

EDUCATION AT THE WELLCOME TRUST



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The Wellcome Trust, referred to as the Trust in this article, is the largest charity in the UK, best known for its substantial funding and promotion of biomedical research to improve the health of humans and animals. As well as tackling immediate priorities, the independence and long-term perspective of the Trust enables it to support research that will benefit future generations. The Trust also seeks to improve understanding of the ways science and medicine have developed, and how research affects people and society today. It is in the latter context that the Trust has proactively developed its extensive programme of activities encouraging public engagement with science.

The Trust has always had an interest in science education and about seven years ago decided that it could make a major contribution to improving the quality of science education by making available high quality continuing professional development (CPD) for science teachers across the UK. This decision was particularly influenced by the Council for Science and Technology's report¹ on science teaching in 2000 which stated that good quality teaching depends on the opportunity for teachers to develop subject related pedagogical skills and competence but that most teachers do not up-date their skills.

Subsequent negotiations led to the setting up of the network of Science Learning Centres in partnership with the then Department for Education and Skills (DFES), now Department for Children Schools and Families (DCSF). The network consists of the National Science Learning Centre (NSLC), based in York and funded by the Trust, and nine regional science learning centres, one per government region and funded by DCSF, with an overall aim to *improve the quality of science teaching and learning through effective continuing professional development for all those involved in science education*. The network, which is now in its second phase and with additional funding support through Project ENTHUSE, a unique partnership in science education between Government, industry and the Trust, has to date exceeded its targets for teachers and technicians engaging in CPD.

As a research based organisation the Trust has always endeavoured to build on evidence, drawing on existing research and commissioning studies in areas of particular interest and concern. For example during the development of the science learning centres it became obvious that little was known about teachers' attitudes to CPD or their engagement with it. A study was initiated and the findings published in the report

*Believers, Seekers and Sceptics*², which, among other things, found that approximately 50% of the science teachers had received no subject specific CPD in the previous five years. More recently the Trust published a report on *Primary Science* in its Perspectives Series³ and is about to publish a second on *Transition from Primary to Secondary Education*. It has also commissioned a study, which is ongoing, into the attitudes of parents and pupils on testing at Key Stage 2 (pupils aged 11) in England.

Through its grant funding mechanisms the Trust also enables others to develop their own activities which support science education directly and indirectly. Importantly the Trust is able to take a more holistic view of education and bring together what might be considered the 'formal' and 'informal' areas of science education. This has been done, for example, on a national scale through the Trust's contribution to the Darwin 200 celebrations, when among other things the Trust instigated two ambitious initiatives with the aim of providing a practical experiment in science for every child of school age. This is currently being put into practice through *The Great Plant Hunt*⁴ for primary schools and *Survival Rivals*⁵ for secondary schools both of which are providing materials to enable young

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people to carry out investigations that have been derived from Darwin's own experiments. Although linked to curriculum requirements the experiments provide scope for teachers and their students to engage with a wider range of activities thereby enriching and enhancing their learning experiences.

Building on these foundations the Trust is looking towards the future and exploring ways in which, working with partners from Government, industry, professional bodies and other charitable foundations, the Trust can increase and improve its contribution to the development of high quality science education for all young people. Indeed the Trust is currently working locally, nationally and internationally to address four key areas.

A) THE SCIENCE EDUCATION AGENDA

Science education and related subjects (technology, engineering and mathematics) have received a great deal of scrutiny in recent years and some progress has been made in trying to bring about greater coherence to the way in which these subjects are supported. Much effort has also gone into encouraging young people to continue to study these subjects beyond the age of 16. Although there is evidence of some success, tensions have arisen between the more traditional approaches to science education and recent developments which explore science in a more contemporary manner. In part this reflects the need to provide a programme of scientific understanding for all pupils, regardless of whether they progress into careers in science, as well as preparing those students who will be the scientists, technologists,

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engineers, mathematicians and medics of the future.

Against this background the Trust has just commenced the development of a science education policy 'roadmap' which will look ahead to what science education might look like in 5-10 years and, importantly, what needs to be done to get there. We will be looking to consult widely during preparation of the report to be published in early 2010.

B) CONTINUING PROFESSIONAL DEVELOPMENT FOR TEACHERS

The Trust remains totally committed to the improvement of the quality of science education through effective professional development of teachers, technicians and other related staff. The success of the science learning centres to date has been a major contribution to raising the profile and quality of subject-related CPD. There is still much to do and the Trust is working with its partners and through Project ENTHUSE to explore ways of further strengthening the commitment to and uptake of CPD. A key element of this is through the development of an accreditation framework which allows teachers to gain recognition for their enhanced expertise. It also involves finding ways of identifying, supporting and encouraging future leaders of science education be they researchers, curriculum developers or excellent practitioners. The ultimate test of the initiative will be the impact it has on pupils and there is already evidence of positive

effects but a major evaluation has been commissioned in which this will be a key focus.

C) INFORMATION ON CONTEMPORARY SCIENCE

Science, as we all know, is a rapidly evolving subject and science education needs to keep abreast of these developments. One of the challenges is to find ways in which young people and their teachers are informed about contemporary science as part of their learning. The Trust is constantly looking to provide information in ways which are engaging to young people, as well as adults, through its public engagement activities, outreach work and publications such as Big Picture⁶ which is designed specifically for those in schools and colleges post 16.

D) SCIENCE EDUCATION RESEARCH AND DEVELOPMENT

Science education research provides some very useful evidence on which to base both policy and practice. However there are three main challenges which need to be tackled. The first is the identification of gaps in the evidence base and what should be prioritised for investigation. The second is more fundamental and related to the methodologies used in educational research which often fail to demonstrate a genuine effect that can be applied beyond the project which generated the evidence. This raises the question as to whether a new methodology needs to be developed or applied to research in education.

The third, arguably the most challenging, is how can research evidence be used more effectively to inform policy and improve curriculum development and pedagogy. The Trust is currently considering these issues with a view to establishing a programme to support better science education research and its influence on both policy and practice locally, nationally and internationally.

The Trust recognises that, like developments in science and medicine, educational change takes time, requires substantial thought and, where necessary, extensive piloting before being implemented system-wide. As such it requires medium to long term commitments and planning cycles which go beyond most political timescales. Taking advantage of its independence and its ability to take a medium to long term view, the Trust is willing to make such a commitment and as the (relatively) new Head of Education I look forward to taking up these challenges.

If you have any views on the future of science education or comments on the content of this article please contact me at d.bell@wellcome.ac.uk

1. Available at: <http://www2.cst.gov.uk/cst/reports/>
2. Available at: <http://www.wellcome.ac.uk/About-us/Publications/Reports/Education/index.htm>
3. Available at: <http://www.wellcome.ac.uk/About-us/Publications/Reports/Education/index.htm>
4. More information at: www.greatplanthunt.org
5. More information at: www.survivalrivals.org
6. Available at: <http://www.wellcome.ac.uk/Professional-resources/Education-resources/index.htm>

