria settled the concerns of many academic staff, that graduate attribute assessment would negate or 'sideline' the discipline knowledge in their subjects.

The role of the ReView software as a facilitator in the engagement of students with self-assessment, has been evident in the non-obligatory adoption of this feature, together with student comments about the online software. There is early evidence that the act of self-assessment in ReView against criteria, followed by tutors' criteria grading for a first assignment, is informing students' judgment of standards for their second assignment in the same subject.

Universities in the ALTC project have already found the data from ReView useful in their AACSB and EQUIS accreditation processes, in regard to their validation of graduate attribute development. However, assessment can only identify attributes evident in work presented as the result of an assignment given. Academics are therefore assessing an attribute of students' work that can clearly change over time. In this important distinction between the student and their work, students need to be encouraged to see assessment as only one aspect of their developmental journey.

Academics need to feel valued for their design of appropriate learning activities and assessment tasks. It has been shown in the research to date that, even with an increasing focus on research commitments, a time-saving strategy using software, can be successful in facilitating change to assessment practices. The 'riders' to this assertion being the need for good academic support, combined with well-reasoned argument, and founded in educational research. The ALTC project with business faculties is due to complete mid 2009. Both the process and the \*ReView software are in ongoing refinement.

It is hoped that this paper has presented one solution to the problems and practicalities of engaging staff and students in criteria-based assessment, explicitly linked to graduate attribute categories. Further studies on the motivation of students to self-assess, and pilot studies where

the self-assessment is an obligatory component of the learning activity, will be part of next semester's research activity.

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