INNOVATIVE TECHNOLOGY IN EDUCATION

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The APPG on Scientific Research in Learning and Education explores issues at the interface between scientific research and education. They recently discussed the benefits and limitations of using innovative technology in education – at all levels ranging from primary to tertiary education. Professor Swithenby (Open University) focused on the use of technology in teaching science, although he argued that any discipline which relied on computer technology in professional practice, such as design or engineering, could benefit from the same approach. In practice science uses technology to collaborate and collect data. This means that anyone with access to a computer should be able to engage with scientific research. Moreover, he proposed that to teach science without these interactions with technology would be to teach out-dated skills. Prof Swithenby demonstrated a number of excellent, innovative teaching tools including a virtual laboratory rat, a digital microscope and a programme for mapping trees across the UK called Treezilla. Engagement with these technologies could offer an authentic experience of STEM disciplines, opening up access to more people and, in the long run, changing public attitude towards STEM subjects.

Professor Michael Hammond (University of Warwick) focused on the reasons for using technology, and whether these could be realistically met. There are three main reasons for engagement with innovative technology: social/vocational, to impact on learning outcomes and as a catalyst for curriculum reform. Each of these reasons has barriers to success, for example, with difficulty in actually measuring impact on learning and the use of technology getting in the way of pedagogy. He also recognised constraints such as access to appropriate facilities and adequate teacher training to support use of technology in the classroom. However, the picture is not all bleak. He provided examples of existing technologies that are effective and suggested where technology comes into its own to support learning: allowing pupils to be creative, visualisation of difficult concepts and as a means of garnering support and feedback. The latter can also be useful for teachers in developing their practice and sharing lesson ideas. He felt that the way to progress required activity at three levels. Teachers must be proactive and put pedagogy first. Secondly, school leaders must provide suitable support and finally, policy makers must offer consistent support for developing pedagogy.

The final speaker was Christina Astin, Headteacher of King's School, Canterbury, and co-founder of the Young Scientist Journal (YSJ). The YSJ is a publication led and written by students and for students between the ages of 12-20 years. It provides an opportunity for pupils of science all over the world to publish articles on scientific topics, including original research. She suggested that the use of online media for the journal had considerable benefits beyond the obvious global collaboration: use of multimedia, opportunity for voting polls and discussion forums. For those working on the journal as editors it develops skills in team-working, decision-making and time management, but also, and perhaps most critical in the current day and age, in digital literacy.

A recurring theme was the sense of ownership that developed with engagement available through such technology. All felt that by developing a sense of ownership more effective learning would occur and may even protect against being the passive receiver of information through screen technologies. A discussion followed, with questions arising as to whether all pupils should be given ipads as a priority and whether such technologies could replace teachers. Although a brief vote suggested that the jury was still out on whether provision of ipads was a priority, there was agreement that these technologies could not replace teachers. High levels of engagement could still be gained through 'old-fashioned' interaction, for example putting on a lab coat and attempting experiments in a laboratory. Despite this, there are still strong arguments for the use of technologies, for example, where access to 'real world' resources is limited. A final note of caution: in order to make the most of these technologies, they must be produced collaboratively and their development must not leave the teachers behind.