

Rethinking Assessment

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Discussion paper 1:

Transforming education through technology enhanced assessment

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Q: Has technology enhanced assessment (TEA) the potential to transform examinations?


Q: Can TEA enable a wider range of achievements to be assessed?


Q: How can the barriers to implementing TEA be overcome?


This paper considers three aspects of technology-enhanced assessment:

-  Assessment in a changing world
-  The potential of technology to support transformations in assessment
-  Implementing technology enhanced assessment

Key recommendations

 Governments, examination authorities, private testing organisations, universities and research institutes now need to pool their efforts in the search for ways of bringing assessment practices into the mainstream of the digital revolution.

 The results of existing research and development projects in TEA should be widely disseminated and discussed, so that their potential in different settings can be properly evaluated.

 Government needs to invest in the development of TEA and to work actively with educational partners to understand and remove the barriers to its wider adoption.



If education systems are to respond effectively to contemporary social, political, environmental and economic challenges, assessment practices need to change

Assessment in a changing world

The world is changing rapidly and with it, the knowledge and skills - even the dispositions and attitudes - that educational systems need to deliver. Where once the focus of education was on the inculcation of knowledge, now it must reflect emerging new priorities. Creativity, problem-solving, adaptability, complex decision-making, innovation, collaboration, global awareness, digital literacy, communication, the ability to be self-motivated, resilience, resourcefulness - even spiritual and moral 'literacies' - are found in the curriculum aspirations of many countries.

Yet in practice, education is becoming more and more out of step with the wider world. As daily life is transformed by the digital revolution; as business demands recruits with very different competencies and as the world faces an unprecedented number of global threats, educational practices continue much as before. This is largely because assessment practices act as a barrier to educational change.

If education systems are to respond effectively to contemporary social, political, environmental and economic challenges, assessment practices need to change. They will need to include evidence of achievement presented in a diversity of formats and to recognise achievement across a much wider range of knowledge and skills.

The methods of assessing students' learning that have so far been developed are surprisingly limited. Written examinations, multiple choice tests and oral examinations, are almost the only tools that are trusted for use in any highly-competitive assessment situation. Most new assessment tools such as the use of portfolios remain largely confined to judging whether students have reached an appropriate standard rather than in highly-competitive testing situations.

The potential of technology to support transformations in assessment

In a world already transformed by technology in the way people communicate, do business and live their daily lives, educational assessment has changed hardly at all. Inertia and tradition and the lack of new assessment tools are a brake on change. While sophisticated digital learning platforms, multi-media technologies and wireless communication are transforming what can be learned, when and how, there is no similar transformation taking place in assessment thinking and practice.

Why is this? Already, emerging digital cultures are making possible greater levels of 'authorship, autonomy, collaboration and choice for students in the process of learning'.¹ Developments that exploit multiple forms of representation could enable students to represent their learning in ways of their choice and to demonstrate, as never before, their knowledge, skills, competences and dispositions. The tools that might be used to support assessment in this area could include Web 2.0 technologies such as wikis, blogs, social networking activities, podcasting and e-portfolios.

In particular, TEA offers the following possibilities:

- ✂ The potential to elicit and evaluate complex skills and practices; to provide immediate 'real-time', feedback and support for collaborative learning.
- ✂ Assessing complex skills like problem-solving, decision making and testing hypotheses, which are argued to be more authentic to future work experiences.
- ✂ Providing richer activities that can lead to improved student engagement and potentially improved student performance.
- ✂ A wider range of measurement using complex data sets. These can measure authentically, multi-faceted skills, knowledge and cognitive processes that are otherwise difficult to assess, improving the validity of assessment.
- ✂ Increasing flexibility in the approach, format or timing of an assessment, without time or location constraints .
- ✂ Integrating formative and summative judgments by making assessment and instruction simultaneous.

1 Jenkins, H., Clinton, K., Purushotma, R., Robison, A.J. and Weigel, M. (2006) *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*. A MacArthur Foundation report. digitalllearning.macfound.org

2 Shute, V. J., Dennen, V., Kim, Y., Donmez, O., & Wang, C. (2010) *21st Century Assessment to Promote 21st Century Learning: The Benefits of Blinking*. A report for Digital Media and Learning network, page 4. dmlcentral.net

3 Gee, J.P. and Shaffer, D.W. (2010) 'Looking where the light is bad: Video games and the future of assessment'. *Edge: The latest information for the education practitioner*, 6 (1), pp. 3-19.



Screen shot of mozilla open badges web page.

Implementing technology enhanced assessment

Some of the barriers to achieving these benefits of TEA are practical. Expressed concerns include:

- ✂ The increased risk of plagiarism and security issues.
- ✂ The lack of techniques that are sufficiently practical and robust.
- ✂ The need for teachers to be trained in the use of TEA.
- ✂ The cost of investing in the necessary hardware and software.
- ✂ Practical constraints such as a lack of suitable physical spaces.

None of these constraints is insurmountable where there is strong policy leadership and the will to impose system-wide imperatives and facilitate these. Unfortunately, educational assessment is big business and is becoming increasingly politicised. Given the range of stakeholders involved, there is little appetite to address the risks and practical difficulties of introducing even a modest use of TEA. Yet there are potentially enormous rewards. The result is a creative desert - little new thinking; little development of new assessment tools; little innovation where it matters.

*'Learning and succeeding in a complex and dynamic world is not easily measured by multiple-choice responses on a simple knowledge test. Instead, solutions begin with re-thinking assessment, identifying new skills and state standards relevant for the 21st century, and then figuring out how we can best assess students' acquisition of the new competencies'.*²

There is no shortage of questions to be addressed if, we are 'to measure what matters'. As Gee and Shaffer suggest, there are three fundamental properties of assessment that need rethinking: 'what is assessed, how the assessment takes place, and the purpose of the assessment in the first place. In other words, nearly everything.'³

Case study: Open Badges

Open badges comprise an alternative accreditation system that often uses communities to validate the skills and knowledge of its members who are then awarded virtual badges (or online visual icons) that recognise different skills or achievements. Often found in gaming environments, badges are gaining support among educators and academics that see them as a new way to acknowledge and represent students' talents, achievements and skills, including that which happens out-of-school. Badges offer an alternative assessment method of representing an individual's range of learning and are potentially portable and useful during and after formal school years.

Mozilla Open Badges, for example, has developed a Badge System Framework. The badges are image files that hold metadata outlining the skills or achievements of the badge-holder, as well as the issuing body. Badges can also link back to the evidence supporting the award, can be portable and displayed on various social networking or recruitment sites. The framework allows badges to be awarded via various mechanisms: through formal awarding bodies, from multiple assessors (experts in a particular online community) or self-awarded. Mozilla is developing an Open Badges Infrastructure that will allow the creation and hosting of badges, including a 'badge backpack' that individuals can use for storing and moving their badges. wiki.mozilla.org/Badges

Rethinking Assessment

2012/2013 Series of discussion papers

1. Transforming education through technology enhanced assessment

Case study: E-portfolios



The term 'e-portfolio' generally refers to a personal online space that acts as an assessment framework and supports a variety of functions, including information repository, personal development record, organisation of learning, and collaboration. In portfolios, students generally collect and upload artefacts to be assessed. The E-Scape (E-Solutions for Creative Assessment in Portfolio Environments) project led by a team at Goldsmiths College, University of London, is a well known example of this. Through the project, students go through the design process using mobile devices and E-Scape records the evidence of their progress. Pairs of judges compared students' work, and by repeating this many times, a consensus about standards was achieved without grading.

Kimball, R. (2007) 'e-assessment in project e-scape'. *Design and Technology Education: an international journal*, 12 (2), pp. 66-76.

Assessment is universally recognised as one of the most important – and powerful – elements of an educational experience. It is also seen as one of the hardest to reform. However, there is an increasingly accepted need for rethinking assessment if it is to keep up with current theoretical, cultural and technological developments affecting teaching and learning.

Digital technologies open up new possibilities for more personalised, immediate and engaging assessment experiences. However, the use of digital technologies for assessment (referred to as 'technology-enhanced assessment') has yet to be 'transformative', with current practices either replicating traditional assessment methods or manifesting in pockets of innovation that are not widespread.

How the potential of digital technologies can best support improved assessment practices and preferred educational outcomes is becoming an issue of increasing importance. An acknowledgement of the potential that digital technologies offer should recognise the complexity of the task, the many factors affecting successful educational change, and the significant ethical questions raised by the use of digital technologies in assessment.

This series of discussion papers draw on a substantial review of literature which aimed to identify the different ways in which technology currently impacts on educational assessment practices and how it could contribute to a new vision for assessment.

The review of literature is available at:
bristol.ac.uk/education/research/sites/tea

The following discussion papers have been produced in order to highlight key issues and questions identified by the review of literature:

- Paper 1:** Transforming education through technology enhanced assessment
- Paper 2:** Integrating the formative and summative through technology enhanced assessment
- Paper 3:** Exploiting the collaborative potential of technology enhanced assessment in Higher Education
- Paper 4:** Learning analytics and technology enhanced assessment
- Paper 5:** Ethical issues in technology enhanced assessment
- Paper 6:** National standards and technology enhanced assessment

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