

the future of ICT

With the National Curriculum under revision, **Miles Berry**, Senior Vice Chair of Naace, suggests now is the time to reconsider how information and communication technology is taught in schools...

Computers and the internet have become a part of almost every aspect of our lives, and thus children should have an entitlement to be taught about information and communication technology (ICT) when in primary school. We live now in an age where to be described as 'educated' and not have an understanding of how technology works and how to use it for creative and collaborative work seems anachronistic, to say the least.

At the moment, primary pupils have a statutory entitlement to be taught ICT thanks to its place on the National Curriculum as a foundation subject. The programmes of study were developed in 1999, when computers were

relatively limited devices and iPhones, Wikipedia and Facebook were unheard of. That said, the programmes have stood the test of time remarkably well, permitting much and prohibiting little under broad descriptive phrases rather than lists of technologies or applications. That's not to say that all remains well in the world of primary ICT, which Ofsted see as focusing too much on presenting work and research at the expense of skills like modelling, handling data and programming. The Royal Society think the delivery of ICT and computing "is so poor that students' understanding and enjoyment of the subjects is severely limited".

Whether or not ICT remains a compulsory subject under the revised National Curriculum, new programmes of study will be needed, either as statutory orders, recommended guidance or developed by schools, local authorities, subject associations and commercial publishers. Bearing the above in mind, now seems to be a good time to consider what shape a primary ICT curriculum should take.



1 Understanding technology

The focus of the curriculum should be on developing children's understanding of technology. Whilst user skills are important, we should recognise that with technology's capabilities growing at an exponential rate, the only way we can equip our learners to use and create new systems, as well as giving the confidence and discernment to use current ones well, is to educate rather than to train. Children should leave primary school having a sound grasp of how computers and the internet work, of how programs are written and how all sorts of information can be stored digitally. This way, they'll have the flexibility to sit down in front of software they've never seen before and get something useful done. Technological understanding should be matched by an understanding of the role computers play in society at large, including legal, ethical and philosophical dimensions. This understanding can best be developed through practical projects allowing ample opportunity for the play, experiment and exploration which is characteristic of early years practice and, I suspect, of how many of us learn to do new things with technology.

2 Finding things out

Some place on the new curriculum must be given to teaching pupils how to use computers for finding things out. This includes using the web effectively, efficiently, safely, responsibly and wisely. It's amazing to think that nearly free access to vast collections of data means that a child with sufficient motivation, basic literacy and ICT capability can now teach herself about almost anything. What she learns might be related to other subjects on the curriculum, and an enquiry based approach has much to commend it, but it might also take in things far beyond the National Curriculum, which has always been a minimum entitlement rather than a limit to learning. 'Finding things out' shouldn't be limited to using the web though – computers are great tools for analysing data collected from measurement and surveys, as a tool to put learners in touch with one another or with experts, or for simulating complex situations interactively – most commonly now as computer games. And GPS enabled smartphones open up exciting possibilities for integrating the virtual and the real far beyond the realm of the humble datalogger.

3 Creativity and collaboration

Good teaching is about meeting learners where they are and moving them on to somewhere new: in ICT, most children are comfortable with, and often quite skilful in, using mobile phones and computers to access content and communicate with one another,



although we're perhaps not quite at the point where these skills can be taken for granted. Moving many 'digital natives' on means teaching them to use technology for creativity and collaboration. The best primary teachers are already providing ample opportunity for pupils, individually or in groups, to develop skills in creating digital media, including digital photography, stop motion and scripted animation, edited video, music sequencing and podcasting as well as more mundane word-processing and presentations: it's going to be interesting to see where the new opportunities for digital creativity lie – 3D, augmented reality and beyond. Seymour Papert's great insight with Logo programming was that we learn best not merely through exploration or discussion but when we create 'public artefacts' for others to see. The internet makes it easy for learners to share their work with a world-wide audience via blogs, or, better yet, to collaborate with other learners, within or beyond their school via forums, wikis and mash-ups.

4 Computing

The fourth dimension of a revised curriculum would be computing itself,



including an introduction to the craft, art and science of programming. Bee-bots and their like are a common feature in early years settings, and moving children on to use more sophisticated robots, screen 'turtles' and other programming tools offers a logical progression, equips children with the understanding necessary to take control of technology and, perhaps, develops the enthusiasm which will lead to further study and careers in computer science or software engineering. Toolkits like Scratch make it easy for pupils to create scripted animations and their own interactive games, and Google's App Inventor provides a similar 'building block' approach for developing mobile phone apps. The nuts and bolts of hardware aren't beyond primary pupils either, with Lego projects and Arduino powered 'toy hacking' having much potential in small groups.

Universal entitlement to a curriculum such as the above is in the gift of government. With or without statutory provision, the delivery of a challenging, stimulating and relevant ICT curriculum remains the responsibility of heads and teachers. The playful, purposeful experimentation with technology that fosters understanding is something which can be modelled by teachers rather than taught, and, whether ICT is taught as a discrete subject or embedded across the primary curriculum, it's this attitude and approach which is most likely to produce an exciting and challenging experience of primary ICT.

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