Ofsted consultation: Better inspection for all

Response by the Wellcome Trust

December 2014

Key points

- Science is a core subject and its inspection should be prioritised alongside English and maths. Ofsted has a powerful opportunity to ensure that all children can benefit from a balanced science curriculum — if this is seized, it could secure a broad and practical science education at all levels, and drive a step-change in primary science. We recommend that Ofsted inspectors monitor the extent to which:
    - science is prioritised (including curriculum time) in primary years; during this time, children start to build up enquiry-based learning skills and develop ideas about whether science is 'for them' in terms of future studies and careers
    - students are taught a balance of biology, chemistry and physics up until the end of Key Stage 4, to develop their core knowledge and enable progression
    - practical work is a central part of every child's primary and secondary science education.
- We know that teaching quality directly relates to the amount and quality of continuing professional development (CPD) undertaken[1,2]. Ofsted should monitor the extent to which teachers and technicians have access to high quality CPD, including sufficient subject-specific courses that develop and sustain expertise.
- School governors, like Ofsted, should use a wide range of high-level indicators to monitor performance. Governors should be judged on their ability to use a variety of data to understand the breadth of their school's performance, such as progression measures or student wellbeing surveys.

Introduction

1. The Wellcome Trust has a long-standing commitment to making inspirational, high-quality science education available to all young people. Each year, we spend around £12 million supporting teachers, funding and creating educational resources, and commissioning high quality research. This will help nurture the next generation of scientists and technicians, and those who draw upon scientific skills in other careers. We also aim to support all students to develop the skills and knowledge they need to live in an increasingly technological world.

2. We are pleased to respond to Ofsted's inspection framework consultation. The proposed changes to the content of inspections should enable Ofsted to look holistically at all areas of importance within a school or college. Ofsted should be highly respected by schools for the critical analysis and expertise it offers. Our response focuses on the powerful opportunities Ofsted has to ensure that science is prioritised within the framework, as well as how a wider range of indicators could and should be used when judging a school's performance.

[1] University of Leeds (2010) Impact of focused CPD on teachers' subject and pedagogical knowledge and students' learning
[2] Institute of Education Sciences (2007) Reviewing the evidence on how teacher professional development affects student achievement

Consultation questions

Prioritising science

3. A high quality and inspiring science education is essential for young people to develop the enthusiasm, skills and knowledge that will enable them to progress into further science, technology, engineering and maths (STEM) studies and careers, and make informed decisions in later life on topics such as healthcare and technology. The future economy will also require a larger proportion of the workforce to possess scientific skills[3].

4. The importance of science is recognised by its status as a core subject, but schools rarely give it the same priority as English and maths, most likely because it does not receive the same emphasis in primary or secondary accountability measures (performance tables). The consultation states that 'English, mathematics and other skills necessary to function as an economically active member of today's British society [should be] promoted'. Given the importance of science to individuals, as well as the national workforce, and the fact that it is a core subject until the end of Key Stage 4, Ofsted should emphasise science in this and other such statements. It is essential that school leadership teams promote science in order to ensure its importance is recognised – Ofsted should include this in their judgment of leadership and management.

5. Children start to develop perceptions about whether science is 'for them' towards the end of primary school[4]. Although science is a compulsory subject for all primary pupils, it is overshadowed by English and maths in many primary schools – this pattern seems to have become more marked after the elimination of external science assessments in 2010. Since then, there is evidence of a decline in the status of science in primary schools[5,6] which Ofsted needs to counter. This could easily be achieved by including a statement in inspection reports on the quality of science teaching. We recognise that science might not be taught during every Ofsted visit to a primary school, but inspectors should nevertheless be able to examine evidence of its teaching through discussion with teachers and pupils, and examination of their work.

6. Ofsted has a crucial role in holding school governors and leadership teams to account for their school's science. The Wellcome Trust report *Primary Science: Is It Missing Out?* [6] recommends that school leadership teams ensure primary science is well resourced and that all primary schools have (or have access to) science leaders with the relevant expertise, as defined in the report and endorsed by the Royal Society. We urge Ofsted to ensure that this is implemented.

7. It is important that students study a balance of biology, chemistry and physics up until the end of Key Stage 4. Each of these subjects contains knowledge that everyone should be familiar with. Those wishing to progress in any scientific discipline post-16 will need to have studied the breadth of all three subjects. The current formulation of the English Baccalaureate does not make this requirement clear to schools and students, and we are concerned that some may replace a core science with computer science. Ofsted has a role in ensuring that a broad and balanced curriculum is delivered across biology, chemistry and physics. Failure to achieve this

[3] Department for Business, Innovation and Skills (2013) The Future of Manufacturing: A new era of opportunity and challenge for the UK
[4] Economic and Social Research Council (2013) What influences participation in science and mathematics? A briefing paper from the Targeted Initiative on Science and Mathematics Education
[5] Ofsted (2013) Maintaining curiosity: a survey into science education in schools
[6] Wellcome Trust (2014) Primary Science: Is it missing out?

risks worsening the gender imbalance that is already evident in the low number of girls studying physics post-16.

The importance of practical work

8. Practical work is a defining feature of scientific observation and inquiry[5]. It enthuses and engages students in science and other STEM subjects, as well as equipping them with skills that are highly valued by employers. In a study of young people's attitudes to science education, 37% mentioned the chance to do experiments as a factor that had encouraged them to study science[7]. Schools can find practical work challenging due to limited resources, time, teacher confidence and skills[8]. It is therefore vital that Ofsted monitors the amount and quality of practical science on offer as part of a well-rounded curriculum.

9. From 2015, the assessment of practical science will no longer contribute to A level grades and we are concerned that this may lead to a decline in its perceived importance. In various meetings with Ofqual, including a recent seminar, it has been suggested that Ofsted could play a key role in monitoring the amount of practical science taking place in schools and conveying its importance to them[9]. We encourage Ofsted to take this opportunity and would welcome more information on how this might be carried out. Meanwhile, a three year project to monitor the amount and variety of practical work in schools is being initiated, funded by the Gatsby Foundation with a contribution from the Trust, as part of a programme of work supporting practical science in schools and colleges.

Ensuring high-quality continuing professional development

10. We support the proposal for inspectors to consider 'the extent to which leaders, managers and governors improve teaching and learning through… appropriate professional development'. We recommend that the uptake of subject-specific CPD is considered in the inspection framework alongside more generic courses. Science teachers and technicians often teach across biology, chemistry and physics, but are usually not specialists in all three. Subject-specific CPD supports them as they develop their skills and keeps them up to date with scientific developments.

11. The 2013 Ofsted report *Maintaining Curiosity*[5] reported 'a strong correlation between a school's provision of CPD for teaching science, and the overall effectiveness of science'. This association was statistically significant. The report recommended that governors and school leaders should ensure that subject leaders have access to subject-specific CPD. We wholeheartedly agree. With recent changes to both the curriculum and assessment structure, this is becoming even more important - school leadership teams must ensure teachers have access to the CPD they need.

Looking beyond the league tables

12. To avoid duplication and explore the richness of factors that stimulate a child's education, Ofsted should be using a wide range of performance indicators to judge a school's effectiveness, and inspectors should ensure that school governors do the same. Currently, Ofsted and school governors tend to focus on the measures published in the Department for Education's school performance tables. A broader approach would be consistent with recommendations that schools should 'use a wider set of measures than examination performance' (from the Royal Society *Vision*

[7] Wellcome Trust Monitor Wave 2, Clemence et al (2013) Tracking Public Views on medical research
[8] SCORE (2009) Practical work in science: a report and proposal for a strategic framework
[9] SCORE seminar on changes to assessment of A-level practical science, 17 October 2014

for science and mathematics education[10]*)*, and that governors have access to a wider range of information (from the Wellcome Trust *Effects from accountabilities*[11] report).

13. Wellcome, together with the National Governors' Association, has developed a Framework for Governance. This will be published in January 2015 and builds on findings from a pilot of the Recommended Code of Governance. The framework suggests a number of key high-level performance indicators which governors could use to monitor their schools, including future aspirations of pupils, quality of teaching, relationships with the local community, and careers information, advice and guidance (spanning vocational routes at further education colleges and apprenticeships, as well as university and employment). The Ofsted report, *Maintaining Curiosity*, also recommended that governors should ensure that there is sufficient time and laboratory space for students to develop good scientific enquiry skills.

14. We have also developed an online resource called Questions for governors[12]. This helps governors compare their schools' performance on a wide range of science and maths indicators against national benchmarks, looking at issues around teaching quality, facilities, attainment, choices and enrichment. We are disseminating this with the National Governors' Association and it was recently highlighted in the updated Department for Education *Governors' Handbook*[13].

15. We hope that the work we have done to build a broad set of evidence-based and data driven indicators of school performance for governors, could also be useful in underpinning a wider range of measures for use by Ofsted.

[10] Royal Society (2014) Vision for science and mathematics education
[11] Wellcome Trust (2014) Perspectives on Education: Effects from accountabilities
[12] www.questionsforgovernors.co.uk
[13] Department for Education (2014) Governors' handbook