

There has been much talk about the nature of British citizenship in the media recently. The *Today* programme on Radio 4 even had a citizenship test on their website. I hate to admit it but I did try the test, which was mostly checking knowledge of constitutional history – a depressingly narrow view of citizenship. Citizenship is surely more about engaging with contemporary events, or even, as the National Curriculum has it, being an informed, thoughtful and responsible member of society – admittedly an idealistic stance. But what does citizenship have to do with science education? The answer rather depends on how you see the purposes of science education. If you view science as a body of established knowledge for pupils to master to understand the world around them, then discussion of contemporary science and society's use of it is irrelevant. On the other hand, if you are trying to counteract a prevailing view of school science as boring and irrelevant, then the encouragement to consider controversial science issues is a breath of fresh air.

Teachers may react to the introduction of citizenship in secondary schools in a variety of ways – token acknowledgement, hostility to yet another innovation, pleasure at an additional opportunity to open up the science curriculum.

For science teachers, citizenship education creates a particular dilemma. Can we one day present scientific knowledge as established when considering much of the science in the curriculum, then the next discuss the uncertainty of scientific knowledge and people's reactions in considering the current media controversy? This is an issue of how we see the nature of science and how we present and evaluate scientific evidence. There are other considerations – science lessons tend to have clear 'factual' objectives, with pupils expected to gain a better understanding of specific scientific principles. We may feel less comfortable in guiding an open-ended discussion or in encouraging pupils to consider their response to issues such as genetic engineering, cloning, mobile phone safety, etc. These issues clearly do have a legitimate place in the science curriculum – embedded in the 'Ideas and Evidence' strand of Scientific Enquiry and in exam specifications. Yet they present us with challenges in the classroom. Are controversial science issues best dealt with by science teachers or in combination with humanities teachers? In English lessons pupils do consider media reports, including those about science. Are we happy that pupils get to discuss their views on contemporary science but not necessarily in science lessons? Cross-curricular collaboration should help, but this seems so difficult to achieve in practice. The most taxing issue, though, is perhaps one of evaluation – what does pupil progress

in dealing with controversial science issues look like and how can we monitor it? Some aspects of the understanding of the nature of scientific evidence and developing informed arguments can be assessed through formal evaluation – be it written tests or coursework. However, if we want to encourage pupils to develop skills of informed argument, we need to give space and value to them.

I see a real tension in much of the innovation being expected of schools. On the one hand, current educational policy is setting out to encourage flexibility and local action, through initiatives such as citizenship, the key stage 3 strategy, and management proposals in the Education Bill '*to increase diversity and promote autonomy*'. On the other hand, teachers see their own and their pupils' performance measured by centralised, 'one size fits all' assessments. It is difficult to break out of the 'league table' and exam-oriented culture. I suspect, despite moans about a centralised curriculum, nobody really wants a revolution. I remember many teachers' lack of enthusiasm for changing the science National Curriculum, when consulted as part of the Dearing review. There are many voices encouraging evolutionary change however. For example, it is interesting to see the Deans of Science Committee (*EiS*, November 2001, page 29) supporting the approach recommended in *Beyond 2000: Science Education for the Future* (Millar and Osborne, King's College London, 1998).

I continue to be an optimist. Perhaps the introduction of the citizenship curriculum will allow a step towards flexibility and renewed interest in science within the curriculum. (There is already evidence that many adults have an interest in science issues, but don't see this coming from school science – see for example *Science and the Public*, OST/ Wellcome Trust, 2000.) Pupils' achievements other than those in written tests may be more important – given the emphasis on values, responsibility and action.

A first step is to consider how citizenship issues, related to science, can be effectively considered in the classroom. ASE is currently producing support materials for citizenship in science, which are designed to provide a practical starting point. Peter Campbell's article (page 8) describes the two units and classroom resources which are to be published next month. Read on to find out what will be available to help you enrich your science teaching.

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