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Sustainable assessment revisited

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Abstract

Sustainable assessment has been proposed as an idea that focused on the contribution of assessment to learning beyond the time scale of a given course. It was identified as assessment that meets the needs of the present in terms of the demands of formative and summative assessment, but which also prepares students to meet their own future learning needs. This paper reviews the value of such a notion for assessment, how it has been taken up over the past fifteen years in higher education and why it might still be needed. It identifies how it has been a successful intervention in assessment discourse. It explores what more is needed to locate assessment as an intervention to focus on learning for the longer term. It shows how sustainable assessment can help bridge the gap between assessment and learning, link to ideas such as self-regulation, students' making judgements about their own work and course-wide assessment.

Keywords

Sustainable assessment, assessment for learning, self-assessment, student judgements, purposes of assessment

Introduction

As the focus in education moves inevitably from what teachers do to what students learn, and from what is provided by way of resources and materials to what effects are produced, how we view educational events must necessarily change. Education comes increasingly to be judged not on what it delivers now but on what it produces in the world beyond the present—its outcomes and consequences. The view of what is sustainable, shifts from being able to retain what has previously been delivered, to what is needed to sustain effective learning now and in the future.

Sustainability in education may be interpreted as a feature of educational systems. It is not just about sustainability of the physical environment, but about the sustainability of educational practices some of which may be too resource-intensive to survive in a constrained financial environment (Beck, Skinner, Schwabrow 2013). That is, promoting teaching, learning and assessment practices that involve less face-to-face, but perhaps more effective, contact between teachers and students. However, such a view of education is too narrow and provision-centred. What is more important for the longer term is to look at the notion of sustainability from the perspective of learning. What educational practices are needed now in order to form and sustain learners who will be able to operate effectively in a complex society?

From such a viewpoint, sustainability becomes transformed into a question of whether educational provision equips learners effectively, not just for immediate educational requirements, such as what they need to be able to do in a course, but whether it prepares them for what might be required in the future whether that be in educational institutions or beyond. That is, in higher education do educational activities equip learners for the multiplicity of challenges they will face after graduation? From this perspective, the consumption of educational resources is judged in terms of their effect on producing students who go on to become self-managing persons who, in association with others, can draw on whatever they need to continue learning effectively beyond the end of the course and be able to make judgements about their own learning outcomes. Sustainable learning is thus a function of what students gain from education, not what inputs are put into the process.

This paper focuses on the particular role of assessment in sustainability debates within education. It considers what sustainable assessment means and what is involved in building such ideas into courses to support learning in the longer term. Teachers may well be teaching with the longer term in mind, but unless this work is actively supported through assessment practices, their good intentions can be inhibited. The paper positions sustainable assessment as a way of rethinking outcomes, curriculum and pedagogy away from a focus on disciplinary knowledge to what students can do in the world. It reviews literature that has taken up the idea of sustainable assessment and its implementation. While it is judged to be a successful intervention in thinking about assessment, it suggests that the implications of sustainable assessment have yet to be fully embraced. The paper considers where the emphasis for further development should be and what related ideas might also be considered. It concludes by identifying directions for embedding sustainable assessment in courses and it discusses some of the key issues to be considered, with a particular stress on the role of assessment design.

Defining and elaborating sustainable assessment

The notion of sustainable assessment was developed to focus on the need for all *assessment* practices to equip learners for the challenges of learning and practice they will face once their current episode of learning is complete. It was defined as assessment 'that meets the needs of the present and [also] prepares students to meet their own future learning needs' (Boud 2000, p. 151). It was created to resonate with earlier definitions of sustainable development (World Commission on Environment and Development 1987), reframed to focus on learning. This notion of sustainable assessment built on a strong foundation of formative assessment that included the important move from assessment *of* learning to assessment *for* learning. However, it

developed further to refer not just to the formation of students within the timescale of a course, but to future practice for which courses are a precursor. It suggested that 'for students to become effective lifelong learners, they need also to be prepared to undertake assessment of the tasks they face throughout their lives' (Boud 2000, p. 152).

This original notion of sustainable assessment was further elaborated to draw out significant issues for continuing learning, including how it is manifested, what is needed to support it and how it links with other ideas in assessment and learning. It was recognised that it 'is not a notion that can be located in particular activities or which is independent of the context of learning' and that 'it will need to be continually reinvented and reconceptualised by teachers and learners over time' (Boud 2000, p. 163) and this theme was developed in later works (Boud and Falchikov 2006; Boud 2009). Boud (2007) and Boud and Falchikov (2007) recognised that conventional views of assessment were inhibiting to the notion of sustainability as they placed emphasis in assessment on learners necessarily having to respond to prompts from others—teachers, assessors, etc.—which lowered expectations of what students needed to do for themselves beyond the immediate prompts. They took up the view of assessment as 'informed judgement' suggested by Hager and Butler (1996). This was done to avoid the unhelpful binary division between summative and formative assessment, which had already been substantially eroded in daily practice, and to shift assessment discourse away from the notion that assessment is a unilateral act done to students, to assessment that is mutually constructed between learners and assessors/teachers.

Informed judgement about one's own capabilities, scope of practice and attainments is not only something that students need to develop in order to learn effectively, but it is also needed by others such as teachers to make judgements that may either be used to advise students or formally recorded as an indicator of progress or achievement by them. It has

> "a multiple emphasis. It relates both to the judgement of others in processes of certification and aiding learning and to informing the judgment of the learner in processes of presenting themselves for certification processes and for learning in the short and long term" (Boud 2007, p. 19).

It includes "the capacity to evaluate evidence, appraise situations and circumstances astutely, to draw sound conclusions and act in accordance with this analysis" (p. 19). The qualities of judgement that need to be developed are similar for students and for teachers; it is only the subsequent ends to which these judgements are put that differ. As Boud (2007) points out "this notion has the potential to incorporate a forward-looking dimension—informing judgement for future decision-making about learning… it acknowledges the importance of reflexivity and self-regulation through acknowledgement of the centrality of judgement as a process." (p. 19-20)

Boud and Falchikov (2007) took this further and they raised questions about what a focus on informed judgement implies. They identified what was needed to build capacity for students to become judges of their own learning. This framing is not dissimilar to student self-assessment, but it more accurately positions the emphasis as one intrinsic to all work and not, as has become common in discussions of self-assessment, as an add-on that might be included in courses at the discretion of

teachers. The key elements of developing informed judgement from the perspective of the student were proposed as:

1. Identifying oneself as an active learner
2. Identifying one's own level of knowledge and the gaps in this
3. Practising testing and judging
4. Developing these skills over time
5. Embodying reflexivity and commitment

They described how these elements might be developed through curriculum and pedagogy and identified useful sources of literature to inform these processes.

Following these proposals, Boud developed resources for sustainable assessment in higher education presented on a website—www.assessmentfutures.com. This assembled an extensive range of examples that demonstrate in a variety of different ways how to promote sustainable assessment (Boud 2010). In this work, which was designed to influence educators, the pragmatic focus was on the assessment task as the unit of analysis. That is, what were suitable assessment tasks, including associated activities to equip students for learning beyond the end of the course. It included specific action required of students along with the activities that surrounded it. The features that framed the website's focus were:

> "the need for sustainable assessment, the requirement that assessment foster students' ability to make judgements, the desire to construct students as reflexive learners and the goal that assessment helps form dispositions for practice. Types of task were arranged around the themes of: engaging students, authentic activities, students designing assessments, integrative tasks, learning and judgement, modelling and practice, working with peers and giving and receiving feedback." (Boud 2010, p. 253-4).

More recently, the role of feedback in developing students' capacities to learn has been taken up enthusiastically (Hounsell 2007; Nicol 2010; Carless et al 2011; Sadler 2010; Boud and Molloy 2013a). Although the importance of feedback has been the subject of discussion in the literature for many years, the focus in this more recent work is on the contribution of others to learning through assessment and repositioning the notion of feedback not as an act of information-giving to students, but as a co-productive process in which both students and others have key roles to play. Learning cannot be sustainable in any sense if it requires continuing information from teachers on students' work.

How has sustainable assessment been taken up?

During the past fifteen years, the idea of sustainable assessment has been embraced by many authors (eg. 779 citations to the original paper in Google Scholar by 1 January 2015). For the most part these have endorsed or used the initial idea or discussed it alongside other considerations of assessment and teaching (eg. Lindberg-Sand and Olsson 2008; Chan and Gurnam 2010; Jackson and Chapman 2012). While many citations refer to the original idea as part of a wider discussion of assessment, some have used sustainable assessment as a rhetorical device to provide a gloss to other agendas (Williams 2008) or take up some elements without referring to the idea and develop these further (eg. Asghar 2010; Fitzpatrick 2006; Greenbank 2003). Few have engaged extensively with the range of features of assessment tasks and the implications for conceptual resources originally proposed.

In terms of developing sustainable assessment, two main directions in the literature are apparent. The first has been to apply the ideas to specific situations or particular contexts. The second direction has been to develop particular practices discussed as part of sustainable assessment.

Applications in particular contexts

In focusing on university tutorials, Beck, Skinner and Schwabrow demonstrated improvement in three long-term outcomes: independence, intellectual maturity and creativity. They suggested that sustainable assessment should be applied with a focus on 'methods encompassing a strong commitment to equity, including shared criteria for long-term learning outcomes and faculty and student monitoring of student progress towards outcomes through periodic [use of] rubrics and reflective sessions' (p. 326). They emphasise clear relationships between identifying assessment criteria, long-term learning abilities, habits of mind and metacognitive skills to contribute to the emergence of judgments in students (Beck, Skinner and Schwabrow 2013).

An important strategy for the implementation of assessment practices is through information and communications technologies (ICT). Williams (2008) suggests that technological tools available can be used to achieve sustainable assessment as they can provide students with authentic contexts through simulations and virtual worlds (p. 403) and 'include the formative benefits of student performance within relevant professional contexts' (p. 450). He proposes that the use of context-based tasks enables students to develop as effective lifelong assessors. Similarly, Nicol (2007) focuses on how ICT supports formative assessment and feedback in order to focus students' learning through practices that will help them develop the skills needed to monitor, judge and manage their own learning.

A focus on the development of assessment through online learning environments is also seen in Van Gog et al (2010). In their adoption of sustainable assessment, they design formative assessment tasks to develop assessment for learning focusing on professional situations. They recognize that

> 'in complex domains, defining assessment criteria and standards is difficult, and so is learning to understand and apply them. To provide learners with an environment in which they can practice both their domain-specific and assessment skills while task complexity and instructional support are taken into account, an online learning environment blueprint was developed' (p. 314).

Online environments are also the focus of McConnell (2002). He discusses how students can readily communicate their experience when learning through collaborative reviews and assessment. He argues for collaborative review and assessment to involve students, peers and tutor in a critical examination of work. He affirms it is necessary to follow two stages; on the one hand, a review and discussion process of the student's work developed providing a critical supportive perspective; on the other hand, offering students the necessary criteria to make judgments on their work. Thus, face-to-face interviews, online discussions and questionnaires constitute the basis for a collaborative assessment.

Development of particular practices

Self-assessment

Many authors affirm the importance of sustainable assessment but provide little discussion of approaches that could be adopted. However, McDonald (2007) has shown how sustainable assessment can be used in the design of self-assessment

techniques to prompt students' learning skills. She suggests that sustainable assessment implies the development of self-assessment through new assessment tools, such as the portfolio. She identifies that this approach to assessment enables students to be aware of their own learning needs and teachers to offer them the necessary skills to keep on learning. Cassidy (2007) also points out how sustainable assessment to develop independent learners encompasses self-assessment as a key element of its practice.

> 'What defines self-assessment for students is the acceptance of responsibility for their own learning and performance. Before students will—or can be expected to do this—they must be offered the opportunity to develop self-assessment skills and be made aware of the value and effectiveness of these skills. The introduction of planned and structured self-assessment activities allows for the development of skills associated with self-assessment capabilities. While these activities may well focus on the delivery of content, the aim should be to develop skills which contribute to the students' ability to judge their own progress and performance.' (Cassidy, 2007 p. 315).

While many authors have applied and discussed the original idea, some have gone further and established tools and methods to use it in the development of formative and summative using self-assessment practices. Fastré et al (2013) suggest that sustainable assessment demands that students make conscious comparisons between self-assessments and assessments by teachers, peers and other stakeholders, and that responsibility for the assessment process must gradually shift from the teacher to the students, because, after graduation, people themselves need to drive their own learning:

> 'the concept of sustainable assessment stresses that students also have to develop a critical attitude towards criteria because when they enter the workplace, pre-

> specified criteria will not always be available to support them in judging their own performance and learning' (Fastré et al 2013, p. 614.).

Indeed, as many authors suggest, to prepare students to face their future learning needs, much research is required, specifically in the creation of assessment strategies to develop self-assessment (Major, Meakin and Perrin 2011; Brown and Harris 2014), to develop skills to contribute to students' ability to make judgments (Cassidy 2007) and the elaboration of new tools to introduce self-assessment in continuing education (Fotheringham 2011). Other authors have also focused on self-assessment but point to the need to incorporate it as part of and overall assessment strategy:

> 'it is more valid to use a totally revised assessment strategy which seeks to include self-assessment, monitored and refined through a process of dialogue, and concerned more with the students' long-term academic and personal development than with their short-term summative performance' (Major, Meakin and Perrin 2011, p. 124).

It is only through such overall assessment strategies that sustainable assessment can be implemented as the use of any given assessment practice may undermine the effects of others. Self-assessment may form part of the mix, but adoption of it alone does not necessarily lead to sustainability.

Use of peers

Linking peer-assessment and negotiated learning activities as part of an outcomes-based curriculum is proposed by McMahon (2010). He describes his practice:

> 'combining peer-assessment with self-directed learning via peer-group supported action-planning, prompted the development of autonomous learning skill sets and improved the ability of students to judge their own and their peers' work to the extent that the perspectives of the students on their own abilities and potentials were changed for the better. (p. 238).

Careful learning design can set up situations in which peer assessment can be linked to a series of artifacts from which students can learn through interaction and dialogue with others (Yongwu, Van der Klink, Jo, Sloep and Koper 2009). Such an 'artifact refers to a tangible or a digitalized object such as an article, a physical model, a questionnaire, or a comment'. (p. 264).

Reflection and the use of portfolios

Reflection activities involving various kinds of peer learning offers students experience in self-monitoring and thus create judgments about their own and others' learning processes. Nicol (2009) links this with the wider notion of the promotion of self-regulation (students actively and consciously controlling their own learning) that he sees as a fundamental requisite of any educational program. In his example:

> '[There] were many opportunities for learner self-regulation …. Firstly, the online tasks were designed to promote learning through peer dialogue and feedback […] Peer discussion around learning tasks also helps attenuate the teacher's voice and lets the students' voice be heard […] Secondly, as well as being actively encouraged to give each other feedback during learning, a key component of the feedback strategy was the use of model answers […] Thirdly, the course leader provided general feedback to the class-wide discussion board …' (Nicol, 2009 p. 341).

To help students achieve sustainable assessment Jones (2010) proposes the development of portfolios in order for students to develop a reflective practice. The introduction in teaching-learning processes of portfolios and projects can reinforce reliability (Jones 2010) and therefore trust (Carless 2009). Jones suggests that

> 'the degree to which a portfolio fulfils the requirements of sustainable assessment will depend upon its design. (p. 701) […] a portfolio in which students are required to select and annotate evidence from practice, and reflect

> on the evidence, is a powerful tool for the development of reflective practice.' (p. 708).

He goes on to point out that only if students continue these practices could a portfolio be considered to have met the requirement for sustainable assessment.

Positioning assessment as part of learning activities

Other authors address the importance of the pursuit of long-term learning outcomes when dealing with sustainable assessment:

> 'Long-term learning abilities do not refer exclusively to content knowledge but rather concern 'habits of mind' and metacognitive skills that embody cognitive and social cognitive abilities that are useful in improving students' learning skills. We selected for study long-term learning skills that enable students to learn on their own, approach problems from multiple perspectives, and work with complex issues' (Beck, Skinner and Schwabrow 2013, p. 326).

Beck and his colleagues see sustainable assessment as "part of a 'constructive alignment' between the teaching system and assessment tasks in which the latter are part of teaching and learning" (p. 2), where 'the most significant new features in sustainable assessment theory that distinguish it from formative assessment would be, in principle, to develop in students the ability to be sustainable assessors of their own long-term learning skills and to develop assessment devices for student self-monitoring' (p. 3).

Assessment practices are normally well entrenched in institutional and disciplinary cultures and take a long time to change. As Lindberg-Sand and Olsson (2008) highlight, trust in assessment practices is difficult to achieve and many factors interfere. They conceive of assessment processes as social practices dependent on

culture and national frameworks and suggest that 'perspectives of learning as a social-cultural phenomenon', are needed in order to explore changes in assessment processes (p. 168). Consequently, assessment can be seen as 'a series of boundary encounters, linked together only by the assessment system […] Hence, the character of the assessment process is not just an outcome of educational design, it is an emergent phenomenon including invisible and unintended consequences for student learning' (p. 172).

What does an emphasis on sustainable assessment contribute to assessment practice?

An important theme in this literature is the challenge to make assessment more manageable. Each idea about assessment needs to be translated into particular local practices that operate within the context of the course or type of learning outcome. Though the authors discussed above provided support for practices which contribute to sustainable assessment, they recognize there is still much to do and a need to create specific approaches.

Assessment generates large amounts of information, but this is little used for pedagogical purposes. Summative assessment as a major source of information to be deployed to improve learning is generally neglected. An example of this is the process of marking. The conventional everyday practice of 'marking' students work involves generating marks and grades and sometimes providing what are intended to be helpful comments to students on the assignment or examination. It is seen as primarily a unilateral judgement, with a secondary process of generating useful information for students. These latter comments are taken to be 'feedback', but they are not commonly part of any designed process to enable feedback to occur and subsequent

work is not checked to ensure that the information provided was part of a genuine feedback process rather than what we can regard as 'hopefully useful information' (Boud and Molloy 2013b). Marking is not normally conceptualised as a vital part of a feedback process to teachers to enable them to adjust pedagogy and curriculum in the light of how students are responding to it.

For assessment tasks to be positioned as sustainable, the whole process of assessment must be conceived of as an active part of the curriculum to enable students to achieve particular outcomes, not just a means of ascertaining whether outcomes have been achieved or not. This means that assessment needs to be consciously and holistically designed to scaffold processes of learning, including students' management of their learning, and lead over the timescale of a course to activities that enable the demonstration of what has been learned. At early and mid stages there would be an emphasis on feedback processes and the building of capacity for students to make judgements of their own work. Later the emphasis would shift to emphasise the assurance and portrayal of learning. A focus on sustainable assessment involves attention being paid to the integration of these elements and the building of capacity through all assessment acts for students to make increasingly better judgements.

Directions for sustainable assessment

Does sustainable assessment stand up as a useful contribution to our understanding of assessment and learning? If it does, how should it develop further and what issues need to be taken up? Of course, many of these directions are not unique and may be shared with formative assessment more generally. While the broader learning environment of the institution, the entering characteristics of students and indeed the

learning outcomes to be sought are a given, there is considerable scope within a course to influence learners through sustainable assessment thinking.

One approach is to return to the original features proposed for sustainable assessment and build on them, while also incorporating features subsequently identified as important. If we deconstruct the elements of assessment as a pedagogical process, we can identify the following categories of interest and consider how sustainable assessment can appear within each.

Purposes

Clearly, the purpose of sustainable assessment, to equip students for their learning beyond the course, is the foundation for development. While assessment normally has to do 'double-duty' (Boud 2000) in meeting more than one purpose at a time, the goal to prepare students for future learning must remain central. As part of this orientation to assessment, seeing it as developing the ability to make informed judgements about one's own work is a key indicator of the presence of sustainable assessment in any particular context.

It might reasonably be thought that developing informed judgement has the character of a graduate attribute (Hughes and Barrie 2010). It would however be inappropriate simply to add it as an additional attribute to existing lists. Brown and Harris (2014) have identified student self-assessment as a core competency and have strongly linked it to the development of capacity for self-regulation. The development of informed judgement encompasses self-assessment and the same argument can be applied to

establish it as a feature that undergirds all specific learning outcomes and enables them to be met.

Assessment tasks

Assessment tasks represent what students are to produce as an outcome of their study. They can be the most direct way of influencing students, as students are likely to take required tasks seriously if they want to be successful. Tasks normally specify both the substantive disciplinary area being assessed and the specific nature of what is needed. However, we should be mindful that assessment is always relational and that there are no intrinsic qualities of the task, method of assessment, nor the activities associated with the task that *necessarily* lead to the kind of learning outcome required. This depends on how each of these is approached by the student, what they bring to the encounter and their intentions at the time (eg. to engage, to do sufficient to pass, etc.).

Nevertheless, tasks can be designed to maximise the possibility of alignment with learning outcomes, focus student attention not only on disciplinary outcomes, and also scaffold students to develop their judgements. Examples of this include: breaking down assessment tasks into different activities over time, or engaging students in identifying criteria for success ahead of their substantive involvement in the task. These involve designing early formative tasks into later summative ones while keeping throughout an emphasis on building capacity for judging one's own work. Assessment tasks are quite overt and can readily be discussed and modified according to student' responses to them.

Dispositions and engagement

Learner dispositions and inclinations to their work are, on the other hand, covert. They are indirectly revealed through what students do, and in particular, on what they spend their time. They represent the orientation of the student towards study and the kinds of activities with which they are confronted, particularly assessment tasks. While such tasks can influence students powerfully when they are positively oriented towards study, tasks themselves have a limited influence over student dispositions. These are built up during a course, and prior to it. The development of suitable dispositions precedes specific assessment events and is a key element of pedagogy.

Courses that adopt sustainable assessment need to review the circumstances that precede assessment tasks and their assumptions about the agency and initiative of students. In general, the learning environment and the expectations placed on learners have a particular influence on their dispositions. If they get the message that 'all that matters are the marks in the examination' and that revising for it is all they need to do to get through, then suitable dispositions and engagement is not likely to eventuate. Depending on students' prior experience in courses where their study dispositions were negatively influenced, more or less time may need to be devoted to this.

While it is commonplace to emphasise the importance of time-on-task as a major and overwhelming outcome of research on learning (Hattie 2009), it is no less important in this context. For learning to occur and be effective, students need to have engaged in a considerable weight of meaningful tasks before any major assessment event. It is the normal expectation of what students need to do to learn that creates the overall

context for sustainable assessment. The design of assessment tasks is not a substitute for good course design to foster engagement.

How students are to be judged

An important consideration is that of how performance of an assessment task is to be judged. Are explicit criteria and standards involved, or are more holistic judgements needed? Indeed, given Sadler's work on how markers go to great lengths to avoid using criteria even when they are specified in detail (Sadler 2009), are students being given a false indication of how work is to be judged by providing such criteria? Further, is an assessment just a paper to be handed in and marked, or does it involve students identifying and using criteria for themselves, or does it involve others (eg. peers) in the judgement process, at least informally?

Design features

All the aspects discussed above need to be brought together through course design, in particular through the design of events and activities that precede, accompany and follow assessment tasks. Assessment tasks do not stand-alone; they are always part of a sequence of activity, either specified by course requirements or suggested or implied by teachers. Considerable influence on learning can occur through the design and structuring of these activities.

As mentioned above, while the assessment task may appear to be at the heart of assessment design, it is the final impact of all the teaching and learning events that go before it that has the influence. Use of sustainable assessment is a way of integrating assessment with teaching and learning. It can provide a form of long-term

constructive alignment to bring assessment and learning for the longer term closer together.

The importance of practice should not be underestimated. Encountering complex new tasks under assessment conditions is not conducive to effective learning. The formal assessment and grading of any task creates situations in which students may feel under surveillance and dare not take the kinds of risks needed to be secure in their understanding.

A particular aspect of course design is how feedback processes are incorporated into student work. Are explicit feedback loops incorporated into the course to enable students not only to receive useful information about their work, but also to act on this information and demonstrate that such information has an effect? Feedback considerations are discussed at length in Boud and Molloy (2013b).

We should note though that while assessment design is of great importance, the strictures of Lindberg-Sand and Olsson (2008) should also be taken into account. How students respond to learning opportunities and assessment tasks is not just a feature of the activities themselves, which can be carefully designed. They depend also on the ways in which they are perceived and the ways students take them up, which cannot be controlled in advance. While many features of teaching, learning and assessment can be designed, there are also emergent practices independent of the dynamics of the context and players involved that can never be fully determined.

Some features of sustainable assessment to be considered in the design of assessment activities can be summarized in the following questions:

- What particular features of the assignment and accompanying activity prompt consideration beyond the immediate task?
- In what ways does engagement in the activity foster self-regulation?
- How does the activity help learners meet challenges they will find in practice settings?
- How is engagement in the current activity likely to improve the capacity of students to make effective judgements about their work in subsequent ones?
- Are the educational benefits of the task likely to persist once the particular knowledge deployed in it can no longer be recalled?
- Does the activity enable students to appreciate, articulate and apply standards and criteria for good work in this area?
- Does the activity enable students to demonstrate those course-level learning outcomes that relate to preparation for learning post-graduation?

Having many desirable features present is often not enough. The socio-cultural context of teaching, learning and assessment can still conspire to thwart good intentions and apparently good design. As Lindberg-Sand and Olsson (2008) show in an engineering context, common assessment practices hold together different teaching practices to produce mixed messages for students which include invisible and unintended consequences for student learning.

Sustainability in assessment should involve a virtuous circle: as students become better equipped to make judgements about their own learning they become more

effective learners as demonstrated by outcomes judged through assessment. This enables assessment to become more focused on sustainability rather than simple judgements about current performance. For a course to be substantially focused on sustainability, every act of assessment needs in some identifiable way to build students' capacity to manage and judge their own learning and thus equip themselves for the more challenging learning environments they will confront post-graduation.

Conclusions

In conclusion, we have identified sustainable assessment as an appealing idea that has shifted attention in assessment discourse and is giving rise to a range of interesting educational interventions. It provides a compelling rationale for assessment reforms, but is yet to have widespread impact on assessment discussions. Where follow-through to practice has occurred it has focused on a limited number of features of the original idea. It has been extended to encompass the development of informed judgement, the use of self and peer assessment and the development of self-regulation. Work on feedback in particular has started to take up the idea more vigorously. However, the potential of sustainable assessment, along with many other initiatives in formative assessment, is still to be fully realised. However, the time scale for assessment change is very long, so quick changes are an unrealistic expectation.

Other ideas focus on what teachers or students need to do to equip learners for the longer term: good teachers focus attention on learning beyond the immediate, and the concept of self-regulation focuses on students' activities. The notion of sustainable assessment is needed as a bridge between teaching and learning on the one hand and summative assessment on the other. The key direction for the potential of sustainable

assessment to be realised is through a repositioning of assessment as an integral part of curriculum and pedagogy.

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