CPD - Leading for Excellence in Science

Leading for Excellence in Science is SSERC's response to supporting those with leadership responsibilities for science education in secondary schools. Current and ongoing changes to the science curriculum in schools and changes to management structures in schools have resulted in a continued demand for such support from practitioners and recognition of its importance from a number of stakeholders.

Leading for Excellence in Science is aimed at all of those who have, or aspire to have, responsibility for leading science education in their establishments. Those with responsibility for science now form a diverse group including Heads of Faculty, Principal Teachers (Curriculum) of combinations of science and other subjects, Principal Teachers of Biology, Chemistry or Physics and Class Teachers with assigned responsibilities in science education. SSERC aims to support all of these in their leadership roles.

The first phase of support is the SSERC publication *The Excellent Science Department – A Guide to Self-evaluation and Leadership,* written by Jim Stafford. This booklet, published in 2007, has been distributed on the basis of five copies to every school in Scotland that is a member of SSERC. The publication is designed as a free standing point of reference on key aspects of leading a science department and includes sections on leadership qualities and skills, the curriculum, resource management, health and safety, self evaluation and planning for improvement.

The next phase of support is the training course *Leading for Excellence in Science*. This residential CPD course is in two parts, an initial four days followed by a recall of two days after a gap of around four months. During the gap between the two parts of the course, participants are expected to carry out an action research, management or similar task and share the outcomes of their task with fellow participants during the second part of the course. The course is coordinated and organised by staff from SSERC and delivered by nationally recognised experts in their fields. Where the course includes generic leadership skills in addition to specific development issues and management responsibilities in science these are developed in science specific contexts. The course includes topics such as:

- Curriculum and course development issues with particular reference to Curriculum for Excellence
- Areas for development highlighted in the HMIe Report *Science: A portrait of current practice in Scottish schools* [1]
- Improving learning and teaching through self evaluation
- Managing science health and safety issues
- Addressing science department/ faculty management issues and policy development
- Leading teams and managing change

Course participants are provided with a variety of supporting publications and resources as well as on-going access to advice both during and once the course has been completed. Participants can also access a further two day course designed to allow them to share their progress and refine their leadership skills around 12 months after completion of the second part of the *Leading for Excellence in Science* course.

SSERC continues to pursue sources of funding from partner organisations so that such courses can be offered at little or no cost to schools. At present, through funding from the Scottish Government (Support for Scottish Science Education through CPD Project) and from the National Science Learning Centre (ENTHUSE Project), funding is available to reimburse schools for the course fees and to provide a small amount of money to support follow up work in schools. In addition, participants are eligible to submit their gap task action plans for consideration for a Rolls Royce Science Prize of £1,000 or more to spend on science teaching in their schools. The first course run under this funding regime has already produced one recipient of a £1,000 Rolls Royce Science prize [2] who will now go forward to further stages of the prize scheme where further additional prizes of £5,000, £10,000 and £15,000 can be awarded.

Course evaluations have shown that almost all participants rated the course sessions *very useful* or *useful* and considered it highly likely that they would use the information gained from the courses in their current post. Particularly pleasing were evaluations

New Teltron equipment

Here we look at four of the latest Teltron Tubes for use in the physics laboratory: the Perrin Tube, Thomson Tube, Electron Diffraction Tube and the Dual Beam Tube.

All the tubes examined incorporate electron-gun assemblies contained within an evacuated clear glass bulb.

This new breed of tube can be mounted in a universal tube holder set at an angle, unlike the older ones. This new style holder (Figure 1) allows for easy access to the tube connections using five built-in 4 mm sockets at the rear of the neck brace. The cathode in each tube can be heated either directly or indirectly. Like the anode, it is in the form of a cylinder. A filament protection circuit is integrated into the neck brace to prevent excess voltage being applied to the cathode heater circuit. The base of the holder has a guide slot built in for attaching Helmholtz coils at distances varying from 68 mm to 150 mm apart. An auxiliary coil can also be inserted into the stepped front of the holder in an axial configuration.

A table summarising the experiments that can be performed with each tube can be found at the end of this article.

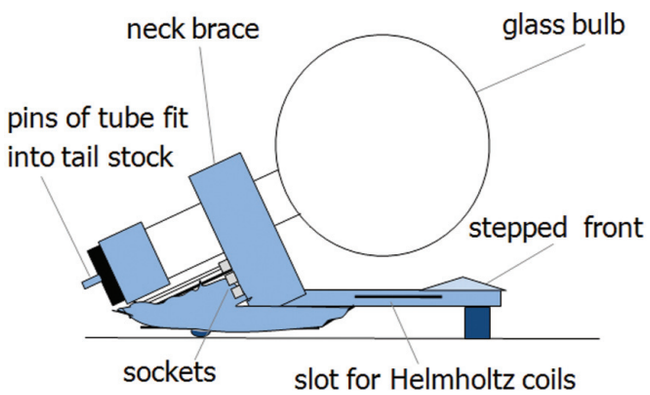

Figure 1 *- Teltron Tube in new-style holder.*

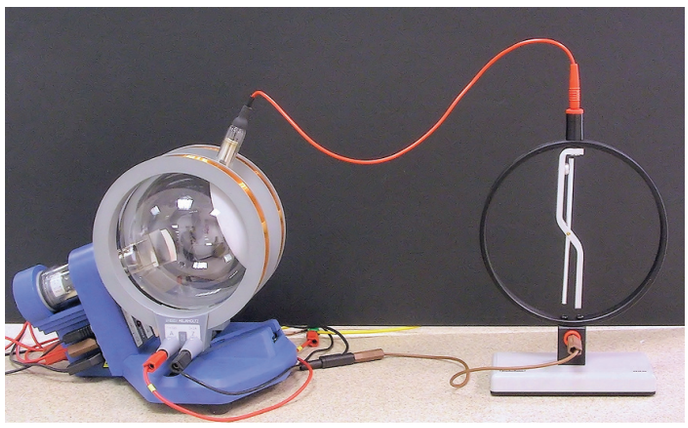

Figure 2 *- Perrin Tube attached to electroscope*

Perrin Tube

Description: In this tube, electrons emitted by the gun form a narrow beam of circular cross section which produces a spot on a fluorescent screen coating the end of the tube. A small glass tube with a Faraday cage is set on the top of the glass bulb at an angle of about 45^{o} to the undeflected beam. The electron beam can be deflected into the Faraday cage electromagnetically by means of Helmhotz coils. Lissajous Figures can be produced on the fluorescent screen by deflecting the beam in two perpendicular planes, either with two sets of Helmholtz coils, or one coil set plus electrostatic deflection with the small plates near the anode.

Thomson Tube

Description: In this tube, the deflection of the electron beam can be achieved either electrostatically by means of built-in parallel plates or electromagnetically by using the Helmholtz coils. The beam is intercepted by a flat mica sheet. One side of this is coated with a fluorescent screen. The other side is printed with a millimetre graticule so that the path of the electrons can

where participants commented that the course had given them the confidence to tackle challenging leadership issues and the high value they placed in learning from other participants' experiences in addition to the sessions provided by nationally recognised experts.

In addition an independent evaluation by the Scottish Centre for Research in Education (SCRE) [3], a requirement of Scottish Government funding, commented that overall SSERC CPD has had a substantial impact on many CPD participants and, perhaps more importantly, has also been translated into changes in the practice of many teachers.

Currently applications are being accepted for a *Leading for Excellence in Science* course on 21st to 24th November 2010 and 17th to 18th March 2011 (closing date - 17th September 2010).

Application forms are available from: sheila.maclellan@sserc.org.uk and a draft programme is available on the Science3-18.org website [4].

References

[1] - http://tinyurl.com/Science-Portrait
[2] - http://science.rolls-royce.com/award_winners/finalists_2009-10/
[3] - http://tinyurl.com/CPD-evaluation
[4] - http://tinyurl.com/Leading-for-Excellence