

# Written evidence submitted by Paul Long, Computing in Education Consultant (DIG0035)

## Executive Summary

1. GCSE and A Level Computer Science qualifications are a positive step forward.
2. The removal of GCSE and A Level ICT qualifications from 2017 is going to extend the digital divide and leave a severe skills shortage in digital literacy.
3. There is insufficient funding for schools to maintain, let alone develop, IT facilities.
4. There is insufficient training available for teachers who will be required to teach Computer Science instead of ICT.

## Who am I

I taught Computer Science and ICT for 15 years in two secondary schools. For 9 of these years I was Head of ICT in a very successful Technology College where I turned their ICT provision and teaching from failing to being commended by OfSTED. I have been a principal examiner and moderator for the OCR exam board and am now currently an adviser and developer for another exam board. I have written several A Level ICT books that are used across the UK and the latest is to be used internationally. I run training courses for teachers across the UK and visit over 30 schools a year to run revision days. I am in contact with over 400 ICT and Computer Science teachers. My website [www.paullong.net](http://www.paullong.net) includes testimonials from both teachers and students. I am submitting this evidence in my capacity as a consultant in Education Computing and as an experienced teacher.

## The extent to which there is a digital skills gap and whether the Government's initiatives are appropriate and sufficient to fill the gap

It is my view, and also that of thousands of teachers across the UK, that the government has made a big mistake by removing GCSEs in ICT and Computer Science from September 2017. This is actually going to increase the digital skills gap rather than reduce it.

We all understand the need for Computer Science as a subject and I fully support promoting it as a subject in its own right. However, the government has suggested that because ICT and CS are in the same 'subject space' that ICT will be discontinued as a GCSE and as an A Level. This is absolute nonsense and shows a complete misunderstanding of the two subjects. Computer Science is a very technical subject focussed on computer programming and computer/software architecture whereas ICT is more focussed on how IT is used. There is extremely little crossover between the two subjects and there is space for both to co-exist. IT covers topics such as networking, database management, system life cycle, project management, advanced spreadsheets, distributed databases and human computer interfaces which are not covered in Computer Science.

Suggesting that IT and CS are in the same subject space is the same as suggesting Physics, Biology and Chemistry are in the same subject space. They are definitely different subjects, but with a common theme of science. IT and CS are different subjects but with a common theme of computers and technology.

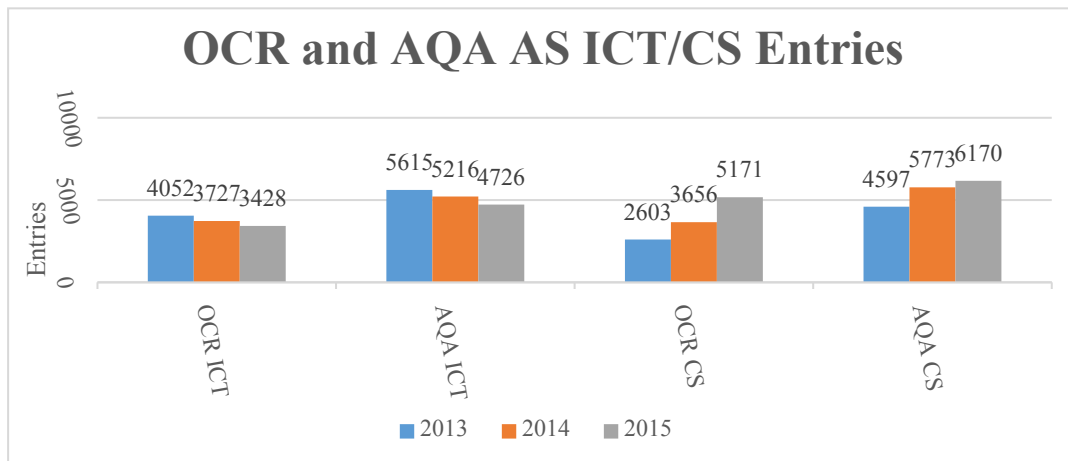
The DfE's decision to remove GCSE and A Level IT is short sighted and needs full consultation. Teachers across the UK will tell you that IT is needed (evidence available from Government petition - <https://petition.parliament.uk/petitions/111693>). If the government believes this will increase the number of students taking Computer Science, then they are sadly mistaken. They are different subjects and non-science and non-mathematical orientated students will not take this as an option. This is going to mean that there is a massive gap for the 111,934 students who took ICT as a subject in 2015 – many thousand more than the 35,414 who took Computer Science as a subject in 2015. That leaves a gap of nearly 80,000 students. Even if 20,000 took Computer Science, it still leaves another 60,000 who will not have IT literacy skills for the employment market place and we will be behind our European counterparts.

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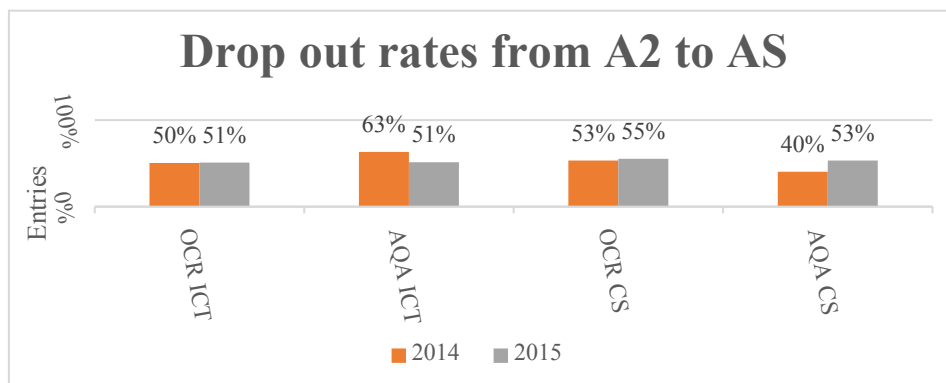
Some government ministers are suggesting that the GCSE and A Levels in ICT are not rigorous enough – I would challenge them to sit those exams and complete the coursework before they make such a sweeping statement.

### Further measures by Government needed to improve digital literacy

The government needs to ensure that GCSE and A Level qualifications in IT are redeveloped. Otherwise, it is clear that the teacher shortage for CS specialists, and the lack of desire for many students to want to do such a scientific subject will result in thousands of students not studying any sort of computing qualification. You will see from the graph below that although the number of students taking A Level CS has increased for OCR and AQA exam boards, it has only slightly reduced for students taking ICT.

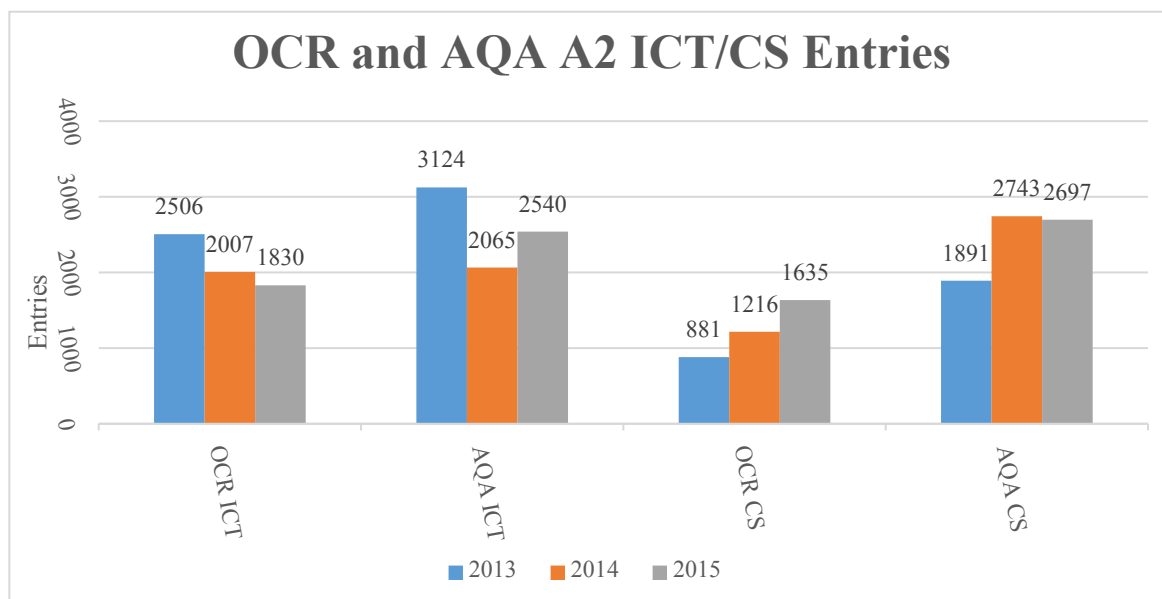


This is good news because it means there are more students taking a computing subject at A Level in total. However, by removing the ICT A Level, there will be far fewer students taking the subject as it is naïve of the government to think that students will simply take computer science as an alternative. You also need to look at the drop-out rates graph which shows there are high drop-out rates for both subjects.



This is reflective of the level of demand of both subjects which students are surprised to discover when they embark on an AS course and find they cannot continue to A2 because the level of demand for both subjects is so high. The graph below shows the evidence of how the drop-out rates were calculated from the initial AS graph to the A2 graph:

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### **How well the current education system addresses the digital skills gap**

With both ICT and CS available as GCSE and A Level qualifications, the current education system is now addressing the digital skills gap. Before CS was promoted as a subject, it was not covering this fully as there was not an option for the more technically minded. However, removing GCSEs and A Levels in ICT will mean that the future education system will not be addressing the digital skills gap correctly. Ridiculous comments like suggesting that ICT is just about word processing and powerpoint are just ignorance of what the subject really involves. Digital literacy needs further promotion.

### **What is being done to equip teachers in the classroom**

Very little. There is still a shortage of ICT teachers across the UK with many schools using non-specialists to teach ICT. Many ICT teachers are specialists in their own subject but not specialists in Computer Science and many fear that they will not be able to cope with teaching a different subject as technical as Computer Science.

The DfE have not considered the implications for the teaching profession. While some IT teachers can retrain to teach Computer Science (despite insufficient training having been made available), many are not Computer Science specialists as they have degrees in IT and so to expect them to teach A Level Computer Science is unrealistic. What does the government propose for these committed and trained teachers who will no longer have a subject to teach? Who will teach A Level Computer Science? Who will teach GCSE Computer Science? It is like asking a teacher of biology to teach physics or chemistry. It is irresponsible. There are courses available but at very high costs to schools and most just focus on programming and ignore the rest of the syllabus. Schools cannot afford to send teachers on training. To be effective, teachers need around 20-30 days of training to change from one subject to another. This is not being provided or funded.

### **The adequacy of the current ICT provision in schools**

This is getting worse. When National Grid for Learning funding was available, schools were able to improve their technology and provide robust systems for students and teachers. Now schools are struggling with funding and with no ring-fenced funding for ICT, systems are becoming old and out-dated. It is not unusual to see computers and servers that are 7 or 8 years old in schools due to lack of funding. There are often insufficient facilities available too with teachers unable to book ICT facilities for their classes. There needs to be annual ring-fenced funding of around £150,000 for a school sized 1,000 pupils plus a capital injection to bring schools back up to standard.

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Further to this, schools that were part of the BSF programme have been left with extortionate running costs for their computer systems. One school I met with told me that they have to pay their provider £1,000 per piece of software they want installed or upgraded, even if it is free software. This has inhibited development and inhibited learning. Schools need to be free to run their own ICT services.

### **The work being done by universities and industry to ensure that the computing curriculum is relevant**

These are the biggest culprits. They are the ones that said CS was needed at A Level and GCSE but it was only the redbrick universities and big technology industries such as Microsoft and Google. The majority of industry needs students with standard ICT skills, not programmers.

While I commend the promotion of Computer Science as a subject, it must not be at the expense of IT. Most employers need students to leave school with high quality IT skills. It is a minority of specialist employers that require programming skills. We are going to experience a serious skills shortage when students who are due to start their GCSEs in September 2017 leave school in June 2021. Employers will be complaining that learners are leaving school with poor IT literacy. Our society needs students who can use spreadsheets competently, who can design, develop and query databases appropriately, can use mail merge to send out letters efficiently, can build networks and can analyse, design, develop and test systems.

Further to this, despite squeezing IT out of the curriculum and promoting CS, universities have not changed their entrance requirements to do a CS degree. The majority of universities require a maths A Level and not an A Level in CS. This means that for higher education, an A Level in CS is pretty useless as it will just all be repeated at university. There are still many universities offering degrees in IT, networking and other computing related areas that are happy for students to have studied an IT A Level.

### **The extent to which there is a digital divide and whether digital exclusion exists [sic] in the current workforce**

Within this consultation, there is clearly a literacy divide as this question does not make sense. I assume that “exists” should be “exists”. This is typical of somebody using ICT who has not checked their spelling but has relied upon a spell checker – something that has always been taught but will not be under the new CS curriculum.

The current workforce suffers far less from digital exclusion. However, by 2021 there will be a massive digital divide and digital exclusion will be higher than normal due to only a minority of students studying computer science at GCSE and A level and most students not studying any type of computing qualification at all. This is why a GCSE and A Level in IT are still required.

### **The financial impact of the lack of basic digital skills on the economy**

This will soon become apparent in 2021 when employers have to run their own IT training and find that employees are less efficient when it comes to digital literacy and so are not as productive as they used to be.

### **The extent of any unconscious bias in the digital/IT sector**

Computer Science clearly attracts more boys than it does girls, in a similar way that physics does. However, it is natural that there are gender differences and that gender is an influence on people's choices in life. Although we should promote subjects like CS and ICT to students, I do not feel that we should be concerned that there is not a 50-50 split. Instead, we should let nature take its course.

There is however a conscious bias in that women in the digital/IT sector are more likely to get jobs or be promoted purely because they are the ‘minority’ and this type of ‘positive’ discrimination must be stopped.

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