



A reflection upon the *Getting Practical* programme: rethinking how we teach practical science

This article gives an overview of the *Getting Practical* training programme of professional development for all those involved with teaching practical science at primary, secondary and post-16 levels. The programme is being led by the ASE, working with its co-ordinating partners: the Centre for Science Education, Sheffield Hallam University; CLEAPSS and the National Network of Science Learning Centres and alongside several other important contributing and supporting partners. It is being delivered by over 200 experienced trainers across the country and will be properly evaluated by the Institute of Education, London.

An overview of the *Getting Practical* programme

The *Getting Practical* programme is introduced on its website with the comment: 'The UK is one of the leading countries in Europe for including practical work in its science education curriculum, so why as a country are we struggling to find young people who wish to continue their study of science past GCSE level?' The programme is in part a response to a report by SCORE (the Science Community Representing Education) in 2008, *Practical work in science: a report and proposal for a strategic framework*. This report found that: 'There is a strong commitment to high quality practical work in science among teachers, technicians, and other stakeholders alike. There is a wide range of good practical work in science taking place across the UK but there are indications that the situation could be improved by extending good practice and focusing on the quality, rather than just the quantity, of practical work.'

Effective pedagogy is at the heart of improving the quality of practical work in science. When well planned and effectively implemented, practical work stimulates and engages students' learning at varying levels of inquiry, challenging them both mentally and physically in ways that are not possible through other science education experiences.'

The *Getting Practical* website draws the following conclusion from the SCORE report 2008:

Although there are a number of good quality practical science resources available, some practical work in schools and colleges can have a limited effect on a young person's engagement and learning.'

Most people involved in science education would agree that practical work can truly inspire, enthuse and delight students. However, the challenge is to move students away from simply 'following a recipe' to thinking about why they are undertaking practical work, and how observations can be explained by thinking about the science. Students can often leave a practical session being unclear as to the expected learning outcomes, even if they have enjoyed and completed the activity within the lesson. Sometimes teachers observe that their students complete practical work, obtain some great observations and may mark this down as a successful lesson. The question to ask is, did students really understand the science?

Delivering the training

I became involved with the programme after reading an ASE newsletter advertising for possible trainers. My own 'train the trainer' session was an intense day, ably led by John Walker from the NSLC. We were shown the course materials, which are designed to be delivered over six hours. The materials and delivery can of course be adapted slightly to suit the target audience. These 'train the trainer' courses have been run across the country, allowing the *Getting Practical* programme to be delivered nationwide. The programme is fully funded by the DCSF for two years. The cost of the course is free to all participants; however, there is an expectation that all participants attend for the full six hours. Costs incurred by trainers, photocopying costs and refreshments are also met out of these funds.

My sessions were delivered at Redborne Upper School, Bedfordshire, over two Tuesday mornings (9.00am until 1.00 pm). There was one week between the two four-hour sessions to keep up the momentum of the programme. The sessions were purposefully longer than 3 hours, to allow for a more relaxed schedule with plenty of valuable discussion time. Rather than a laboratory, we used a comfortable room in the training school at Redborne, with a range of quality refreshments: this may seem trite, but experience dictates that comfort leads to improved participation.

As trainers we had full access to the *Getting Practical* wiki, (not open access) and this was certainly invaluable in planning the sessions and allowing adaptation of the electronic materials to suit my own style of delivery (fewer slides, more discussion) and the participants. There is also a website for the teachers to access; however, at the time of writing, this has not been used by my colleagues (perhaps because I have been mailing material directly to them). I have used the site myself and will be adding some of the practical material and links to my own department site.

The training for 10 participants from eight different schools (Key Stages 2 to 5 (ages 7-19)) was remarkably well received. The evaluations were universally positive: 'this was truly a superb workshop.' 'This course really helped me put a better perspective on how I carry out practical lessons in my teaching.' In the evaluations, when the participants were asked: 'How likely are you to use any of the materials provided and/or share them with a colleague?', all answered 'very likely'.

The main points from the session

Although the idea of 'hands on, minds on' has always been key in my lessons, the pupil refrain during a practical lesson: 'so what should I do now?' is still ever present. Delivering training on this

AstraZeneca

Science Teaching Trust appoints new Director

The AstraZeneca Science Teaching Trust is pleased to announce the appointment of Professor Dudley Shallcross as its new Director, following the retirement of Professor Hugh Lawlor who had held the post since the establishment of the Trust in 1998.

Under Hugh's guidance, the Trust has established a reputation within the science education community for providing pedagogic support and continuing professional development for science teachers in the UK. Its work was initially targeted at teachers of science at primary level, but it has recently become more engaged with the transition to secondary education. The Trust has long been a staunch supporter of ASE.

Professor Shallcross came to the School of Chemistry at Bristol University in 1999 as a lecturer and combined running a very successful research group in atmospheric science with establishing a strong regional chemistry schoolteacher network, called CHaMeT. Dudley became the Outreach Director for Bristol ChemLabS, a post he has held until becoming Director of the AZSTT. Two of the main reasons for the success of Bristol ChemLabS Outreach were the establishment of a full time School Teacher Fellow position and the provision of high quality training in science communication for postgraduate students, who then took on the role of science ambassadors. During this time, Dudley has won nine national awards and one international award for science education and science communication. He is a great advocate of hands-on science and wants students and the public to experience real science for themselves.

More information on the Trust and its activities can be found on its website at:

www.azteachscience.co.uk

topic has really reinforced the need to ensure 'minds on' during practical work. Direct evidence of its immediate impact came from my own formal lesson observation on the last day of this term. My observer commented upon the huge emphasis on 'thinking' in my lesson and the noticeably positive response of the students to this way of teaching. On a similar theme, one of the participating teachers came to the second training session with laminated 'hands on, minds on' cards and some useful anecdotes about their use to share with us.

Our second vote was to focus upon reducing the number of learning objectives in a practical. Keep student learning outcomes tight and focus the

students on what they are trying to find out. Keep up the mantra: 'why are you doing this experiment? What are you looking for? Hands on: minds on'.

The programme encourages the consideration: is the practical always necessary or is it merely an opportunity to break up a lesson? There are many ways of teaching a particular topic and sometimes a practical is used because 'it is in the scheme of work' or because we always have done it, rather than because it offers the best route to, say, group work, or commenting on anomalies.

The contentious issue of 'fun' was raised and challenged with gusto. We all agreed that we had put in practical work just because 'it was fun'; however, the course challenges the notion of what is meant by 'fun' and the insinuation that, if practical is fun, is it nothing else?

I have delivered many training sessions in my 18 years of teaching: the success of this programme was obvious almost immediately, for many reasons. In the second session, two teachers stated that they had received formal lesson observations in the previous week. Both recounted their practical lessons and discussed how the knowledge they had applied from the course had been specifically commented upon by their assessors. I recount this anecdote from memory:

'I was observed yesterday by my line manager. I had a practical session going on with a variety of activities. In her feedback of my lesson, which she graded as 'good with outstanding features', she specifically commented upon how the students all seemed incredibly clear about the outcomes of the practical. She was used to seeing practical work with too many outcomes and in my lesson she felt they were really hammered home and the students were thinking about and questioning what they were doing all the time. I felt this was a direct reflection of Session 1, as I was trying to apply the principles we covered.' (An NQT at a secondary school in challenging circumstances, March 2010).

After the second session, I spent some time with a middle school colleague who, after discussing the programme with his Headteacher after the first session, had been asked to deliver a staff training session that evening. The Head was hugely impressed with the training materials and discussions he had with the teacher. To conclude, we all discussed how best to train colleagues in the participating schools. The Pareto

principle saved the day: 80% of our impact will be achieved by 20% of our actions. What small yet significant changes can we make to our practice to really have an impact on learning and thinking in our classrooms?

I now have one session left to deliver to my own science department on our April training day. The material will be condensed, but will still make an impact on colleagues. We are a very large department in a successful science (training and sports) college. It is always a challenge to sustain new ideas and practices: in this case, it is made infinitely easier by the fact that, once this training programme has been introduced, the ideas make sense and have an immediate and obvious impact on our students' learning. That surely is the crux of a successful and sustainable programme.

Websites:

Getting Practical programme (2010)

<http://www.gettingpractical.org.uk/m1-1.php> (Visited March 2010)

The SCORE Report (2008)

<http://www.gettingpractical.org.uk/m1-10.php> (Visited March 2010)

(SCORE is a partnership between the Association for Science Education, the Society of Biology, the Institute of Physics, the Royal Society, the Royal Society of Chemistry and the Science Council. SCORE acts under the auspices of the Royal Society and is chaired by Sir Alan Wilson FBA FRS)



Getting Practical

For more information regarding the Getting Practical programme, please visit www.gettingpractical.org.uk. The programme is recruiting trainers for the 2010/2011 academic year and is keen to hear from enthusiastic teachers with a passion for practical science from primary through to post-16 levels. Please see the website for more details, or contact kirstiehampson@ase.org.uk or georginawestbrook@ase.org.uk

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