

## **Helping the next generation of teachers to get children enthused about science through fieldwork**

A briefing note for Parliamentarians

### **The problem in a nutshell**

The FSC was established in 1943 as an educational charity committed to bringing environmental understanding to all. It currently welcomes 103,000 visitors every year on courses to its national network of 17 Field Centres. These include secondary science groups from nearly 600 schools. We know that fieldwork is a great way to increase students' enthusiasm for science and help them on their way to becoming the new scientists of the future. Unfortunately, we have found that there are a number of barriers to fieldwork provision. In particular, working with partners we have specifically identified that Initial Teacher Training (ITT) is not working effectively enough to help produce sufficient numbers of science teachers with the competence, confidence and commitment to meet the modern day challenges of teaching fieldwork to the next generation of children and young people<sup>1</sup>. This could undermine the UK's ability to compete in STEM-related areas.

### **The scale of the problem – the skills gap in science based industries**

A recent study by the Organisation for Economic Co-operation and Development (OECD) reported that the performance of students in science in UK secondary schools was well above the international average. This is good news because Science, Technology, Engineering and Mathematics (STEM) industries are of strategic importance to the UK. They contribute over £68 billion a year to the economy and account for over a third of all UK exports. A skilled workforce is essential in achieving the aim of a high technology and high value-added economy and by 2014 it is expected that the UK will need to fill over three-quarters of a million extra jobs requiring highly numerate, analytical people with STEM skills. It is unfortunate, therefore, that the number of school students choosing to take physical science post-16 has fallen over the last 25 years<sup>2</sup>. Research recently published by Shell revealed that only 28% of those students electing to study science after the age of 16 intended to pursue a scientific career. The result is that six out of ten companies employing STEM-skilled staff say they are having difficulty recruiting and are turning to countries such as India and China for new staff. Unless the numbers selecting STEM subjects post 16 are retained there will be a loss of innovation and participation by UK companies in this area and Britain will struggle to compete in the global market.

### **The link with science fieldwork**

The research described above suggests that the UK is missing out on a pool of potentially thousands of new scientists as a result of school students not pursuing STEM subjects even if they have an initial interest post-16. Many studies have indicated a major decline in positive attitudes from students towards science. Young people at secondary school generally see less relevance in science to the real world, find it less inspiring, enjoy less practical work and feel they have less opportunity to use their imagination. Students are 'turning off' science and more work is needed to ensure that students are inspired and to enable the UK to develop a rich source of skilled scientists so vital to the future of the British economy.

Whilst there is no single reason for the fall in popularity, particularly in physical sciences, it is clear that students need to be engaged in the subject to a higher level. Their enthusiasm for, and commitment towards, science needs to be raised. Hands-on practical science is known to stimulate and inspire and effectively-planned and well-taught fieldwork is a particularly powerful approach which helps to improve education standards<sup>3</sup>. High quality 'field experiences' can help to define life choices, tipping the balance in favour of post-16 science.

### **Current levels of provision of fieldwork in schools and ITT**

The current quantity and quality of secondary science fieldwork in UK schools will not achieve the desired impacts. Fieldwork provision in science is declining in British secondary schools. More than 96% of GCSE science pupils will

<sup>1</sup> ITT and the Outdoor Classroom. FSC/ASE 2007

<sup>2</sup> Learning to Love Science: Harnessing Children's Scientific Imagination, 2008

<sup>3</sup> National Foundation for Educational Research, 2004