



# Computing Science Teachers in Scotland 2014

A report by

**COMPUTING AT SCHOOL SCOTLAND**

EDUCATE • ENGAGE • ENCOURAGE

Part of BCS, The Chartered Institute for IT

## Introduction

Computing At School Scotland conducted FOI requests in 2012 and in 2014 regarding the workforce of secondary Computing Science teachers across Scotland.

In 2012 we requested information from all 32 local authorities on the number of Computing Science teachers in each school in their authority currently and the same figures from 2006. We knew that 2006 was the peak for numbers of Computing Science teachers from the Government statistics that are published each year.

Unfortunately the government figures didn't give information broken down school-by-school in 2006, and the 2012 figures didn't provide us information about Computing Science teachers in each local authority.

We asked the SQA for numbers of pupils sitting Computing Science courses at schools in Scotland as a way of identifying possible errors in the results that we got from the local authorities.

In June 2014 we repeated the FOI requests so see if the picture had changed with the introduction of National 5 in schools. This time, we also asked for information about which qualifications the schools were planning on delivering this year and if the local authorities had encountered any problems recruiting Computing Science teachers or finding supply cover in the subject.

We felt that it would be useful to investigate the numbers of new teachers coming into the system so we also asked Initial Teacher Education institutions and the GTCS about the numbers of probationers and student teachers in Computing Science in Scotland.

## Data Sources

We made FOI requests with the following organisations:

- All 32 local authorities (30 satisfactory responses, one did not breakdown the figures by school and one is thought to be inaccurate)
- The Scottish Qualifications Authority (SQA)
- The General Teaching Council for Scotland (GTCS)
- The Universities of Aberdeen, Glasgow, Strathclyde, Stirling, Edinburgh, Dundee and Highlands and Islands
- The Scottish Government
- The Scottish Funding Council

## Key Points in this Report

**Key Point 1:** There has been a drop of 14% in Computing Science teachers over the last two years.

**Key Point 2:** 12% of schools do not have a Computing Science teacher.

**Key Point 3:** Low uptake, staff leaving and a need to reduce staffing were reasons given by some Local Authorities for the reduction.

**Key Point 4:** Some comments demonstrated a lack of understanding of the difference between ICT and Computing Science

**Key Point 5:** 10 of the 32 Local Authorities have had problems recruiting Computing Science teachers.

**Key Point 6:** Many Schools claim to be delivering Computing Science outcomes across the curriculum, but there is evidence of confusion with ICT skills.

**Key Point 7:** 43 schools are not in a position to offer Certificate-level Computing Science courses

**Key Point 8:** The target for PGDE Computing Science students (25) has not been met in 2014.

**Key Point 9:** ITE institutions are not getting enough quality applicants.

## Overall Results

**Key Point 1: There has been a drop of 14% in Computing Science teachers over the last two years.**

**Key Point 2: 12% of schools do not have a Computing Science teacher.**

Overall the number of Computing Science teachers in Scotland has gone down from 866 in 2007 to 773 in 2012 and to 663 in 2014. This is a drop of 109 teachers (14%) in the last two years, and a drop of 93 in the five years before that.

The number of schools without any Computing Science teachers has gone up slightly from 7.6% in 2012 (27 schools) to 12 % in 2014. That is 43 secondary schools without a subject specialist to deliver the experiences and outcomes for the subject or to deliver certificate-level courses.

We saw in 2012 that there were a couple of local authorities where this was a greater problem. This seemed to be in the more geographically challenging areas of Highland Council, Scottish Borders Council and Comhairle nan Eilean Siar where respectively 41%, 56% and 60% of the local authority schools did not have a Computing Science teacher employed. Shetland Islands have 2 schools without Computing Science staff but due to the low numbers of high schools in that authority that works out at 28% of their schools.

In 2014 we saw those percentages for those councils stay relatively steady, but an additional local authority joined the list: Glasgow City Council. Six of Glasgow's high schools don't have a Computing Science teacher now, which is 20%. In addition Dumfries and Galloway now have 7 schools without Computing Science teachers (47%).

Although the number of schools with Computing Science teachers had not changed too dramatically, the total number of teachers has had a sharp decline. In particular Fife and Glasgow have both lost 41 Computing Science teachers each. In Glasgow, 13 teachers were listed as "supply teachers" without an allocated school. Edinburgh and West Dunbartonshire saw a reduction of 9 teachers each, North Lanarkshire have reduced by 8 teachers and Argyll and Bute reduced by 6 teachers.

One local authority reported an increase in the number of Computing Science teachers: South Lanarkshire with 24 more teachers. Given this authority is reporting a greater number of Computing Science teachers than the peak year of 2006-7 it is anticipated that the authority has reported inaccurately, perhaps including Business Studies teachers in their returns.

## Reasons for the Decrease in Number of Teachers

**Key Point 3: Low uptake, staff leaving and a need to reduce staffing were reasons given by some Local Authorities for the reduction.**

**Key Point 4: Some comments demonstrated a lack of understanding of the difference between ICT and Computing Science**

**Key Point 5: 10 of the 32 Local Authorities have had problems recruiting Computing Science teachers.**

If a school does not have a Computing Science teacher, we asked local authorities to tell us the reason this had happened and the school's strategy for addressing the relevant Experiences and Outcomes.

Many of the schools without Computing Science teachers said that it was due to a combination of low uptake of pupils and a staff member leaving or a need to reduce staffing.

“Due to a falling school roll and staffing levels we now have no designated Computing teacher.”

“Overstaffing, poor results, low uptake”

“No demand from pupils”

“Teacher retired and not replaced. Low uptake”

One school mentioned that one factor was Universities don't require Higher Computing Science as an entry requirement:

“[We] stopped offering certificate computing over ten years ago. The Head Teacher decided that with reducing staffing, low uptake by pupils and the fact that the higher was not required for further and higher education entry that certificate classes were not viable.”

Another school said that they felt Computing skills were being developed across other subjects. This comment, and several others that stated

“The decision was taken to remove Computing from the senior phase of the curriculum due to low student uptake and the fact that it is very much a permeating element with the necessary skills being developed across subject areas.”

This statement raises a concern that Head Teachers and school management teams perhaps do not understand the difference between Computing Science and ICT, or that Computing Science is a rigorous academic subject.

Another area of concern is the lack of Computing Science teachers. There are currently not enough Computing Science teachers to address demand. Ten local authorities out of the 32 said that they had problems recruiting Computing Science teachers. Many authorities also mentioned low numbers of applicants. One local authority stated that of the eight vacancies advertised only one teacher was recruited. Another had 17 vacancies of which only nine were filled.

“When the teacher left the post was advertised several times and despite several attempts at advertising the post there were no applicants.”

"We had one applicant and he was appointed"

The lack of applicants also affecting the schools' ability to select high quality applicants.

“Not all candidates were of a high standard”

Fourteen local authorities out of 32 also said they had problems finding Computing Science supply teachers, with school supply requests going unfilled, even in central Scotland.

“There was no one available/prepared to take on the booking”

This is an understandable situation given the difficulties in recruiting permanent Computing Science staff and the difficulty getting supply staff more generally across all subjects and stages.

One school is addressing this problem by working with industry professionals:

"Tarbert Academy is working with the Argyll and Bute Digital Developer Forum with a view to delivering improved Computing provision within the school"

Two local authorities declared a surplus of Computing Science teachers. Glasgow said they had 13 supply teachers in Computing Science and East Ayrshire said they didn't need supply teachers in Computing Science because “we have surplus teachers in this subject area.”

## How are schools providing pupils with Computing Science Experiences and Outcomes?

**Key Point 6: Many schools claim to be delivering Computing Science outcomes across the curriculum, but there is evidence of confusion with ICT skills.**

Many schools said that Computing Science outcomes were going to be covered in ICT, Business, Enterprise, and technical classes or other curricular areas.

“The school continued to teach Computing Science/ ICT to 1st and 2nd year students by means of timetabled ICT classes and learning across the curriculum.”

“We have an S1 ICT course delivered by [the] Business Education teacher.”

“The outcomes are delivered through Business Management/Admin and are called ICT on timetable, some Technical teachers also deliver some aspects.”

“Coverage of Es and Os in the BGE phase through Enterprise periods as well as induction activities.”

“The broad outcomes are delivered in ICT/other curricular areas and a module available to S3 pupils.”

“There are teachers who deliver the ICT programmes as part of the BGE; teachers who may not have a formal qualification but do have an interest and expertise in ICT.”

One school’s response demonstrated the common lack of understanding regarding the difference between ICT and Computing Science:

“Students are taught some aspects during technical classes and the remainder is delivered cross-curricular, since each student has their own portable device.”

While it is commendable that each pupil in a school has access to a personal device, computer use should not be conflated with the principles of Computing Science. Computing Science is the study of computational systems and includes the design and development of software rather than just training in the use of software.

A few schools have thought about the previous experience and knowledge of the teachers who will deliver the Computing Science outcomes:

“The course will be taught next session by a member of staff with computing experience at university level.”

Some schools stated that some outcomes are not covered currently:

“We deliver TCH 3.08 through Business Management and TCH 3-09 is an area of development for the school.”

“TCH 4 outcomes not compulsory and thus not covered.”

## Higher Computing Science Choices

**Key Point 7: 43 schools are not in a position to offer Certificate-level Computing Science courses**

Seven local authorities have the majority of their schools offering the new Higher Computing Science course, ten are continuing with the existing Higher Computing course this year, and nine councils have a mix of schools offering the new Higher and schools offering the existing Higher.

Eleven local authorities have at least one school offering Higher Information Systems.

The greatest concern with the fact that 43 schools do not have any Computing Science teachers is that pupils at those schools will be unable to study Computing Science at certificate level, whether it be one of the existing Highers or the new Higher.

One school reported Higher Computing Science was offered but there was not enough uptake to run the class.



## New Teachers

**Key Point 8: The target for PGDE Computing Science students (25) has not been met in 2014.**

**Key Point 9: ITE institutions are not getting enough quality applicants.**

The target for PGDE Computing in Scotland this year was 25 students (with a maximum cap set at 42 places). To date, 20 offers have been accepted for courses at Glasgow and Strathclyde Universities.

There are also 20 newly qualified teachers participating in the probationers' scheme this year, allocated to one of eleven local authorities. South Lanarkshire has been allocated five probationers, Renfrewshire have four, and the remaining nine local authorities have one or two probationers each.

It is clear we need to increase the number of students training to teach Computing Science over the next few years. However the Initial Teacher Education institutions are not getting enough qualified and quality applicants.

It is hoped that publicity and awareness campaigns by Skills Development Scotland as part of the Skills Investment Plan will persuade more Computing Science graduates to choose teaching as a profession.

It is thought that more opportunities for current undergraduate students to do volunteer work in schools would encourage some students to then go on to train as teachers. The good practice at Glasgow and Napier University should be shared with other universities through SICSA.

It is also felt though that investigating alternative delivery models for the PGDE Computing course might be beneficial, such as part-time or part-distance models. This would be more appealing to those potential students who are not straight out of university and have been working in the industry since graduating. This is a suggestion that has come from industry volunteers who would be keen to undertake such a course. Although there are administrative challenges to this new PGDE model, there is a potential benefit of getting more industry links with schools.

Currently only two universities provide a PGDE course in Computing: Glasgow and Strathclyde. It would make the course more geographically accessible to students if the University of Edinburgh and the University of Aberdeen were to teach this qualification again. Edinburgh has not run the course since 2009 after the death of the tutor, Tom Conlon and although Aberdeen has a Computing qualified tutor they haven't trained any new Computing Science teachers since 2011.