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Using self- and peer-assessment to enhance students' future-learning in higher education.

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In higher education settings, assessment tasks get the attention of students, but once students submit their work they typically become disengaged with the assessment process. Hence, opportunities for learning are lost as they become passive recipients of assessment outcomes. Future-learning oriented assessment engages students in the assessment process to improve both short- and long-term outcomes by requiring students to make sophisticated judgments about their own learning, and that of their peers. In this paper, we describe and critique three initiatives that experimented with future-learning oriented assessment within a faculty of education. These initiatives involved self- and peer-assessment in a mathematics education subject for first year pre-service teachers; peer assessment of individual contributions in a group project using a Wiki; and self- and peer-assessment to help students learn about leadership. Based on our experiences, we conclude with suggestions of how others might also use self- and peer-assessment to work towards better short- and long-term learning outcomes in higher education.

future learning, self-assessment, peer-assessment

Introduction

Assessment typically frames how higher education students learn because it provides the clearest indication of what the institution gives priority to (Boud, 2007). Assessment sets the agenda more persuasively than any syllabus or course outline and it is "one of the most significant influences the students' experience of higher education and all that they gain from it" (for more details see Boud & Associates, 2010, p. 1). Unfortunately, sometimes assessment does not adequately focus on the processes of learning, and particularly on how students will learn after the point of assessment (Boud & Falchikov, 2007b). This means we may be missing an opportunity to better prepare our students for their professional lives post-graduation. If this is true, the quality of assessment should not be judged on narrow technical grounds, but "in terms of how it influences the learning for the longer term of those who are being assessed" (Boud & Falchikov, 2007b, p. 9). As Kvale (2007) explained there is new pressure on academics to develop forms of assessment which promote efficient learning for more students for a longer time – assessment for lifelong learning.

Assessment focussed on future learning reportedly improves both short- and long-term outcomes by helping students to make "increasingly sophisticated judgments about their learning" (Boud & Falchikov, 2007a, p. 186). The underlying premise of this paper is simple; assessment is an integral part of the learning process that must play an important role in instructional design. Hence, assessment processes focused on future learning are carefully and constructively aligned (Biggs & Tang, 2007) with the intended learning outcomes in ways that allow that learning to extend beyond the completion of the subject. Ideally, the instructor and students co-operatively determine the criteria by which judgments are made regarding the quality of student work. This approach to assessment requires academics to share the responsibility of learning with the students and helps the students to develop the intellectual skills necessary to make sound decisions in their academic and personal lives well into the future (Boud & Associates, 2010). Brew (1999) summarised the challenge well,

> *Assessment and learning must increasingly be viewed as one and the same activity; assessment must become an integral part of the learning process. . . . When teachers share with their students the process of assessment - giving up control, sharing power and leading students to take on the authority to assess themselves - the professional judgment of both is enhanced. Assessment becomes not something done to students. It becomes an activity done with students. (p. 169)*

In this paper we describe our attempts to design and implement assessment processes that encouraged future learning in the Faculty of Education at La Trobe University in Bendigo, Australia. Before describing our interventions, which specifically focus on the use of self- and peer-assessment to foster future learning, we provide a brief overview of the relevant literature.

Literature review

Assessment for future learning

In the last decade there has been interest in the idea that assessment needs to contribute to future learning. David Boud and various colleagues (Boud, 2007; Boud & Associates, 2010) have championed this cause, but in our opinion there is a need for more empirical research to support the claims being made. In this review of the literature, we provide details of claims based on empirical research, and demonstrate that such research tends to be the exception rather than the rule. This weakness in the literature, is also highlighted by the authors of the *Assessment 2020* paper (Boud & Associates, 2010), and warrants serious consideration be given to the issue.

The literature suggests that students need to develop as independent learners in order to be successful in their higher education programs and also in their professional lives post-graduation. Boud and Falchikov (2007a) have described the ability to evaluate one's learning and performance as an essential part of "becoming an accomplished and effective professional" (p. 184). Similarly, Biggs and Tang (2007) argued that the ability to make judgements about whether a performance or product meets a given criteria is vital for effective professional action in any field. Tan (2007) also argued for "self-assessment development practices that can develop and sustain students' self-assessment ability beyond its immediate programme of study" (p. 115). However, part of this preparation for the future requires helping students to learn to continuously monitor the quality of their work during the act of production itself, so they can make improvements in real time (Montgomery, 2000; Sadler, 1989).

Two effective teaching and learning processes that can assist with the development of such judgment are self-assessment and peer-assessment, and the literature provides examples of how these processes have been used successfully in higher education. A third strategy, which will not be discussed extensively in this paper, concerns the use of portfolios as an assessment tool. Portfolios involve students in the direct monitoring and regulation of their own learning as they reflect on their achievements and select work that they believe demonstrates they meet or exceed certain standards (for more details see, Nicol & Milligan, 2006). In the project described in this paper, we chose to focus primarily on the processes of self- and peer-assessment, and in the following section we will review selected recent literature published describing the efficacy of these processes.

Self- and peer-assessment

Many developments in self- and peer-assessment have focussed on a form of academic socialisation, which seeks to make the codes or rules of the assessment 'game' explicit and transparent to students (Norton, 2004). For example, requiring students to use rubrics to assess the work of their peers helps them to understand the assessment criteria that will be used to assess their own work. However, self- and peer-assessment can reportedly achieve more. It may also help students to become realistic judges of their own performance, by enabling them to monitor their own learning, rather than relying on their teachers for feedback (Crisp, 2007; Sambell, McDowell, & Sambell, 2006).

Students' ability to self-assess can provide valuable clues to the teacher about how deeply they have understood the tasks and this information can improve teaching and learning (Montgomery, 2000). Research conducted by Tan (2007) involving interviews of academics across 12 discipline areas in three universities in Australia identified three progressive conceptions of self-assessment:

teacher driven, program driven, and future driven self assessment. The future driven conception of self-assessment seeks to help students to develop skills to construct assessment criteria, negotiate against external standards, and make judgements using those criteria. According to Tan only this future driven assessment helps students to sustain their self-assessment capacity independent of teachers in future contexts because it:

> *permits greater reflection by forcing students to look beyond the academic and the program of study when judging what and how well they have learned. This seems to provide students with more scope to reflect critically on their learning as well as their assessment practices. (p. 120)*

Peer-assessment includes processes which require students to "provide either feedback or grades (or both) to their peers on a product, process, or performance, based on the criteria of excellence for that product or event which students may have been involved in determining" (Falchikov, 2007, p. 132). Whatever form of peer-assessment is used, ideally the method should allow learners to practice making reasonable judgements about the extent to which their peers have achieved expected outcomes (Falchikov, 2007). Some academics are cautious about using peer-assessment as a form of summative assessment that actually counts towards students' grades. However, Falchikov (2007) urged us to be wary of all grading processes, not just peer-assessment, and she argued that concerns about the validity and reliability of peer-assessment can be addressed.

Three strategies which teachers can use to improve the quality of both self- and peer-assessment include *modelling*, *scaffolding*, and *fading* (Falchikov, 2007). Before engaging students in self- and peer-assessment, teachers can provide examples of how they personally use assessment tools and strategies to improve reliability and accuracy. In terms of scaffolding, Falchikov (2007) encouraged teachers to initially start with structured grading schemes (for example, rubrics), before moving to less structured systems where students negotiate the assessment criteria, before students eventually developing their own criteria. Andrade and Du (2007) also recommended the use of scaffolding to teach students how to use self-assessment tools. They found that students' attitudes toward self-assessment became more positive as they gained experience with it. The students' experiences were more positive if teachers provided clear articulation of assessment criteria and rubrics – resulting in higher grades, better academic work, increased motivation, mindfulness, learning, and reduced anxiety. As students achieve greater independence in peer-assessment the amount of direction and level of support offered by the teacher fades, or is withdrawn, over time. However, this should be discussed and negotiated with students and Brew (1999) maintained that more positive responses to the use of self-assessment are likely when the teacher's expectations are clear and when the students have received systematic practice.

Research drawing on student feedback on the use of a computer assisted peer assessment tool (Davies, 2003) and student responses to surveys after participating in self assessment (Cassidy, 2007) identified some barriers to the effective use of self- and peer-assessment. Davies and Cassidy reported negative consequences if: students perceived that self- and peer assessment were being used as a means of alleviating pressures for tutors; if students feel ill-equipped or not capable; if students feel uncomfortable with the responsibility of peer assessment duties; and if tutors have concerns about subjectivity and reliability of assessment. Carless (2006) suggested that teachers can improve the effectiveness of self- and peer-assessment by being very clear with the students how they will benefit from participating. Biggs and Tang (2007) agreed "It is important

that these educational outcomes are made clear to the students, not only because the rationale for all teaching and assessing decisions should be transparent, but because it is necessary to get the students on side" (p. 233). Finally, Boud (2007a) was adamant that teachers must do more than just align assessment with the subject objectives; we must also align assessment with the future. In this regard, Boud suggested that it would be preferable for assessment tasks to be designed with due consideration of how the student will be required to use skills and knowledge in the future – and he suggested that the links to the future should be made explicit. Hence, a course which produces graduates who are required make critical judgments about the quality of some work output, must provide students with opportunities to make such judgments in a contextually appropriate manner, when they are studying. This extends Biggs and Tang's (2007) concept of constructive alignment beyond its normal application of aligning assessment with intended learning outcomes and activities within a subject.

Peer-assessment of individual contributions to group projects

Falchikov (2007) cited evidence that students view peer assessment of group work within higher education as relevant to their future careers and having a role in promoting lifelong learning skills, including reflection, autonomy, self-efficacy, diplomacy, problem solving and responsibility. However, assessment of individual contributions to a group project can be difficult for the assessor who is typically not present while the work is being completed and must therefore often rely on peer-assessment to differentiate the contributions of individual students. Lejk and Wyvill (2001) compared the application of holistic and category-based peer-assessment of a group project[1] and found that the holistic approach produced overall higher agreement between peers when compared to the category-based approach, which focussed on specific traits. They concluded that holistic assessment was "more effective at dealing with outstandingly good and outstandingly weak contributors to the group whereas category-based assessment leads to a fine-tuning of small differences in group 'contributions'" (p. 69).

In closing this brief review of the literature, it is important to acknowledge the difficulties of incorporating self- and peer-assessment whilst meeting other functions that assessment has to fulfil like certification and licensing. Also, self- and peer-assessment challenges the traditional power relations between learner and teacher, and raises questions about objectivity and reliability in assessment (Leach, Neutze, & Zepke, 2001). These are not insurmountable challenges, but they will require some deliberate and intentional consideration.

Three projects exploring assessment for future-learning.

In this section, we will describe three assessment initiatives that sought to encourage future learning within the Faculty of Education at La Trobe University. Although La Trobe University is a multi-campus institution, all of the authors teach on the Bendigo campus, which is located in a regional area of north-central Victoria in Australia. The campus has about 4000 students, approximately 1375 of whom are enrolled in Faculty of Education courses. The case studies described were part of a Distributed Leadership Project focussed on assessment, which was funded by the Australian Learning and Teaching Council, and co-ordinated by Dr Geraldine Lefoe from the University of Wollongong (Lefoe & Parrish, 2008). The initiatives described in each case study were implemented in 2008.

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[1] *Holistic peer-assessment requires each group member to award an overall, or global, grade to the other students. Whereas, category-, or criteria-based, assessment requires students to assess one another according to a set of previously determined criteria.*

In the cases that follow, each author will provide some more specific details about their case before using a common format to describe: *The problem*, *The proposed solution*, and *The outcomes*. In the case study description the use of the term "I" refers to the author concerned with that case. The descriptions are by necessity brief, and they aim to provide only enough detail of the initiatives to allow the reader to comprehend the learning that emerged for us as the facilitators/teachers.

Case #1: Peer-assessment in mathematics education (Dona Martin)

My work includes co-ordinating and teaching a core education subject 'Working mathematically' in the first year of a four-year education course, with some 212 pre-service primary school (elementary) teachers. The outcomes of the subject include an aim to 'Demonstrate an informed capacity to teach and reflectively evaluate mathematics lessons.' The framework that supports this outcome was designed to be a systematic approach for developing expertise in future teaching. For as discussed in Boud and Falchikov (2008) if "fostering awareness of personal and professional practice begins as soon as learners begin the process of judgement (p. 190) then the first year of teacher education is a pivotal time to highlight the value of assessment in learning and teaching.

The problem

In approaching assessment as a key element in preparing self-monitoring and self-regulating learners and consequently future teachers my problem became: How to encourage first year pre-service teachers to be critically involved with assessment practices? Indeed, how could the assessment practices used engage pre-service teachers in constantly rethinking, modifying and refining their teaching and learning?

The proposed solution

I believed peer-assessment offered me the solution. I was aware of the developments in self- and peer-assessment in relation to academic socialisation - using rubrics to assess the work of their peers (Norton, 2004), and I was aware of literature that demonstrated how well-planned peer-assessment assisted pre-service teachers to monitor their own learning (Crisp, 2007; Sambell, et al., 2006). I also knew that to avoid superficial feedback I needed to develop feedback opportunities that demonstrated insight into how assessment processes affect these pre-service teachers as both learners and as future teachers. Added to this, I knew that a large part of engaging pre-service teachers with mathematics, or getting them to become active learners in mathematics education required me to take particular account of high levels of mathematical anxiety. Again the research (Martin, 1994, 2004; Tobias & Itter, 2007, January) in this area and my history of teaching in this field had demonstrated to me that a high proportion of pre-service teachers experience high levels of mathematical anxiety. Getting these pre-service teachers to engage in sharing their understandings was going to require careful planning.

When planning the peer-assessment I understood the importance of the three stages of developing expertise in self- and peer-assessment (Falchikov, 2007). As my work engages first-year pre-service teachers I had clear opportunity to *model and scaffold,* however *fading* would need to come later in their course. To address these first two steps I knew I not only had to demonstrate that pre-service teacher knowledge and understandings were being assessed in a comprehensive manner, I also had to demonstrate aligned outcomes, actively engage the pre-service teachers in

the assessment process and provide genuine opportunities for discussion and exploration of each assessment experience.

In designing the new assessment processes I first considered what was important to me and what it was I wanted to achieve. One critical step in this process included the generation of an assessment schedule that accounted for student-centred learning where the depth of learning was not only determined by the nature of the learning activities but also supported by the assessment. By providing students with the opportunity to explore how assessment aligned with content to direct and inform their understandings, I knew I had to provide them an opportunity to consider the importance of reflexivity and self-monitored learning. As the proposed solution developed, the self- and peer-assessment factors were guided by the following principles:

- The self- and peer-assessment marks had to be authentic and weighted fairly.

- To account for anxiety, the peer assessment had to be provided anonymously, to encourage a genuine emphasis on point/s to be addressed and to minimise negative repercussions.

- Feedback between the students had to be framed in both a focused and constructive way.

- The marking criteria needed to be open, genuine and explicit.

- Finally, to increase student confidence in the process, I knew I had to maintain the overriding authority in the assessment process so if, for example, a peer evaluation was deemed by anyone involved to be unfair I could then address the concerns they had with the assessment process.

The outcome

Each week a group of three pre-service teachers prepared and delivered a 45 minute presentation on a predetermined mathematical concept to the rest of their tutorial group. After the presentation, a period of 10-15 minutes was allocated for the three presenters to complete a self-assessment task and for the others to complete a peer evaluation sheet. The self-evaluation covered areas such as: the introduction to the session; the body of the presentation, visual aids; conclusion, language, delivery, body language, question time, notes, and how well the group worked together. The purpose was not only to alert the pre-service teachers to the many qualities that make up a strong presentation, but also to assist pre-service teachers to understand what to look for when assessing the presentations of their future students. They were encouraged to focus on aspects of content and pedagogy and to develop an awareness of the many elements of a quality presentation. This process of developing positively framed judgements about what constitutes a quality presentation was deemed extremely relevant to them as future teachers. While they did this the other pre-service teachers completed peer-assessment sheets. They connected, through genuine involvement as active members of each class, the interrelationship between learning and teaching and began to build strength in assessing what was going on around them.

The class then came together to share these reflections. Presenters discussed what they considered they did well and what they could have improved on. Peers added to the discussion by highlighting what they considered the presenters could have done to lift the learning experience and also

focussed attention what had worked well for them. For example one pre-service teacher's feedback included the following comments:

> *You had great ideas for using Bloom's taxonomy and spoke confidently because you clearly knew your topic. If you related this work back to VELS [our curriculum framework] you would have connected dots for us. . . . Maintain eye contact as much as possible and if there is a question make the answer clear and defined.*

As learners they also made connections to how the concepts under investigation worked within their perspectives of knowing, how they linked this knowledge with prior understandings, how the learning experiences could be extended and how the knowledge could be transferred into or from other settings. Another example:

> *It was great that you employed a number of different materials eg: interactive white board, laptop, referring to the text book, Unifix blocks, etc. You illustrated the concept clearly and with different methods that could be used to facilitate the learning… I did not know you could use all of that. You linked common misconceptions to the lecture last week and showed how students could be using different methods depending on their understanding.*

The strength in these new assessment practices, as evidenced within these comments, was clear and encouraging.

After each tutorial pre-service teacher self- and peer-assessment work was graded by the lecturer on how well they each assessed the work presented, either their own or that of their peers. After grading all work was de-identified and put on public display for peers to read. There was no problem with negativity as all work was graded on not only content but also on how constructive the feedback was. All pre-service teachers understood the marking criteria as they were provided with rubrics and walked through expectations. As a point of interest, at no time have I as the lecturer had to keep an assessment piece aside in fear of it being perceived in a negative light.

For the pre-service teachers involved this opportunity to explore teaching and learning through assessment impacted on how they learn and how they will teach mathematics. The feedback from pre-service teachers was consistently positive about the processes involved. The pre-service teachers understood the reasoning behind drawing attention to both what makes a good presentation and to what a teacher needs to take account of when assessing the presentation of others. They were all highly engaged and became increasingly confident to discuss not only what they expected from each class but to also link what they were experiencing to what they needed to do as developing teachers.

Personally, I found this constructively-aligned focus on what was happening in each class enriched the learning opportunities. Pre-service teachers were attuned to what was being presented and how the learning and assessment practices were benefiting their development as both current learners and as teachers of mathematics in the future.

Case #2: Peer assessment of group work using a wiki (Kathleen Pleasants)

Teaching and Program Development (TPD) is a core, second semester subject in the final year of various Bachelor of Arts degrees within the School of Outdoor and Environmental Education. The subject requires students to work in groups of up to eight to negotiate a four-day outdoor environmental education program in consultation with an outside agency, usually a school. In 2008 there were 37 students enrolled in TPD, completing seven different negotiated programs. In addition to the program planning components, students attend a combination of lectures, tutorials and workshops throughout the semester designed to support their learning. This was the first time I taught this subject.

The problem

In previous years, feedback from students clearly indicated that they felt there was insufficient time and opportunity for them to meet, plan and negotiate with one another in order to complete the program design. This is, in part, a function of their course of study, which requires a high number of practical days to be completed. In the most extreme cases a student could spend approximately 40 days and nights in the field[2], necessitating their absence from 'normal' lectures and tutorials. This challenge echoes a very real issue faced by professional outdoor educators. Research conducted by Thomas (2001) sought both quantitative and qualitative data about work-related stress among outdoor professionals in Australia. He concluded that seven of the most commonly cited factors contributing to the work related stress of respondents "relate[d] to, or [were] strongly influenced by, the time and energy commitment that OE [outdoor education] demands of practitioners" (Thomas, 2001, p. 20). Hence I was able to make an explicit link for my students between their current and potential future challenges.

The proposed solution

One of my responses to this challenge was to ask the students to use a wiki to plan and present their program. According to Jones (2007, December), "a wiki is a website that is editable by users, who access the site through a standard web browser. . . . The particular characteristic of the wiki which has made it of great interest to educators is the potential it has for facilitating online collaboration through an effective, easy to use interface" (p. 463).

My reasons for choosing to use a wiki were manifold. Firstly, as near-graduates many of the students would soon be working in situations where they were required to complete duties very similar to this assessment task in their daily work. Hence I sought a solution designed to provide real life consequences for the future and in framing this task with the students I was explicit about my intended educational outcomes and rationale (see Biggs and Tang, 2007 and Boud, 2007a for further discussion). I was also mindful, as Falchikov (2007) pointed out when citing Lave, that "learning is a social activity, requiring social interaction and collaboration," and I wanted to emphasise the need for knowledge to have "both an authentic context and structure" (p. 129).

My intent then was to focus the assessment on the process of developing the program, more so than the final product. There is tension for me in my role as an educator between delivering an

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[2] *Time spent in the field varies significantly as a function of the activity electives a student undertakes.*

educative experience verses facilitating learning aimed at meaning making and knowledge construction. This is exacerbated by the commodity aspect of education at this final stage of a degree that dominates some students' approaches to their studies. This discord between use value (education as lifelong learning) and exchange value (education as articles of trade including, for example, grades and credit points) has been documented elsewhere (see for example, Engestrom, 1989; Marton & Booth, 1997). Finally, I wanted to explore the use of collaborative media – in this case a wiki – and consider whether it could afford opportunities to engage in online collaboration from disparate geographical regions and allow students to negotiate the terrain of their conflicting demands.

Students were required to use their wiki to construct their outdoor environmental education program. They were asked to demonstrate an equitable spread of tasks, regular contact with each other, the relevant external agencies and me. A wiki allows users to track the contributions of its members – it becomes clear very quickly if students are not participating equally (the quality of contributions may remain variable however).

The outcome

Initial student responses were wary, but open to the notion of using a 'new' form of technology once I had explained my rationale and invited their input and discussion. There were a number of learning resources available to facilitate student engagement with both the core subject material and the use of a wiki. These included lectures, face-to-face tutorials and workshops, on-line tutorials, journal articles, other prescribed readings, and scheduled meetings between their groups and with me. Following Brew (1999) and Andrade and Du (2007) the use of such scaffolding tools allowed for practice and the development of confidence among students, leading in turn to a more positive approach to something 'different' in the repertoire of assessment tasks they were presented with throughout their courses.

Following the delivery of their program, students completed an evaluation of their fellow group members. Each individual within their group was required to provide a grade and developmental comment focussing on the participation and contribution of their peers. Some student responses to this aspect of the assessment were extremely resistant. Some commented that they were unwilling or unable to judge their fellow students, while others asked me to just give them all the same mark. I suspect that this resistance reflected a number of student concerns, including anxiety about how their comments may be received by their peers, an unwillingness to engage in what some described as 'your job' (see for example, Brew 1999; Cassidy, 2007; Davies, 2003), and a lack of confidence in their ability to determine a suitable grade. Once again, the task confronting students was similar to the role they would take on in their future careers where they can expect to have to provide feedback about their co-leaders' efficacy and competence, often in aspects of their work relating to safety management in outdoor adventure activities with very real and immediate consequences.

We have previously noted Carless' (2006) assertion that the effectiveness of peer-assessment can be improved by being clear about the future benefit to students of participation. This belief is supported by Race (2000), who suggests that simply explicating the assessment criteria associated with group work can lead to an increase in the contribution levels of potential non-participants. These were two strategies I employed to engage my students. Eventually, when it became clear to the group that I was not going to write the criteria for them, the class agreed on a set of three criteria on which to base their assessments. The criteria agreed to were: 1. Plan and lead a practical

program; 2. Develop subject material with guidance; and 3. Work cooperatively as a member of a team. A list of descriptors was drawn up to act as a guide to judging performance in each criteria and a score of between 0 – 5 (ranging from 'not shown' to 'excellent') awarded for each of the three. We did negotiate that I would contribute a percentage of the assessment of their individual contributions from my position as overall supervisor of the projects (this amounted to seven per cent of a possible 15 per cent for this aspect of the assessment for the subject).

The degree to which students engaged with the assessment of their peers' contributions varied significantly between groups. Some chose to completely ignore the three criteria and simply award each group member a mark out of 15, others had clearly collaborated and awarded each group member the same mark, while others described each criteria in its component parts and provided detailed feedback to one another. For me, these outcomes echo discussions of deep and surface approaches to learning (Marton & Booth, 1997) where the surface approach consists of learning the sign (for example the required text or theoretical knowledge) and the deep approach focuses on what is signified by the texts and theoretical knowledge and developing understanding.

During the evaluative phase of the subject I conducted a focus group in which I asked the students to comment on the value and suitability of a wiki for collaborative work of this nature in this subject and the value of the wiki experience to their future-learning. Responses indicated that students felt the wiki was extremely useful as a collaborative tool and recognised the future-learning contained within the task by being able to identify skills they would be able to draw on in future. For example,

> *working in this way often means more work (collaborating often takes longer) but the ideas that develop mean more rewarding and more varied learning experiences for students. Working all ideas into the design was initially time consuming and difficult, but I think more interesting and relevant results followed.*

> *I believe a wiki has both good points & bad. It saves on paper, however can be confusing and cumbersome to negotiate. It creates a connectible base for the whole group to work on, however is not always accessible, reliable or up to date.*

> *The second benefit is in the actual work on the Wiki itself. While I did find it quite frustrating and tedious at times, the benefits in actually going through the process of setting up, establishing and completing a unit of work in this manner has greatly improved my literacy skills in the technology area and, made me look for different ways to do things rather than the ones that I am comfortable with.*

However, it is also clear that the mechanics of the technology had several shortcomings that detracted from its value for some students and this issue is worth consideration in future use of such a tool.

One of the learning objectives for TPD identifies the desire for students to become reflexive learners and to continue that process throughout their transition to further study and/or the workplace. Throughout the semester I highlighted my conviction that as future educators, the students must question what is being taught and aim to find different ways of both teaching and assessing learning. Brookfield (1995) maintained that being a critically reflective teacher is about being able to explore the hidden dimensions of one's practice and becoming aware of the

omnipresence of power. Although I was frustrated by the varying degrees to which the students engaged in the peer-assessment phase of their collaborative project, I recognise the tension (and the irony) that occurs when some of them start doing as I have been advocating, and grow as learners to the point that they can ask, 'what and why' and, ideally carry this trait into aspects of their future study or work.

Case #3: Self- and peer-assessment for emerging outdoor leaders (Glyn Thomas)

Leading Groups in Outdoor Environments is a core, second year subject in several Bachelor of Arts programs within a School of Outdoor and Environmental Education. The subject aims to equip students with some of the skills, theory, and experience required to lead groups in outdoor environments as teachers, environmental interpreters, or outdoor recreation leaders. There are typically about 65 students enrolled each year and the subject involves a mixture of lectures, tutorials, and fieldwork. In 2008, I was teaching the subject for about the seventh time.

The problem

I have experimented with numerous assessment innovations within the subject. For example, I have sought to provide clear assessment criteria (using detailed rubrics), and have tried to use assessment tools that would encourage and measure deeper learning (such as negotiated, individualised learning plans and take-home exams). However, I sensed that my students were still 'tickling my ears' and that my best efforts were just helping them to 'play the game' better (Norton, 2004). I was interested in finding a way to engage the students in learning that was both deeper and of more relevance to the contexts in which they would work after graduating. In essence, I wanted my assessment to encourage and measure the development of the skills, practice and theory needed to effectively lead groups in outdoor environments long into the future.

The proposed solution

In the past, I had viewed self- and peer-assessment as gimmicks with limited value, but that was before I understood the potential of these tools could be used to help students to become more independent judges of the quality of outdoor leadership that they experience now or which they might provide in the future (Boud, 2007). To this end, I decided to use two smaller written assignments (500 words each) early in the semester to trial the use of self- and peer-assessment and investigate the impact of these assessment processes on future learning. The two assignments contributed to 20 per cent of the overall grade in the subject so the stakes were low but I hoped the value of the experiences would be high.

I examined the online self- and peer-assessment software available (for example, *ipeer* (Centre for Instructional Support, nd)) to assist with the project, but resolved to do the work manually. I made this decision because the software was inflexible and it included some functions that were not compatible philosophically with what I was trying to achieve. Completing the process manually was simple, but tedious. Students submitted their assignments electronically and I anonymously coded their papers and allocated them to a group of three. Students were then directed to mark the papers from another group of three as well as their own paper. They submitted marks and some brief qualitative feedback for each paper. The student's final mark for the assignment was

determined by averaging the three peer-assessments of their paper and their self-assessment mark. I collated all of the results and delivered the feedback in one list using their student identification numbers. In order to support the students, prior to submitting their paper, we discussed in detail the assessment criteria and the marking rubric they would use. After they had submitted their papers, I provided some annotated examples of good, average, and poor quality papers to help calibrate their judgements prior to conducting their assessments. In the second assignment, I removed some of this scaffolding, in accord with Falchikov's (2007) application of the fading principle, so they could become a little more autonomous. I did this by provided a more detailed rubric, but not the examples of students' work.

The outcomes

The students' responses to my self- and peer-assessment proposal initially ranged from disbelief, confusion and fear on one hand to excitement and enthusiasm on the other. Consequently, I went to considerable lengths to explain my rationale and my perceptions of the educational benefits of self- and peer-assessments as recommended by Brew (1999). I worked hard to allay the student's fears by outlining the processes we could use to resolve any difficulties we might encounter. This was one of the best outcomes of this initiative. We were having conversations about assessment in class, and the students were active participants in discussions about their learning and how we could best measure it – exactly the sort of learning that Boud and associates (2010) advocate in their *Assessment 2020* document.

Logistically, completing the process manually was very time consuming, and certainly saved no time when compared to completing the assessments myself in previous years. However, the students responded very positively, and we had some excellent discussions about assessment validity and reliability, particularly in response to some large discrepancies between some student's self-assessments and the peer-assessments of their work.

After the second assignment, I invited students to participate in an anonymous, online survey so I could get their feedback of the project. Twenty-eight of the 58 students participated (a response rate of 48 per cent), which indicated a reasonable level of interest. Given the small number of responses, I have not conducted any statistical analysis to determine the significance of the findings, but I will describe some of the general trends that emerged. Sixty-four per cent of the respondents agreed, and seven per cent strongly agreed, that the self- and peer-assessment process helped them to learn more about outdoor leadership. Pleasingly, 46 per cent agreed and 43 per cent strongly agreed that the assessment process helped them to learn how to submit better assignments. The students also provided positive responses (agreed and strongly agreed respectively) that the assessment process was fair (54 per cent, 11 per cent), accurate (48 per cent, 4 per cent), and appropriate (59 per cent, 11 per cent). The aspects of the process that they found helpful were: the examples of work in assignment one (75 per cent very useful), completing the peer assessment (70 per cent very useful), and the detailed rubric in assignment two (75 per cent very useful). Finally, I asked the students to describe in their own words what made the assessment process useful (if at all), and I also asked them to suggest how the process could be improved to make it more useful. There was a range of responses to both questions, but the most pleasing aspect of the responses was the level of level of thinking and engagement demonstrated in some of the students' responses. For example:

> *The ability to mark others' papers gave me a much better idea as to what kind of paper deserves a high mark versus a low mark, and gave me useful information to consider when reflecting on my own work.*

Chance to understand how to mark assignments, and also able to see what made a good assignment.

I think the introduction of the detailed rubric really helps. I think it's a good process to go through, because it's our first time [and we] need to be educated and helped through it.

I personally don't believe this process is that successful. This is because from marking some assignments I can recognise that certain people do not have much of an idea of what they are writing about, therefore when they come to marking other people's papers they may think theirs was correct and mark the right people wrong.

This final student's concern, is consistent with the findings of a study (Lew, Alwis, & Schmidt, 2010) exploring the accuracy of self-assessments with more than 3500 students. Lew et al. found an ability effect where "students judged as more academically competent were able to self-assess with higher accuracy than their less competent peers" (p. 135). It is quite possible that the same inaccuracy would be true for peer assessment too. Hence, although this student's concerns appear to be valid, I reminded my students that developing their abilities to make judgments about the quality of works is a process. This journey into deeper learning processes appeared to make a positive contribution to their development as critical-thinking practitioners based on the survey responses described earlier. This is not only what Boud and associates (2010) encourage academics to do more of, it also what employers expect our graduates to be able to do. In 2010, I am using the same assessment processes in this subject, and intend to collect some more data investigating how well self- and peer-assessment contributes to their future learning.

Conclusions

In this final section of our paper, we would like to share some of the learning that we feel has emerged from the implementation of our self- and peer-assessment initiatives designed to encourage future learning. Before doing so it is worth restating our belief that curriculum reform processes in higher education should encourage academics to find ways of assessing students' work that demonstrate high levels of constructive alignment (Biggs & Tang, 2007). We encourage academics to consider constructive alignment not only within the context and timeline of their subjects, but also in terms of how the assessment and intended learning outcomes align with the contexts their students may work in upon graduation. We would argue that assessment processes can be designed to not only measure, but also encourage, learning that is relevant to the roles that students may fulfil in the professional community upon graduation. The projects described in this paper, have experimented with the use of self- and peer-assessment processes as tools to encourage such future learning. To conclude, we offer the following recommendations for other academics on how we think self- and peer-assessment can generate better short- and long-term learning outcomes in higher education - based on our case studies and our interpretation of the literature.

- Developing assessment processes that encourage future learning is not a simple task and based on our experience careful planning is required to ensure alignment between the philosophical underpinnings, the intended purpose, and practicalities of the assessment tools and processes. This requires a deeper level of constructive alignment of assessment principles with teaching

and learning practices. We consider this to be a form of *external* constructive alignment of the subject with contexts where learning will be applied and the assessment processes that best measure that learning. This contrasts with the constructive alignment described by Biggs and Tang (2007) seems to be mostly concerned with the internal alignment of intended learning outcomes with teaching content and assessment tasks. We suggest recruiting the assistance of critical friends to work through new initiatives to help identify alignment glitches that students seem to discover.

- If you plan to use self- and peer-assessment processes to encourage future learning, be prepared to spend sufficient time discussing with students your rationale for doing so, as recommended in the literature (Carless, et al., 2006; Cassidy, 2007; Tan, 2007). Such discussions provide excellent opportunities to engage students' thinking about learning and assessment and in our initiatives these discussions promoted unexpected, but welcomed, higher order thinking. We also found in our initiatives that these discussions addressed students concerns and anxieties about self- and peer-assessment and made explicit our hopes for the way these processes would contribute to future learning.

- There are numerous electronic tools available (see Bhalerao & Ward, 2001; Centre for Instructional Support, nd; Davies, 2003; Sung, Chang, Chiou, & Hou, 2005), which may support and streamline self- and peer-assessment processes. However, examine these tools carefully before adopting them because their design and operation will be based on some inherent assumptions, beliefs and values. We recommend that academics check the compatibility of these tools with their own values and beliefs about assessment and the purposes for which they will be used.

- Expect resistance from students, peers, and supervisors when developing and implementing innovative assessment strategies. Although there is a paucity of empirical research demonstrating the effectiveness of assessment strategies to foster future learning, there is considerable agreement within the literature on the benefits of using self- and peer-assessments with students in higher education settings. With an appropriate level of support and planning we believe that the advantages of involving students in self- and peer-assessment processes that we observed in our initiatives easily outweighed the disadvantages. Be prepared to do the research to support and substantiate your proposed innovations to relevant stakeholders and get the required buy-in to make these initiatives work.

- Self- and peer-assessment processes are more than a gimmick or fad. In theory, along with portfolios they provide some of the best assessment strategies to encourage and measure our students' future learning. However, to best foster future learning, assessment tasks must be designed with the future application of those skills and knowledge in mind. If the profession that graduates will ultimately work in will require rapid, oral responses to challenging situations, then assessment tasks should be designed accordingly. If graduates in the future will work in teams, or have time to review the literature, then again assessment tasks should reflect this. This may require academics to rethink the assessment tools and processes that they have been using to date.

The description of the three initiatives provided in this paper highlight some of the challenges, and potential value of, using self- and peer-assessment to encourage and measure learning that persists into the future. We have not attempted to prove the effectiveness of self- and peer-assessment to enhance future learning, but this would be a worthy focus for future research. We hope that our

stories might stimulate other academics to reflect on their own assessment practices and to find ways to encourage their own students achieve deeper learning in both the short- and long-term.

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