Working Group 5: Assessment as, for and of 21st century learning

David Gibson, Curtin University, Australia

Mary Webb, Kings’ College London

Assessment is of major importance for most education systems and consumes much educational resource. New technologies can be harnessed to enable assessment in many different ways. We aim to advance the discussion on ways in which assessments can be used and developed to support learners, teachers and the enterprise of education by identifying promising new developments, issues and limitations.

Introduction

The Call to Action EDUsummIT 2011 (see: goo.gl/QSNt6) emphasised that to align 21st century curricula and learning environments, assessment models must be revised. Education stakeholders should articulate and support a shift in assessment from the dominant high stakes, test-based evaluation model used in many school systems, to one that more effectively measures the preparedness of today’s digital age learners. The emphasis should shift from summative assessment to continual, diagnostic, and formative assessment throughout the learning process. ICT-supported assessments that serve 21st century learning goals including higher order thinking skills and deep knowledge can become a lever for the implementation of 21st century learning. Assessment should include: personal growth of the student, impact on social issues, and cultural importance.

To effectively revise assessment models, three major questions should be considered: “What is the nature of assessment?” “How can technological advances impact assessment?” and, “Exactly what should be assessed?”

Background

New technologies can support both formative and summative assessment and are increasing the range of possibilities for assessments. Today, students can be assessed through simulations, e-portfolios, or interactive games. Formative assessment can be enabled by online peer assessment systems, adaptive feedback from computers, self-assessment, and “semi-automatic systems” that combine teacher, peer, and automatic feedback. Three aspects of assessment identified as critical for 21st century assessment models at EDUsummIT 2011 were: student involvement in assessment, digitally-enhanced assessment,
and assessment of the application of ICT skills acquired in formal and informal learning environments. Digitally-enhanced assessments were defined by the Working Group as those that integrate 1) an authentic learning experience involving digital media with 2) embedded continuous unobtrusive measures of performance, learning and knowledge, e.g. “stealth assessment” (Shute, 2011) which 3) creates a highly detailed (high resolution) data record which can be computationally analyzed and displayed so that 4) learners and teachers can immediately utilize the information to improve learning. The benefits of embedded continuous unobtrusive measuring of performance are obvious in that learners can become engaged in interesting tasks that have been designed to support their learning. However, at the same time, as we have argued in Webb, Gibson and Forkosh-Baruk (2013 in press), learners also need to be involved in discussing and negotiating their learning intentions so they should have access to meaningful representations of evidence-based arguments about their achievements. Therefore rather than describing this unobtrusive measuring as “stealth assessment,” which has connotations of secrecy and furtiveness, we prefer to conceptualise these processes as “quiet assessment” whose volume can be turned up by learners and teachers whenever they wish.

The future of assessment in the digital age may appear in many forms. It may involve for example a pedagogical agent patiently tutoring someone in anything he or she would like to learn (Sabourin, Mott, & Lester, 2011); an analysis of a learner’s decisions during a digital game or simulation (Clarke & Dede, 2010; Gibson, 2011); students reviewing and commenting on each others’ digital creations through an online discussion (Ertmer et al., 2007; Van Der Pol, Van Den Berg, Admiraal, & Simons, 2008; Webb, 2010); a multimedia-constructed response item created with an online animation and modeling application (Lenhard, Baier, Hoffmann, & Schneider, 2007; Mislevy, Steinberg, & Almond, 2003); students receiving remote asynchronous expert feedback about how they worked with each other via ICT to solve a problem and communicate their understandings (Rissanen et al., 2008) or an emotionally engaging virtual world experience that unobtrusively documents progression of a person’s leadership and ethical development over time (Turkay & Tirthali, 2010). Whether these possibilities excite or concern us, this small set of vignettes begins to outline a broad range of possibilities that place ICT in a variety of roles including a medium for communication, learning assistant, judge, test item, performance prompt, practice arena, and performance workspace.

An important challenge for the design of educational assessment is whether the following four perspectives on assessment: feedback information, improvement decisions, degree of engagement and understanding, and value judgments can co-exist to the benefit of learners. In order to explore this challenge in more depth we examined and compared two important current frameworks for assessment design: 1) Evidence-Centered Design (ECD) for computerised assessments and 2) a framework for formative assessment (assessment FOR learning) based on empirical research in classrooms (Webb et al., 2013 in press).

Evidence-Centered Design provides a useful framework for creating components that could be re-assembled fairly easily to provide assessments that address users’ needs (Mislevy et al., 2003). However in order for users to benefit fully, developers need to consider how to make the reasoning and decision-making processes accessible to users so that they not only understand them but can contribute to assessment development and interpretation. There is thus a need to develop assessment literacy (Stiggins, 1995) in teachers and other users so that they understand the advantages and limitations of assessment types and processes and
are confident in developing and analysing arguments from evidence based on current understanding of validation (Black, Harrison, Hodgen, Marshall, & Serret, 2010). These processes of professional development could also be supported by computerised assessment systems that analyse data about student performance and misunderstandings. In this way development could become a shared process between assessment bodies, teachers and other stakeholders.

**Issues/unresolved questions/concerns**

Even with the increased possibilities that ICT provides we have not yet found a way to say confidently that the multiple purposes for which some assessments have been used (Mansell, James, & Group, 2009) can or should be supported through the same assessment systems. This is because the impacts of some purposes interact with the validation processes for others. Therefore in considering assessment design for multiple purposes, users need to examine impact factors carefully in order to minimise negative impacts on learning and learners. Significant challenges remain for developing validation approaches that can take account of the complexity of learning experiences especially for group tasks in simulations, games and other problem solving environments.

Current high-stakes assessments at the school level focused predominantly on assessing individuals. The importance of assessment of collaborative work is sometimes recognized, but rarely addressed. In addition, assessments of teaching skills, such as observation, judgment, test making, and scoring, which could contribute significant information for the assessment of 21st century skills, have decreased because concerns about reliability and costs have outweighed those of validity, trustworthiness, and value to the learner.

Key questions might be:

1. Which current examples of computerised assessments embody our vision?
2. For what purposes are computerised assessments particularly useful and where should other (non-computerised) approaches be retained or developed?
3. Which combinations of assessment approaches are proving to be most fruitful and where do digitally enhanced and other computerised assessments fit in?
4. How can digitally enhanced assessments be designed to be transparent for teachers and learners?

**Recommended additional reading**

Paper that emerged from EDUsummit 2011:


Research on Assessment in Games (GlassLab-Research)
http://www.sri.com/work/projects/glasslab-research


References


