Royal Society Scientists in Schools

Association for Science Education
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Science education outreach

• Relationship between scientists and schools
• Teachers’ perceptions and drivers
• Scientists’ perceptions and drivers
• Training needs for scientists
• Recommendations for future education outreach
Education outreach training


Aim: Inspire Research Fellows to engage with schools, teachers and young people by equipping them with relevant skills, connections, and resources and providing the support to develop their own activities.
Education outreach training

- Pre and post questionnaires with course participants $N=37$
- Qualitative interviews with course participants $N=7$
- Questionnaire with teachers at the Summer Science Exhibition and from Associate Schools and Colleges scheme $N=45$
Outreach as public engagement

Obligation – Research Councils, UK 2010

Enthusiasm – Royal Society, 2006

Informal learning – Fogg-Rogers et al., 2015

Wider context – Stocklmayer et al., 2010
Wilkinson & Sardo, 2013
Public engagement
Public engagement
Public engagement

• In Person vs Digital

• Discuss your experiences and motivations participating in education outreach

• Explain your likes and dislikes
Education outreach

• Royal Society:
  – Associate Schools and Colleges Scheme
  – Invigorate teaching resources
  – Royal Society Summer Science Exhibition and lectures
  – Grants
  – Vision for science and mathematics education
    https://royalsociety.org/topics-policy/projects/vision/
Teachers’ perceptions of RS outreach

Percentage of respondents who rated aspects of ASC membership

- Very beneficial
- Quite beneficial
- Moderately beneficial
- Not very beneficial
- Not at all beneficial

Membership of the Associate Schools and Colleges scheme for your pupils
Membership of the Associate Schools and Colleges blog and newsletter
The Royal Society Summer Science Exhibition
The Invigorate teaching resources
The Associate Schools and Colleges scheme for your pupils
Membership of the Associate Schools and Colleges blog and newsletter

0 10 20 30 40 50 60

Percentage of respondents who rated aspects of ASC membership.
Teachers’ perceptions of RS outreach

- *Bringing the world of science to our pupils in more, different and real ways.* (Male, Secondary School Teacher, ASC member)

- *My college has strong links with [a local university] – showing students possibilities and potentials for future science study.* (Secondary School Teacher, ASC member)

- *A lot of girls are keen on science, and trying to connect to scientists is important for careers in science.* (Secondary School Teacher, ASC member)
Scientists’ perceptions of outreach

Pre-training response

Post-training response

Rated importance of impacts where 1=Not at all important and 5=Very Imp
Scientists’ perceptions of outreach

• Not everyone can become a scientist, but we need people who have an understanding of what science is, what scientists do, the scientific way of thinking.

• My main interest is that children learn the advantages in understanding STEM - or the scientific method, and decide that sticking with STEM will help them navigate day-to-day life in the future.

• My ultimate aim is to get across the idea that science is for everyone who is interested in it. So to break down the barriers that this is an elite subject, or it’s something that girls don’t do, or it’s something that you have to go to a private school to do, or any of those stereotypes that people might have.
Scientists’ perceptions of outreach

• I think the problem tends to be that it’s not really regarded as something that counts towards your CV by the University. It’s very clear that the money you bring in and the papers you get out are going to be more important until the Government decides to base something on outreach, and how it funds [research].

• Education outreach should be supported more openly and concretely by universities (time should be allowed and support funds provided).

• I think the most important thing for the Royal Society is that they can influence the policy makers. I know in America every researcher has to do outreach, but the UK has an optional one [system].
Teachers and scientists

• How do these perceptions match up?

• What training should scientists receive about education outreach?
Education outreach training

Aims:

• to develop an understanding of the school and college environment and structure, including the National Curriculum and pupil progression routes

• to share good practice of working with schools and young people, including child protection responsibilities

• to develop greater confidence and skills for use during engagement activities

• to consider a range of methods for engaging primary, secondary and tertiary students with contemporary research
Education outreach training impact

Percentage of Research Fellows

- Not at all equipped
- Not very well equipped
- Don't know
- Fairly well equipped
- Very well equipped

Pre-training
Post-training
## Designing activities

Didactic teaching  Inquiry-led science education

<table>
<thead>
<tr>
<th>Topic</th>
<th>Format</th>
<th>Personal Learning and Thinking Skills</th>
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</thead>
<tbody>
<tr>
<td>Genetic modification</td>
<td>Debate/Role play</td>
<td>Creative thinking Teamwork etc</td>
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<tr>
<td>Space exploration</td>
<td>Game show</td>
<td>Effective participation Reflective learning etc</td>
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Hands-on
Girls do better when they see female role models (boys don’t do worse)

Same applies to BME students: The “Obama effect”

Use historical examples, case studies, photographs, name checks...
Royal Society recommendations

• Further training in education outreach
• Advocate and lobby for the value of education outreach
• More grants to buy time for teachers and scientists
• Match-make scientists and teachers through Associate Schools and Colleges Scheme, and STEMNET
References


