

On-screen, on demand delivery of qualifications: Some implications for learners, institutions and awarding bodies

By

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***Disclaimer:** The views expressed in this paper are those of the author alone.*

Introduction

Learning and assessment in the UK are undergoing a technological revolution. Information and communications technology (ICT) is being used in a variety of ways to change traditional learning and assessment processes. The motivations for change are resource and structurally based:

- To make a wider range of learning resources available to students studying at home, in schools, colleges and libraries;
- To address the shortage of teachers and lecturers in the UK that are willing to act as examiners, verifiers and markers for qualifications and national curriculum assessments;
- To reduce the costs of external assessment and reduce time taken to report results;
- To increase the flexibility and availability of the existing vocational and academic qualifications;
- To meet the demands of centres, candidates and employers for improved feedback on candidates' performance so that it can be used to inform later learning.

Currently, the general term "e-assessment" is being used to cover the following groups of innovations:

1. E-learning systems;
2. E-portfolios to;
 - Replace paper based reports, studies and projects required for many academic qualifications; and,
 - Record evidence of competencies acquired for vocational qualifications;
3. Internal e-testing by centres for diagnostic and formative purposes;
4. External e-testing by awarding bodies to provide an on-screen alternative to paper-based qualifications delivery for summative and certification purposes;
5. E-marking by awarding bodies to improve the balance of human, technical, time and cost resources required for large-scale qualifications delivery.

E-testing is currently associated with a single, and some will say “limited”, form of assessment – the multiple-choice test. As more complex types of assessments come to be delivered on-screen, e-testing will become one of a number of available techniques that will become subsumed into a generic process which, for the purposes of this paper, will be referred to as “on-screen qualifications delivery”.

The development of on-demand qualifications delivery

A parallel initiative aims to provide qualifications “on-demand” and on-screen qualifications delivery provides the obvious, but not the only, medium for achieving it.

In addition to the obvious organisational advantages of on-demand assessment for many institutions, Kingdon and Gupta (2003)¹ have reported increased motivation among adult and further education candidates when on-demand qualifications are also delivered using the full on-screen qualifications delivery package of:

- On-demand, on-screen delivery;
- Immediate results, generated using pre-set pass marks; and,
- Detailed feedback on their performance to the candidates and their centres;
- The ability to re-sit an assessment within a short period of time.

This paper

This paper is primarily concerned with three examples of e-assessment-namely, e-learning, on-screen qualifications delivery and e-marking - plus their interaction with on-demand assessment. It is reasoned that despite apparent differences between the last two, they are merging to become a standard model for the e-delivery of qualifications units.

E-learning

The early e-learning materials were of poor general quality, largely because they were derived from pre-existing paper-based versions. Currently, e-learning development is being led by large-scale vocational training organisations.

¹ Kingdon, M. & Gupta, A (2003), *On-screen qualifications delivery: issues for regulators, awarding bodies and test centres*, paper presented to the 28th I.A.E.A. Conference, Manchester, October 2003, organised by AQA and published on the IAEA conference web site.

As the issue of quality is addressed and new materials are developed directly for e-learning, the existing UK trend toward individualised learning is likely to accelerate in both the academic and vocational areas. Students with the resource to access the worldwide web, plus the motivation to seek out and use relevant materials are already able to increase the breadth and depth of their learning.

Looking forward, there are two key ways in which e-learning and e-assessment are likely to come to relate:

1. E-learning materials and/or institutions might provide formative and diagnostic assessments to enable students and their teachers to evaluate their progress towards external qualifications;
2. If external qualifications were to be redesigned to permit significant proportions to be delivered on a “test-when-ready” basis, it is possible to envisage large numbers of students passing traditional qualification hurdles earlier in their academic career.

Not all of this thinking is new. In the 1970s and 1980s a number of General Certificate of Education Ordinary Level, Certificate of Secondary Education syllabuses and graded assessment schemes experimented with paper-based “test when ready” units. An example was the Kent Maths Project², which used a syllabus divided into a series of relatively small units. Participating schools were provided with banks of tests to administer as students became ready to take a unit test. The final award was based on a summative examination paper and an internal grade derived from the internally marked and externally moderated unit tests. The award of the latter was derived from the breadth and depth of each student’s coverage and test results for essential and optional units.

A characteristic of the Kent Maths Project was that many students completed the essential course units early and either studied enrichment material while waiting for the next scheduled summative examination or began higher work in the subject.

Awards derived from summative examinations and formative coursework are standard for many UK higher education institutions, especially the Open University. A general methodology for novel awards, using decision theory, was developed by the Decision Analytic Awards to Awarding (DAATA) project³, managed by the SEAC – a forerunner of QCA - in the 1980s.

² The project was sponsored by the Kent Local Education Authority and the University of London School Examinations Board provided certification. The project ran from the early 1970s until the introduction of the GCSE in 1988.

³ French S, Willmott AS & Slater JB (1990), *Decision Analytic Aids to Awarding (DAATA)*, Research and Monitoring Unit, School Examinations and Assessment Council (SEAC), London.

The challenge for awarding bodies and regulators is to create the development of qualification structures that:

- Facilitate individualised learning;
- Permit “assessment-when-ready” of intermediate targets or qualification units;
- Reward optional learning whether it is in terms of depth or breadth;
- Where appropriate, permit early access to higher-level learning;
- Reward hardworking and motivated students, not just the gifted ones.

Current and developing e-question types

To understand the relationship between on-screen qualifications delivery and e-marking, it is necessary to consider the types of questions that are currently being delivered by the former and those that will ultimately be available for e-marking.

At the time of writing, the qualification units that are being delivered using on-screen qualifications delivery in the UK are largely confined to a limited number of qualifications at levels 1 and 2 of the UK National Qualifications Framework (NQF). Examples include the Basic and Key Skills and some industry specific (vocational) qualifications. In almost all cases the assessments being delivered are MCQ pattern tests that were written for paper-based delivery. It is only recently that QCA has approved new qualifications for on-screen delivery, without a pre-existing paper-based equivalent.

Over the next few years it is expected that the use of on-screen assessment, and associated question types and marking systems, will be developed to assess units of qualifications at NQF levels 3 to 5. The developing assessment techniques and their associated e-marking technologies are expected to fit into the following hierarchy:

1. Multiple choice questions (MCQs) that can be marked automatically using optical mark reading (OMR) or intelligent character reading (ICR) technologies only;
2. Other forms of objective questions that can be marked automatically using intelligent character reading (ICR) technology, supported by clerical markers;
3. Short writing passages, calculations etc. that can be marked by clerical markers, supported by expert markers;
4. Extended writing passages, more complex calculations and work in other media that must be marked by expert markers.

The on-screen qualifications delivery and e-marking continuum

In their current forms on-screen qualifications delivery and e-marking appear at first to be separate but complementary aspects of a generic concept that is generally called “e-assessment”. These relationships are illustrated by:

- Their focus on different stages of the assessment process. The former focuses on the presentation of assessment items on-screen to candidates and the capture of their responses, and the latter on the presentation of assessment responses on-screen to markers and the capture of the marks awarded;
- The degree to which they can contribute to on-demand assessment. The links between on-screen qualifications delivery and on-demand assessment are obvious. The advantages of imaging the small numbers of candidates’ scripts associated with on-demand assessment are less so;
- The existence of a common hierarchy of questions types and technologies for their marking suggests that the significant difference between on-screen qualifications delivery and e-marking focuses on how the images of candidates’ responses are prepared for e-marking. The balance of question types and their methods of marking will vary with the requirements of the NQF level and subject to be assessed. When the requisite balance has been agreed and the question types developed, e-testing will have evolved through on-screen assessment delivery to become:
 - A general tool for the e-delivery of qualification units;
 - A standard method of generating images for e-marking.
- Last, Kingdon and Gupta (2002)⁴ identified a number of intermediate on-screen qualifications delivery/ e-marking models that will be required until it can be assumed that all candidates have sufficient keyboard skills to make all of their responses on-screen. An implication of this is that, if all qualifications delivery in the UK were also to be on-demand, or sufficient resources were available for all candidates to take their external assessments on-screen, the imaging of candidates’ scripts for e-marking would become unnecessary. If either or both of these prerequisites were to come to pass, e-marking would become just a stage in the on-screen qualifications delivery cycle.

On-demand on-screen qualifications delivery at NQF levels 1 to 5

It is not envisaged at this time that all qualification units will be delivered using on-screen qualifications delivery, or that all qualifications will contain some to be assessed in this way. Instead, it is envisaged that most awarding bodies will seek to extend the frontiers of on-screen qualifications delivery by applying particular assessment techniques to particular types of qualification units, where it is economic to do so.

⁴ Kingdon, M. & Gupta, A (2002), *Weekly testing of Basic and Key Skills Qualifications: First steps in IT-based assessment delivery*, in The proceedings of the 27th I.A.E.A. Conference, Hong Kong, September 2002, organised by HKEA and published on the IAEA conference web site.

Even if sufficient ICT resources were to be assembled to permit all qualifications to be delivered on-demand, it seems to be likely that UK public opinion would demand that some qualifications should retain a synoptic element and/or at least one paper-based unit. The patterns of possible use and incidence of combinations of on-screen qualifications and on-demand delivery are analysed in Table 1.

The conclusions to be drawn from Table 1 are that there are only three likely patterns of combinations of on-demand and e-assessment:

1. Full on-screen qualifications delivery is very likely to be used in the future for qualifications at all levels and all combinations of on-demand;
2. Qualifications in areas where there are no resource, competition or other pressures for change may continue to use traditional (non-e) methods of assessment. A proportion of these may be delivered on-demand;
3. A minority of full on-demand qualifications will use on-screen qualifications delivery for some units only.
4. Finally, the possibility of a full on-demand qualification that does not use some on-screen qualifications delivery is considered to be unlikely.

Implications of e-learning and on-screen, on-demand qualifications delivery

Implications for learners

E-learning coupled with on-screen, on-demand qualifications delivery offers students the opportunities to:

- Access a wide range of relevant study material from their home or library workstation;
- Broaden and deepen their study of essential topics;
- Access formative assessment material that will assist them with monitoring progress and focusing future study;
- Spread the burden of assessment by taking some/ all of the units of key qualifications/ subjects when they are ready;
- Received early and detailed feedback on their performance in externally assessed units. If they have failed a unit assessment they will be able to focus on reported deficiencies;
- Re-sit failed unit assessments early;
- Monitor their progress towards each qualification;
- Potentially, pass some external qualifications early.

Implications for institutions

The corresponding opportunities for institutions are to:

- Enable all students to take greater responsibility for their own learning;
- Monitor and guide students' progress through available internal and external assessments;

- Enable gifted and well motivated students to be assessed on-demand and complete some qualifications early and/ or enriching their study of others;
- Receive detailed feedback on the teaching and other learning opportunities provided;
- Assist students that have failed external assessments with their preparation for re-sit assessments.

However, e-learning and on-screen, on-demand qualifications delivery will create new responsibilities for institutions. They will be required to:

- Establish and staff permanent on-screen, on-demand assessment facilities, which may come to be used outside the traditional working day and during holidays;
- Ensure that their permanent on-screen, on-demand assessment facilities remain compliant with the technical specifications issued by the relevant awarding body;
- Assist students to decide when they are ready to take (and re-sit) externally assessed units;
- Provide advice to students that have failed external assessments and assist them to focus their preparation for re-sit assessments;
- Manage their ICT resources so that adequate resources are programmed to meet the needs of the different e-learning and e-assessment facilities;
- Develop options for the early achieving students;
- Counsel early achieving students on their options.

With respect to the last two points, current thinking in the UK is that early entry to higher education has not generally worked, because of the students' lower social maturity and that legally they are not yet adults. Instead, various forms of subject and general academic enrichment are preferred.

Implications for awarding bodies

The poor quality of some of the current on-screen assessments points to the need for the qualification units that will use for on-screen qualifications delivery to be designed for the purpose. Current experience suggests that awarding bodies will need to:

- Restructure the content of syllabuses into units that are designed for specific question types and marking technologies. A consequence of this recommendation is that units of qualifications will become smaller than those in current use;
- Revise their appeals procedures to include on-screen issues such as the use of pre-set pass marks, on-demand re-sits and technical failures during on-screen test delivery;
- Continue to review their procedures and codes of practice to reflect developing good practice in on-screen and on-demand qualifications delivery.

If on-demand assessment is used, awarding bodies will also need to:

- Decide, if assessment banks are to be used, whether it will be items or complete papers that will be banked;
- Ensure ongoing variety in the assessments (examinations papers, tests, etc.) that will be used to assess the same qualification unit and level over time;
- Manage version control for the assessments for the same qualification unit and level so that re-sit candidates do not receive the same or similar version of an assessment they have already attempted;
- Provide feedback to centres and candidates;
- Monitor the use of on-demand re-sits to determine whether the facility is being abused.

A big question for awarding bodies will be whether they will offer on-screen and on-paper versions of the assessment for a particular qualification unit. To do so will create new comparability issues. To fail to do so may create access issues for candidates with some forms of disability.

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Table 1: The potential likelihood of future assessment models that use combinations of on-demand and on-screen qualifications delivery

Key ✓ = Low likelihood ✓ ✓ = Medium likelihood ✓ ✓ ✓ = High likelihood		Potential use of on-screen qualifications delivery		
		Full	Part	None
Potential use of on-demand delivery	Full	L = ✓ ✓ ✓ It is likely that many qualifications, at all NQF levels and combinations of on-demand delivery, will use full on-screen qualifications delivery.	L = ✓ ✓ It is likely that some qualifications below – say – NQF level 4 will come to be delivered on-demand with some units using on -screen delivery.	L = ✓ A combination of full on-demand assessment with no use of on-screen delivery appears to be unlikely.
	Part		L = ✓ ✓ ✓ It is likely that many qualifications, at all NQF levels, will come to be delivered with some units using on -screen qualifications delivery and/or some delivered on-demand.	L = ✓ ✓ Examples of qualifications that will not use on-screen delivery, but may use some on-demand assessment will continue. They are likely to be restricted to qualifications in areas where there are no resource, competition or other pressures for change.
	None			