



“Make it more relevant and practical”

Young people’s vision for school science in England

Executive summary



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What do young people think about their school science experiences? What would they like to see improved? What should the curriculum cover, and how should science be taught? How can school science best prepare young people for life and the future? How could we help more young people to find school science engaging and worthwhile?

There are many views on these fundamental questions. However, decisions about teaching and learning within school science have overwhelmingly been made by adult policymakers and professionals. The views of young people tend to be ignored or sidelined and are routinely absent from education policy discussions.

Young people are key stakeholders within education, and their perspectives and experiences are both important and illuminating. As young people in our study explained, they wanted to be "given more of an option on what was being taught to [them]" and called for educationalists to "involve students in decision-making" to better reflect their needs and interests.

In this report, we summarise new national survey and interview data from a cohort of nearly 8,000 young people aged 20-22, in which they share their vision for how school science could be improved. As a cohort who have recently left compulsory education and are now moving through further/higher education and/or entering the workforce, these young people offer an insightful and thoughtful perspective into what others might need from school science. Their views can help inform how school science might better engage young people, prepare them for active citizenship, and support wider participation in science, technology, engineering and maths (STEM).

While many young people agreed that learning science is important¹, only 39% said that they had enjoyed school science and only 25% agreed that the science they learned at school has been useful in everyday life. In fact, 20% felt that school had put them off science. When asked to reflect on their school science experiences, the vast majority identified areas of improvement – **only 5% said that no improvements were needed.**

¹ 54% of young people agreed that it is important to know about science in daily life and 64% agreed that their parents thought it was important for them to learn science at school.



Young people's vision for school science

Analysis of data from nearly 8,000 young people – including multiple-choice questions, open-ended survey responses and in-depth interviews – identified the following four improvements for school science that young people felt would support their learning and engagement with the subject.



Improvement #1:

Make the science curriculum more relevant

Headline: 72% of young people wanted the school science curriculum to be more relevant.

Key trends: Young people who wanted this improvement were more likely to be women, live in more socioeconomically privileged areas², have taken A Level science, or be working in or studying in non-STEM fields.

Detail: The most popular form of relevance requested through the multiple-choice survey questions was for science content to be more related to "my everyday life", followed by more links to personal health and wellbeing, and then more on climate change and how to protect the environment. Coding of open-ended survey responses and interview data revealed that that young people also wanted science education to be more contemporary and inclusive and focus on jobs both in, and beyond, science.



Improvement #2:

Increase practical and problem-based science learning

Headline: Almost 60% of young people indicated that there was a need for a greater focus on practical, experimental and problem-based learning.

Key trends: Those who wanted this improvement were more likely to have attended comprehensive schools, taken A Level science, or be working in or studying in STEM fields. There were no gender, ethnic and socioeconomic background trends.

Detail: Young people wanted not only a greater amount of practical, experimental and problem-based learning in the curriculum, but also increased resourcing of equipment and labs, and better-quality experiences that developed understanding.

² Privilege refers to individuals with higher English Index of Multiple Deprivation (IMD) quintiles. IMD was calculated using survey respondents' postcodes matched to 2019 Office for National Statistics data.



Improvement #3:

Reduce exam pressure and broaden forms of assessment

Headline: Over half of the young people (52%) indicated that they would have liked less exam pressure at school.

Key trends: Those who wanted this improvement were more likely to be women or non-binary people, or to have taken A Level science.

Detail: Young people suggested less emphasis on ‘teaching to the test’, which they had experienced as a result of the pressures created by high-stakes examinations. They also called for broader forms of assessment, including coursework and assessed practical work, rather than relying on written examinations.



Improvement #4:

“Better teachers”

Headline: 41% of young people identified that they would have liked “better teachers and/or more specialist teachers”.

Key trends: Young people who wanted this improvement were more likely to be women, from less privileged socioeconomic backgrounds, have attended comprehensive schools, or be currently studying or working in STEM fields.

Detail: Through open-ended responses and interviews, young people explained that by “better teachers” they meant knowledgeable, passionate subject specialists who stay in post, and teachers who care about, and include, all students.



Percentage of young people wanting specific improvements to school science

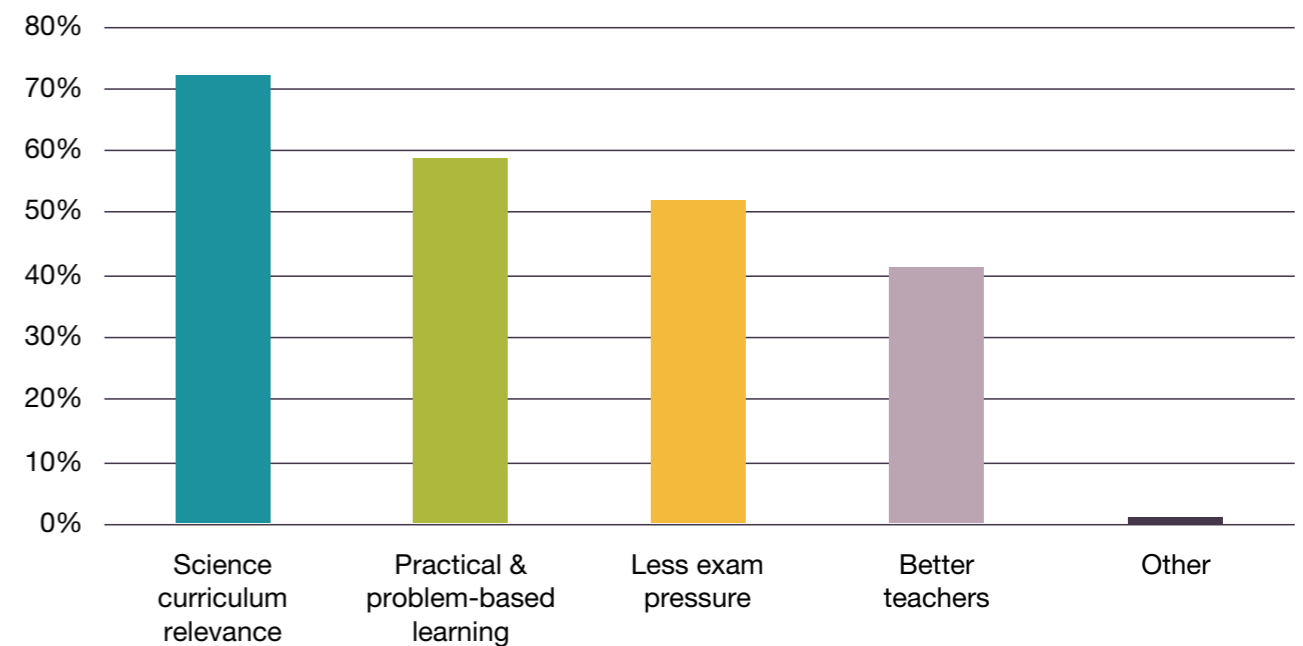


Figure 1: Proportions of young people wanting specific improvement to school science: multiple-choice survey responses

Our analysis showed that young people who are working in or studying STEM were as likely to call for at least one of these changes to school science as their non-STEM peers, suggesting that even those who continue with STEM feel valuable improvements could be made.



Suggestions for policy and practice

Building on the insights offered by young people, we make the following suggestions to help inform further improvements to science education in England.

1. Delivering a more relevant science curriculum

To respond to young people’s calls for improving the relevance of science education, we suggest that there would be value in:

- Supporting teachers to further draw out the relevance of the existing science curriculum in relation to students’ identities, careers (within and beyond science) and broader lives, and to make more explicit links to contemporary issues³.
- Ensuring that young people are meaningfully involved in any future curriculum review and reform.

2. Improving high-quality practical and inquiry-based learning in school science

To respond to young people’s calls for more practical, experimental and problem-based school science, we suggest that policymakers and practitioners might usefully:

- Review how best to support and enhance the role and place of high-quality inquiry using practical (experimental) science within classroom learning⁴.
- Consider how to focus additional support for practical science, particularly within comprehensive schools that serve the least privileged young people in society.

We are not only advocating for more opportunities for young people to engage in practical science inquiry in schools, but for approaches to practical and inquiry-based work to be high-quality, effective, relevant and meaningful [4].

³ The Science Capital Teaching Approach is one example of an approach for supporting teachers to connect the science content within any curriculum to the lives of diverse students. Evidence from trials of the approach showed significant increases in young people’s sense of engagement and connection with science, and their aspirations to continue with one or more sciences at A level [1] [2].

⁴ These suggestions are particularly relevant in the wake of the controversial analysis of PISA 2015 data that led to reductions in school science practical/experimental work in many countries [3].

3. Rethinking the wider context of learning and assessment

We recognise the challenge of responding to young people’s desire for ‘less exam pressure’, given the wider context of high-stakes national examinations and the dominance of summative testing within the English education system. Addressing these concerns would require changes that are beyond the remit of most science education practitioners and policymakers. However, the young people’s views provide a helpful prompt to consider:

- Reviewing the opportunities and costs of the current high-stakes education system in England and undertaking exploratory comparative work with other national systems that take more formative approaches.
- Exploring ways to help mitigate and manage the negative impact of exam pressure on young people’s experience of school science – for instance, conveying the relevance of science knowledge and skills beyond high-stakes test scores, and supporting students’ mental health.

4. Supporting science teachers

Concerns about the knowledge, quality, specialism and retention of science teachers are not new nor only voiced by young people [5] – and our findings show that these concerns remain highly pertinent. There is a need for continuing acquisition of subject knowledge and pedagogical skills by science teachers⁵. However, young people’s responses also made clear that they want to experience equitable and caring science teaching. We suggest that possibilities for initial teacher education and/or professional development might include:

- Continuing to encourage and incentivise STEM subject-specialist graduates to enter teaching and support and extend initiatives that develop disciplinary specialisms among school science.
- Continuing to develop ways to support science teachers and safeguard their wellbeing in order to help counteract attrition, particularly within schools serving less privileged communities.
- Supporting teachers to inspire deep and wide learning, as well as subject passion.
- Supporting teachers to teach in ways that are equitable, inclusive and can meaningfully connect science learning with young people’s identities, lives and futures. This would involve building capacity among science teachers for ‘caring’ teaching, drawing on the principles of inclusive pedagogy and critical professional reflection [7] [8].

⁵ Evidence shows that high-quality professional development also improves teacher retention [6].



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Further Information

For more information on the ASPIRES 3 project, visit <http://ucl.ac.uk/ioe-aspires>

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We would like to thank the young people who took part in the study and shared their views.

How to reference this publication: ASPIRES Research. (2022). *ASPIRES 3 Project Spotlight 2: "Make it more relevant and practical": Young People's Vision for School Science in England*. London: IOE, UCL's Faculty of Education and Society.



ASPIRES 3 is funded by the UKRI Economic and Social Research Council (grant number ES/S01599X/1) with additional support from our impact collaborators, including the Royal Society, Royal Society of Chemistry, Institute of Mechanical Engineers and Institute of Physics.