CASS CONFERENCE 2012 AN OVERWHELMING SUCCESS

On Saturday 27th October we held our first annual conference in Edinburgh. The event delivered a full day of cutting edge talks and training sessions for Computing Science teachers from across the country.

The conference was opened with a keynote speech talk from Prof. Muffy Calder, Chief Scientific Advisor to the Scottish Government. Her talk focussed on the importance of ‘computational thinking’ skills in all walks of life, not just Computing Science. She defined Computational Thinking as thinking “precisely and unambiguously about data and computation”. 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!”

The second keynote came from Dr. Quintin Cutts. 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.

The response from the delegates at end of 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.

Roll on #CASScot13!

Kate Farrell and Mark Tennant

CAS SCOTLAND ATTEND LEARNING FESTIVAL

CAS Scotland was represented at the Scottish Learning Festival at the end of September, where we launched the first Scottish issue of Switched On.

National Committee members Kate Farrell, Claire Griffiths and Mark Tennant travelled to Glasgow at the invitation of BCS who had a stand in the learning village. Kate was quick to her feet at the first keynote and managed to pose a question about the fall in computing teachers to Mr Russell (http://bit.ly/cassjan02). Although somewhat non-committal, his answer did acknowledge that he was aware of the issues and was working with Muffy Calder and the SQA to ensure Computing remained an attractive subject.

Back at the Learning Village we took the opportunity to present Mike Russell with his very own copy of Switched On! If you haven’t had a chance to see the first issue yourself, it’s online at http://bit.ly/cassjan03.

Our thanks go to the BCS for inviting us, as well as RunRev and the RSE who were eager to support us during the day from their stands.

The “Computing At School” working group (CAS) is a membership association in partnership with BCS, The Chartered Institute for IT and supported by Microsoft, Google and others. It aims to support and promote the teaching of computing in UK schools.
All of the videos from this year’s conference are on the Computing at School YouTube channel. Highlights include keynotes from Muffy Calder & Quintin Cutts along with several breakout presentations and workshops.

Head over to http://bit.ly/cassjan01 for some visual CPD, or follow the QR codes below on your smartphone.

**MUFFY CALDER**
The Importance of Computational Thinking in the Digital Age

**QUINTIN CUTTS**
Teaching Programming: too much doing, not enough understanding

**PETER DICKMAN**
Industry Sponsored Classroom Resources

**STEVEN GRIER**
New Tools and Technologies for the Computing Classroom

**KATE FARRELL & TOM HENDRY**
Interdisciplinary Projects in ICT and Computing Science

**DUNCAN SMEED**
Raspberry Pi- oneering: learning with the Raspberry Pi computer

**You Tube TM**

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HIGHLIGHTS FROM THE FIRST CASS CONFERENCE

“Be Scientific and Rigorous: Be Brave.” Those closing words from Prof. Muffy Calder set the tone for a day of exploring the skills and ideas needed to deliver a Computing Science course that is fit for purpose. The future started here.

On 27th October, Computing Science teachers from across Scotland met in Edinburgh for the first CAS Scotland conference. Sold out in days, the lucky attendees were not left disappointed.

After the morning keynotes from Prof. Muffy Calder and Dr Quintin Cutts, delegates were able to attend a number of breakout sessions looking at recent developments in Computing Education.

**Session Summaries**

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.

Charlie Love demonstrated some free web development tools from Mozilla. Hackasaurus lets you change existing web pages. We also saw how to teach CSS positioning by using a zombie fighting project in Mozilla Thimble.

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.

CAS Scotland was well represented with Claire Griffiths provided an introductory talk about the gender gap in the technology sector (see page 4), and Mark Tennant leading a forum session on Extra-curricular clubs and activities.

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 gave an informative presentation about the iFitQuest iPhone game. Kate Farrell and Tom Hendry provided an excellent range of interdisciplinary projects using ICT and Computer Science. These 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.

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
Colin Maxwell talked about the wonders of programming and the benefits it can bring to students.

Steven Whyte gave delegates an insight into the world of physical computing and how it has helped to transform the teaching of programming in Gracemount High School.

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'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 traffic lights.

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.

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 were 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.

Steven Greir talked about some Microsoft tools to support teachers and learners, eg Dreamspark, which 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. He also announced the Kodu Kup schools game design competition and how to improve the representation 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.

Afternoon Keynotes

Peter Dickman provided examples of Computing Science learning environments and design software for free. He spoke about Microsoft Azure cloud platform being available for schools who request access. He also announced the Kodu Kup schools game design competition and expressed his determination that there would be a Scottish winner!

Lastly, Jody Greig demonstrated how magic can be used to teach Computing Science!

Many thanks to...

Microsoft
Google
Adobe
Oracle
Microsoft Research

...we couldn't have done it without you!
CAS is to receive 1000 Raspberry Pi computers to help schools introduce computer science into classrooms across the UK. The organisation is one of five to have been selected by Google as part of their £1 million investment project to support the Raspberry Pi Foundation.

Simon Peyton-Jones, Chair of CAS explains: “This is a great initiative from Google and we’re delighted to have been identified as one of the organisations that can introduce the Raspberry Pi directly into schools.”

CAS will use the Raspberry Pi boards initially to support their continuing professional development programme with teachers across the UK. The boards will then be issued to schools identified by CAS’ Master Teachers and CAS Hub Leaders as those most in need of the assistance.

Theo Bartram from Google said “We’re delighted to be supporting the Raspberry Pi Foundation through our work and in turn working with such organisations as CAS. This is a really exciting project that we hope will put these amazing boards directly into the hands of teachers and children”

There is considerable concern about the ‘gender imbalance’ in Computing Science both in Scotland and UK-wide. At the CAS Scotland conference, Claire Griffiths led a forum session on the subject. Here she aims to give further insight into the problem.

In the past women were present at the forefront of computing in the UK. They worked as code breakers at Bletchley Park and programmers on ENIAC, the first electronic general purpose computer, where six women completed most of the programming. In recent years there has been a worrying fall in the number of people - particularly girls - wishing to study Computing at school and degree level.

Numbers for Computing Studies at SCQF level 6
Total A-C grades 2,971 24% girls compared to English 14,981 60% girls.
Source: Table 3.10, Gender Audit of Statistics 2007, Scottish Government

Active recruitment of girls requires us to connect Computing with their existing interests. Does this mean we colour a portion of the technology market pink? It is one option but it’s worth bearing in mind that a significant section of the female population would find this approach patronising and in the same category as pink tool kits. The introduction of the Barbie Computer Engineer doll had a mixed reaction when it appeared in 2010 though it is interesting to note that it is still for sale. Girls like to be creative and work in collaborative groups so they could work together to develop programs which have creative outputs. In project work they could take on a variety of roles including developing the design, coding, user testing, and evaluating.

Girls often lack confidence in their ability and when things go wrong blame their lack of ability rather than the software or tools they are using. They need to be supported and encouraged with an expectation that they will succeed. Other ideas include the use of gender-neutral software, if you can find it and Computer Clubs for girls.

Finally in Scotland only 27% of women graduates remain in the STEM subjects they qualified in compared to 52% of men. This means that even when women study STEM subjects they are either finding work elsewhere or choosing to work in other sectors outside their field of study.(Source: Royal Society Report (2012) - Tapping out Talents). So as we work hard to increase female participation in Computing Studies we need to look forward at the whole picture to make sure those gains are not lost after graduation.

Claire Griffiths

References


Image shows Admiral Grace Hopper examining UNIVAC tape drives. Courtesy of Computer History Museum, CA, USA.
Under a joint project, the Royal Society of Edinburgh (RSE) and the BCS have developed teaching materials that support Computing Science related aspects of Curriculum for Excellence (CfE) in S1 to S3. These were finalised and launched in December.

The materials are the result of a project initiated and supported by the RSE and the BCS and with a grant from Education Scotland. The project has received widespread support from universities and industry partners.

The Societies secured funding to second Jeremy Scott, Head of Computing at George Heriot's School, to lead the development work. He has been seconded on a part-time basis since August 2011. Three resources comprising tutor and learner materials have been produced in the first phase of the project and they were launched at the RSE on Tuesday 4th December.

The project has sought to highlight the value of learners having insight into computational thinking. The project has also worked with Education Scotland so that aspects of the materials may be used to support parts of the new national qualifications for Computing Science. While CfE is a Scottish initiative, the materials are driven by the latest Computing pedagogy so they have considerably wider international applicability.

Professor John McDermid, Vice-President Engineering & Science and Ambassador of Computing at the BCS adds: “All school children will benefit from having a sound foundation in computing, which these new materials will provide. Significantly, they also have the potential to increase academic interest in the subject and thus to foster an expansion of the numbers studying computer science at University and then entering the profession. Thus the BCS is optimistic that there will be a major long-term benefit from this initiative.”

Minister for Learning, Dr Alasdair Allan said: “I welcome the production of the RSE exemplification materials on Computing Science. They are a valuable resource which will help teachers develop pupils’ understanding of core computing concepts and the associated skills as part of Curriculum for Excellence, from early secondary into the new qualifications.

“Young people should have opportunities to undertake learning in Computing Science, to help them make sense of how computer technology works and can be applied. The relevant and up-to-date contexts in the exemplification produced by Jeremy Scott offers practitioners inspiring ideas for its delivery.”

Professor Sally Brown, Chair of the RSE/BCS Project Advisory Group explains: “The RSE is pleased at being able to support this very exciting project, involving a range of committed partners. Curriculum for Excellence and the new national qualifications in Scotland provide an excellent opportunity to re-energise the teaching of Computing in schools and highlight its importance to a digitally enabled society. The materials can contribute to this by providing a more interesting, up-to-date and engaging experience for both teachers and learners, an approach which the RSE firmly supports. The materials have been trialled in schools across Scotland to very positive responses from teachers.”

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**KNOX STUDENTS GET TO GRIPS WITH KODU KLUB**

For the past 3 weeks, Adam Richmond and Finlay Munro, two students who are studying Higher Computing this year, have been running a games design club using a Kodu in an effort to encourage students into the Computing Science department of Knox Academy.

Kodu is a high level language-based creative environment used to create realistic looking worlds and your own unique video games. Pupils, using Xbox 360 controllers, can learn simple programming techniques, manipulate environments in order to create fun, playable video games. The club has been very successful attracting between 10 and 20 pupils each lunchtime and everyone seems to be learning a lot and having fun.

The running of the club had been made possible thanks to Education Scotland’s Consolarium project where schools can bid to borrow games equipment for school projects.

The pupils hope to move the club onto Blender in the new year.

Andy McSwan

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**THE FUTURE OF GLOW?**

For the last few months the ICT Excellence Group (including teachers, parents and pupils) have been working with Professor Muffy Calder (Chief Scientific Adviser) looking at the future on ICT in our schools and specifically, the future of Glow.

Their report has now been published and is well worth looking at. You can access it at http://bit.ly/cassjan07

Kate Farrell

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**RUNREV ANNOUNCE OPEN-SOURCE LIVECODE PROJECT**

RunRev have launched a Kickstarter fundraising campaign to make their popular programming platform open source. The software has gained popularity due to the cross-platform development opportunities for both traditional programs and mobile apps.

This is fantastic news for schools and teachers. Both myself and Jeremy Scott from the Royal Society of Edinburgh have been in discussions with RunRev about how valuable access to LiveCode would be for schools and both of us were stunned and excited when RunRev told us the news.

Explaining why the company need to do this fundraising, Kevin Miller, CEO of RunRev said “Our small team supports a code base that is now some 20 years old. We support more platforms than we have engineers.” It is Kevin’s hope that “millions of school children can be inspired in the same way that I was when I was 12 years old and starting out.”

Once RunRev meet the fundraising goal they will make the existing platform available to the supporters. The current version has half a million lines of code in it. Over the next few months the developers will work on creating a new open source version with community-friendly modules so that other developers can more easily create extensions and make changes.

As with every KickStarter project there are ‘rewards’ for supporting a project. One reward that might be of interest to teachers is the £55 reward level. As well as a heap of resources such as ebooks and mobile app, games and database academies this reward level includes a full day’s CPD in using LiveCode based in Edinburgh (including lunch!) Computing At School are working with RunRev to help them tailor this day for teachers and educators on how to teach young people programming and computational thinking skills.

Kevin told us “This is your chance to support an idea. I hope you see this Kickstarter project as a chance to make something happen. Because that is what this is really about. This is the most audacious, ambitious plan we’ve ever dreamed up as a company.”

If you’d like to support RunRev in this project or sign up for the CPD day, then go to their Kickstarter page at http://kck.st/WutiWr


Kate Farrell
COMPUTING AT SCHOOL SCOTLAND: MEET THE TEAM!

CAS has only been going north of the border for the last 18 months. Behind the scenes, a small group of eight teachers have been working to make CAS a success. We thought it was time we introduced ourselves properly...

Kate Farrell
Kate is the Chair of Computing at School Scotland. She teaches at Castlebrae Community High School in Edinburgh. She has curriculum development experience with the SQA, Scottish Screen, BBC and Global Kids.

Kate has worked in almost every sector of education and she is an experienced trainer and public speaker having presented at events in UK, Europe and the USA.

Kate enjoys making jewellery by soldering together scrap metal scavenged from the CDT department. She’s also makes bracelets from network cables and beaded necklaces with secret messages in binary!

Andy McSwan
Andy is the Computing teacher at Knox Academy in East Lothian and has previously held posts in the Scottish Borders and the Highlands.

Andy is an SQA marker and in his spare time enjoys playing video games.

Claire Griffiths
Claire is based in Elgin and she runs the Moray CAS hub. Her teaching experience spans from Early Years to Tertiary Education in England, Canada and Scotland. She currently teaches Computing/ICT at a primary and a secondary school alongside working on an IT project called Moray Heritage Memory project.

Claire is currently studying for a Masters in Online and Distance Education with the OU. She recently presented a seminar at BETT in February on the theme of Intergenerational learning using Memory Blogs.

Charlie Love
Charlie is a teacher and developer with a strong history of curricular innovation and assessment. He is a member of the ICT Excellence Group advising the Scottish Government on ICT in education, and is currently developing an online portal for education called Glew.

He is a member of the Qualifications Design Team for the new Computing Science courses, and is also involved in vocational qualifications. He has written several educational books, contributed materials to Scholar, and runs the CompEdNet online forum.

When he has spare time he enjoys computer games and snowboarding!

Mark Tennant
Mark has recently moved to Westhill in Aberdeenshire, having spent much of his teaching career in East Lothian & the Borders.

He has always been a vocal advocate for Computing Science in schools, having been involved in the early discussions in 2007 that (eventually) brought changes through CfE and the formation of a national organisation for Computing teachers. Mark currently edits the Scottish edition of Switched On.

Outside of work - and CAS - Mark is keen on the outdoors. His free time is usually spent climbing the hills and mountains of Scotland, and volunteering with Mountain Rescue.

Peter Donaldson
Peter is Principal Teacher of Computing in Crieff High School in lovely Perthshire as well as the membership secretary for CAS in schools. He taught in Dundee for a number of years and has worked with colleagues in both local authorities to develop materials and trial new ideas and approaches to teaching the subject of Computing.

Peter strongly believes that Computing is central to developing a long lasting understanding and appreciation of our digital society that every pupil should be able to experience and benefit from.

In his spare time, Peter is a student of Karate and an enthusiastic hill walker who would like to get out and about a bit more. He’s also been known to play the occasional video game - or two - when he has the time.

Ian Simpson
Ian Simpson is currently Principal Teacher of ICT for Learning and Teacher of Computing at Robert Gordon’s College, Aberdeen. Professionally he has a keen interest and increasing experience in mobile learning, games-based learning and use of social media to enhance learning and teaching. Personally he has an enduring love for Italy, good music, bad television, his family and Tim Horton’s coffee.

Quintin Cutts
Quintin has researched and practised programming education for 15 years. He has explored many instructional designs, endeavouring to maximise the value of face-to-face teaching using technology and peer-based learning. He is closely involved with schools, having led CS Inside in Scotland and now running a successful Undergraduate Ambassadors Scheme course.

He is assisting the SQA in the design of new qualifications, in particular developing rigorous examination formats. This is feeding into CPD and exemplification efforts led by the Royal Society of Edinburgh, for which Quintin is a project board member.

TOM CONLON LECTURE

Last year Professor Alan Bundy of the School of Informatics, University of Edinburgh gave a lecture in memory of Tom Conlon: “Computing - what shall we tell the kids?” A video of the lecture is online at http://bit.ly/cassjan09.
Adobe Generation offers a series of free online courses in Photo Imaging, Animation and Games Design. Each course has a set syllabus, runs for nine weeks and gives students a free 60 day trial to the Adobe software required for the course.

Each week a new topic, supported by a guest speaker, is covered in the online classroom along with homework assignments. A recording is made of the class in case attendance is not possible.

I signed up for the Animation and the Games Design courses in the hope that I would learn some new skills that I could use in the classroom and I was not disappointed.

Further courses are planned for this year and I would thoroughly recommend it, not only to school students, but also to teachers as it is a fantastic CPD opportunity. Further information can be found at www.adobegeneration.com

Fiona Currie

Adobe Generation

TALKING ‘BOUT MY ADOBE GENERATION

CAS Scotland has been going for about 18 months and now has around 300 members. If you’ve not joined yet, here’s what to do:-

Create an account at Compednet.com and put CAS Scotland then the school or organisation you work for in the “School/Establishment Name” field.

Sign in to Compednet with the username and password you chose, click on Groups, find the CAS Scotland group and then click on the Request Membership button.

We’d also recommend signing up to the UK-wide CAS community: full information available at: http://bit.ly/joincasscotland

Claire Griffiths

JOIN CAS SCOTLAND

I stumbled upon Edmodo during the October holidays in 2011. I had originally been looking for a resource to enable sharing of class resources with my Higher Computing students but in Edmodo found a lot more functionality than I’d expected.

I’m now one of many Edmodo users at my school with a growing number of students and subject areas.

I have some tips for using Edmodo with Computing classes. I schedule posts so that students don’t get overwhelmed by a lot of information at the start of a lesson. I even schedule task solutions to appear at 4 or 5pm so that they can follow up on their learning before the next class but still have a little bit more time to try and solve the tasks by themselves.

I use YouTube videos with my Higher Computing class a lot. It provides them with a break from my style of teaching and a more diverse pool of knowledge to draw from, although at present they have to access these videos out-with the school network.

I use the shared tags feature within Edmodo in a very simple way. I tag by topic and unit so my students can filter posts within a group when revising.

I upload smartphone snapshots of my whiteboard to the group to aid revision as well as keep a record of my lessons in case of absence.

Lastly I use Edmodo to keep my classes learning, even when I’m absent. Instead of leaving cover work I can virtually take the lesson by leaving pre-recorded video or audio clips for the students to use. In addition if I’m online when the class is in progress I can answer queries in real time.


Fiona Currie

TALKING ABOUT MY ADOBE GENERATION

CAS & COMPUTING SCIENCE CENTRE STAGE AT BETT

BETT 2013 was an exciting four day show based at the EXCEL centre in London. There were interesting speakers including inspiring Head Teachers and enthusiastic scientists including the great Professor Brian Cox. Mark Dorling, CPD Co-ordinator for CAS was on hand at the OCR stand promoting CAS.

CAS was in the main BETT arena on Thursday when Simon Peyton-Jones and friends spoke about Schools and Real Computer Science. Many of the exhibitors had wonderful hands-on displays and talks. There was a fascinating display of Lego Mindstorms robots and App Shed was sharing a free app developer for schools. At the Coder Dojo groups of children were taught web design. A successful and worthwhile event.

Claire Griffiths

HARNESSING SOCIAL MEDIA WITH EDMODO

Ian Simpson

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We’d also recommend signing up to the UK-wide CAS community: full information available at: http://bit.ly/joincasscotland

Claire Griffiths

CAS Scotland has been going for about 18 months and now has around 300 members. If you’ve not joined yet, here’s what to do:-

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