GATSBY

SCHOOL TEACHERS' VIEWS AND EXPERIENCES OF PRACTICAL WORK IN SCIENCE

Results of a survey undertaken by EdComs for the Gatsby Charitable Foundation, February 2012

Summary

In February 2012, 396 teachers in secondary schools and further education colleges in England were surveyed on their views and experiences of practical work in science. The results suggest a varied and unstable situation regarding the quantity and quality of practical work in schools and colleges, and indicate the powerful and unpredictable influence that changes in the curriculum and assessment can have on practical work. Supporting teachers through the provision of regular CPD and securing allocations for equipment and consumables within the school science budget could help buffer practical work against an upcoming period of curriculum change and financial insecurity.

- 84% of teachers use practical work frequently in their science classes but 50% of respondents have changed the amount undertaken during the last five years, mainly due to changes in the curriculum.
- 93% of all respondents felt it was important to explicitly list practical techniques in the National Curriculum, and the majority of teachers felt that practical techniques should be externally assessed, though more thought this important at A level (81%) than GCSE (66%).
- Teachers report CPD has increased their practical expertise and hence the amount of practical work undertaken, though responses suggest that FE teachers may get fewer CPD opportunities than those in secondary schools.
- Expenditure on equipment was the top choice for improving the quality of practical work in schools, however only 22% of teachers predict spending on equipment and consumables to stay at current levels, and 41% predict a decrease over the next 2 years.

Key Findings

Teachers frequently use practical work in science classes, but the amount carried out now compared with five years ago has been affected by a number of factors, particularly changes in the curriculum.

- *Respondents said that they use practical work frequently (47%) or very frequently (37%) in science classes.*
- *50% of respondents said that the amount of practical work they carried out now was about the same as they did five years ago. 26% said that they carry out more practical work now, while 24% said that they carry out less.*
- *Among those who now carry out more practical work, the most commonly cited reasons were changes in: the curriculum (56%); the teacher's own knowledge and skills (46%); assessment (40%); and the availability of equipment (31%).*
- *Among those who now carry out less practical work, the most commonly cited reasons were changes in: the curriculum (76%); assessment (49%); budgets (30%); and technician support (22%).*

Teachers report high levels of confidence in using experiments as part of their teaching, mainly due to CPD and opportunities to learn from colleagues and try out practicals themselves.

- *Almost all of the teachers reported that they were confident in using experiments as part of their teaching (99%). Three quarters of respondents said that they were very confident (76%).*

- *Just under one in four teachers cited CPD (23%) as most effective in developing their practical expertise, followed by on the job experience (19%), and help and advice from their colleagues (17%).*
- *Most teachers who responded to the survey had undertaken CPD in relation to practical work in science at some stage. Only 12% said that they had never taken part in any.*

Teachers consistently identify changes to the curriculum and assessment methods as key drivers of changes in the type and quantity of practical work carried out in their science classes.

- *67% of teachers said changes to the curriculum had led to changes in the type of practical work they used as part of their teaching.*
- *More than nine in ten teachers thought it was important that practical techniques should be listed in the National Curriculum, although significant proportions were not confident that the practical skills currently gained by their students in science classes adequately equipped them for further study (30%) or employment (43%).*
- *The majority of teachers felt it was important that practical techniques should be externally assessed, though more thought it important at A level (81%) than GCSE (66%).*
- *At the same time, 34% of teachers reported a positive impact of the removal of Key Stage 3 tests on the amount of practical work, and a mixed impact of the introduction of controlled assessment at GCSE and A level.*
- *94% of secondary school respondents were in schools offering triple science, and around half said that pupils studying triple science carry out the same amount of practical work as pupils studying double science (47%).*

Funding is seen as the biggest limiting factor on practical work, yet spending on equipment and consumables has been falling in many schools and teachers fear further decreases in the next two years.

- *38% of teachers nominated a lack of money for equipment or consumables as the biggest limiting factor on practical work, while 21% nominated a lack of money for lab refurbishment.*
- *Four in ten teachers reported a significant decrease in spending on equipment and consumables over the last two years, and just 13% said spending had risen.*
- *41% of teachers expect spending to fall over the next two years, while 31% are unsure what will happen. Just 6% expect spending to rise.*
- *Despite financial limitations, 37% of teachers admit that there is equipment in their science department that has never been used, and only 54% have shared equipment with another school.*

About the study

Gatsby is a foundation set up by David Sainsbury to realise his charitable objectives. Gatsby has been supporting Science, Technology, Engineering and Mathematics (STEM) education in the UK for more than 25 years. In 2011, Gatsby began work to build an accurate picture of the health of practical work in secondary school science in order to understand how best to support it in the future.

In February 2012, Gatsby used the National Science Learning Centre teacher panel, managed by EdComs, to carry out a survey of science teachers in secondary schools and FE colleges on their views and experiences of practical work in science. Of the 396 responses, 90% were from secondary school teachers.

For more information about this study and Gatsby's Practical Work in School Science programme, please see our website: http://www.gatsby.org.uk/Education/Projects/Review-of-Practical-Science-in-Schools.aspx