A National Engagement Model for Developing Computer Science Education in Wales

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14 October 2016
Where is Wales?
No, Really – Where is Wales?

Eurostat yearbook 2004
The statistical guide to Europe

Data 1992-2002
No, Really – Where is Wales?
Wales Matters!

**BBC NEWS**

Wales' 'fastest growing' digital economy outside London

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Wales has the fastest growing digital economy outside London, according to a report on the sector.

The number of digital enterprises in Wales jumped by 9.2% last year, says the analysis by law firm Nockolds.

Numbers rose from 3,000 in 2014 to 3,275, although this is below all UK nations and regions except for Northern Ireland and north east England.

The report said cities including Cardiff and Swansea could "flourish" because of comparatively low rents.
Policy

Something’s Wrong with CS Education in the UK...

NESTA
Making Innovation Flourish

Next Gen.
Transforming the UK into the world's leading talent hub for the video games and visual effects industries

A Review by Ian Livingstone and Alex Hope

Shut down or restart?
The way forward for computing in UK schools

January 2012

THE ROYAL SOCIETY
A Very English Fix...

Computer science to be included in the EBacc

Press notice

Press notice date: 30 January 2013
Updated: 01 February 2013

The Education Secretary, Michael Gove, announced today that computer science will be included in the EBacc.

The change is being made because of the importance of computer science for both education and the economy. The previous "harmful" ICT curriculum was removed in 2012 and will be replaced soon with a new programme of study focused on computer science.

Today, the Education Secretary announced that computer science will be added to the list of separate science options (so there are now four separate sciences instead of the traditional three) in the EBacc. Pupils who sit any three of the four separate sciences and get at least a C in two of them will get the EBacc. For instance, a pupil who sits physics, chemistry and computer science and gets at least two Cs will fulfil the science requirement of the EBacc. This change has no effect on those doing the 'traditional' three separate sciences, it is just another option. The 'core plus additional' option is unchanged.
Press release

Facebook, Microsoft and BCS back government funding for computer science teaching

Organisation: Department for Education
Page history: Published 24 April 2013
Policy: Improving the quality of teaching and leadership
Topic: Schools
Minister: Elizabeth Truss MP

Education Minister Elizabeth Truss announces more than £2 million of funding so the best computing teachers can help train thousands more teachers.
Teachers supporting teachers

(CAS motto: “There’s no them, there’s only us!”)
Computer science touches upon all three of my education priorities: literacy, numeracy and bridging the gap. It equips learners with the problem-solving skills so important in life and work.

The value of computational thinking, problem-solving skills and information literacy is huge, across all subjects in the curriculum. I therefore believe that every child should have the opportunity to learn concepts and principles from computer science.

Indeed, computing is a high priority area for growth in Wales. The future supply and demand for science, technology and mathematics graduates is essential if Wales is to compete in the global economy.

It is therefore vitally important that every child in Wales has the opportunity to study computer science between the ages of 11-16.

– Annual Technocamps Teachers’ Conference Keynote Speech
‘ICT’ in schools needs to be re-branded, re-engineered and made relevant to now and to the future;

Digital literacy is the start and not the end point – learners need to be taught to create as well as to consume;

Computer science should be introduced at primary school and developed over the course of the curriculum so that learners can progress into a career pathway in the sector;

Skills, such as creative problem-solving, should be reflected in the curriculum; and,

Revised qualifications need to be developed in partnership with schools, Higher Education and industry.
Successful Futures

Independent Review of Curriculum and Assessment Arrangements in Wales

Professor Graham Donaldson CB
February 2015
Written Statement - Introduction of a Digital Competence Framework

Huw Lewis, Minister for Education and Skills
Wales – The Challenges

There are very serious geo-political problems with Wales

- Sparse population spread over difficult terrain with scenic (ie, slow) roads. (3million – 20% Welsh-speaking – in 20,000 km²)
- Just over 200 secondary schools, giving an average catchment area of 100 km² (far greater than this for many rural schools)
- Devolved government (Education Department) since 1999 resulted in a decade of decline in educational standards
- Minister for Education (Jun 2010–Feb 2013) commissioned no fewer than 24 lengthy and costly Reviews (1 per month)
- 75% of (CS/)ICT teachers hold no qualification in CS/ICT
- Key Stage 3 (first two years of Secondary) is termed “The Wasted Years” as teaching effort is concentrated on later (Exam) years.
Starting in 2000, Swansea University Computer Science tried (unsuccessfully) to engage with local schools/teachers

Technocamps Workshops directed at pupils started in 2003

Delivered as University outreach ("Third Mission")

Financial support in 2004 from Microsoft for 1 week of Workshops

Primary engagement added ("Playground Computing")

Teacher engagement added ("Technoteach")

Quickly grew to unsustainable levels of demand.
£6m EU-funded project (2011-2014)
Universities of Swansea, Bangor, Aberystwyth and Glamorgan
11+ only – no primary schools nor teacher training
  ● NESTA funding to support Playground Computing
  ● NSA funding to support Technoteach
  ● (But only enough to support Swansea Bay region)

Convergence area of Wales only
  ● Support given to CAS for teacher-led activities in the East
  ● But CAS model was struggling: hubs being led by lecturers/universities, not teachers/schools
  ● very active during Technocamps ESF period, but since died out
Wales Divided – Technocamps versus CAS

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All 43 teams travelled in from schools in West Wales!
Education Department looking to embed CS/DCF in all schools

Two-year, £400K project to deliver a 3-hour Workshop in every single Secondary School across Wales
  - With re-engagements, averaged 8 hours in each school.

Playground Computing: 175 half-day Workshops to 4000 pupils

Technoteach: 80 CPD sessions to 350 teachers; 30 teachers earned / working towards 18-day accredited *Teacher of Computing Certificate*

Crucially: everything is completely free to participants.
Technocamps delivers first International workshop in partnership with Microsoft Education

Tuesday, September 6, was no ordinary day for fifth grade pupils at Allisonville Elementary School in Indianapolis, Indiana, when two classes of 10 and 11 year-olds experienced an unplugged introduction to computer science as part of Microsoft’s Skype in the Classroom initiative, delivered by Technocamps from Swansea University.

The lesson, which has been developed by the Technocamps team is an extension of the current pan-Wales programme, allowing it to reach a global audience and engage with pupils from around the world in computer science, through a series of thought-provoking questions and hands-on activities, challenging pupils to think differently about computers and computer programming.

The Technocamps programme, which has already worked with over 25,000 pupils across Wales since 2011, has for the first time engaged with International pupils through the Skype in the Classroom initiative, which is part of the Microsoft Education Community, designed to bring together an online community of experts and educators from around the world.

Latest News

Extra £850,000 EU funds to drive research in Wales’ engineering sector

Burton@14 – young people to investigate growing up in Port Talbot

College of Engineering at Swansea University wins Bronze Athena SWAN award

more Latest News...

Latest Research

Study breakthrough in Type 2 diabetes treatment

WISERD highlighted as ‘major resource’ in Diamond Review

Black Prince of Florence – US tour to launch biography by Swansea historian