



Royal Society of Chemistry Annual Report to the EuCheMS Division of Chemical Education for 2008-2009

1. Abstract

The latest GCSE specifications have been reviewed, and consultation on the forthcoming Science Diploma has continued. Government initiatives have addressed how to attract more young people into science, and how to stimulate more able pupils. National events relevant to chemical education have been held by the Royal Society of Chemistry, the British Association for the Advancement of Science, and the Salters' Institute of Industrial Chemistry. Several activities have related to the Chemistry for our future project, which has also been extended to Wales. There have been publications to support Olympiad activity, provide maths support, to identify good practice in the employment of university staff and to discuss the readiness of UK chemistry departments to succeed in the European Higher Education Area. The Royal Society of Chemistry has collaborated with Pfizer in an outreach programme called *Discover chemistry*. The RSC and the Royal Society of Edinburgh have launched a project to support science teachers in implementing Scotland's new Curriculum for Excellence.

2. National educational policy

The Science Diploma Development Partnership began a consultation process to consider the vision, purpose, content and factors determining the success of the Science Diploma. This new qualification is expected to comprise a three tier progression route, incorporating the requirements of the National Curriculum for 14-16 year olds and GCE A levels post-16. However, the introduction of the Diploma at level 3 has been delayed for a year. The Government has invited interested parties to participate in a national science and society consultation based on its strategy document *A vision for science and society*. Key themes addressed are how to improve communication, generate interest, increase participation and convey the relevance of science, how to build trust and confidence in scientific research in the public and private sectors, and how to inspire young people from diverse backgrounds to become tomorrow's skilled scientists. The Department for Innovation, Universities and Skills published a consultation report *Higher education at work: high skills, high value*. The Higher Education Funding Council for England published *Strategically important and vulnerable subjects* which concluded that it is the Government's role to designate subjects as being strategically important and identify the interventions necessary to address this. *Understanding the undergraduate learning experience in chemistry* reported research that shows that chemistry undergraduates are satisfied their courses are well balanced and not too academic nor too applied. The Training and Development Agency for Schools have launched a national Science Additional

Specialism Programme for teachers of physics and chemistry, aimed at developing non-specialist teachers' knowledge and skills in these subjects so that they can teach them more effectively. The Science Community Representing Education have launched *Getting practical: a framework for practical science in schools*, designed to encourage schools' heads of science and their science teaching staff to plan how the quality of practical work in science can be improved. A report entitled *The new GCSE science examinations. Findings from the monitoring of the new GCSE science specifications: 2007 to 2008* was published by Ofqual and questioned whether grades can be compared across awarding bodies and noted that insufficient opportunity was provided for more able students to demonstrate the extent of their knowledge. The Qualifications and Curriculum Authority has launched a consultation into the criteria on which current GCSE science syllabi are based. The Chemistry Network is funded by the Department for Children, Schools and Families and aims to target able, gifted and talented chemistry students with activities that will challenge them and take them beyond the curriculum.

3. Events in chemical education

Twenty students attended the University Chemistry Experience Camp held at the University of Bristol's school of chemistry. This event aims to give university experience to students who are considering studying for a degree in chemistry. The UK team gained two silver and two bronze medals at the 40th International Chemistry Olympiad held at Eotvos Lorand University in Budapest, Hungary. The RSC has launched an Online Olympiad competition, the winners who will be encouraged to enter the first round of the 2010 competition. The British Association for the Advancement of Science celebrated National Science and Engineering Week in March. The Chemical Education Group of the Salters' Institute of Industrial Chemistry held a seminar Teaching and learning science at Key stage 3 which highlighted the importance of practical work and the need to build more time into the curriculum for students to understand some of the more abstract and microscopic concepts of chemistry.

4. Activities of the Royal Society of Chemistry

The RSC's Bill Bryson science communication competition was won by Emily Bullman from Walthamstow Hall School with a book entitled *Science and sport in action*. The Schools Education Awards were won by Chris George of the Royal Latin School and Leila Elliott of the North East Process Industry Cluster's Science Education Unit. Loughborough Grammar School won the National Schools' Analyst Competition Shield. *Meet the universities* was attended by 200 ChemNet members who were able to question representative from 20 universities. The Chemistry for our Future project has been extended to Wales with the support of the Higher Education Funding Council for Wales. The project continues in England with the appointment of three teachers to one year secondments in universities as part of the Teacher Fellowship Scheme. The project has commissioned a report, *An investigation into the factors affecting the employment of chemical science graduates in the UK*, which analysed existing sources of data as well as undertaking original research.

Anthony Hardwicke, formerly head of chemistry at Challoner's Grammar School, Amersham is the RSC teacher fellow for 2008-2009. The Curriculum and Assessment Group published a booklet which summarises the current content of the chemistry specifications available from each of the awarding bodies of the General Certificate in Secondary Education qualification at age 16 in England and

Wales. The Top of the Bench national competition was won by a team from Bootham School in York. The Nyholm Prize for Education was awarded to Tina Overton of the University of Hull.

5. Publications

The Maths Resource Database lists a range of books, software and online resources which will be useful to support higher education students.

<http://www.rsc.org/Education/HElecturers/Resources/MathsforScientists.asp>

The Assessment for Learning website aims to support teachers who want to develop their use of assessment for learning to involve students in their learning of chemistry.

<http://www.presentingscience.com/aflchem>

The Interactive Lab Primer shows fifteen common laboratory techniques including the apparatus, video instructions, health and safety issues and reference material.

<http://www.rsc-teacher-fellows.net/index.htm>

The RSC and the Athena Project published a report Planning for success: good practice in university science departments. This surveyed working practices in 38 chemistry departments and identified the best practice which benefits all staff.

<http://www.rsc.org/ScienceAndTechnology/Policy/Documents/PlanningforSuccess.asp>

Online tests contains 2500 pages containing tests and revision notes, some of which is aimed at A level courses.

<http://bestchoice.net.nz>

The RSC has published a Chemistry Olympiad support booklet aimed at teachers of gifted and talented chemistry students.

The Science Council has hosted a new online resource as part of the Government's national campaign to promote science, technology, engineering and mathematics subjects.

<http://www.futuremorph.org>

The chemistry of climate change is designed to support the teaching of climate change in schools and colleges. The resource is aimed at intermediate and advanced students, and aim to show how the chemical sciences contribute to our understanding of the challenges of climate change.

<http://www.rsc.org/climatechange/>

The Science Museum has produced a series of activities for teaching materials and their properties at key stages 3 and 4. They include ideas for demonstrations and experimental investigations.

http://www.sciencemuseum.org.uk/educators/classroom_and_homework_resources.aspx

6. Liaison with the chemical industry

The Royal Society of Chemistry has collaborated with Pfizer in an outreach programme called *Discover chemistry*. This has included the dissemination of a module developed at the University of Bristol comprising an interactive laboratory manual for AS chemistry units. Industry study tours for teachers were held, based in Chester and Barcelona.

7. International and European initiatives

Six students travelled to Boston, US as winners of a competition organised through the RSC-Shire partnership. The Royal Society of Chemistry published *Mastering Bologna: a report on the readiness of UK chemistry departments to succeed in the European Higher Education Area*. This makes a number of recommendations, including the need for scholarships to fund students undertaking study at masters level.

8. Other events and activities

Vijay Chudasama, a student of University College London, was given the 3M award for the Best Chemistry Student at the 2008 Science, Engineering and Technology Student of the Year Awards. The Centre for Science Education at Sheffield Hallam University has developed a new qualification, the STEM Leaders Qualification, to recognise the personal leadership skills students develop through their study of science, technology, engineering and mathematics. It has been developed with support from the Specialist Schools and Academies Trust, and supports the development of students' personal, learning and thinking skills. The RSC and the Royal Society of Edinburgh have launched a project to support science teachers in implementing Scotland's new Curriculum for Excellence, which will be introduced in Scottish schools from 2010.