On-screen assessment will shortly touch the life of every learner in this country. Advances in technology have given us the opportunity to access and record aspects of human achievement that have been difficult to capture in the past. There is a massive potential to increase participation, learning and performance.

Ken Boston, QCA, April 2004

The keys to successful learning are engagement and reflection. Electronic portfolios allow today’s students to demonstrate their knowledge and think about their work in a way that appeals to both their creativity and their comfort with digital media.

Helen Barrett, e-portfolio champion

Within a few years, e-assessment and e-portfolios will be integral parts of modern learning and teaching. They are vital elements for personalising learning, with benefits for both learner and practitioner. E-assessment provides the flexibility for learners to strengthen their understanding of key concepts, and to formally demonstrate that understanding at a time that is right for them. E-portfolios allow learner and practitioner to track progress, carry evidence of their work across transition points (for example, from school to college), reflect on their learning and build a skills profile across a lifetime.

This document provides a short introduction to e-assessment and e-portfolios, how they might develop, and why Becta strongly believes that they will support engagement and achievement in learning.

Policy context

The policy context is unusually convergent in this area, and supports e-assessment and e-portfolios for their pedagogical strengths as well as their ability to validate and evidence learning through formal assessment.

The links between assessment and the system it drives – or supports – have been clearly recognised by government. There are many major policy drivers for reforming the assessment system and promoting e-assessment and e-portfolios as outlined overleaf.

Becta is the Government’s key partner in the strategic development and delivery of its information and communications technology (ICT) and e-learning strategy for the schools and the learning and skills sectors.
Harnessing Technology – The e-strategy

Priority 2 of the e-strategy is to ‘ensure integrated online personal support for learners’. There is an action to ‘provide a personalised learning space for every learner that can encompass a personal portfolio, and a milestone to make a ‘personalised learning space with the potential to support e-portfolios available to every school [and college] by 2007-08’. E-assessment is an equally strong theme throughout the strategy.

Skills Strategy

The Skills Strategy strongly emphasises the availability of training throughout a person’s working life. Key to the assessment agenda are:

- unitisation of qualifications and the development of a credit framework, indicating the potential to ‘bank’ units over time towards a qualification
- strengthening vocational skills programmes
- supporting the use of more e-learning and e-assessment.

14–19 reform

The white paper on 14–19 reform supports assessment reform through e-assessment. In encouraging provision for learners across the physical boundaries of school, college and the workplace, 14–19 reform is establishing a system which will require accurate and timely tracking of learners’ progress across all providers. We have moved beyond a system where transfer of paper records will suffice.

QCA blueprint for e-assessment

Published in March 2004, this short document sets out a challenging timetable for the integration of e-assessment with our public examinations system. QCA has announced that, by 2009, it wishes to see all new adult learning qualifications including an option for on-screen assessment, for all existing A- and AS-level assessments to be available on screen and for the first ‘on-demand’ assessments to be introduced.

Framework for Achievement

This large-scale reform of post-16 qualifications sets out a coherent, unitised framework. Success in delivery will require flexibly-timed and stringently-recorded assessment. A unitised framework of qualification would be highly labour intensive and restrict flexibility if delivered using paper tests, so alternatives are needed.

What are e-assessment and e-portfolios?

Those who have read the e-strategy, Harnessing Technology will be aware of the need for clarification of the distinctive characteristics and areas of overlap between e-assessment, e-portfolios and the personalised online learning space. The working definitions below may help.

(E)-assessment

The (electronic) process by which learner progress and understanding is assessed. This can be:

- diagnostic (to assess current levels of knowledge and understanding in order to target future learning appropriately)
- formative (to support and feed back into current learning)
- summative (to assess knowledge and understanding at the end of an episode of learning, usually equated with a formal award).

Outcomes of assessment of all types may feed into a learner’s e-portfolio.

(E)-portfolios

- The (electronic) process and services through which outcomes of learning and assessment are recorded.
- The process and services through which outcomes and evidence of learning are used to support transitions between phases of learning and career development across a lifetime
- A process of presenting digital evidence of progress and achievement to self and others.
- A process to support reflection on learning through creating a personal narrative of progress.

In addition to assessment outcomes feeding into an e-portfolio, some (usually vocational) courses will require a dedicated e-portfolio through which evidence is submitted to the awarding body.

E-portfolios supporting transition

http://www.cityofnottinghampassport.com/what_is.htm

The City of Nottingham Passport is a set of documents produced at the end of each key stage to reflect a student’s achievement, progress and ability to manage their own learning. It is the result of work done in many areas of the curriculum and relates closely to the Progress File.

Personal online learning space

This is a virtual space (structured or otherwise) in which learners may ‘store coursework, course resources, results, and achievements… with the potential to support e-portfolios’ (Harnessing Technology).

There are clear overlaps between the personal online learning space, e-portfolios and e-assessment. Harnessing Technology views e-portfolios as forming one part of the personal, online learning space. This presents an interesting hierarchy, with e-assessment feeding into an e-portfolio which itself forms the only part of the personal online learning space taken forward across phases of learning. The functionality of all three areas, and the need for interoperability between them, must be clarified, and an approach taken which defines the processes rather than the products required to address learning, teaching and assessment requirements.
Assessment is central to learning and teaching. We require measurements of knowledge and capability for progression into employment or further learning. However, assessment can also be a driver for modernisation. There are two clear examples of this:

- If we assess when the learner is ready (‘on-demand’), we assume a learning process that is similarly flexible on timescales. ICT can give us this capability, through online testing that draws on huge banks of randomised assessment items which the learner can access at will.
- If we assess a learner by ‘doing’ through visual or audio media rather than by ‘writing about doing’ in a vocational or skills-based course, we support the teaching of that course through practice, in combination with the development of theoretical knowledge. If all we can test is the theoretical, its demands tend to drive the course. ICT lends itself towards the recording of vocational achievement.

But this is only the external, qualifications-based assessment. If we integrate assessment with the heart of learning and teaching, we reform educational practice, and the relationships between learner and practitioner. There is a strong argument within recent research literature, particularly the Black Box research series referenced at the end of this paper that clearly illustrates the benefits of good practice in this area.

Becta believes that e-assessment, used throughout the learning process, is the key means by which this modernisation of both the formal assessment system, and the day-to-day business of supporting and tracking the progress of the learner can be achieved. Further, Becta supports the view that all formal and informal assessment can be of benefit in the learning process. Using assessment for learning maintains engagement and encourages achievement. ICT is the mechanism by which assessment can be most effectively embedded into the learning and teaching process for every learner.

Farnborough College has just opened England’s first e-assessment centre on campus. All students are able to submit written material to an online program that feeds back support and ways to improve work. The Centre helps assessment to become part of learning, with students in control of assessing their understanding and progress.

**ICT supporting assessment for learning**

E-assessment provides an unprecedented facility to support assessment on demand, through the use of randomised banks of assessment items, and at the level of granularity (course, module, single issue) required by the practitioner. Additionally, the increasingly mature e-learning resource market is moving towards the embedding of assessment (and the means to track outcomes) into learning resources themselves. Practitioners therefore have access to the means by which they can easily support ongoing assessment as part of the learning process.

Using assessment for learning maintains engagement and encourages achievement.
The rationale of assessment for learning is to support the learning process – to inform both learner and practitioner of progress and to establish levels of knowledge and skills in order to better direct the learning.

A key part of assessment for learning is the need to recognise ‘distance travelled’ rather than achievement of a norm referenced level.

ICT can contribute to assessment for learning in two ways:

• As a medium for the assessment for learning transactions themselves through presenting online opportunities for learners to check their understanding. This can also enable the regular use of peer assessment to increase understanding of required outcomes.

• As a monitoring/tracking tool to manage and act on the information gathered through the assessment for learning process. An electronic Individual Learner Profile to set goals and track progress, supported by face-to-face meetings between learner and practitioner, is far more accessible to both parties than a filing cabinet, or the limited information in a markbook.

Assessment for learning has a double benefit in that it provides feedback into teaching practice as well as to the learners on their progress.

E-portfolios

E-portfolios provide a way of looking at learning and the outcomes of learning for the long-term benefit of the learner. For institutions, it is more about a change in culture to support personalising learning, than it is about technical solutions. E-portfolios can be anything from a personal webspace or blog, to a structured template for storing evidence of achievement tagged against objectives. The process of capturing personal progress and achievement is far more important than the format used.

From the perspective of the national system, the potential uses of e-portfolios cover a broad spectrum between requirement and entitlement. A requirement to provide the in-depth electronic transcript required for entry to higher education could be extended to an entitlement to a single lifelong learning portfolio, containing formal (certificated or verified) acknowledgement of learner achievement alongside informal evidence of achievement outside the formal education arena (for example sports or voluntary work) which would form the basis of an ongoing CV, or ‘virtual home’, owned and used by the learner.

An alternative, and probably a more pragmatic, view is of a number of e-portfolios (or evidence stores) from all stages of learning upon which the learner may draw at any time, to re-use and adapt for different purposes. For example, an e-portfolio from school or college might contain information about learning styles from diagnostic testing, examples of the learner’s best work and links to awarding bodies to verify qualifications gained. An employment e-portfolio might be specific to the employer or professional body, and contain evidence of continuous professional development. A personal e-portfolio might have information about voluntary work or sporting activity. Information contained in each might be used to support a job application. What is key is that it is the learner who is in control of the information stored and drawn from each of these portfolios.

Becta believes that e-portfolios should be regarded as a process, which supports the assessment for learning and reflection processes as well as the qualifications gained, and not as a product. It is what they do for the learner that is important.

QCA and Futurelab’s e-VIVA project looked at the potential of e-portfolios to support reflection and the recording of learning outcomes for Key Stage 3 ICT. Pupils could record milestones on the website, and choose to communicate them to their teachers and peers when they were ready. A more formal assessment (by mobile phone) was prompted by this process – a clear example of assessment when the student is ready.

Technical issues

While there should be common entitlement to the processes supported by e-portfolios, there are technical issues concerning the central or regional hosting and transferability of portfolios over time. The definition of services and functionality for e-portfolios will need to be in line with the schools-based national digital infrastructure that Becta is developing, and the common post-16 architectures that JISC supports through its Regional Support Centres.

This will require some key technical issues to be addressed.

Connectivity and network infrastructure

The provision of a national e-portfolio support system will require a sound, common or interoperable infrastructure between all users, with learner data based upon a unique learner ID and dataset. Ubiquitous access will be essential. Explicit reference needs to be made to the necessity of this underpinning infrastructure and a unique learner ID alongside an indication of the place of an e-portfolio in a modernised assessment system. The availability of such an infrastructure would support practitioners to improve their practice in incorporating assessment for learning and learner tracking.
Hosting
The pressures placed on a central hosting service to support a lifelong learning portfolio relate mainly to storage space, and the ability to provide a scaleable solution for all learners (potentially all UK residents).

Offering local (institution based) or regional (Local Authority or RBC based) hosting for portfolios on a distributed model, and using an aggregator, or ‘thin’ e-portfolio service has its own issues. When learners move on to the next stage of their life, or to the next learning provider, does the portfolio remain, and how can the host guarantee access across a lifetime, when all connections with the learner are gone? These are management issues which may compromise the ideal of a lifelong learning portfolio and which need to be seriously considered.

Access, authentication and security
The development of e-portfolios will create more pressure for a swift resolution on the unique learner ID in order to ensure transferability and continuity for a lifelong learning portfolio. Learners using an e-portfolio process will require a single sign-on to access every element of functionality. Elements of portfolios – for example formal qualifications – will need to be authenticated by the appropriate body (in this case the relevant awarding body) on the fly.

Accessibility
There is currently little guidance in relation to accessibility of e-media other than for content. This needs to be remedied before decisions are made to implement online learning spaces or e-portfolios or any other large-scale initiative which changes the learning environment. Equity of access is key. Authentication is likely to be one area in which accessibility is an issue – if you can’t authenticate, you can’t access provision. Personal assistive technologies are regarded by industry as non standard and are susceptible to lock-out by security measures. Browser-based authentication to date has tended to centre around fixed media/format entry/output which can be inflexible and inaccessible to some groups of learners. There is a certain irony in the fact that learners with profound disabilities may benefit most from e-portfolios which can hold film or photographic records of their achievements, and where paper-based assessment will be inappropriate.

Technical standards and interoperability
The added value for e-portfolios may come from the underpinning standards allowing the seamless transfer of learner-centred content across episodes of learning and diverse systems. Defining specifications for transactions rather than definitions of a physical e-portfolio is likely to support this.

We acknowledge that there are many systems currently in use in education which adequately offer elements of the e-portfolio process. We recommend that the implementation of e-portfolios across education should incorporate these existing systems.

However, all elements of the system must be interoperable. Whatever their provenance, systems need to be able either to export directly in a common agreed format to required specifications, or to be able to provide a two-way ‘translation’ service (proprietary format into a common agreed format and vice versa).

Technical standards which will have an impact on elements of e-portfolio functionality are developing. In the post-16 world, UK LEAP and IMS e-portfolio are important. In schools, other areas such as SIF (the Schools Interoperability Framework) are worth exploring. In essence, SIF provides the middleware which defines standards for data exchange and rules for inter-application interaction, enabling for example, a management information system and a VLE from different suppliers to interact.

Essential functionality
Whatever e-assessment and e-portfolios may be used for in a local context, Becta believes that both should:

• allow 24/7 access
• be based on open standards
• support nationally agreed interoperability standards
• be based on functional specifications
• be convergent with national approaches to MIS architectures in all sectors
• be transferable across phases of learning
• be usable over mobile and wireless technologies
• be able to incorporate many different types of learning and evidence of learning, including multimedia files
• allow the learner to maintain access to their learning and evidence of learning across a lifetime
• be built with accessibility for all learners in mind.
Next steps

Becta and JISC are working with partners and the DfES to support the development of definitions around e-portfolios and encouraging the development of an appropriate infrastructure for e-assessment. JISC is currently developing a reference model for e-portfolios which will start to identify appropriate web services to support the portfolio process (for example, online access to information, advice and guidance). Ensuring that appropriate interoperability standards and specifications are in place – and used – is a vital part of this work. JISC and Becta are working closely with CETIS (the Centre for Educational Technology Interoperability Standards) to make sure that the different standards for data handling used in different sectors are able to work together to provide continuity for the learner.

On e-assessment, Becta and JISC are working on roadmaps for e-assessment in their various sectors to set out the proposed development for e-assessment over the next few years. JISC is working with QCA on developing an e-assessment glossary, which will be available on the JISC website.

Further information

The Black Box series of reviews on good practice in assessment (not e-assessment) are referenced on the QCA website
http://www.qca.org.uk/294.html

A useful overview of institutional web-based e-portfolios can be found on the EDUCAUSE site
http://www.educause.edu/content.asp?page_id=666&ID=ELI3002&bhcp=1

For a description of the personal development aspects of e-portfolios in the US context, see Helen Barrett’s blog on e-portfolios for learning
http://electronicportfolios.com/blog/index.html

Futurelab literature review of e-assessment
http://www.nestafuturelab.org/research/lit_reviews.htm#lr10

JISC projects are listed at http://www.jisc.ac.uk (search on e-assessment and e-portfolios)

A report to JISC, Developing and Implementing a Methodology for Reviewing E-portfolio Products is downloadable at
http://www.jisc.ac.uk/uploaded_documents/epfr.doc

Information on the JISC e-assessment glossary may be found at
http://www.jisc.ac.uk/assessment

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