

Arguments for a baccalaureate education

Exhibit A

Royal Society: Vision for Science and Mathematics Education, 2014

Chairman Sir Martin Taylor

Recommendation 2

The A level system should be slowly changed to a baccalaureate type system in which a broader curriculum (including core English, mathematics and the Extended Project qualification) which meets the requirements of a designed framework for key competences as outlined in recommendation 3, is provided for all post-16 learners.

Recommendation 3

England must, as soon as possible, formally adopt a framework for key competences guided by recent international developments (such as the European Framework), which includes: communication in English and in foreign languages, competence in mathematics, science and technology and digital competence, learning to learn individually and as part of a team, personal, interpersonal and intercultural competence, including an understanding of codes of conduct and the importance of business ethics, a sense of initiative and entrepreneurship, creativity and cultural awareness. These competencies must fall under the inspection framework and should be embedded throughout the curriculum and associated qualifications.

Recommendation 4

Project work evidenced by the Extended Project and other qualifications should become a key requirement for university entrance.

Recommendation 5

Non-cognitive skills and attributes such as team working, emotional maturity, empathy, and other interpersonal skills are as important as proficiency in English and mathematics in ensuring young people's employment prospects. Assessment should reflect this reality and so investment is needed to support assessment experts in finding ways of reliably evidencing these skills.

Exhibit B

Making Education Work: Chairman Sir Roy Anderson, Imperial College, London (Pearson)

'Firstly, in order to ensure young people have a broad and balanced education through to age 18, baccalaureate-style frameworks should be introduced. Inspirational science and mathematics curricula should be placed at the heart of these, and should emphasise practical work and problem-solving. The new frameworks should incorporate subjects in the arts, humanities and social sciences and place equal value on vocational learning. Secondly, education systems need to provide stability for the curriculum and its assessment in order to support excellent teaching and enable innovation. To achieve this, new, independent, expert bodies that draw on the wider STEM professional

community need to be created in England and Wales to determine curricula and assessment in STEM subjects.'

Exhibit C:

Sir David Bell, Vice Chancellor, Reading University

Association of Science Education Conference, January 2015

'Second, let us finally build cross party consensus on expanding A-levels into a broader, richer baccalaureate-style system – with core specialist subjects supplemented with extended project work and top-level literacy, numeracy, computer science and softer, non-cognitive skills. "I have talked about the need for collaboration between academic disciplines. The sciences need the arts. And the arts need the sciences. Yet five years of permanent revolution has seen us come full circle to a decades old system which culminates in sixth formers still specialising in three or four 'gold-standard' A-levels, with two years of study ending in a pass-and-fail exam. The economy and society is changing out of all recognition - and yet we still have an out-of-date system, when the UK can least afford it.

'A broader and deeper curriculum and exam system must be our ambition. It will not happen overnight and will have to be carefully phased in. It would require tough decisions over the real long-term value of qualifications at 16. It will require better specialist teaching and facilities. It will not be appropriate for all students. And top-class science, technology, engineering and maths degrees will still require early specialisation. But given the demands of employers and society, it is a no-brainer. Future generations will need retraining and education throughout their lives. A Bacc-system sends out a clear message from pre-school onwards that students must have a rounded education to equip them for this, with a wide range of skills on top of specialisms. This does not undermine rigour. It enhances it. "A decade ago ministers bottled creating such a system following the independent Tomlinson Review because they were scared of being seen to be weak on standards. We cannot make the same mistake again.'

Exhibit D

Andreas Schleicher, Director of Education, OECD

'Education today is much more about ways of thinking which involve creative and critical approaches to problem-solving and decision-making. It is also about ways of working, including communication and collaboration, as well as the tools they require, such as the capacity to recognise and exploit the potential of new technologies, or indeed, to avert their risks. And last but not least, education is about the capacity to live in a multi-faceted world as an active and engaged citizen. These citizens influence what they want to learn and how they want to learn it, and it is this that shapes the role of educators.'