



# 16-19 Accountability

SCORE's response to the Department for Education consultation

20 November 2013

## Introduction

SCORE is a partnership of organisations, which aims to improve science education in UK schools and colleges by supporting the development and implementation of effective education policy. The partnership is currently chaired by Professor Julia Buckingham and comprises the Association for Science Education, Institute of Physics, Royal Society, Royal Society of Chemistry and Society of Biology.

### In general:

- SCORE believes, and has stated in previous consultation responses<sup>1</sup>, that the publication of school and college performance data is only useful and meaningful if measurements relate directly to an institution's ability to bring value to the education of *all* of its students.
- Though numerical measurements may appear to be designed for ease of comprehension, performance measurement data often mask deep complexities and distort the information made available to parents and students.
- While SCORE welcomes the use of data to monitor the education system, there needs to be an effort to harness the subtleties of data for greater and more purposeful insight.

### In summary:

- It is not appropriate to use progress measures for cross-subject comparison; progress measures should only be applied to subject-specific comparison because some subjects are graded more severely than others;
- The 'best 3 A-level measure' is likely to restrict the curriculum of our most able future scientists and may introduce perverse incentives with undesirable consequences;
- Accountability measures are needed that help address some of the issues confronting STEM education – for example gender imbalance;
- We welcome further work on the use of destination and progression data for holding schools and colleges accountable.

## Comments on consultation as a whole

Where an accountability measure such as the 'best 3 A-level grade' measure is being introduced in order to 'encourage substantial A-level programmes' it is essential that the motive is explained. Considering that the term 'Substantial vocational qualifications' is defined in the consultation SCORE seeks an equivalent definition for the term 'substantial A-level programmes'.

## Equivalence across subjects

Grades achieved in one A-level subject cannot always be compared reliably to grades achieved in another subject. This is particularly significant where the sciences and mathematics are deemed to be subjects in which it is harder to achieve high grades.<sup>2</sup>

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<sup>1</sup> [Secondary school accountability, a SCORE response to the Department for Education consultation](#); 1 May 2013; [Primary Accountability and Assessment, a SCORE response to the Department for Education consultation](#); 11 October 2013

<sup>2</sup> [Relative difficulty of examinations in different subjects](#); Robert Coe, Jeff Searle, Patrick Bamby, Karen Jones and Steve Higgins; CEM Centre, Durham University, July 2008

As a result, candidates who take science subjects generally achieve lower grades in those subjects than comparable (or the same) candidates do in other subjects.<sup>3</sup>

Where accountability measures are introduced based on the comparability of points and scores across subjects, potential perverse outcomes are twofold:

1. Schools and colleges may be incentivised to allow students to do qualifications that are less severely graded at A-level in order to ensure that school averages are maintained or improve. In addition, where it is difficult to achieve a high grade in A-level sciences and mathematics without an A at GCSE, students who pass with a B grade at GCSE may be discouraged from opting to take science and mathematics A-level as they could achieve a higher average grade in other subjects;
2. The perception that the sciences and mathematics are 'harder' will be strengthened; the result of which will be that uptake in these subjects is likely to decrease.

## Recommendations

- A cross-subject comparison of average grades and point scores is a misrepresentation of the knowledge, skill and understanding required of students in each subject. SCORE therefore recommends that the proposed progress measures are only reported on a subject-specific basis, and not as a cross-subject comparison.
- By calculating pupil progress at 16-19 on a subject-by-subject basis the Department for Education will have the data to be able to calculate and apply correction factors that are needed to allow for the severity of grading across A-level subjects for that year. We recommend that this course of action is planned into a scheme of implementation, so that schools that have high numbers of candidates entering subjects that are more severely graded get proportional credit for successes of those candidates.

## Effects of 'best 3' A-levels

A combination of four subjects at A-level in the sciences and mathematics is often chosen by students in order to progress to science degrees at university. Basing a student's average grade on their 'best 3' A-levels could lead to the break-up of any of these subject combinations due to school pressure to achieve the accountability measure by only allowing students to sit 3 A-levels that count towards the measure. In this sense, it may contradict the intended aim to 'encourage substantial A-level programmes'.

For example, chemistry, mathematics, physics and further mathematics is a common combination chosen by students wishing to go on to study the sciences at university.<sup>4</sup> An introduction of the proposed measure may inadvertently lead to the break-up of this 'package' of four complementary subjects. This could be reflected in a drop in uptake of further mathematics as it is the subject deemed most difficult.

It may also result in an exacerbation of gender stereotyped choices – where girls drop a subject not traditionally chosen by female students, such as physics, and vice versa<sup>5</sup>. For

<sup>3</sup> Grading severity In science assessment, Professor Robert Coe at the SCORE Annual Conference 2011

<sup>4</sup> An in-depth study on the combination of sciences, mathematics and further mathematics was conducted in [Preparing for the transfer from school and college science and mathematics education to UK STEM higher education: A 'state of the nation' report](#); Royal Society, February 2011

<sup>5</sup> For information on gender stereotypes in subject choices at AS- and A-level see Factsheet 2, [AS and A Level Choice Gender makes a difference](#); Cambridge Assessment

example, male students may drop chemistry where the combination of physics, maths and further maths A-levels have been traditionally chosen by male students wishing to pursue a physics or engineering degree.

The 'best 3 A-level' measure is likely to stimulate perverse outcomes in science subject uptake amongst A-level students similar to those outlined in SCORE's response to the Department for Education's consultation on the 16-19 Funding Formula Review<sup>6</sup>. The funding formula is extremely likely to discourage 16-19 providers from offering science provision, thereby reducing the number of students in this age group who are able to progress further with science qualifications.

### **Recommendations**

- SCORE proposes that the Department for Education publishes any evidence used in the development of this accountability measure.

### **A gender participation measure**

There are problems associated with the proportions and numbers of female and male students choosing science subjects. A-level results published in August 2013, demonstrated that the gender divide has worsened since 2012. 28,190 male students sat physics A-level examinations, compared to 7379 female students. The percentage of the cohort of students sitting physics increased for male students, from 6.9% to 7.2%, whereas it stayed the same for female students at 1.6%. This indicates that although 9 more female students took the subject in 2013, there has been no real increase in uptake of physics amongst female students since 2012.<sup>7</sup>

### **Recommendations**

- To help offset a potentially worsening problem over gender imbalance and transition to Higher Education, SCORE proposes the introduction of an accountability measure that encourages schools and colleges to monitor and support a balanced number of female and male students studying gender-stereotyped subjects. One possibility would be for schools as a minimum requirement to benchmark themselves against national norms, but we would encourage the Department for Education to explore this, and other ways of stimulating an attitudinal change in school behaviour towards particular subjects. We would not want this to result in schools channelling students into subjects for the sake of balanced numbers.
- The concern over imbalance in gender participation in the sciences is not limited to this age group. SCORE proposes that the issue is addressed at GCSE level simultaneously in order to acknowledge that GCSE participation is the main route to uptake at A-level.

The consultation document proposes to ensure that those students receiving pupil premium and those with learning difficulties and disabilities are included within new measures. A gender participation measure would complement this effort to support accessibility in education. It would serve as a signal to parents and students that schools and colleges are

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<sup>6</sup> [16-19 Funding Formula Review: A SCORE response to the Department for Education consultation document](#); 4 January 2012

<sup>7</sup> [Joint Council for Qualifications – A-level results 2013](#)

committed to giving all students the opportunity to study the subjects best suited to them, regardless of their gender, both in society and the teaching profession.

### **Vocational qualifications in comparison to A-levels**

SCORE strongly supports the desire to give vocational qualifications a high status and ensure that those vocational qualifications on offer are valued within accountability measures in a way that encourages quality for students, schools, colleges, parents and other stakeholders.

However, comparisons of providers across the vocational and academic spectrum are extremely difficult to define and measure. The reporting of performance measures outlined in this consultation document indicates that vocational and academic qualifications will be measured within a single framework.

Measurement within a single framework would lead to direct comparisons being made between academic and vocational providers, which could lead to the undermining of providers offering vocational qualifications and the qualifications themselves. A situation of this sort occurred when BTECs were introduced at key stage 4 as equivalent qualifications to GCSEs in school league tables.

### **Recommendation**

- Vocational qualifications, as with academic qualifications, should be measured on the merit of the course to student progress alone. Vocational qualifications providers should be measured on the outcomes that they are aiming to achieve. These outcomes may be different from the outcomes envisaged from academic qualifications.

### **Impact of completion and non-completion rate measure**

Subject completion and non-completion rates can be inferred from the data gained by a robust destination measure. SCORE recommends that a destination measure be prioritised as a nuanced measure of student progress; destination measures could also indicate where students fail to complete a subject and therefore act as another indicator of school performance.

SCORE is interested in understanding how a completion and non-completion rate measure has been modelled and whether the following factors and outcomes have been considered:

- 'Completion' could be taken to mean that a student has passed the qualification, has attended the course but failed to achieve in the qualification, or that a student has simply attended for the duration of that course. This ambiguity needs to be clarified.
- Where schools and colleges are incentivised to ensure that students remain studying a subject this may put pressure on the system and lead to lower standards.
- There may be a school impetus to ensure that students complete subject courses even where students have indicated they would prefer to change subject.
- Schools and colleges could become more risk-averse: some schools and colleges may enforce stricter entrance criteria on students in order to limit those who are perceived as potentially not being able to complete a subject course. This would be extremely

detrimental to those students for whom acceptance onto an A-level course is a motivation to study and opportunity to access further education.

### **Destination measures**

SCORE strongly supports the tracking and evaluation of the destinations of students at age 19, and the employment and education paths that they follow. We would like to see work done on producing an accountability measure from this information. However, tracking destination is an extremely difficult and complicated task and SCORE questions the way in which this could be carried out, and whether it can be carried out effectively.

The concept of progression post-19 is multifarious, comprising various concepts of destination – each attached with different significance depending on who it is reported by and for what purpose - therefore any destination data could be manipulated to indicate the progress of one cohort over that of another.

In particular, there is a danger of devaluing destinations that are harder to measure or that cannot be measured by comparing these with destinations, such as transition to Higher Education that can be more easily measured. SCORE would be against using data for accountability that only related to progression to higher or further education in the year following the completion of courses.

### **Extended Project Qualification (EPQ)**

The Extended Project Qualification is a positive and engaging way to allow students to concentrate on the investigation and inquiry skills involved in practical science. In this consultation document the EPQ is currently only listed as an option for study under the TechBacc. We are concerned that this will diminish the incentive for schools and colleges to offer the EPQ as an option for students in A-level programmes.

SCORE would like further clarification as to how the Department for Education envisages the EPQ sitting amongst the other qualifications on offer and how its status will be protected.

### **Massive Online Open Courses (MOOCs)**

Massive Online Open Courses were designed for a specific purpose, to allow individual learners to freely access education for personal self-improvement. A MOOC is potentially a new form of qualification, not simply a method of learning.

SCORE feels that where technology and the internet can be applied appropriately to teaching 16-19 science there is no reason to prevent schools, colleges and teachers doing so. However, SCORE states that it is not yet appropriate to introduce MOOCs as additional qualifications to 16-19 education where there is already a profusion of educational institutions and qualifications available.