SCORE

SCIENCE COMMUNITY REPRESENTING EDUCATION

Study Programmes for 16-19 year olds

A SCORE response to the Department for Education consultation

4 January 2012

1. 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 Graham Hutchings FRS and comprises the Association for Science Education, Institute of Physics, Royal Society, Royal Society of Chemistry and Society of Biology.

2. In summary, SCORE calls for further clarification into the role of Ofqual and Ofsted in ensuring the principles of 16-19 study programmes are followed. SCORE also strongly supports the recommendation that all students up to the age of 19 should continue to study some form of mathematics. We recommend that SCORE is engaged with the development of what this requirement may look like for those learners studying science qualifications post-16.

3. This response should be considered alongside the SCORE response to the Department for Education consultation on 16-19 funding formula.

Overview

4. SCORE welcomes the government initiative to review the study programme for 16-19 year olds. SCORE fully agrees with Professor Wolf that there is a need to ensure that a learner's best interests, in terms of progression and educational value, are prioritised over performance table points and funding in school decision-making. This criterion should apply across all academic and vocational study programmes.
5. SCORE strongly supports the recommendation that all students up to 19 should continue to study some form of mathematics. The type of mathematical provision will vary across different study programmes and the SCORE organisations are keen to engage with the Department and other stakeholders, including the Advisory Committee on Mathematics Education (ACME), on what this may look like for the sciences.
6. A study programme that includes high quality work experience and internships is fine in principle but SCORE is concerned that there simply isn't the capacity within industry and business to provide this. The Department for Education should consider the following:
    - Establishing a national mechanism to coordinate work placements, for example an extension of the STEM brokerage system. This will help to develop the required links between the provider and local business and industry.
    - Establishing training institutions that offer work-based training in a range of relevant fields. This already exists in some areas but there needs to be coordination and establishment of agreed standards of provision.
    - Establishing a set of national standards for effective, high quality work experiences. These should include agreed procedures on insurance and Health and Safety issues.

Will the measures listed in the consultation document be sufficient to ensure that the 16-19 study programmes principles are followed?

7. SCORE is concerned that providers are not sufficiently incentivised to provide suitable programmes of study for learners. We would strongly recommend it is a requirement,

not an expectation, of the funding system that the 16-19 programme principles are followed.

8. SCORE also seeks further clarity on the role of Ofsted and Ofqual to ensure the principles of 16-19 study programmes are followed:
    - Ofsted, providers and Government must have a common understanding of what each principle entails. The document is vague in its description of the characteristics of a qualification of substantial size and challenge. SCORE would like to see further clarity into what these may look like for a science qualification. We would, for example, expect most science qualifications at 16-19 to include a substantial element of high quality practical work.
    - SCORE recommends that Ofsted carries out subject-specific inspections in addition to routine inspections. Subject-specific standards should be informed by dialogue with appropriate stakeholders, including learned societies.
    - The quality of work experience and internships should be regulated by Ofsted, as should the quality of its assessment, to ensure there is a consistent standard across different providers, business and industry in England.
    - As part of their inspection, Ofsted should ensure providers offer informed guidance for students (and parents) on the possible progression routes the programme of study are likely to offer, and routes that could be closed down.
    - SCORE would like the role of Ofqual to be made explicit within this document. Ofqual should be responsible for ensuring that all qualifications that sit within a 16-19 study programme are of substantial size, with rigorous assessment and good progression opportunities.
9. SCORE supports the inclusion of progression and destination data into performance measures, providing the publication of this information is timely and the impacts (intended and unintended) are thoroughly considered before introducing the measure. If used correctly, these performance measures will encourage providers to offer study programmes that have real progression opportunities for their learners and that can positively influence planning and teaching.
10. Assessment methods are equally as important as content and course structure in defining how the course is delivered. Therefore, assessment must be considered in parallel with the reform of performance measures and qualification development. There should be a range of assessment mechanisms that reflect the different purposes of a course, including for example the assessment of practical and work-related components.

How will the proposals affect different providers?

11. The proposals are likely to affect providers differently across the country. Progression from 14-16 to 16-19 education relies on local, not national, availability. This issue is highlighted very clearly in traditional qualifications such as GCSE science, where A-level physics is not available in about 500 schools and colleges[1].

[1] Royal Society 2011, *Preparing for the transfer to STEM higher education*

12. While many existing vocational and applied science Level 2 qualifications have follow-on Level 3 qualifications, there is no guarantee that a local provider will offer the Level 3 qualification. In these cases, the Level 2 qualifications essentially become dead ends, with no progression possible. Hence, mechanisms to ensure local provision of a sequence of qualifications are important if the principles for the study programmes are to be adhered to.

In line with this ambition for all to be studying maths post-16 in the next decade, we would be interested to know what you feel could be done to encourage more young people who have already achieved GCSE A*-C to study maths. What would this provision look like?

13. SCORE supports the recommendation that all students up to 19 should continue to study some form of mathematics. It must however be appropriate to the study programme and meet the needs for each group/type of student going through 16-19 education. The maths programmes should be made up of appropriate content in relevant contexts (for each type of learner) and should be a sensible size and be set at the right level.
14. In particular, SCORE would support a study programme explicitly linking mathematics and the sciences at 16-19 and that promotes coherent teaching across the two subjects. There is much evidence to suggest the current study programmes are not adequately preparing learners with the knowledge and understanding of mathematics, particularly within the context of the sciences, to progress into STEM Higher Education or STEM related work. A recent report from the Institute of Physics showed that physics and mathematics A-levels are not sufficiently preparing learners for undergraduate courses in physics and engineering[2]. Within the biosciences a recent report highlighted that many students enter biosciences degrees with a very wide variety of mathematics qualifications, causing difficulty in designing appropriate courses.[3] Preliminary findings from SCORE also show that existing science A-level examinations do not meet the needs of students in terms of the way they assess the mathematical and analytical nature of science.
15. SCORE is keen to engage with the Department for Education and other stakeholders including the Advisory Committee on Mathematics Education (ACME) into what this provision may look like for those learners studying science academic and vocational qualifications at 16-19.
16. Together with the mathematics community, SCORE recommends that there are agreed national criteria for mathematics in science courses and that these criteria would reflect differences in the purpose between academic and vocational courses.

[2] Institute of Physics 2011, *Mind the gap:* Mathematics and the transition from A-levels to physics and engineering degrees

[3] Dr Jenny Koenig 2011 *A survey of the mathematics landscape within bioscience undergraduates and postgraduate UK higher education,* commissioned by the UK Centre for Bioscience, Higher Education Academy