How might e-assessment contribute to the changing educational agenda?

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Summary

Over recent years the Government and its advisors have put an increasing emphasis on assessment to identify success, and to target funds where they are required. Now it is seeking to use assessment data to improve the teaching delivered to individual pupils. The Government has identified several drivers behind this:

- a desire to raise standards in schools through a shift in emphasis from summative end of key stage tests to more frequent formative assessment
- a desire to measure schools on pupils' progress as well as absolute levels reached
- an increased emphasis on teacher assessment backed up by portfolios of evidence
- a need to improve teaching by personalising learning for individual pupils.

Against this background, NFER's e-assessment project focuses on how e-assessment can contribute to this shift in emphasis. Rather than an increased burden on teachers and pupils, the additional data could become a valuable tool to enable teachers to unlock the potential of their pupils.

Policy context

Recent policy announcements have made it clear that Government thinking on assessment is moving into a new phase. Added to its existing monitoring and accountability functions are new demands for tracking pupil progress and giving teachers the evidence they need to provide personalised learning. To meet the new requirements, assessment will have to deliver new types of data and become more sharply focused.

The consultation document *Making Good Progress* sets out this ambitious vision. It expresses concern about the discrepancies in progress made by individual children in the course of their school careers. Based on this, it suggests that a combination of high

expectations and targeted interventions could be mobilised to address the problem. For assessment to play its part in this process, it should take on a new focus on progress, with progress targets supplementing the existing targets for absolute attainment. Alongside this, the integration of effective assessment into ongoing teaching and learning is seen as central. A major implication of the report *2020 Vision* is that teachers will be expected to make systematic use of data analysis, regular assessment of curriculum topics and techniques such as pupil peer and self assessment. This will lead to a clearer understanding in the minds of both teacher and pupil about the pupil's existing understanding and help to formulate sharper and more achievable targets for continuing progress.

However, this picture of a coherent, constructive assessment system makes enormous demands on the teacher. Schools must manage national tests, stringent accountability targets and now a new requirement that each child has a personalised curriculum planned in the light of comprehensive assessment evidence. There is a risk that these demands will become overwhelming, and indeed there are indications that many teachers are already finding them so. There are also reports that pupils find assessment stressful. It is essential to ensure that assessment is a coherent, manageable and useful process for teachers so that pupils benefit from it.

At the same time, with strong Government backing, digital technology is playing an unprecedented part in school life. ICT is now an integral part of school activity, both in the classroom and in school administration. ICT makes its mark on teaching through the use of interactive whiteboards, teaching packages to aid pupil learning and word processors and presentation software that enable pupils to present their work. There are is now one computer for every 6.7 pupils in UK primary schools (up from one for every 12.6 pupils in 2000) with most having the required resources for large group use – and this trend can only increase with time. Computers should surely be able to make a positive contribution to solving the teacher's assessment administrative burden. Yet so far this idea has had little impact.

E-assessment

Introducing e-assessment for important, high stakes national tests has the potential for great improvements, but also brings with it significant problems. The Qualifications and Curriculum Authority announced a policy in 2005 for the gradual introduction of

more computerised testing, with GCSEs, AS and A2 examinations having an on-screen option within five years. In time, this could also apply to the proposed national curriculum progress tests. However, in moving towards this situation the confidentiality of high-stakes test materials must not be compromised, and the chances of candidates cannot be blighted by technical failures.

Less attention, however, has been paid to the potential of e-assessment in low-stakes contexts. It is clear that teachers are required to focus on the understanding and attainment of individual pupils in order to develop effective plans for personalised learning. This will involve the management of a great deal of assessment evidence for planning teaching, in the form of test data and information on progress through the ongoing curriculum. Making sense of this mass of evidence requires teachers to discern patterns, interpret their meaning and use the results to formulate targets and specific differentiated teaching plans. Traditionally, this has been done informally, based on the teacher's personal knowledge of each pupil. With a requirement for more systematic assessment of progress and recording of targets, however, e-assessment can occupy a central role, first in gathering detailed information about the nature of individual pupils' understanding and attainment, and then in collating and analysing this data. Rather than supplanting the teacher's role in relation to the child, it could supplement it, reducing the marking and recording workload while increasing and easing the flow of genuinely useful information.

Using e-assessment for low-stakes, formative purposes would seem to offer some attractive opportunities:

- A bank of assessments could focus in depth on individual curriculum topics, rather than attempting to cover an entire subject, leading to richer data on individual pupil progress.
- Printed test questions can assess only limited aspects of the curriculum, whereas the dynamic and interactive capacity of the computer allows for a wider range of question types and styles of assessment. E-assessment also helps pupils to demonstrate their visual and kinaesthetic understanding more effectively.
- More frequent assessments can give formative data before a subject has been taught, and summative (as well as further formative) data afterwards. Tests can be used to inform individual teaching plans as well as to assess achievement. By

contrast, many conventional tests are primarily summative, with only limited diagnostic or formative information.

- Instead of being taken at distinct points in the school year, formative e-assessments can be integrated into ongoing classroom teaching. In this way, assessment becomes an integral part of the normal teaching and learning cycle for teachers and pupils.
- E-assessment can build a profile of strengths, weaknesses, partial understandings and misconceptions. Going far beyond scores and standard outputs, these reports can be used to improve teaching as well as communicating effectively to various interest groups.
- Because it is low-stakes, e-assessment can be a positive part of the classroom experience. Administering tests on computer and using engaging tasks can make them more motivating. Boys, in particular, may engage more readily with computers.

There are corresponding challenges, however. Where pupils' responses are to be computer-marked, computer-based assessment is usually limited to the use of questions with closed answers, rather than allowing pupils to express their responses in their own ways. To be effective, these questions must be carefully devised to capture as much as possible of the full richness of the curriculum, and to be thought-provoking rather than superficial. Computers have a potential for dynamic and interactive activities that are not available on paper, and this potential must be exploited to create effective, innovative digital question types. Computers can effortlessly capture a vast quantity of data about each pupil's responses, but much work has to be done before this becomes a useful, meaningful and manageable tool for the teacher.

What does this mean for schools?

Schools are faced with a changing environment when it comes to assessment and setting and achieving targets for pupils. This changed environment raises several issues that a school must consider in order to be able to adapt.

School issue	e-assessment benefit to teacher
There is a constant need to raise standards and to engage with groups with specific learning needs	• Systems can be put in place to identify individual pupils' needs, and to match these to appropriate teaching plans • Assessment data can be used to better understand why a pupil is getting a question wrong, and so to inform teaching
Current national curriculum tests and optional national curriculum tests are not designed to inform teaching decisions, as they are summative at the end of school a year.	• Assessments can offer analyses to inform actual classroom teaching • These results should be in addition to (would track progress towards?) the summative data derived from NC tests and used in part to assess school and pupil achievement
Teachers and school leaders need to report new sets of data to a variety of audiences	• Assessments should provide systems to help teachers to sift the mass of data generated to provide apposite reports for different audiences • New audiences for data are emerging. These include parents – and in order to engage parents more effectively attainment data relating to the individual pupil needs to be shared
Measuring progress and personalising learning have the potential massively to increase the administrative load for teachers	• ICT has the potential to ease this burden by marking tests automatically • Electronic delivery allows presentation of results in an easily digestible and customisable format
High-stakes assessment places pupils under pressure to succeed	• Low stakes, low pressure assessments can and should become a part of standard classroom activity • E-assessments can be designed to be highly interactive, engaging and motivating for pupils •
DfES is looking to embed personalised learning in schools	• ICT-based assessment can offer a wider range of question types and activities, allowing pupils with different learning styles to demonstrate their achievement and understanding. • The results of ICT-based assessment can provide an evidence base for the Individual Learning Plans that teachers set up for pupils • These results can be used to provide pupil-level feedback to assist in pupil self- and peer-assessment
Ofsted examine the use of ICT in the management of pupils	• E-assessments can provide an evidence base for decisions made about individual pupils' learning priorities

The way forward

This table shows that there are additional uses for assessment data that complement those to which current statutory and optional national curriculum tests are being put.

Computerised assessment and analysis can be harnessed to meet these purposes. Assessments can be tailored to offer meaningful information upon which teachers act, provided in a way that does not increase the workload of teachers or place undue pressure on pupils and which significantly enhances the educational outcomes for individual pupils.

In order to explore this opportunity an NFER research project is currently testing some of these principles. Experimental prototype questions are being trialled with samples of pupils and a variety of exploratory statistical analyses are being undertaken. This work may give rise to a clearer understanding of how e-assessment can provide a sensitive and unobtrusive evidence base for classroom activities and informative progress records.

More information is available at www.i-nfer.co.uk, or by contacting jon.williamson@i-nfer.co.uk or m.sainsbury@nfer.ac.uk