Computer science for schools – panacea or bandwagon?

By Mark Baker

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There is a growing campaign for the introduction of computer science into the National Curriculum to address an economically crippling skills shortage. The case is a compelling one. Ian Livingstone and Alex Hope, in their recently published review of how this impacts on the UK's video games and visual effects industries (see www.nesta.org.uk), highlight some stark statistics.

Worldwide, the video games industry alone is worth around $50 billion annually and this is expected to rise to nearly $90 billion by 2014. This is an important market, especially at a time of widespread economic stagnation and it is one where the UK has historically been very successful. In 2008, UK global sales of video games was put at £2 billion, larger than that generated by either of the UK's better known film and music industries.

However, all is not looking rosy for the future. Speaking at a recent Microsoft Partners In Learning event in Reading, Ian Livingstone (co-founder of Game Workshop and Life President of Eidos) spoke of how the industry is "crying out for talent", having to turn away business because of a lack of skills and forced to look overseas for recruits to make up the difference. This is a sad state of affairs, given current high levels of unemployment, particularly amongst graduates and young people. In terms of global development rankings, the UK is reported to have fallen from 3rd to 6th place in just two years.

The Hope-Livingstone review found that only 12% of graduates from specialist video games courses managed to find a job in the video games sector within six months of graduating, despite demand from the industry. ICT in schools is seen as failing to produce the skills needed, resulting in mismatches between what schools are producing and what universities want and between what industry needs and universities are producing. Given the scale of the economic opportunities, that should give us all reason to reflect.

One of the remedies that has been proposed is to bring computer science into the National Curriculum, with ICT disparaged by some as being merely for users of technology and just concerned with boring office-type applications. There is a danger that politicians will be seduced by this message and seek to effect a "quick fix" initiative focused around a new subject name and some curriculum changes that will do little, if anything, to improve outcomes.

There is sometimes a very worrying lack of understanding of what ICT is concerned with. One coalition MP was recently reported commenting about his daughter, who produced interesting video material when at home; at school she had to study spreadsheets – by implication a tedious and unnecessary area of focus for Key Stage 3.

The quality of ICT teaching is variable and there is nothing sadder than hearing from learners who find their ICT lessons dull and without challenge. ICT should be and can be an incredibly rich and engaging area of study that offers crucial support to the whole range of human endeavour. The study of modelling and data handling (spreadsheets and databases) and the associated mathematical and analytical concepts requires academic rigour and skills of fundamental importance. ICT can also cover sound and video editing, graphics, design, control, programming, website production and more, thanks to a National Curriculum that recognised the rapid pace of technological change and allowed teachers significant flexibility.

The vision for the subject that underpinned the Secondary National Strategy further promoted richness of content and a vibrant, evolving curriculum. Whilst some valuable developments were initiated, much of this vision remains unfulfilled, but there was a shift to begin to promote the learning of some of the more technical aspects of computing.

All pupils should be exposed to some of these more elemental aspects in order to build their understanding of technology and the underlying concepts and to inspire those who might go on to further specialised study. In the stronger ICT departments this is happening already.

However, we should not forget that most learners will spend their working lives as users of technology and will not need, nor find engaging, protracted study of the maths and science of computing.

Computer science can be incredibly rich, challenging and engaging to a smaller number of pupils. It suffers from being a relatively specialist interest and getting viable class sizes for GCSE and post-16 courses will be an issue for many schools. Finding sufficient numbers of high quality specialist teachers will be an even greater challenge. Providing appropriate professional development for existing ICT teachers to improve their ability to deliver aspects of computer science and to improve overall teaching quality, will require determination and imaginative solutions, especially following the rapid contraction of local authority curriculum teams.

Secondary schools that are forced to use large numbers of non-specialist teachers to deliver the subject at Key Stage 3 face the biggest hurdles. Whilst GCSE and post-16 courses are

normally given priority, this can result in poor experiences in Years 7-9 that drive pupils away from ICT and related areas when choosing examination courses.

We rightly try and place learners at the heart of education. However we should not forget that teachers generally perform best when they are delivering material of which they have a thorough understanding, enjoy teaching and believe to be of fundamental importance.

Government should be mindful of the effect of operating in a market-driven qualifications environment. There is huge pressure on attaining excellent examination grades throughout the education system and an expectation that we can go on improving results year after year. The danger is that this comes at the expense of true educational quality.

If heads of department are offered two qualifications, one of which is challenging, academically rigorous and likely to result in lower average scores and the other which is more routine and easier to get good grades for large numbers of learners, how many would have the courage, or indeed be allowed, to select the former? This creates strong market pressure for all examination boards to offer qualifications with less rigorous characteristics and the potential for a "race to the bottom". No great surprise that we end up with qualifications that offer multiple GCSEs and which are seen as an easy way to climb examination league tables.

The push for teaching computer science as part of the National Curriculum brings a welcome focus on technology and reveals how much support there is, from highly dedicated individuals, for doing the very best we can for our young people. It is crucial that we do not lose the opportunity to reinvigorate the teaching of technology by rushing in to poorly considered, relatively superficial initiatives.

We need strong collaboration between Government, industry and all sectors of education, together with a determination to find long-term, sustainable solutions to issues such as

- the supply of specialist technology teachers

- continually reviewing and updating what is taught to reflect changes in technology and market opportunities

- reviewing and updating qualifications to maintain rigour and relevance

- properly equipping schools to allow the effective delivery of the curriculum

- and perhaps most importantly, improving the professional development of teachers to help them keep abreast of changes, update their knowledge and skills and boost their confidence in new areas of the curriculum, in order to improve the overall quality of technology teaching

The debate about the place of computer science provides a valuable opportunity to make a significant difference to the lives of young people and to the UK economy, by improving technology education. High quality educational discussions should avoid the descent into a turf war between ICT and Computer Science factions. However, there is a danger that the proposed suspension of the programme of study might be seen in some weaker departments as an opportunity to ditch some hard to teach aspects of the curriculum, instead of striving to find more engaging approaches. It could also lead overall to an unwelcome narrowing of the curriculum. Is the Government setting the subject free or casting it adrift?

All change brings risk, the benefit should be the generation of a raft of new opportunities for schools and teachers to grasp. Ultimately the outcomes depend on the qualities of those that choose to get involved. We should be in for a period of stimulating developments.

Mark Baker

Director, Education Vision Consultancy Ltd.