

# **National Centre for Excellence in Science Teaching**

## **Consultation**

**Department for Education and Skills**

**February 2002**

## Background

In March 2000 the Council for Science and Technology (CST), the Government's advisory body on science, published a report called *Science Teachers, A report on supporting and developing the profession of science teaching in primary and secondary schools*<sup>1</sup>. This highlighted that science teachers have particular need of effective continuing professional support because of the breadth of the subject taught in schools and because of rapidly developing scientific knowledge. The report recommended that a National Centre for Excellence should be set up to provide this support.

The Labour Party Business Manifesto, published in May 2001 included a commitment to this recommendation saying that: *'with charitable and corporate involvement we will establish a National Centre of Excellence for Science Teaching to promote best practice'*.

The CST's recommendation was based on a survey of teachers that focused on their current experience of Continuing Professional Development (CPD). To ensure that the Centre is shaped by the needs of science teachers, and also takes into account the views of others, the DfES carried out an exploratory study in the summer of 2001 to sample the views of stakeholders, including science teachers, CPD providers and professional institutions. The present consultation is based on the results of this as well as the findings of the original CST report. It seeks the views of a wider range of stakeholders than were represented in the exploratory study.

## Introduction

1. This Department for Education and Skills consultation, sets out the proposals for establishing a National Centre for Excellence in Science Teaching.
2. The consultation seeks the views of primary and secondary teachers of science, school science technicians, advisers and inspectors, ITT and CPD providers, members of professional and subject associations, industry and higher education.
3. You can respond to this consultation:
  - by completing the response form which accompanies this booklet
  - by letter or email, [science.excellence@dfes.gsi.gov.uk](mailto:science.excellence@dfes.gsi.gov.uk)
  - electronically, by completing the form on [www.dfes.gov.uk/consultations](http://www.dfes.gov.uk/consultations)
4. After analysis of the responses, the Department will develop a specification for the centre and consider carefully how best to set up and manage it.
5. Please return responses to this consultation by 8 May 2002 to:

Jackie Bellfield  
Consultation Unit  
Area 1B  
Castle View House  
Runcorn  
WA7 2GJ

6. If you have any questions about the consultation process please contact [colm.carty@dfes.gsi.gov.uk](mailto:colm.carty@dfes.gsi.gov.uk)

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<sup>1</sup> Available on the CST website [www.cst.gov.uk](http://www.cst.gov.uk)

## Aims of the Centre

The overall aim of the Centre would be to develop teaching and learning in science so that young people are encouraged to succeed, to become confident and informed users of science and have a secure base from which to pursue scientific study or employment. (*Question 1*)

In working to fulfil this aim the Centre would be expected to:  
identify needs and develop provision for CPD in science in line with national priorities, such as the Key Stage 3 strategy for science

- work with partner organisations to establish a strategy for CPD for teachers of science and for school science technicians
- work with other providers of CPD
- contribute to the quality assurance of CPD and materials. (*Questions 2 - 5*)

### 1. The aim of the Centre should be to develop teaching and learning in science

Agree ✓

**Comments:**

Neither agree nor disagree

**The Centre could also have a role in taking an independent overview of the curriculum and of the methods used by those obtaining best results across the world.**

Disagree

### 2. The Centre should identify needs and develop provision for CPD in science in line with national priorities

Agree

**Comments:**

Neither agree nor disagree

**The Centre must be seen to be for teachers, not something they have to participate in because of national priorities. It must not have one particular philosophy as there is insufficient evidence on which to base the choice of philosophy. It also should be seen as a source of help for the non specialist in primary schools and the person teaching outside their subject specialism in secondary schools, and should promulgate a variety of approaches for students of different learning styles.**

Disagree ✓

### 3. The Centre should work with partner organisations to establish a framework for CPD for teachers of science

Agree ✓

**Comments:**

Neither agree nor disagree

**The framework should reflect both the long term needs of science teachers and the short term need to accommodate national priorities.**

Disagree

4. **The Centre should work with other providers of CPD**

Agree ✓

Neither agree nor disagree

Disagree

**Comments:**

**The Centre, at best, would only be able to facilitate access to modern academic and industrial science and thus should work with learned societies, professional bodies, and others such as awarding bodies.**

5. **The Centre should contribute to the quality assurance of CPD and materials**

Agree

Neither agree nor disagree

Disagree ✓

**Comments:**

**This could detract from the Centre's work and could be seen to be contentious if it was seen to be approving one provider's course over another.**

## **Organisation**

To improve access to high quality CPD for science teachers throughout England a network of regional centres (possibly around ten) would be needed through which there would be the possibility of face to face or telephone contacts with a known colleague. The regional centres would be supported by a virtual centre whose organisation draws on teachers' experience of effective on-line support. One of the regional centres would act as a national coordinating centre to complete the organisational structure. All three types of centre would make up the body known as the National Centre of Excellence in Science Teaching. (*Questions 6 - 8*)

6. **The centre should include a number of regional centres**

Agree ✓

Neither agree nor disagree

Disagree

**Comments:**

**However the proposal contains references to 'regional' rather than 'local' areas. Our experience is that organising regional events in some areas of the country is problematic due to geographical reasons.**

7. **The Centre should include a virtual centre**

Agree ✓

Neither agree nor disagree

Disagree

**Comments:**

**Many teachers for reasons of family commitments, geography etc are unable to commit themselves away from home after the working day. Some training can be best carried out on-line. However the opportunity for face to face contact as well is essential.**

8. **One regional centre should also have the role of a national coordinating centre**

**Comments:**

Agree ✓

Neither agree nor disagree

Disagree

**This could, however, mean that one part of its work then suffers. It is important to clearly separate the two functions of regional and national centre. The Centre should bring together expertise in both science - that is real scientists who are innovating, developing and problem solving, and in science education - that is experts in pedagogy, educational research, and teacher education and highly skilled classroom practitioners. No single body currently do this.**

**The national centre should be a place where materials and training packages are trialled across the whole range of schools and teachers before implementation, so that change is based on what is known to work. Thus policy is borne of experience, rather than experience trying to catch up with policy.**

## Management

There are already many organisations active in providing CPD for science teachers. Management of the Centre could be undertaken by one of these, by a consortium of the leading organisations or by a new body set up specifically for the task. Alternatively it could be based in a university with a strong science faculty. In addition, Beacon Schools and Advanced Skills Teachers (ASTs) have a role to play in the CPD of teachers and could be involved in the determining how the aims of the Centre are put into practice and in contributing to development and delivery of training at a regional level. (*Questions 9 - 13*)

### 9. The Centre should be managed by one existing organisation

Agree

Comments:

**The Centre should bring together both expertise in science - that is real scientists who are innovating, developing and problem solving, and in science education - that is experts in pedagogy, educational research, and teacher education and highly skilled classroom practitioners. No single body currently does this.**

Neither agree nor disagree

Disagree ✓

### 10. The Centre should be managed by a consortium of existing organisations

Comments:

Agree ✓

**The Centre, whether with regional arms, or as a virtual body should not promulgate one view of science education, nor should it exemplify 'best' practice but a wide variety of good practice and different approaches to science education. There are several existing organisations that could do this, especially in a properly funded consortium arrangement.**

**A possible approach would be a consortium (of e.g. ASE, IoB, IoP, RSC), who would ensure that a variety of approaches could be followed. The consortium would need to be an independent non-governmental body, whose sole business would be science education for all. It would need to seek advice from those with an international perspective and from other partners in education such as awarding bodies.**

Neither agree nor disagree

Disagree

### 11. A new organisation should be set up to run the centre

Comments:

Agree

**This would be counter productive since it would necessarily have to draw on the pool of existing personnel in the field.**

Neither agree nor disagree

Disagree ✓

12. **The Centre should be based in a university**

Agree

**Comments:**

Neither agree nor disagree ✓

**The location is only important if it is perceived that a particular view of science education would be promulgated.**

Disagree

13. **Beacon Schools and ASTs should contribute to development and delivery of CPD provided by the Centre and its regional arms**

Agree ✓

**Comments:**

Neither agree nor disagree

**The management of the work of AST's in co-operating with other schools leaves much to be desired. The Centre could make use of this valuable resource in a more effective way.**

Disagree

## Priorities

In order to teach science effectively teachers need considerable breadth and depth of knowledge and opportunities to keep up with rapid developments. Science teaching is therefore particularly challenging. The Centre should be concerned with developing subject knowledge, for primary teachers who may not be specialists, for secondary teachers teaching outside their specialisms, making it possible for pupils to be taught about cutting edge advances in science and developing innovative and imaginative approaches to the National Curriculum, e.g. Sc1 Scientific Enquiry. The Centre's work in these areas would need to build on what is currently being offered in the Key Stage 3 Strategy for Science. The Centre should also establish CPD for school science technicians. (*Questions 14 - 18*)

In some areas of the country there are well-developed networks where teachers can share expertise and get practical advice from others about effective ways of teaching. In other areas these networks do not exist. One priority for the Centre could be to ensure that all teachers and technicians have access to such networks. (*Question 19*)

There is a wide variety of CPD provision available to teachers of science. One priority for the Centre could be to establish an easily accessed, up-to date database of existing provision. (*Question 20*)

### 14. The Centre should provide or make available resources to help primary teachers of science develop their subject knowledge

Agree ✓

Neither agree nor disagree

Disagree

#### Comments:

**As the vast majority of primary teachers are not specialists in science the scale of this undertaking has to be recognised.**

**Indeed many primary teachers will have either no qualification in one or more branches of the sciences or an 'O' level or GCSE qualification only.**

### 15. The Centre should provide or make available resources to help secondary teachers of science teaching outside their own specialism

Agree ✓

Neither agree nor disagree

Disagree

#### Comments:

**In order to do this it will be important to have quantitative national data to establish the size of the problem both in terms of numbers and key stages.**

**These resources must include the facilities to experience, develop, and enhance practical work and thus high quality laboratory provision is essential.**

### 16. The Centre should work with higher education and teachers to make available resources for teaching about recent developments in science

Agree ✓

Neither agree nor disagree

Disagree

#### Comments:

**There are many other sources of information about recent developments in science such as learned societies, trade associations etc. These should supplement and complement existing provisions such as, for example, the RSC Industry Study Tours and Hands-on symposia.**

**17. The Centre should provide or make available resources to help teachers of science with teaching about Sc1, Scientific Enquiry**

Agree ✓

**Comments:**

**This should seek to broaden what is done and move away from the formulaic approach often currently followed.**

Neither agree nor disagree

Disagree

**18. The Centre should develop CPD for school science technicians**

Agree ✓

**Comments:**

**Modern science in schools needs to be supported by a well trained technician force. This is not the current situation. National Occupational Standards for laboratory technicians working in education have been developed as have the associated S/NVQ. The Royal Society Report (*Supporting Success: Science Technicians in schools and colleges*) states that these should be vigorously promoted by DfES to schools. This is in order to: a) provide a framework in which existing skills can be formally recognised; b) encourage technicians to continue to develop their skills throughout their careers; and c) support a career progression pathway. This will require significant funding to allow the appropriate training to be put in place for technicians to meet these National Occupational Standards.**

Neither agree nor disagree

Disagree

**19. The Centre should ensure that all teachers and technicians have access to networks through which they can share expertise**

Agree ✓

**Comments:**

**The provision of a network is not enough. Workload issues need to be addressed in order to provide the time for the sharing of expertise.**

Neither agree nor disagree

Disagree

**20. The Centre should establish and maintain a database of CPD provision in science**

Agree ✓

**Comments:**

**It is important that very clear guidelines are established as to how this is carried out. If such a database were on-line participants could be asked to give their opinion of quality (cf resources metatagged to the National Curriculum website).**

Neither agree nor disagree

Disagree

## Using the Centre's resources

Although good quality CPD is available to those who teach science at present, take-up remains relatively low. Courses often relate to management rather than to developing subject-specific expertise. In order to make sure that the Centre's resources are used as widely as possible schools could be encouraged to give higher priority in their development plans to CPD leading to improved subject knowledge and teaching and to take account of what is offered by the Centre when individual and departmental training needs are identified. (Questions 21 - 22)

### 21. Subject specific CPD should have a higher priority in schools development plans

Agree ✓	<b>Comments:</b>  If teaching and learning are the highest priorities than they must be supported by high quality subject specific CPD. This not only means the provision of the resources but the provision of either the time to make use of the resource or proper financial recompense should the CPD take place in the teachers' own time.
Neither agree nor disagree	
Disagree	

### 22. CPD offered by the centre should be considered when individual and departmental training needs are considered

Agree ✓	<b>Comments:</b>  This CPD should complement and supplement existing provision, and be seen to be a part of a wider programme from a wide range of bodies.
Neither agree nor disagree	
Disagree	

## Any other comments

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Many of the proposed roles of the Centre are already being done, if in a somewhat ad hoc manner and successful models are available.

Models such as the RSC Industry Study Tours and Hands-on Symposia, with a clearly defined focus, are recognised by participants as successful. These are three and one-day events for teachers held in industrial or academic locations and combine visits, talks, workshops and practical activities and allow teachers the opportunity to exchange information and ideas.

The RSC activities are primarily to develop participants as subject teachers and to improve their knowledge, pedagogy, etc. Thus they gain knowledge and acquire materials that will make their teaching more interesting and successful and may help career progression.

The Centre has a role to play in providing information about current activities but could also be proactive in seeking to determine national priorities.

The RSC is happy to give of its considerable expertise in the CPD field to the development of the Centre.

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## Your details

Name **Dr C Osborne, Education Manager, Schools and Colleges**  
Organisation **Royal Society of Chemistry**  
Address **Burlington House, Piccadilly, London**  
**W1J OBA**

The DfES may, in accordance with the Code of Practice on Access to Government information, make individual responses available on request. Please indicate if you wish your response to remain confidential.

My response is confidential. Yes  No

If you are making an individual response to the consultation please indicate whether you are responding as a:

- |                                                    |                                                   |                                                    |
|----------------------------------------------------|---------------------------------------------------|----------------------------------------------------|
| <input type="checkbox"/> Primary teacher           | <input type="checkbox"/> Headteacher              | <input type="checkbox"/> Science adviser/inspector |
| <input type="checkbox"/> Secondary teacher         | <input type="checkbox"/> CPD provider             | <input type="checkbox"/> Employer                  |
| <input type="checkbox"/> Advanced skills teacher   | <input type="checkbox"/> ITT provider             | <input type="checkbox"/> Other (please specify)    |
| <input type="checkbox"/> School science technician | <input type="checkbox"/> Teacher of science in HE |                                                    |

If you are making a response on behalf of an organisation please indicate whether the organisation is a:

- |                                                                                                     |                                                              |                                                 |
|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------|
| <input type="checkbox"/> Primary school<br>Beacon school yes/no                                     | <input type="checkbox"/> Business or industry                | <input type="checkbox"/> LEA                    |
| <input type="checkbox"/> Secondary school<br>Beacon school yes/no<br>City Technology College yes/no | <input type="checkbox"/> Subject association                 | <input type="checkbox"/> Other (please specify) |
| <input type="checkbox"/> University science department                                              | <input checked="" type="checkbox"/> Professional association |                                                 |
| <input type="checkbox"/> University education department                                            | <input type="checkbox"/> Employers' association              |                                                 |