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Fostering Students' Self Assessment Skills for Sustainable Learning

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INTRODUCTION

Enhancing academic quality and the employability of graduates are among the most frequently mentioned driving forces behind global higher education improvement initiatives for the past two decades (Garfield 1994; Gibbs 1999; Harvey and Green 1994; Reichart and Tauch 2003; Edwards 1997). This has contributed to shifts in teaching, learning and assessment practices to enhance students' academic competencies and generic attributes as compatible goals of higher education and employers. Consequently the role of assessment of student learning in higher education is continually being broadened to contribute to sustainable learning.

Sustainable assessment, in Boud's (2000) words refers to 'the knowledge, skills and predispositions that underpin lifelong learning activities' (p. 151). Moreover, sustainable assessment is akin to sustainable development , in that it is aimed at 'meet[ing] the needs of the present without compromising the ability of . . . ' (World Commission of Environment and Development 1987), 'students to meet their own future learning needs' (cited in Boud 2000, p. 151). Notwithstanding the general role of assessment for certification purposes, assessment can also be used to build students' capacities for lifelong learning. To achieve this goal, it is necessary to prepare students to undertake assessment of their own learning and performance. This will enable students to not only contribute to their own learning in the immediate situation, but also to their own and others' learning in future situations throughout life. Hence, sustainable assessment builds the skills needed for lifelong learning.

To address the goals of lifelong learning, burgeoning changes are occurring in learning, teaching and assessment. Such changes are reshaping academic goals to produce graduates who have the capacity to function successfully in an era that demands adaptable, autonomous, self regulated individuals who are capable of analytical, critical and reflective thinking and problem solving with the ability to apply theoretical knowledge to solve real world problems; who are capable of leadership, teamwork and conflict management; and who can cooperate and communicate effectively with others upon entry into employment and beyond (Boud 2000; Birenbaum 1996; Dochy 2001; Dochy and McDowell 1997; Dochy et al. 1999; Falchikov and Boud 1989; Moerkeke 1996; Schon 1987). In particular, profound shifts in the conception and practice of assessment in higher education are occurring, for example an increased focus on the role of formative assessment to focus students' attention on the processes of assessment and to encourage them to instil such processes as part of the act of learning, rather than reinforce the notion that assessment is just something that they are subjected to by an external source. This is at the heart of sustainable assessment.

Self assessment provides a means of promoting the goals of lifelong learning. Boud (1995) defines self assessment as 'the involvement of students in identifying standards and/or criteria to apply to their work and making judgements about the extent to which they met these criteria and standards' (p. 5).

Hence, self assessment is seen as not only an effective tool for formative assessment of learning, but also as a critical life skill (Boud and Falchikov 1989) that is important at all levels of the curriculum. Moreover, Boud and McDonald (2003) surmise that since 'self assessment affects cognition, affection and conation' (p. 211), it can encourage deep as opposed to surface approaches to learning, with positive implications for the quality and sustainability of learning.

The purpose of this paper is to explore some of the issues involved in fostering self assessment skills to promote sustainable learning in students. The authors argue that by focusing students' attention on self assessment processes, lifelong learning is promoted as this not only builds students' capacity to judge the quality of their work against given criteria but also stimulates an improvement orientation. Moreover, self assessment processes once developed are sustainable beyond the immediate assessment task and therefore potentially influences student learning positively. Theoretical support for this argument is drawn from the literature on self assessment and lifelong learning, and practical significance is demonstrated by means of a case study investigation.

CONTEXT

The case discussed in this paper is situated within an Australian higher education setting. A formative self assessment strategy was adopted to promote the development of 'cognitive, meta-cognitive and social competencies and affective dispositions' (Dochy et al. 1999, p. 334) to promote sustainable learning. A written assessment task provided a cognitive challenge that created opportunities for students to demonstrate problem solving, critical thinking, questioning, searching for relevant information, making informed judgements, using information efficiently, analysing information, and communicating effectively in written form. To promote meta cognitive competencies, the learning process was grounded in self reflection and self evaluation. Social competency was limited to engagement by students in written reflective dialogue with the lecturer about their learning. Affective dispositions such as perseverance, internal motivation, responsibility, self management, self efficacy, and independent learning were recognised as important facets contributing to students' learning processes and assessment outcomes. Overall these dimensions reflected the desired graduate attributes embedded in the curriculum.

LITERATURE REVIEW

Existing literature is abundantly clear about the ways in which formative assessment contributes to the goals of sustainable, lifelong learning, and how these inform the axioms of sustainable assessment. However, there are many complexities surrounding competing purposes of assessment including challenges that emerge within particular learning environments.
Self Assessment and Learning Benefits

Self assessment in educational practice is reported to have demonstrated many benefits, for example, improvements in the quality of learning (i.e. produced higher grades) (Hassmen et al. 1996); reinforcement of students' awareness of their strengths and weaknesses in the subject knowledge, and enhanced ability to apply knowledge and effective learning strategies (McNamara and Deane 1995). Improvements in students' capacity for self awareness and the ability to monitor one's own learning and performance are invaluable benefits reported by some studies (for example Cassidy 2006; Falchikov and Boud 1990; Peters 2002; Reid 2001; Rivers 2001). Improved affective dispositions, such as enhanced self motivation (Norton 2004) and independent learning are further reported benefits (for example Cotton 2001; Peckham and Sutherland 2000; van Krayenoord and Paris 1997). Self assessment is also believed to have promoted student success and lifelong learning (McAlpine 2000).

Sustainable Assessment

An important axiom of lifelong learning is that people need to focus as much on the judgements they make about learning as on the learning tasks themselves. Since students in a university environment are being prepared largely for an increasingly unknowable future, Bowden and Marton (1997) argue that curricula need to focus on developing students' critical ability to discern variation in knowledge, so that they are able to perform effectively in new situations; implying that learning and assessment must be viewed in wider terms. To achieve this, it is reasoned that both formative and summative assessment practices must consider their effects on learning and learners (Boud 2000). However, Boud cautions that summative assessment 'acts as a mechanism of control exercised by guardians of particular kinds of knowledge' (e.g. teachers, educational institutions, professional bodies) 'over those who are controlled by assessment' (e.g. students, novices, junior employees) (p. 155). The problem with this is that it too easily locates 'responsibility for making judgements in the hands of others and undermines learners' ability to be effective through simultaneously distinguishing the criteria and standards of performance being upheld' (p. 155). But, 'insufficient attention has been given to those aspects of assessment that contribute most to students' ability to learn for themselves and thus contribute to a learning society' says Boud (p. 155). This makes a strong case for refocusing on the role formative assessment can play in what and how students learn.

Several axioms for sustainable learning may be drawn from Black and William's (1998) extensive review of the literature on formative assessment. Put simply, to foster sustainable learning, formative assessment must:

- Focus on learning rather than performance
- Build self assessment skills vital for lifelong learning
- Rest on a belief that all students' learning must be supported
- Make students aware that their beliefs about their own capacity as learners affects their outcomes
- Be aligned with teaching and learning practices
- Generate self improvement
- Separate feedback on learning from grading processes
- Utilise a criterion or standards- based framework
- Encourage reflective learning.

These principles suggest that suitable forms of formative assessment as well as 'ways of embedding formative assessment thinking into all acts of learning' are necessary to foster sustainable assessment (Boud 2000, p. 158). Assessment of learning by students themselves provides a strategy to promote ongoing learning. Hence self assessment that enables students with capacities to construct formative assessment schema, in other words, meta assessment competencies, provides a form of sustainable assessment. To foster sustainable learning, a self assessment strategy must include the following features according to Boud (2000):

- Build students' confidence that new learning tasks can be mastered
- Promote exploration of tasks and standards which apply to any given learning task
- Foster active engagement with learning tasks to test understanding and application
- Provide tools for self monitoring and judging progress
- Create opportunities for practice to identify critical aspects of problems and issues
- Provide feedback to influence further engagement with the task
- Demonstrate care in the use of language to prevent premature closure on ongoing learning.

These characteristics would suggest that sustainable assessment needs to be inextricably woven into the teaching and learning context and cannot be operationalised in an instrumental way. Importantly though, it is recognised that what is a sustainable learning activity in one situation or for one student

may not be for another. Therefore, whilst sustainability of assessment is informed by a set of general principles, its application must address the unique teaching and learning issues that characterise each context. Hence, an assessment task cannot be judged as contributing to sustainable learning simply on the basis of the subject content upon which the task is based or the instructions given to students; it depends on many factors, for example, students' interpretation of the task and how they respond to particular aspects of the task, their critical capacities to apply knowledge, their beliefs about their own capabilities, the learning processes they adopt and the learning resources they use, their motivations and the social environment within which the learning is embedded, and of course, the array of teaching aspects that are involved (e.g. the knowledge area, disciplinary practices, teaching strategies, etc.).

METHOD

A self assessment strategy was used to investigate three areas: (1) the effectiveness of students' capacity to assess their own academic performance; (2) the correlation between students' and the lecturer assigned grades; and (3) the effect of self assessment on students' learning. Data was obtained from 80 students enrolled in a second year unit within a computer science undergraduate course. The data was collected from two different cohorts in subsequent semesters. The study cohort was diverse in terms of language, age and gender. Almost 50% of students originated from countries other than Australia.

Students completed a self assessment questionnaire that included a range of items linked to the abovementioned aims (Note: this paper reports on the third aim of the study). Two questions about the impact of the self assessment task on their learning were included (i.e. notions of quality in written academic work, and motivation to critically evaluate and improve individual work). Responses to these items were recorded on a five point Likert Scale. The quantitative measurements were simply analysed and charted as sums and percentages using Microsoft Excel. Students were also encouraged to elaborate on the responses they supplied. The qualitative data was analysed using principles of content analysis (i.e. by identifying recurring patterns / themes in students' responses to the open ended questions).

FINDINGS AND DISCUSSION

The first key finding was that student assigned grades were concentrated on the upper end of the assessment scale whereas, the lecturer assigned grades were weighted more heavily towards the middle and latter end of the scale, with a relatively small percentage point difference in the lower three grades (i.e. nine, seven and four respectively) . The second key finding was that while there was a high level of correspondence between student assigned and lecturer assigned grades (42%), a large percentage of students (39%) assigned themselves grades higher than the actual grade assigned by the lecturer and about a fifth (19%) of the group had assigned them self a grade lower than the actual lecturer assigned grade. Both the effectiveness of students' capacity to assess their own academic performance and the correlation between students' and the lecturer assigned grades are discussed in depth elsewhere (Singh and Terry, 2008).

In this paper our focus is on the extent to which self assessment promoted attributes of sustainable learning. Therefore the third key finding was that 56% of students reported that the self assessment process assisted their understanding of what constitutes quality in a written assessment. It is disturbing that 44% of students were either neutral or derived no gain in their understanding of the quality indicators (see Figure 1).
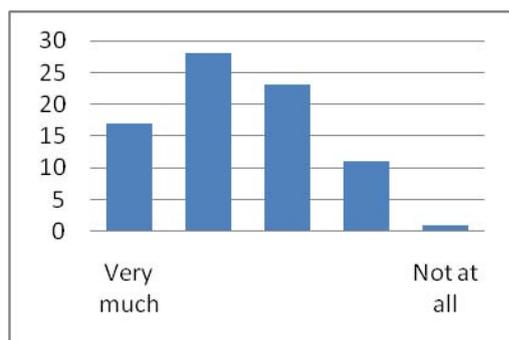
Figure 1: The extent to which completing the self assessment assisted students' understanding of 'quality' in their assignment.
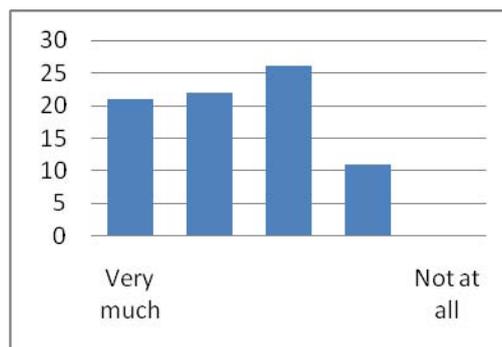
Figure 2: The extent to which completing the self assessment encouraged students' to critically evaluate and improve their assignment.

The fourth major finding was that a small majority (55%) of students reported that the self assessment process encouraged them to critically evaluate and improve their assignment. Again this leaves a disquieting 45% of the cohort as neutral or as having felt the assessment descriptors and their usage did not encourage them to evaluate and improve their work.

However, it is interesting that of the students who achieved a HD (80 – 100) or D (70-79) grade, 77% were positive about the self assessment having assisted their understanding of quality in the written assessment, and 75% were encouraged to critically evaluate and improve their assignment as a result of undertaking the self assessment. The likelihood is that the high performing students had adopted deep learning approaches as opposed to surface learning approaches, hence their improvement in understanding the notion of quality in academic work. However, it cannot be assumed that the self assessment strategy per se was responsible for deep learning, but it may have had a positive influence. On the other hand, of those students who received a N (Fail, below 50) or C (pass, 50-59) grade the comparative percentages were 38% (i.e. self assessment assisted understanding of quality) and 44% (i. e. self assessment encouraged critical evaluation and improvement) respectively.

Despite the underwhelming association between students' self assessment and positive impacts on their understanding of the quality indicators in the present study, the positive impacts on ways of learning that accrued should not be overlooked since there is ample evidence suggesting that self assessment results in improvements in students' capacity for self awareness and the ability to monitor one's own learning and performance (Cassidy 1999; Peters 2002; Reid, 2001). Indeed, it is likely that less motivated and weaker students were less clear on understanding the lecturer specified quality indicators, thus impacting negatively on self identified cognitive improvements. Also since almost 50% of this cohort was of an ESL background with varying levels of English language competency and new to the Australian higher education environment, it is plausible that these factors may also have influenced the results. In fact, for many students, this may have been their first encounter with self assessment, and it is assumed that others may have had limited experience with self assessment and or reflective learning. Their lack of self assessment experience may have undermined their ability to engage with the process effectively thus hampering their capacity to simultaneously distinguish the criteria and standards of performance being upheld and their use of these to guide and reflect on their learning.   This demonstrates some of the challenges that arise from both the dual purposes of assessment, as well as the application of sustainable assessment in a particular teaching and learning environment. It is also possible that some students may have dispensed with the self assessment component in an instrumental way, and not engaged with it as a learning strategy to generate a self improvement orientation (i.e. sustainable learning).

Content analysis of students' comments demonstrated lifelong learning gains in the cognitive, meta cognitive, social and affective domains. Evidence of cognitive benefits was drawn from several comments along the lines of '. . . this gave me a deep understanding of the problem domain' and '. . . my understanding of the issues improved. . . .' Likewise, evidence of reflective learning indicated

meta cognitive gains. Students showed awareness about their learning, for example, a student said: 'this is the grade I would like to get but may not due to . . .' Another student was particularly eloquent in the description of benefits derived from the self assessment experience. She said:

> I never thought a self assessment will make me strive to do my best until I did this assignment. I really made sure all the criteria of the assignment were met as I had to justify my grade. Although I could have gone for the HD, I was not that sure I could justify it therefore selected D. I think I have met all the requirements of researching extensively, discussing the tools and techniques that could be used, discussing the processes involved in all the areas, explaining the benefits of following the right path and the consequences of not planning a project well.

The findings showed that students' awareness of their strengths and weaknesses in the knowledge area, their capacity to apply this knowledge as well as the learning strategies they employed were brought into consciousness, as was the case in McNamara and Deane's study (1995). A further aspect of reflective learning is an improvement orientation, which was shown in comments such as 'I need to work on my grammar . . .' 'Because of bad time management and planning . . . next time I will . . .'; 'I am aware my . . . is not acceptable, I need to . . .' Both, the capacity for reflective learning and an improvement orientation were evident from students' responses therefore reinforcing the finding that the self assessment strategy promoted sustainable learning for a large number of the students involved in this study.

The self assessment strategy also promoted dialogue between individual students and the lecturer about their learning. Common themes in the written dialogue included the scope of the assignment, the nature of resources that they had used, knowledge that was generated by consulting with experts in the field and peers, challenges encountered in their application of theoretical knowledge, etc. By promoting dialogue, the self assessment strategy encouraged students to tap into the social domain to support and extend their learning. Hence, social engagement was channelled to foster sustainable learning.

Affective dispositions were somewhat harder to track in students' responses as these were generally expressed as likes and dislikes about the work they had produced. Some of the comments included earlier allude to improved self motivation, which Longhurst and Norton (1997) identify as significant for life long learning. The affective domain is further linked with dispositions such as perseverance, internal motivation, responsibility, self management, self efficacy, and independent learning. Generally, students recognised these as facets that contributed to the quality of their learning and which had positively impacted their assessment outcomes. This positive association between affective dispositions and quality of learning has been widely reported in literature cited earlier (for example Cotton, 2001; Peckham and Sutherland, 2000; van Krayenoord and Paris, 1997; Black and Williams 1998).

CONCLUSIONS AND IMPLICATIONS

This study has highlighted the complex issues involved in fostering self assessment skills to promote sustainable learning in students. The findings have demonstrated that a particular self assessment strategy achieved the goals of sustainable assessment in so far as it contributed to building students' capacity to judge the quality of their work against given criteria and that it stimulated an improvement orientation that extended students' learning. However, it is difficult to anticipate whether the learning and self awareness gains would be sustained beyond the assessment context as this is influenced in varying ways by students' personal affective attributes. Given these complexities, self assessment can only foster sustained learning when it is appropriately integrated into the curriculum at various levels – it cannot simply be operationalised in an instrumental way. It is crucial that sustainable assessment be guided by the principles of both lifelong learning and formative assessment.

The study has raised some significant implications about sustainable assessment. Firstly, what is considered a sustainable learning process in one situation or for one student may not be so in another situation or for another student. Secondly, an assessment cannot be judged as contributing to sustainable learning simply on the basis of the task and instructions given to students; it depends on many interrelated factors that impinge on the teaching and learning environment, for example, the nature of the task, students' interpretation of and how they respond to particular aspects of the task, the tools for self monitoring and judging progress that are available, the opportunities available to apply the knowledge and skills in real world situations and nature and quality of feedback students receive about their learning. However, there are many factors that may lie outside of the direct scope of teaching and assessment, for example students' beliefs about their own capabilities, their attitudes and motivations about learning, their perceptions about the learning environment, the learning processes they adopt and their level of intellectual and social engagement within the learning environment. Ongoing attention to these factors can continuously and positively shape sustainable assessment.

This initial investigation into the benefits of a self assessment strategy has provided the impetus to continue our work on sustainable assessment in a more integrated and rigorous manner, possibly by beginning with attempts to construct sustainable assessment (formative) across the entire unit, and later to explore opportunities to extend the work across units within the course (vertical sustainability). Areas for further exploration include the development of appropriate self monitoring tools for students to assess their progress, integration of opportunities for dialogue with peers and the lecturer to encourage exchange of ideas and facilitate various levels of feedback on individual progress. To prevent premature closure on ongoing learning, ways of integrating student debriefing will also be explored.

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