

# COMPUTING AT SCHOOL

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## **Computing At School Scotland Annual Conference 2012 Summary / Press Release**

Computing At School Scotland hosted their first annual conference for the nation's Computing Science teachers in Edinburgh last Saturday. The event, which was sponsored by leading computing industry companies: Microsoft, Google, Oracle, Amazon, Adobe, RunRev and the Mozilla Foundation, aimed to deliver a full day of cutting edge talks and training sessions for Computing Science practitioners from across the country.

This first annual conference of Computing At School Scotland was held on Saturday 27th October 2012 at Microsoft's Edinburgh office in the Waverley Gate building and featured an address from the government's Chief Scientific Adviser for Scotland, Professor Muffy Calder. It is essential in today's digital world that we have the skills to deliver a 21st century education to our young people and to inspire them to be creative innovators with digital technologies. This event, which also supported by the BCS, the chartered institute for IT, and Education Scotland, is a step towards achieving this goal. The event featured sessions to expose teachers to the very best in modern Computing Science and develop further their understanding of the pivotal role that Computing Science has to play in Scotland's digital economy.

The conference sold out in just two weeks despite it being held on a Saturday and there being a nominal ticket cost. By the week of the conference there was a waiting list of 41 people. We managed to increase the capacity to 115 but there were still many disappointed teachers who didn't get to come along.

The conference was organised by a team of six volunteers, all of whom have day jobs as Computing teachers, who were supported by staff at Microsoft and the BCS. There were six keynote speakers and ten seminars, six hands-on workshops and three forum discussions. The conference ended with a drinks reception and a magic show.

The response from the delegates at the conference was overwhelming. When asked if they felt that the conference would affect their practice back in school it looked like every hand in the room shot up. The very fact that the room was still packed and every chair taken for the closing keynotes at the end of a long day was a testament to how much people valued the day.

## **Morning Keynotes:**

### **Professor Muffy Calder, Chief Scientific Adviser for Scotland: The importance of Computational Thinking in the Digital Age**

Professor Muffy Calder, the Chief Scientific Adviser for Scotland, kicked off the first Computing At School Scotland conference by discussing the importance of computational thinking. She defined Computational Thinking as thinking “precisely and unambiguously about data and computation”.

Professor Calder gave examples of things to consider when looking at data, particularly big data, such as choosing the best representations for abstracted data, and whether companies look at an ‘average’ user or try to track individual users to build up a bigger picture of general data use (both approaches, general to specific and specific to general, have problems associated with them).

Professor Calder finished her speech saying that all science including Computing Science is empowering and she encouraged teachers to “be scientific and rigorous, be brave!”

### **Dr Quintin Cutts, Glasgow University: Programming Education as Cognitive Apprenticeship**

Quintin used [Carol Dweck’s](#) work around mindsets as a springboard into thinking about some of the pedagogy around apprenticeship models of coding. He used an analogy of tailoring and becoming an apprentice tailor. He asked where “the button-holes, the cutting, the hemming of programming” are, pointing out that minimal guidance doesn’t work. We ask learners to problem-solve and write whole programs too early before they’re equipped through worked examples and peer instruction.

Quintin discussed the work he had done in America in breaking down programming tasks into small chunks to assess learning. He stressed the need for exams to have actual programming tasks. He said that you can assess best understanding by using questions that ask the learner to move between English, pseudocode and a programming language.

## **Summary of seminars and workshops:**

### **Bobby Elliott, SQA: National Certificates and National Progress Awards in Games Design and Digital Media Computing**

Bobby Elliott from the SQA explained to delegates how vocational qualifications like National Units, National Progress Awards and National Certificates can benefit schools and complement the qualifications they already offer to learners. There was particular interest in the Computer Games Development and the new Mobile Technologies awards.

### **Charlie Love, Aberdeen City Council and ICT Excellence Group member: Web development using Mozilla Thimble**

Charlie Love demonstrating some free web development tools from Mozilla. Hackasaurus lets you change existing web pages, which was effectively demonstrated by Charlie changing Microsoft's website into a Google site! We then saw how to teach CSS positioning by using a zombie fighting project in Mozilla Thimble.

### **Chris Martin, Dundee University: Arduino electronics**

Chris Martin kicked off the Arduino session with a bang (from a party popper popping machine) demonstrating how the arduino board can be programmed to operate different components such as motors, sensors and speakers. What followed was a hands-on session where we were able to explore the possible uses of these flexible boards and possible uses in the classroom.

### **Claire Griffiths, Moray Council: Reducing the Gender Gap**

Claire Griffiths provided an introductory talk about the gender gap in the technology sector. There then followed a discussion about possible reasons for the under-representation of women including differing learning styles and computer usage. Possible solutions included the promotion of strong role models, use of paired learning, group projects and innovative coding lessons to maintain the interest of girls.

### **Duncan Smeed, Strathclyde University: Raspberry Pi-oneering**

In the afternoon Duncan Smeed discussed the work he has been doing with the Raspberry Pi. He showed some of the possibilities the £25 computer can do. It's easy to see why this device generates such a buzz for Computing education.

### **Judy Robertson, Heriot-Watt University: iFitQuest: Health and fitness apps for pupils**

Judy Robertson gave an informative presentation about the iFitQuest iPhone game. She described how the game was being successfully tested in Scottish Primary and Secondary Schools and encouraged young people to be more active. Children will be involved in the future developments of the game and the testing process.

### **Kate Farrell and Tom Hendry, Castlebrae Community High School: Interdisciplinary ICT and Computing projects**

Kate Farrell and Tom Hendry provided an excellent range of interdisciplinary projects using ICT and Computer Science. They used their knowledge of Computer Games Design and Digital Media Computing in a variety of ways to embed ICT across the curriculum. This included using Scratch to create German Language quizzes and Lego We Do components to create control boxes in CDT. During English lessons the students wrote/drew their own stories and comic books and then published the books and created online eBook versions for the school website.

### **Michael Kolling, Kent University: Teaching programming with Greenfoot and Java**

We were amazed, entertained and illuminated by one of the world's foremost experts on educational programming environments, Michael Kölling. He took us on a magical whistle stop tour of the Greenfoot environment and its' many different scenarios and we were soon cheering loudly to make a lobster move and watching Michael fighting off falling circles using Microsoft's Kinect motion controller.

Iris Lanny from Oracle also spoke to tell delegates about the free online resources and professional learning that Oracle offer to teachers.

### **Steven Whyte, Gracemount High School (with RunRev): The New Reality of Teaching Computing with Live Code**

Steven Whyte gave delegates an insight into the Livecode programming environment and how it has helped to transform the teaching of programming in Gracemount High Schools Computing courses. Kevin Miller, the CEO of Runrev, then gave a quick demonstration of how easy it is to create programs in Livecode and even deploy them to pupils' smartphones or tablet devices.

### **Sue Sentance, Anglia Ruskin University / Microsoft: Teaching with .NET Gadgeteer**

Sue Sentance's .Net Gadgeteer workshop introduced delegates to the wonderful world of physical computing using the familiar programming language of Visual Basic in an entirely new way for Scottish teachers. It was all go, followed by a bit of stop as delegates were challenged to write a program to simulate a set of British traffic lights.

### **Ollie Bray, Deputy Headteacher, Highland Council: Strategies for teaching internet safety**

Ollie Bray gave an informative talk on the theme of Internet Safety. One of the key messages was emphasise to students the permanence of anything they post to the web e.g. a photo or a website. The Internet has ways of remembering everything permanently whether we delete it or not! They should also be taught to check the authenticity of what they read online. Parents and teachers need to be aware that students can access websites all over the world in any language so the risk is beyond their media surroundings.

### **Doug Belshaw, Mozilla Foundation: Open Badges for Learning**

Doug Belshaw from the Mozilla Foundation explained how Open Badges can be used to track achievement both in class and in extra-curricular settings. The session created a lot of buzz online, in fact delegates have been twittering for a couple of days after the conference about the session and implementing open badges in their classes. Everyone attending the conference was also given a special CAS Scotland badge.

### **Jeremy Scott, RSE / George Heriot's School: Royal Society of Edinburgh Computer Science Exemplification Project**

Jeremy talked to the delegates about the exemplification support material that is now available for supporting the teaching of Computing Science in the Scottish curriculum. The packs focus on how to teach the principles of computational thinking through different programming environments. There are now packs covering: introduction to programming in Scratch, intermediate programming in Scratch and mobile app development in App Inventor.

### **Colin Maxwell, Carnegie College: Practical workshop on games design with Blender**

Colin talked delegates through creating a simple game using 3D modelling in the open-source development environment Blender.

### **Afternoon Keynotes:**

#### **Dr Peter Dickman, Google: Industry-sponsored Classroom Resources**

Peter Dickman provided examples of Computing Science learning resources from Intel, Mozilla, Oracle as well as Google (who he works for) and he talked through some of the issues surrounding industry-provided educational resources. He encouraged delegates to provide feedback to resource creators so that they can justify continuing to develop materials. Peter suggested that the best place to find new resources is the CAS Online, the Computing At School community forum. He also directed delegates to [computingplusplus.org](http://computingplusplus.org), a website matching up schools with industry to increase computing education in schools.

#### **Steven Greir, Microsoft: New Tools and Technologies for the Computing Classroom**

Steven Greir talked about some of the tools that Microsoft have been developing to support teachers and learners. He talked about the Dreamspark programme that allows pupils to use Microsoft development environments and design software for free. He spoke about Microsoft Azure cloud platform being available for schools who request access. Steven talked about the resources and support available on the Partners In Learning website. He also spoke about some exciting areas that are planned for the new Glow environment. Steven announced the Kodu Kup schools game design competition and expressed his determination that there would be a Scottish winner! Steven also announced that there are plans for setting up schools in Scotland as Microsoft IT Academies, starting with every secondary school in Glasgow and Edinburgh.

#### **Jody Greig, Magician: The Conjurers' Classroom**

Jody Greig explained that he was a Computing teacher in Scotland before winning the Forth Valley Magic Circle competition. He has since been focusing writing a book about how magic can be used to teach Computing Science as part of Curriculum for Excellence. Jody then amazed the large crowd of delegates with a couple of magic tricks. He then confounded delegates with magic tricks during the drinks reception at the end of the conference.

#### **Kate Farrell, Computing At School Scotland**

Kate Farrell, the Chair of Computing At School (CAS) Scotland, ended the conference by describing the challenges facing computing teachers in Scotland at the moment. 8.9% of Scottish Secondary schools no longer have any computing teachers (although this rises to around 50% in a couple of councils) and we have 100 less Computing teachers now compared to 2006/7. The amount of time allocated to Computing in the timetable of most schools is still pitifully low. Many parents (and some Head teachers) don't understand Computing Science is a rigorous academic discipline and feel that it is an unimportant subject if pupils are skilled in using social networking tools.

Kate talked about some positive changes though, including the fact that in just a few months over a third of Computing teachers joined to up to be members of CAS Scotland. CAS Scotland have been supporting the RSE Exemplification project work. CAS Scotland have been meeting with the Scottish Government, Education Scotland, the SQA, Professor Muffy Calder and representatives from the RSE project and SISCA to discuss how to improve the representation of Computing to schools and parents and how to improve the provision of professional learning for Computing teachers.