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TOWARDS A SUSTAINABLE SOLUTION TO THE SHORTAGE OF COMPUTING TEACHERS IN SCOTLAND

Judy Robertson, November 2019



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EXECUTIVE SUMMARY

Learners in Scottish schools deserve high quality teaching about computer science so that they have the opportunity and skills to participate in Scotland's digital economy. Scotland's digital sector is growing fast, contributing £4.9 billion (GVA) to the Scottish economy and employing 100,000 people¹. However, as around half of Scottish employers in the digital sector report difficulty in recruiting to fill their digital skills gaps, it is clear that the education system needs to do more to support talent development in computing. One barrier to achieving this is the current shortage of computing teachers in Scotland. For the last three years, the target numbers identified by Scottish Government for student computing teachers on initial teacher education (ITE) courses have not been met. There are currently 595 computing teachers in Scotland, whereas a decade ago there were 766 (22% fewer)².

Co-ordinated action is required to sustainably address the shortage of computing teachers. We present recent research, commissioned by University of Edinburgh and with grant support from Skills Development Scotland, which explores why computer science graduates do not choose to become computing teachers, and what might persuade them to pursue this career. We conducted a literature review, a survey of recent computer science graduates and focus groups with current computer science students. This research focuses primarily on the recruitment of new teachers; future work could consider the retention of existing teachers. Our research highlights that:

- *The problem isn't too big to tackle.* We require between 50 and 60 new computing teachers per year, whereas our Universities produce in the order of 5000 computing graduates per year.
- *There is a group of qualified individuals who could be persuaded to become computing teachers.* 44% of recent computing graduates who took part in our survey said computing teaching was "quite a good", "good" or "great" career option.
- *Computer science students value good teaching.* Participants in the focus groups spoke about how they had been inspired by their teachers and recognised the value of teaching to society. They felt that the teaching profession is now less respected in society that in previous times.

¹ <https://www.skillsdevelopmentscotland.co.uk/media/43306/scotlands-digital-technologies-summary-report.pdf>

² <https://www2.gov.scot/Topics/Statistics/Browse/School-Education/teachcenssuppdata/teasup2018>

- *Concerns about pay and conditions are complex.* Many participants were concerned about what they perceive to be low pay for teachers. However, there is a wide range of starting salaries within the IT profession, and this varies by geographical region. Current initial teacher salaries are comparable to the lower end of IT graduate starting salaries, particularly considering the 13% pay increase for teachers which was agreed in March 2019. Participants considered other aspects of the working environment to be important too, such as working hours, job related stress and autonomy.
- *Flexible work options make computing teaching more attractive.* Survey respondents said that teaching for 2-3 years (rather than their entire working life) would make it a more attractive option (47%) and 80% considered part-time options more attractive. This is consistent with focus group participants' views.
- *Computer science graduates want to keep their technical knowledge up to date.* Participants emphasised the importance of continued professional learning and personal development.
- *Computing teaching careers are not visible when students make their career choices.* Computer science students are actively "courted" by industry but they do not hear about the teaching profession at careers events. Their attitude to this career is shaped by their own school experiences (which unfortunately were sometimes negative), and some influence from friends or family.

We propose a short-term plan for improving communication about computing teacher career routes, and a medium to longer term plan to open up flexible routes into computing careers. We believe it would be most effective for national stakeholders - including government agencies, GTCS, universities, IT employers, and learned/professional societies - to work together to solve this problem.

- In the short term, *we recommend a relatively low-cost project to improve communication about computing career options* including a positive campaign to promote computer science teaching careers among computer science university students. We believe that face to face presentations by enthusiastic computing teachers at university careers events could be effective, along with a well-designed website to present factual information.
- In the medium to longer term:
- *We recommend opening up more flexible routes into computing teaching, each step of which introduces more computing experts into the classroom to perform a useful role.* We believe that computer science undergraduates should have the opportunity to help in classrooms, and should be rewarded for doing so. There should also be structured routes to make the most of the valuable contributions from software industry volunteers. We recommend more flexible (perhaps part-time or distance) initial teacher education courses in this subject.
 - We propose the introduction of a *computing expert role for classrooms*, similar to the British Council's language classroom assistants where experts are paid on a part-time basis to work alongside computing teachers, helping children to learn challenging and up to date topics.
 - We also recommend that teaching jobs should be more flexible (supporting braided careers), and offer more opportunities for up to date professional learning.