Astronomy, STEM skills and young people

Dan Hillier – Head of Public Engagement with National Laboratories
My background

• Royal Observatory Edinburgh Visitor Centre, 1999

• Relevant experience:
  • Training for teachers
  • Dark Sky Discovery Sites
  • Wonder initiative - for areas of deprivation in the UK
  • Evaluation
  • Kenya Observatory Project
A sharpening focus on young people

Where are we now?
• 13% of UK jobs are in “Core STEM occupations”
• 15% of UK young people aspire to become a scientist

What has been our approach?
1. No target age range
2. 11-14 year olds – choosing STEM subjects
3. 8-14 year olds, and their families – identifying with STEM
Why 8-14 year olds and their families?

UK is excellent at attracting young people into physics A-level
• if you are a boy! ~20% of A-level students are girls

ASPIRES project (Kings College London, University College London), 2013
• Few young people (~15 per cent) aspire to become a scientist, even if they report liking science.
  • Most students and families are not aware of where science can lead
  • The brainy image of scientists puts off many young people
  • Black students experience multiple inequalities – not a poverty of aspirations.
  • Science aspirations are less common among ‘girly’ girls.
• A key factor affecting the likelihood of a student aspiring to a science career by the age of 14 is the amount of “science capital” a family has.
Science capital – identifying with STEM

Eight key dimensions:
1. Scientific literacy:
2. Science-related attitudes, values and dispositions:
3. Knowledge about the transferability of science:
4. Science media consumption:
5. Participation in out of school science learning contexts:
6. Family science skills, knowledge and qualifications:
7. Knowing people in science-related roles:
8. Talking about science in everyday life:
Halton Schools Space Week, 2019

247 pupils involved, 10 Primary schools (10-12 year olds)
80% of pupils live in 10% most deprived areas in the UK
Week of intensive activity for schools and parents

PE outcome: Participants will consider choosing, or encouraging others, to study and pursue careers in science and technology.

13% of UK jobs are in “Core STEM occupations”

Before attending the event, 11% of participants said they were considering a science and technology job.

After attending the event, 26% of participants said they were considering a science and technology job.
Kenya Observatory Project

• A one year project (2018/2019) to progress plans for an optical observatory on the equator in Kenya.
• Kenyan, South African and UK partners
• Funded by Global Challenges Research Fund (GCRF)
• Looking at how an observatory could support development of:
  1. Astronomy research and teaching in East Africa
  2. High-level STEM skills in Kenya
  3. STEM skills in schools
  4. Astronomy tourism
Astronomy and STEM skills in Kenya

We explored three main mechanisms for supporting astronomy in schools:

1. Schools using the telescope
   1. Not realistic for school students to visit the observatory
   2. Remote/robotic observing - partnership with UK National Schools Observatory, Liverpool John Moores University

2. Schools using smaller mobile telescopes
   1. Travelling Telescope project and others already doing this.
   2. Opportunity to expand this existing activity.

3. CPD/training for teachers
   1. Difficult to make connections with the necessary partners in Kenya.

Build in PE from the very start of the project
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