SCIENCE COMMUNITY REPRESENTING EDUCATION

SCORE statement on the Science Diploma

February 2009

The Science Diploma offers opportunities for school science, which we as members of SCORE in principle welcome and embrace. However, SCORE has identified a number of fundamental issues about the development and delivery of the Science Diploma which have not yet been addressed. These are discussed below.

Vision and purpose of the Science Diploma

The purposes of the Science Diploma have not been clearly defined or prioritised. The proposals for how the Diploma should be developed are therefore, inevitably, confused. Further work should be halted until a serious review of purpose, structure, content and delivery has been undertaken.

For example, the Science Diploma is intended to cover the full range of sciences and will entail students continuing to take three sciences to the equivalent of AS Level. While this could be seen to offer something new, and needed, we are not convinced there is sufficient evidence that a post-16 qualification with equal amounts of each of the science subjects will in practice lead to increased take-up of science-related studies post-19.

Nor is there sufficient market research on the potential take-up of the Science Diploma itself at any level, or on the likelihood that the inclusion of a work-based element will increase take-up at post-16 and post-19 levels.

Meeting the needs of all students

Diplomas attempt to provide a fully rounded education for all young people at all levels of ability. They should also aim to meet the needs of students with differing learning styles. The Science Diploma – as currently structured – cannot do this. The structure of the Diploma, in terms of content and the split between the different elements, restricts the flexibility of the Advanced Science Diploma. This structure makes it impossible properly to meet the needs of all young people with an interest in the sciences, at all levels of ability. In particular, by 16, students are perfectly capable of making choices to specialise (or broaden) their studies. The Advanced Diploma in science as currently envisaged allows for neither of those possibilities.

The styles of learning and teaching promised by the Principal Learning component cannot be accommodated in the timescale currently being followed. In particular, the Awarding Bodies will not have sufficient time to develop and trial new Principal Learning courses, and will therefore draw heavily on existing qualifications. This will reduce the potential of the Science Diploma to meet the needs of any cohort of students who do not already choose existing qualifications.

We are also concerned that the style of the Principal Learning component will not follow through into the Additional and Specialist Learning (ASL) components related to the sciences. These are likely to be drawn from existing GCSE, AS and A2 qualifications, creating an unhelpful change of approach for the learner.

Progression post-19

The Diplomas aim to allow students to progress to further study, work or an apprenticeship. The Science Diploma, as currently being developed, cannot simultaneously support all of these progression options. Although learners will be able to tailor the Science Diploma using the ASL, the Principal Learning component remains common to all. If the Principal Learning component is designed to enable learners to progress to the full range of related HE options, it cannot be compatible with the needs of learners on the progression pathway leading directly to employment.

The Advanced Science Diploma does not allow sufficient time (except possibly within the Extended 4.5 A levels option) for learners aiming at Higher Education to reach the specialist level of knowledge and understanding equivalent to two or more science and/or mathematics A levels. Most students planning to enter HE would be best advised to take one of the existing range of Level 3 qualifications currently accepted by universities.

Social mobility

The Government has a clear agenda to broaden social mobility. It is not evident that the Science Diploma will support this aim, particularly with regard to accessing science and engineering within Higher Education. The different sectors of education already offer a range of qualifications, with the Independent Sector (and some of the State sector) seeming to move towards iGCSEs, the Cambridge pre-U and the International Baccalaureate. In addition, some universities are exploring or using their own entrance exams. Students who have chosen to follow the Diploma route will be directly competing with students holding qualifications specifically tailored towards entry to HE. Hence there is a danger that the Diploma will increase rather than reduce the gap between the Independent and State Sectors in terms of progression to HE in science-related subjects.

Broadening access to STEM

The Government and the wider scientific community would like to see more young people inspired by science and wanting to study the sciences post-16. The Science Diploma, by asking learners as young as 14 to label themselves as 'science specialists', may be counter-productive. The Principal Learning component in the Higher Diploma contains more science hours than a triple science GCSE and is therefore very unlikely to attract those not already committed to studying science post-16.

Just as Science Diploma students will need to take science-related ASLs to progress to science-related courses at university, students taking other Diplomas may also face restrictions in their choice of ASLs if they wish to progress in their chosen field. This will narrow students' options post-19, and will reduce the number of students obtaining a qualification in the sciences or mathematics at Level 3. It will also be difficult for a Science Diploma student wishing to study a science-related HE course to take a non-science ASL at Level 3.

Delivery

While it may be too early to consider many of the issues related to delivering the Science Diploma, some issues should be raised now.

- **Potential takeup –** Given the low numbers, a single school will not have a viable group. Even a consortium of four schools would be unlikely to have a viable group. So the travelling distances will be large or the groups will be unsustainably small.
- **Parity –** Unlike with many of the early phase Diplomas, there will not be parity across the country. The scientific industries, and hence work-related learning and work placement opportunities, vary

considerably from one region to another and from rural to inner city locations. This will affect the flavour of a particular Diploma offer, and also make it very difficult for students moving from one area of the country to another. We do not think that there are enough work places available for Science Diploma students.

- **Teaching workforce** – The design of the Science Diploma is interdisciplinary. The issue of who will teach joint modules and whether they have the subject expertise needs to be considered. Science Diploma should not reduce the numbers of specialist teachers available to teach GCSEs and A levels. The mathematics workforce in particular risks being diverted to delivering a range of additional maths units tailored to meet individual Lines of Learning.

Conclusion

The Science Diploma offers an opportunity for a radical revision of school science, which we as members of SCORE in principle welcome and embrace. However, we believe that at present the government is in danger of not making the most of this massive opportunity because of the timescale and constraints imposed on the development and implementation of the qualification.

We would be happy to work with the appropriate groups to ensure that the Science Diploma achieves its potential, but at present our concerns are so great that we have reservations about continuing to support the current development phase. A serious review of purpose, structure, content and delivery is needed before any further work is undertaken. That review needs to address the following key points.

- Purpose – Until there is a clear statement of its purpose, the development of the Science Diploma will be flawed.
- Meeting the needs of all students – The current constraints on the development of the Science Diploma (eg having to take all the subjects rather than providing specialist routes within the framework) makes this an impossible task.
- Progression post-19 – We do not think the Diploma will encourage or enable any more students to study science post-19. It may even be detrimental to this cause.
- Social mobility – If the Diploma cannot enable or expand post-19 study, it will not address this agenda.
- Broadening access to STEM – Rather than broadening access, the Diploma model may reduce access to STEM related subjects and qualifications at Level 3 and post-19.
- Delivery/implementation – The timescale for implementation will mean that the teachers and schools are not ready, competent and confident to deliver the Science Diploma.

SCORE recommends that once the purposes of the Science Diploma have been clearly expressed, an urgent and radical review of the Science Diploma is undertaken. For example it may examine whether two Science Diplomas, with different Principal Learning components (for example Applied Science and General Sciences), might better meet the needs of learners and raise the number of students continuing their science studies post-19 than the current proposed model.

About SCORE

SCORE is a partnership between seven organisations, the Association for Science Education, Biosciences Federation, Institute of Biology, Institute of Physics, Royal Society, Royal Society of Chemistry and the Science Council. The science education sections of the partner organisations use their combined resources to inform the development of science education policy.