



NETWORK OF
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SCIENCE
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Network of Teaching Excellence in Computer Science, DfE Project Update January 2014

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The Network of Teaching Excellence in Computer Science is run by BCS and CAS, with funding from April 1st 2013 to March 31st 2015.

Executive Summary

The Network of Excellence has set ambitious targets for the Master Teacher programme and we are delighted that, to date, we are broadly meeting those targets and in some cases exceeding them. There are now 876 schools registered to the Network, with 261 Lead Schools. There are, to date, 63 Level 2 secondary master teachers and 16 level 2 primary master teachers. We have many applications waiting to be processed for the next round of applications, ahead of schedule.

The Level 1 master teachers have been appointed and are starting their training with their allocated university this term.

Concerns over primary recruitment are generally being addressed by the actions we are now taking, but the targets going forward are challenging and we maintain our focus on reaching primary colleagues through various channels including the 'Barefoot Computing' programme, regional training days and working with partners such as Code Club and Rising Stars.

Schools

The Network of Excellence team has been incredibly productive and creative to ensure that we have met and exceeded our January 2014 target. We undertook a range of activities to make both primary and secondary teachers aware of both the Level 1 and Level 2 Master Teacher programme.

A sample of these activities include: greater use of social networks including Twitter, a covering letter accompanying the [Primary Guidance Booklet](#), a letter to all 157 Primary Teaching School alliances outlining how the programme could enhance and support their work as a Teaching School. Members of the NoE Team have regularly spoken at conferences

run by not-for-profit partner and commercial organisations addressing directly senior leaders in schools. We have also mobilised our existing network of Master Teachers to recruit a minimum of 10 primary colleagues from feeder or cluster schools to join CAS, noting both the Primary Guidance and opportunities to become a CAS Master Teacher.

As a result of this work, both the Level 1 and the Level 2 Primary Master Teacher program were heavily over subscribed. However, the recruitment for Level 2 Primary Master Teachers will remain challenging for the Team with respect to meeting future targets as the numbers of required appointments increases. We are working closely with the Department for Education on a social media initiative that will include interviewing CAS Master Teachers and filming a primary CAS Hub meeting to raise the awareness of their value, as well as building partnerships with both the SSAT Schools Network and Academy chains.

Targets for January 2014:

Description	Target number:	Applicants	Appointed	Comments
Level 2 Primary Master Teacher	15	19	16	11 have successfully completed and returned references The extra position will be used to back fill one of the two positions from the September cohort i.e. we only used the funding for 13 of the 15.
Secondary Level 1 Master Teacher	30	96	30	23 have successfully completed, returned references and been allocated to a university

Targets for April 2014:

Description	Target number:	Applicants	Appointed	Comments
Level 1 Primary Master Teacher	30	52	30	22 have successfully completed, returned references and been allocated to a university

References are still coming in from Head Teachers and in the process of allocating successful candidates to universities it has not been possible produce a list of names and map their geographical locations in time for this report.

A summary of the activities and impact of Level 2 Primary and Secondary Master Teachers will be provided in the next report because the deadline for providing such information doesn't align with this reporting period.

University Engagement

Work with Level 1 (Trainee) master Teachers

Six universities have been recruited to provide training from January to July 2014 for 30 Primary MT (No Comp) and 30 Secondary MT (No Comp). These universities are:

- Anglia Ruskin University (CS + Edu)
- Birmingham City University (CS)
- Edge Hill University (Edu)
- Newman University (Edu)
- University of Roehampton (Edu)
- Sheffield Hallam University (CS+Edu)

This training will include 1-1 sessions and will start at the end of January.

The six universities have met to coordinate their training so that consistency will be maintained between all providers. Resources will be shared between universities to minimise duplication of effort and to share best practice. Primary Master Teachers will have 5 days of training plus self study and 1-1 sessions. Secondary Master Teachers will have 10 days of training plus self-study and 1-1 sessions.

In the next stage of the programme for L1 CAS Master Teachers, 14 universities will be engaged to deliver training in the next academic year to 140 teachers (100 primary and 40 secondary) according to the milestones we have been working to. We are currently preparing to open the bidding process for the funding to deliver this training.

Other University Engagement

73 universities in England are signed up to the Network of Excellence and the number of contacts who are interested and engaged is growing steadily. We have a small University Task Force to support the NoE team in working with universities. For example, Professor Achim Jung travels to different universities to give talks on how universities can become engaged with the Network of Excellence. We also hold regular meetings for universities and share information via a mailing list and it is clear that a strong community of practice with a

common goal is developing. 23 universities were represented a meeting of Network of Excellence universities in London with the next meeting to be held at the University of Manchester on Tuesday 14th January. This will have a focus on sustaining networks and how universities can work with master teachers.

University engagement takes place in a number of ways:

- Running CPD events for their local teachers, in conjunction with master teachers.
- Providing structured training for Level 1 CAS Master Teachers (funded)
- Providing SKE provision for applicants to teacher training courses
- Providing training and support leading to the new Certificate
- Hosting CAS primary regional conferences
- Providing on-going support for experienced Master Teachers

In terms of universities wishing to run CPD events we provide support in terms of suggested outlines for courses and administrative support in terms of booking, certificates and feedback forms. Some universities do not require this support as they have developed systems within their own university for doing this and have established programmes of CPD. We welcome any university willing to support teachers in this way. The University of Warwick and the University of East Anglia have created MOOCs to enable teachers to study Computing from home.

The current task is to ensure that universities are in contact with local master teachers within a region. As the network of master teachers grows there will be more of a role for universities to support these teachers in maintaining and developing their Computer Science subject knowledge so that they can continue to be outstanding CPD providers for other teachers.

Newsletter

We now have a Network of Excellence newsletter to facilitate communication amongst all parties involved with the Network of Excellence. The new online newsletter is being sent to all schools and universities in the Network of Excellence, and master teachers. It will be issued every half term ([Issue 1 was October 2013, Issue 2 December 2013](#)) and contains useful updates on what has been happening within the Network of Excellence and ways in which schools and teachers can get involved. See an example [here](#).

BCS/CAS Certificate of Computer Science teaching

We wish to accredit master teachers and other good Computer Science teachers with this new BCS/CAS Certificate of Computer Science teaching. It will be awarded to teachers who can show evidence that they have competence in both the subject knowledge and pedagogy of Computer Science teaching. We have just commenced a pilot with 53 teachers from

primary, secondary and further education, with a view to being formally launched to start in September 2014.

The intention of the BCS/Certificate in Computer Science Teaching is to give teachers recognition of teaching competence in the Computer Science elements of the new Computing curriculum. In the next few years we anticipate that many teachers across the UK will become skilled in teaching Computing although this may not be the subject for which they have trained. This requires a good understanding of the domain of Computer Science and the development of appropriate pedagogical skills to teach the subject. The aim of the certificate is to recognise this.

The certificate is evidence-based. Teachers wishing to gain the certificate will supply us with three pieces of evidence. These will demonstrate the following three competencies:

- 1) A commitment to improving/maintaining subject knowledge and skills in Computer Science
- 2) Computer Science knowledge and skills, including programming skills
- 3) Understanding of and application of pedagogical strategies suitable for teaching Computer Science

Our long term hope is that the certificate will gain credibility with support from DfE and/or NCTL

Universities in the Network of Excellence are in a key position to support the new certificate as they can comment on project proposals and assist us with assessment.

Training events

The new master teachers are planning a number of events for January and February. Here is a snapshot of a few of the events that have just been held and some of those planned for the next few months:

Month	University/Master Teacher	Title of Event	Audience
Nov-13	University	Introduction to Python Programming	Key Stage 3 (Years 7, 8 and 9); Key Stage 4 (GCSE or equivalent)
Nov-13	University	What happens if ... algorithms and prediction at Key Stage 1	Key Stage 1 (Years 1 and 2)
Dec-13	University	Teaching Python Programming	Key Stage 3 (Years 7, 8 and 9)

Dec-13	Master Teacher	Prepare to Teach Algorithms and Programming	Key Stage 1 (Years 1 and 2)
Dec-13	Master Teacher	Little Man Computer	Key Stage 3 (Years 7, 8 and 9);Key Stage 4 (GCSE or equivalent);A Level
Dec-13	University	Algorithms and Computer Science at Key Stage 2	Lower Key Stage 2 (Years 3 and 4);Lower Key Stage 2 (Years 5 and 6)
Dec-13	Master Teacher	Introduction to computational thinking (Primary)	Lower Key Stage 2 (Years 3 and 4);Lower Key Stage 2 (Years 5 and 6)
Jan-14	Master Teacher	Using Raspberry Pis to teach computing	Lower Key Stage 2 (Years 5 and 6);Key Stage 3 (Years 7, 8 and 9);Key Stage 4 (GCSE or equivalent);A Level
Jan-14	Master Teacher	Computing at Key Stage 3	Key Stage 3 (Years 7, 8 and 9)
Jan-14	Master Teacher	Teach Programming With Scratch	Lower Key Stage 2 (Years 3 and 4);Lower Key Stage 2 (Years 5 and 6)
Feb-14	Master Teacher	Binary numbers and data representation.	Key Stage 4 (GCSE or equivalent);A Level
Feb-14	University	Computing in the Key Stage 1 Classroom	Key Stage 1 (Years 1 and 2);Lower Key Stage 2 (Years 3 and 4);Lower Key Stage 2 (Years 5 and 6)
Feb-14	Master Teacher	Introducing the World Wide Web for KS2	Lower Key Stage 2 (Years 5 and 6)
Mar-14	Master Teacher	The CPU, fetch execute cycle, binary logic (logic gates)	Key Stage 4 (GCSE or equivalent);A Level
Mar-14	Master Teacher	Bits, bytes & Binary: How data works	Lower Key Stage 2 (Years 3 and 4);Lower Key Stage 2 (Years 5 and 6);Key Stage 3 (Years 7, 8 and 9);Key Stage 4 (GCSE or equivalent)
Apr-14	Master Teacher	Planning for KS3 Computer Science from the Program of Study to	Key Stage 3 (Years 7, 8 and 9)

Learning Journeys

Feedback from each event is collected via an online form and feedback on the impact of training is collected 10 weeks later (see previous report). The forms have been designed centrally to maximise consistency of feedback for effective evaluation and also to ensure quality assurance.

An issue – data collection

Many other events are held within CAS which were not specifically registered as Network of Excellence events – however we believe many of these were intended by the providers to be Network of Excellence events. One of the issues we are facing is encouraging schools and other providers to keep us informed of events that they run for teachers so that we can focus on gaps in a particular region. The ethos behind the Network of Excellence is ground-up not top-down and a side-effect of this is that the data can be difficult to gather effectively.

Subject Knowledge Diagnosis Tool

Progress is being made to develop a tool to clearly diagnose areas of subject knowledge with which teachers will need training in Computer Science. This is based on actual knowledge not perceived knowledge. It will be trialled with the Level 1 CAS Master Teachers just starting their training. Teachers will use the tool online by answering a series of subject knowledge questions and the CPD they need will be identified.

Primary School teachers

As noted in our previous report engagement with primary teachers was considered to be more challenging than with secondary teachers for a number of reasons. It is particularly pleasing that the recruitments to the Master Teacher programme for primary practitioners is now essentially on target. Many of the applications were made at the end of the Autumn term (2013) and is due, in no small part, to the work done by the team and our supporters to reach primary schools. The [primary guidance document](#) has been particularly influential.

The CAS Regional hub leaders have also been encouraged to make a concerted attempt to connect with primary schools in their area. Many of whom are now running hub meetings for primary colleagues.

Although future targets are still challenging we are hopeful that the regional training days (see below) will bring the needs of the new curriculum into focus for many teachers and from there we will build communities of practice for primary colleagues. The new 'Barefoot Computing' project will also fill a strategic gap and equip primary school teachers with the basic knowledge and confidence needed to begin the journey towards becoming an

excellent computing teacher. We see this project as a stepping stone to encourage more experienced primary teachers to join the Master Teacher programme in their area.

Regional Training Events

A number of regional training events have been arranged for primary teachers in association with many of our university partners:

28th February	Exeter University*
12th March	Nottingham Trent University*
26th March	Oxford Brookes University*
28th March	Manchester Metropolitan University*
31st March	University College London*
2nd April	University of Cambridge*
2nd April	Southampton University
2nd April	Newcastle University

Those starred (*) have been organised in partnership with [Rising Stars](#) who are supporting through administration and logistics. There is scope for more and several of our partner universities are currently considering how they might be able to contribute.

Simon Humphreys
Network of Excellence Coordinator
January 2014