

Removing the duty on maintained schools to follow the information and communication technology (ICT) Programmes of Study, Attainment Targets and statutory assessment arrangements

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This evidence has been prepared by The Institution of Engineering and Technology (IET) who will be pleased to provide further information on request

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Please mark an x in ONE box below that best describes you as a respondent.

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<input type="checkbox"/>	Young Person	<input type="checkbox"/>	Higher Education	<input type="checkbox"/>	Further Education
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Q1 a) Do you agree with the Government's proposal that the statutory Programmes of Study for ICT should be disapplied in maintained schools in England from September 2012?

Please explain the reasons for your answers.



Yes



No



Not Sure

Comments:

The IET has welcomed the Education Secretary's recent announcement that Computer Science is a rigorous subject discipline that can and should be taught at school and that sufficiently rigorous and academic Computer Science GCSEs can be considered for inclusion in the English Baccalaureate

In this regard, we welcome the withdrawal of the existing ICT Programmes of study as we believe the present curriculum was doing more harm than good with regard to students' experience of computing and IT at school.

However, for this model to work, it is critically important that DfE take a leadership role in encouraging schools to teach Computer Science and provide support and guidance for teachers. Without a national programme of study, while some schools will have the resourcefulness to develop a more exciting and engaging curricula as exemplified by the Computing At School (CAS) curriculum, others will provide only a statutory minimum.

Computing has an immense impact on modern life as technical staff and managers are the two areas where the largest employment growth will take place over the coming years. The job prospects are excellent and the field is rigorous, intellectually vibrant, and multi-faceted. Yet, computing is in danger of disappearing from schools, with a critical skills shortage developing. A technical skill gap amongst such people is a serious problem. A study by the UK Council of Professors and Heads of Computing illustrates the problem: it predicts that demand for IT professionals will increase by up to 15% in the next eight years, while the number of students aiming for jobs in the industry has fallen by 50% since 2001¹.

Therefore, whilst we agree that the DfE should step back from defining detailed programmes of study, the Government has a responsibility to promote and support the provision of ICT in schools to help mitigate the skills shortage. There is a danger is that a significant number of head teachers will choose to withdraw from teaching ICT as a discrete subject altogether, whilst delivering a statutory ICT component by embedding it across the curriculum. This would be contrary to the Secretary of States aim of encouraging more schools to teach Computer Science. This possibility is evidenced by the 2008² and 2011³ Ofsted reports on ICT that point out even the small amounts of computer programming that are a statutory part of the current curriculum are often not

¹ <http://www.cphc.ac.uk/docs/reports/cphc-itlabourmarket.pdf>

² <http://www.ofsted.gov.uk/resources/importance-of-ict-information-and-communication-technology-primary-and-secondary-schools-20052008>

³ www.ofsted.gov.uk/resources/ict-schools-2008-11

taught.

Q1 b) Do you agree with the Government's proposal that the statutory Attainment Targets for ICT should be disappplied in maintained schools in England from September 2012?

Please explain the reasons for your answers.

Yes

No



Not Sure

Comments:

Whilst we agree that a disapplication would be beneficial in the long term, we are concerned that an immediate disapplication would carry the danger of creating a gap wherein ICT is not taught at all, thus contrary to the government's aim of encouraging more schools to teach Computer Science. This will have the effect of reducing the importance of ICT and leaving a period of no support for improvement in schools before the introduction of the new National Curriculum, thereby worsening the situation.

We recommend that Government should work with the engineering and computing communities to develop attainment targets that are more relevant for the new computing curricula.

Q1 c) Do you agree that the statutory assessment arrangements for ICT at Key Stage 3 should be disappplied in maintained schools in England from September 2012?

Please explain the reasons for your answers.

Yes

No



Not Sure

Comments:

We agree that the statutory assessments for ICT at KS3 should be disappplied in its current form. However, the effectiveness of future pathways cannot be assessed without some kind of benchmarking standards for individual school years or Key Stages.

For example, If basic literacy is not measured during Key Stage 3 there is the danger that a significant minority of pupils will not receive the remedial attention they require before they start Key Stage 4. Anecdotal evidence suggests that as many as 20% of year 6 pupils do not have the minimum level of digital literacy they require to successfully use digital software and technology at secondary school.

We recommend that Government should work with the engineering and

computing communities to develop suitable statutory assessment arrangements.

Q2 a) What would be the likely impact in schools of disapplying the existing Programmes of Study and Attainment Targets?

Comments:

If the existing ICT Programme of Study and Attainment Targets are removed without the provision of support and guidance on how to teach ICT, it will make it very difficult for schools to:

- know what academic principles and concepts schools are expected to teach, which will remain fixed over the long term even though each school will decide how best to bring them to life through inspirational and innovative pedagogy that continuously evolves year on year
- have teachers with expert knowledge in the discipline
- have support from organisations who will help them move from ICT as it is now to Computer Science as we would like it to be
- have incentives for investing time and people in radically changing a core component of their school's education

Therefore, we stress that it is important for the government to provide support and guidance to help schools achieve these prerequisites for teaching Computer Science effectively. If not, it will severely jeopardise their original aim to encourage all schools to teach Computer Science to a high quality.

In order to ensure schools respond to the disapplication of programmes of study in the way in which it is intended, Government must ensure that there are incentives for schools who apply the more challenging aspects of computer science in their curricula, such as making Computer Science and addition to the E-BAcc, and disincentives for schools which look to deliver only basic provision. For the latter, the DfE could look to Ofsted to ensure high standards of all aspects of Computing is delivered in schools.

Q2 b) How might this vary between different types of school or differentially affect different groups of pupils?

Comments:

There is a danger that removing the Programme of Study leaves head teachers the option of not teaching ICT at all, including not teaching Computer Science. This possibility is evidenced by the 2008⁴ and 2011⁵ Ofsted reports on ICT that point out even the small amounts of computer programming that are a statutory part of the current curriculum are often not taught. Also, according to the 2011 Ofsted report:

“In outstanding secondary schools ICT was seen by the headteacher as an engine for innovation and raising standards. In contrast, half of the secondary schools surveyed in which leadership and management of ICT were no better than satisfactory had common weaknesses that included insufficient attention given to progress in ICT across the curriculum and lack of support for staff in teaching more challenging topics.”

The highly predictable outcome of this DfE proposal will be that the best performing schools will take this new freedom and do better in ICT than on their current track and the already under-performing bottom will entirely lose their way and do a lot worse. The seeds will therefore be sown for the next generation of the digitally excluded.

Therefore, if it is left entirely to local initiatives there is a risk that a very large number of under-performing schools simply lose their way entirely.

Q3 a) Do you agree that schools should be encouraged to deliver a more challenging, rigorous, discipline-related curriculum in ICT, especially by focusing on the foundational principles and practices of computer science?

Please explain the reasons for your answer.

Yes

No

Not Sure

⁴ <http://www.ofsted.gov.uk/resources/importance-of-ict-information-and-communication-technology-primary-and-secondary-schools-20052008>

⁵ www.ofsted.gov.uk/resources/ict-schools-2008-11

Comments:

We agree with and repeat the views of the “Education for engineering” group in their response to the National Curriculum review⁶. Every school pupil should encounter Computer Science because:

- Universal scientific, engineering, mathematical and business principles, concepts and methods can be encoded in formal languages that a human can understand and a digital computer can execute automatically.
- The rigorous design and automation of different kinds of machine executable languages is unique to Computer Science; in particular designing and building languages capable of describing elegant, efficient solutions to hard real-world problems that affect our societal wellbeing as well as our future economic prosperity.
- Computer Science develops a way of thinking about issues, problems and situations that uses the powers of logic, algorithm, precision and abstraction (understanding through analysis and reconstructing from the constituent parts) - it is a scientific, engineering and mathematical approach.
- Computer Science supports economic well-being at the personal (intellectual), vocational (employability), social (stronger work force) and national (more competitive market force) levels.

A prerequisite for the creation of systems based on computer and communications technologies is an understanding of mathematics and logical processes. It is for this reason we cannot overstate the importance of the provision of a strong element of mathematics with in the curriculum. It is suggested that an elements of computing are made integral with the existing mathematics curriculum so providing practical examples of automated solutions to solve problems using computer based methods.

Q3 b) How can schools be best supported to engage with the ICT industry and subject associations in curriculum development, in order to develop innovative and creative approaches to ICT teaching, including the teaching of computer science?

⁶ http://www.educationforengineering.org.uk/policy/pdfs/E4E_NC_Review.pdf

Comments:

To develop innovative and creative approaches to ICT teaching, we believe that schools would be best supported by the provision of a step-wise guide that sets out how they can effectively move from ICT as it currently is to how Computer Science as we want it to be.

We support the BCS and Computing at School (CAS) proposal of a three year road map that shows how a significant proportion of schools can achieve this. We recommend the DfE engage with the computing community to create such a road map for schools to be published before September 2012, as well as proactively support and promote this initiative.

Q4) Do you have any other comments you would like to make about the proposals in this consultation document?

Comments:

IET fully supports the submissions to the consultation from:

BCS – The Chartered Institute for IT

The Royal Academy of Engineering

E4E - E4E represents the collective views on education and training policy of 36 Professional Engineering Institutions, the Engineering Council, EngineeringUK and the Royal Academy of Engineering