



Principles for routes into teaching  
the sciences at secondary level  
January 2015

# Introduction

There have been considerable changes in recent years to the organisation and management of initial teacher education, and while the effects of those changes are not yet clear, the SCORE organisations believe that the quality of initial teacher education in the sciences should be of a consistently high standard, wherever it is undertaken. Accordingly, this statement sets out the aims and features required of high-quality initial teacher education (both undergraduate and postgraduate) in order to ensure

the supply of capable subject specialist teachers in the sciences at secondary level. SCORE will use this document as a benchmark when commenting on reforms to initial teacher education, and hopes that others will also find it a useful tool.

This document covers secondary level only; SCORE hopes to produce, at a later date, a similar set of principles for routes into teaching science at primary level and for teachers in further education institutions.

## 1 The purpose of initial teacher education courses

**All initial teacher education courses should begin the process of developing high-quality subject specialist teachers, and should be of a duration to allow and support student teachers to develop the following in the context of their specialist subject:**

- subject knowledge at a level well above that which they will teach
  - sound pedagogic content knowledge in their specialist subject, to enable them to present subject content in a way that is appropriate for their students
  - sound pedagogical skills (including practical skills and the use of current technologies)
  - skills in classroom management
  - a comprehensive set of skills for assessing and supporting students' understanding, progress and development
  - experience of teaching gained through school placements in different schools, and of teaching students at different key stages
  - a clear understanding of the needs of all students, whatever their background, and of theories relating to how children learn
  - skills in appraising different approaches to pedagogy, and in appraising research as well as reflecting on practice
  - an understanding of the sources and consequences of unconscious bias, so that the achievement and progression of all students in all subjects is unaffected by gender, minority ethnic or social background.
  - knowledge of the structure and function of the education system
  - knowledge of career pathways within and related to teaching
  - commitment to ongoing professional development
  - knowledge of safeguarding, school governance, administration and management
  - knowledge of health and safety
-

## 2 Appropriate support and guidance

- All student teachers should be provided with **support and guidance** during their studies, within the schools in which they carry out their placements and externally. This should include both subject specialist guidance and guidance, support and mentoring from supervisory and non-supervisory staff in placement schools. This is to ensure that any issues within the schools, for example poor behaviour or leadership, can be addressed.
  - All providers of teacher education should have **staff dedicated to providing support and guidance**, who have:
    - sufficient **time and resources** allocated for their own development in the role, including subject knowledge, general pedagogy and educational matters;
    - formal links with **sources of information** on educational research and good practice in teacher education.
  - Student teachers should have **experience of at least two contrasting schools and of different key stages and of teaching students of different abilities** during their initial teacher education to ensure that student teachers gain experience of a variety of approaches to teaching their specialist subject. They should also develop an understanding of how science at key stages 1 and 2 contributes to students' learning or progression. Their teaching practice should focus on their specialist subject.
  - Student teachers should have the **right to request to change the school** in which their classroom experience is taking place should training provided be unsatisfactory.
  - All providers should have procedures in place to **identify candidates who are struggling** during their studies, and provide them with support and guidance to help them get back on track, as well as opportunities for mediation.
- 

## 3 Assessment that provides information on progress and attainment

- Assessment of student teachers' progress should be carried out in a manner appropriate for the skills and knowledge being assessed, whether through coursework, observation or examination. The **timing and purpose** of each assessment point should be made clear at the start of the course and examinations should be limited to subject knowledge.
  - As far as possible, assessment systems should be consistent but also be designed to allow for the fact that **individual student teachers will develop at different rates**. Student teachers should receive regular feedback on their performance to allow them to incorporate changes into their practice and teacher educators should be afforded the time to do this properly.
  - Successful completion of initial teacher education should as a minimum qualify students to teach **a specified subject (or subjects) up to a particular level**, rather than provide a general qualification to teach. Following this the teacher should make a commitment to undertake regular subject-specific professional development.
-

## 4 Ensuring that all initial teacher education is high quality

- All institutions offering teacher education should have their courses **accredited and inspected** regularly, at both institution and subject level, and providers should be held accountable for the aspects of the student teachers' learning for which they are responsible. This should include all schools at which student teachers undertake any part of their learning.
  - **A range of organisations** such as learned societies and professional bodies, using their different methods of expertise, should have an advisory role in accreditation and inspection.
  - The **experience** provided to student teachers by schools should be monitored, to ensure a **consistent standard** across different providers. This should include common principles for the assessment of student teachers' work, to ensure that all newly qualified teachers reach a benchmarked standard of performance.
  - Success criteria should be **common across all different models** of teacher education.
  - There should be measures in place to deal with any **shortcomings** in the initial teacher education course that are uncovered as a result of inspection or through feedback from student teachers, teacher educators, tutors or others involved in initial teacher education.
- 

## 5 Ensuring a long-term supply of high quality teachers in the sciences

- There should be **planning at a national level** for the number of teachers required, taking into account changes in curricula, demographics and movement of teachers into and out of the profession. This planning should be used, alongside other relevant considerations, to inform the **allocation of teacher education places**, ensuring a geographical spread across all teacher education routes.
  - The timing of the announcement of the annual allocations should allow providers **sufficient time** to plan their provision and meet their quotas – this has previously been three years. There should be adequate opportunity for **marketing**, and all routes should benefit from equitable access to marketing and recruitment funding.
  - There should be **common and transparent criteria for entry** across all teacher education routes, including in subject knowledge.
  - **Financial incentives** established to increase entrants to teacher education in science subjects should be reviewed annually to ensure continued fitness for purpose.
  - Schools should provide **good quality placements** for student teachers, and provide time and resources to enable all student teachers to gain experience in the subject(s) in which they are specialising and in teaching students of different abilities and ages.
  - **Partnerships** between schools and other institutions involved in teacher education should be fair to all parties, with funding and responsibility suitably allocated.
  - Those running teacher education courses should be able to demonstrate that those courses are fully compatible with **pre-ITE SKE courses**, which are vital to ensure a new supply of teachers of the sciences, so that student teachers have equitable access to a means of strengthening their subject knowledge before they begin their initial teacher education.
  - The **School Workforce Census** and other data should be used to track teachers over time, in order to develop a better understanding of the factors, including initial teacher education, that influence decisions about continuing in the teaching profession.
-



#### **SCORE**

6 – 9 Carlton House Terrace,  
London SW1Y 5AG

**T** +44 (0) 20 7451 2252

**E** [score@score-education.org](mailto:score@score-education.org)

**W** [score-education.org](http://score-education.org)

#### **Funders**

SCORE is funded by the five SCORE organisations, the Gatsby Charitable Foundation and the Department for Education.

SCORE, a collaboration of organisations working together on science education policy:

#### **Association for Science Education**

[www.ase.org.uk](http://www.ase.org.uk)

#### **Institute of Physics**

[www.iop.org](http://www.iop.org)

#### **Royal Society**

[www.royalsociety.org](http://www.royalsociety.org)

#### **Royal Society of Chemistry**

[www.rsc.org](http://www.rsc.org)

#### **Society of Biology**

[www.societyofbiology.org](http://www.societyofbiology.org)