

# BCS CERTIFICATE IN COMPUTER SCIENCE TEACHING

The BCS Certificate in Computer Science Teaching provides certification which is tailored to the individual needs of computing teachers

STORY BY Nadine Vaillant Hill & Andrew Csizmadia

**T**he Government's digital strategy (DfE March 2017) recognises the fact that the UK's future economic prosperity depends on us addressing the growing digital skills crisis. Schools are embracing the computing curriculum introduced in 2014; however, the national shortage of computing teachers is growing. This means that schools often need to turn to teachers of other subjects to help deliver the computer science elements of the curriculum including teaching the subject at GCSE. Schools and teachers can access a range of support, training and CPD from various organisation such as Computing At School and the Raspberry Pi Foundation, but how do they know their knowledge of the subject is at the standard to teach their GCSE students?

The BCS Certificate in Computer Science Teaching (the Certificate) was conceived by Sue Sentance, Senior Lecturer in Computer Science Education at King's College London, who recognised that teachers give up their time "developing their computing subject knowledge and a mechanism was needed to give recognition and "certify" teachers."

Sue and the team that developed the Certificate recognised that serving teachers are very busy, and they felt it was really important that the Certificate was

"rigorous, but not onerous" and made a difference to teaching practice and student learning. The certificate was developed to have "a focus on pedagogy and formative assessment of drafts, and gave teachers an opportunity to work on useful projects as well as provide certification." Thus, the Certificate provides teachers with certification and recognition for their professional development.

## Structure and Support

The two versions of the BCS Certificate in Computer Science Teaching (Primary and Secondary allow teachers to reflect the school settings they work in. Teachers have up to a year in which to complete the three parts that make up the Certificate. A bespoke, secure Certificate Learning Environment has been developed and continues to be updated to support teachers with the guidance and resources to enable them to complete the Certificate successfully.

As teachers work towards the Certificate they are supported by their individually assigned e-assessor, who will support them in developing their evidence for the Certificate. The Certificate has been designed and developed around a model of formative assessment. This means the e-assessor provides meaningful and constructive feedback on plans and drafts

at each stage to help teachers to improve and refine their work instead of simply submitting it all at the end, when they believe they have achieved the standard required for the Certificate.

## Components of the Certificate

As indicated the Certificate consists of three parts, as shown, which can be completed in any order. (Fig.01)

### 01 Reflection on professional development

To pass Part One of the Certificate, a teacher is required to show evidence of having undertaken at least 20 hours of eligible CPD within the previous two years. The evidence is recorded in a professional development log which includes their reflections on the impact of the CPD on their own learning, on their teaching of computer science and for their learners. As with all evidence and communications, it is submitted via the secure Certificate Learning Environment. Evidence can be drawn from a variety of sources, e.g. CAS Hub Meetings, Picademy training and online learning.

### 02 Programming project

The second component of the Certificate has been designed to allow a teacher to design, develop and submit a

ATTEND  
AND REFLECT  
ON CPD



COMPLETE A  
PROGRAMMING  
PROJECT



CARRY OUT A  
CLASSROOM  
INVESTIGATION

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working program. Secondary teachers are required to produce a program using a text-based language of their choice. Whilst a primary teacher can produce a program using either a block-based language or a text-based language if they prefer. Instead of writing small snippets of code, teachers demonstrate their ability to produce a complete working project by using a range of programming techniques.

Projects that teachers have produced include:

- Text-based adventure game (Secondary)
- Demonstration of encryption techniques (Secondary)
- Numeracy quiz (Primary)

Teachers submit their proposal of the program they intend to develop and receive constructive feedback from their e-assessor regarding the suitability, feasibility and complexity of the program proposed. Teachers need to act upon the feedback and develop a program which meets their design brief. Teachers will receive feedback on their first draft suggesting any improvements before submitting the final revised program.

### 03 Classroom investigation

For Part 3, the teacher needs to do on a small-scale classroom investigation with reflections and a report. This will focus on some aspect of teaching the computer science elements of the computing

curriculum. As with Part Two, teachers submit a proposal for their investigation, act upon the constructive feedback they receive from their e-assessor before conducting their investigation using the most appropriate research methods and tools. A short draft report is provided for feedback before they submit their final report.

Teachers have chosen investigations such as:

- How can students successfully progress from Scratch to Python?
- The importance of storytelling in teaching programming
- Does paired programming help students with debugging?

Exemplar materials produced by teachers who have completed the Certificate are available to help teachers at each stage of the Certificate.

### Support for achieving the Certificate

Following the established principles of good CPD, the Certificate was designed to support teachers from their own starting points and to achieve the learning objectives that they set for themselves. Consequently, teachers can choose to achieve the Certificate independently, drawing on their existing subject knowledge and attendance at relevant courses.

Alternatively, the Certificate team offer online courses to guide and support

teachers for both Part 2 and Part 3.

Teachers can enrol on the courses at any stage of working towards the Certificate, even if they began with the plan to achieve the Certificate independently. This helps when busy teachers find they need the structure attending a course provides, or they need to supplement their subject knowledge. These online courses are delivered by subject matter experts, such as Dave Ames, Duncan Maidens and Jane Waite.

The Certificate is based upon a model of experiential learning. This approach allows a teacher to realise the benefit of the CPD they have attended; their own personal study by putting what they have learnt into practice by creating a functional project, and investigating an aspect of teaching computer science in the classroom. (HW)

## SUMMARY

- For further information: [www.bcs.org/teachingcertificate](http://www.bcs.org/teachingcertificate)
- An evaluation of the Certificate by Sue Sentence and Andrew Csizmadia is available at: [helloworld.cc/2CGU4r3](http://helloworld.cc/2CGU4r3)
- "My assessor was brilliant and always on hand to answer any of my questions. She was also very good at marking/responding within a few days of me submitting my assignment."  
Nicola Hancock (Secondary Teacher)