

Subject specialist teachers in England

Who are they? What knowledge and skills do they need? How can their impact on student learning outcomes be ensured? Why would other countries be interested in this issue?

**Nick von Behr, Research and Analysis Specialist
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Summary of document

This is a proposal for a strategic analysis of secondary teacher subject specialism in England. It may have broader lessons for education systems in other parts of the world.

There are many people and organisations that have a communal stake in learning outcomes within 'functional educational areas'. The aim of this strategic analysis would be to provide these stakeholders with cross-cutting, evidence-informed arguments to support potential policy and delivery measures about the role of subject specialist secondary teachers. These arguments would cover the professional case for maintaining (and potentially increasing) real terms levels of spending in the training and development of specialists in secondary subjects. The proposal builds from the premise that all stakeholders need to have a clear understanding of the following three facets of subject specialist secondary teachers:

- a) their personal and professional characteristics;
- b) the types of subject knowledge and pedagogical skills they need;
- and
- c) the impact of their teaching on student learning outcomes.

The document presents background context, a set of questions that could be asked about these three facets and then proposes a methodology for producing evidence-informed arguments to be used within England and more widely across global education.

Context for and focus of this proposal

The importance of understanding subject-based issues

The Department for Education [published a technical description](#) of the state teacher supply model for England on 9 January 2014 in response to a request from the Education Select Committee. Professor John Howson, a UK expert on teacher supply issues, [analysed the paper on his blog](#) and raised a number of issues around the assumptions made, especially on localised recruitment to School Direct and Teach First, as well as the breakdown between separate subjects. Core subjects in England are often defined by the English Baccalaureate (EBacc) performance measure at GCSE and the Russell Group's 'facilitating subjects' at A-level. The 'Progress 8' measure in the latest English school accountability proposals will be used from 2016 based on student progress across eight EBacc GCSE subjects: English; mathematics; three other EBacc subjects (from the sciences, languages and the humanities); and three 'other subjects'. The 'facilitating subjects' include: English Literature A-level; Geography A-level; History A-level;

Languages (Classical and Modern) A-levels; Mathematics A-level; Further Mathematics A-levels; Physics A-level; Biology A-level and Chemistry A-level.

Characteristics of secondary subject specialists

The characteristics of secondary subject specialists are often based on school, college or university level qualifications related to a specific subject and used as a measure of candidate subject knowledge on application/entry to teacher training. They are also connected to Subject Knowledge Enhancement (SKE) courses and a degree, postgraduate or M-level teaching qualification that is gained as part of the teacher training and professional development process. These characteristics should ideally knit together the acquisition of essential subject knowledge and understanding with subject-related pedagogical content knowledge, topic specific pedagogy and relevant wider teaching skills. In England the Institute of Physics, Royal Society of Chemistry and the British Computer Society/Computing At School are developing, with support from the Gatsby Charitable Foundation, online subject knowledge diagnostic tests in physics, chemistry and computer science. Similar processes are happening through the evaluation of a range of teacher subject knowledge projects in London funded by the Mayor of London.

Quality assurance of specialist teaching

There are formal entry qualifications for teaching in England i.e. Qualified Teacher Status (QTS) or equivalent, which may eventually require re-validation in order to allow someone to remain in the profession - however academies and free/private schools are allowed to bypass this currently and there is no requirement to teach within your specialism. One school might require someone who is capable of improving learning outcomes for the brightest post-16 students in a single academic subject - a different school might be more concerned with the specialist teacher's ability to progress students from less able backgrounds through a range of vocationally-oriented pathways. All of this would be measured by students' progress, using test results together with ongoing observation and professional judgement.

Scotland requires subject-based registration for secondary state school teachers who in effect have a licence to teach as a specialist in state-funded schools. A standard/quality mark/code of practice system already exists for mathematics-specific CPD as well as more generically across a range of different types of CPD in the UK/England¹. The National STEM Centre has a toolkit to help schools link Ofsted inspection criteria to science-specific improvement and associated subject-specific CPD for teachers². An indication of specialist teacher capability might also be linked to the performance management process and ultimately relative salary levels, though there are risks associated with doing this too simplistically. The proposed independent College of Teaching plans to accredit master teachers against the voluntary professional areas of 'subject content knowledge' and

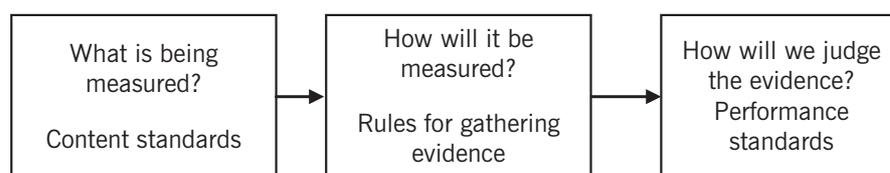


FIGURE 20.2. Conceptual framework for developing standards-based assessments.

‘pedagogical knowledge’³ - this assumes exemplification of subject content/performance standards linked with existing Chartered Science, Mathematics and Geography Teacher Status (see diagram courtesy of Dr Lawrence Ingvarson, ACER⁴).

Broad questions that could be answered

Research would focus on answering questions linked to 3 key facets of secondary teacher subject specialism:

- a) teachers’ significant personal and professional characteristics;
- b) the types of subject knowledge and pedagogical skills they need;
- and
- c) the impact of their teaching on student learning outcomes.

Approaches to analysis

The analysis would employ the following approaches:

- **assimilating** the most relevant current global research and policy evidence on subject specialism in secondary education (e.g. 11-19 age range).
- **consulting** with education stakeholders in England at a localised level drilling down into the essential detail to confirm the validity of the evidence acquired. This would focus on case studies in functional educational areas linked with 2 successful metropolises (e.g. London and Greater Manchester) and 2 south/north areas with significant pockets of ‘poorer’ educational outcomes (e.g. the Humber and the Solent).⁵
- the production of compelling, evidence-informed, policy-oriented **argumentation**. This would apply principally to England but could be adapted to wider global contexts.

Prioritising specific questions to tackle

The above approaches have been mapped to the 3 key facets of secondary teacher subject specialism and linked specific questions, which have been listed in the below table to produce 5 work strands. Note: ‘Secondary’ means the 11-19 age range in England. ‘Teacher’ means someone responsible for formal, in-school/college teaching as opposed to private tutoring and informal, out-of-school/college teaching.

Category/Strand	No.	Specific Question	Approaches
Characteristics of subject specialist secondary teachers	1	What are the shared personal and professional characteristics of subject specialist secondary teachers and how do these vary according to localised needs?	Assimilation, Consultation and Argumentation.
Types of subject knowledge needed by secondary teachers	2a	What types of subject knowledge do secondary teachers need, at which critical points do they acquire these and by what means should this happen?	Assimilation, Consultation and Argumentation.

Category/Strand	No.	Specific Question	Approaches
	2b	In what ways do undergraduates applying to teach in their specialist subjects have different subject knowledge needs from graduates and subsequent career changers?	Assimilation and Consultation
Impact of secondary subject specialist teaching	3a	How should subject specialist provision be monitored by governing bodies, SMTs, HMI and other accountability partners, to contribute to the best possible learning outcomes for all students, whatever their characteristics?	Consultation and Argumentation.
	3b	What impact do: teaching experience; class size (both physical space and student numbers); and student-teacher ratios have on the effectiveness of secondary subject specialists?	Assimilation and Consultation.

¹ See for example: <https://www.ncetm.org.uk/resources/21049> and <http://goodcpdguide.com/code> .

² <https://set.nationalstemcentre.org.uk>

³ There would be 5 professional areas. A blueprint for a College of Teaching was published by the Prince's Teaching Institute (PTI) in February 2014. It is currently being progressed by the PTI, the Department for Education and the existing College of Teachers. See: <http://www.princes-ti.org.uk/CollegeofTeaching/>; <https://www.gov.uk/government/consultations/developing-the-teaching-profession-to-a-world-class-standard>; and www.claimyourcollege.org.

⁴ Ch 20: Standards-Based Professional Learning and Certification. By the Profession, for the Profession. In 'Handbook of Professional Development in Education. Successful Models and Practices, PreK-12'. Edited by Linda E. Martin, Sherry Kragler, Diana J. Quatroche, and Kathryn L. Bauserman. (Guildford Press 2014) <http://www.guilford.com/cgi-bin/cartscript.cgi?page=pr/martin.htm>

⁵ A link could be made to the 2014-2020 UK Assisted Areas Map confirmed by the EU on 1 July 2014: <http://www.ukassistedareasmap.com> .