National Curriculum review 2011 – Call for evidence

Computing and ICT

This response to the National Curriculum Review is on behalf of the Royal Society and refers specifically to matters relating to Computing and Information and Communication Technology (ICT). This submission complements the Royal Society's input regarding the National Curriculum for science which it is making through the SCORE partnership.

For the purposes of this submission, we use the word 'Computing' to mean the concepts and fundamental principles of the subject such as algorithms, programming, design, problem-solving etc. By 'ICT' we mean the technology and application of computers, including the skills of using computer applications, systems management and computer networks.

Headline issues:

- ICT is not the same thing as Computing (also called Computer Science). While the current National Curriculum seeks to cover both, in a significant number of schools it is interpreted in a narrow way which has led to a negative perception of this subject and a conflation of the terms.

- Decisions relating to the inclusion or exclusion of ICT or Computing in the National Curriculum should be made with a full understanding of the differences between the two, and of other terminological issues which may cloud decisions.

- Essential knowledge, including principles, concepts and methodologies, exist across the ICT and Computing landscape. These are distinct from the skills of using office applications which some might associate with the subject.

- Inclusion of a statutory component of Computing may be necessary to ensure that both *Computing* and ICT are taught in schools in an appropriate way

- There appears to be a shortage of specialist Computing teachers which would affect delivery of a statutory component and this would need to be addressed.

- The Royal Society is undertaking work in this area which will be highly relevant to the Department's decision on ICT and Computing in the National Curriculum.

Background

The Royal Society is now part-way through a review of Computing and ICT in schools which is highly relevant to the Department's deliberations in this area. Our project began in 2010 with a call for evidence which attracted a large number of responses from a range of organisations and individuals, and has continued in 2011 with a series of stakeholder meetings with teachers, HE and others. Our project is supported by partners in industry, other learned societies and HE institutions.

The final report is due to be published at the end of 2011, and the Royal Society would like to engage with the Department for Education as this work progresses. The Society has not yet completed its investigations and does not wish to pre-empt the remaining work to be done in this area, but we present in this document a small number of important messages from the initial stages in order to support a request for further dialogue with the Department on the place of ICT in a new National Curriculum.

Terminological difficulties

There are considerable terminological difficulties in this area which can lead to confusion among teachers, students, parents, school leaders and policy-makers, and can have an impact on progression in the subject. An important message from our call for evidence phase was that 'Computing' – in the sense of rigorous topics such as programming and algorithms – is distinct from 'ICT', which is associated with the skills of using computer applications, systems management and networks. Computing is associated with understanding concepts.

ICT in the current National Curriculum

Although the existing ICT curriculum provides some scope for the teaching of computing concepts, it would appear from our call for evidence that the flexibility – or vagueness – of the current National Curriculum has allowed a significant number of schools to teach a restricted diet of 'learning how to use word-processing packages and spreadsheets', without being required to explore the more rigorous and challenging aspects of computing.

Possible reasons for this approach include a shortage of specialist teachers in this area, and the Society is investigating this as part of its project. The existing curriculum has the flexibility to be 'deliverable' by teachers with a range of backgrounds, knowledge and confidence. Many examples of excellent teaching of Computing certainly exist where a teacher is knowledgeable and enthusiastic, but the results of our call for evidence suggest that there is considerable variation in what pupils experience and the opportunities they have to make informed decisions about Computing.

Negative trends in numbers studying Computing post-16 and at undergraduate level suggest that a significant number of young people are deciding against the subject on the basis of an impoverished ICT curriculum experience. This is ultimately to the detriment of the economy.

ICT/Computing in a new National Curriculum

The formulation of 'ICT' as a National Curriculum subject is therefore not without its problems, and its brand has been eroded in recent years. However, current progress with our project suggests that a body of 'essential knowledge' across the ICT and Computing landscape exists and could be included in a National Curriculum in place of the existing entitlement. If our investigations reveal a considerable shortage of specialist teachers in these areas then a statutory component could help ensure that recruitment difficulties will not dissuade schools from striving to teach these important subjects.

The Society stands ready to engage further with the Department on these issues, with the message that terminological issues or 'brand' problems should not cloud decisions in this highly important area. There is a risk that Computing and ICT will be conflated in the Review and that a decision to remove one from the National Curriculum will amount to a decision to exclude both.

14 April 2011