The SOPHia Project: Science Outreach for Promoting Physics to Female School Students

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The SOPHia Project

What’s it all about: Physics

Why you should do Physics for the Leaving!

The SOPHia Project
Science Outreach for Promoting Physics
Female physics students in Ireland
(3 year average data, 2013/14 to 2015/16)

Leaving Certificate Physics
Physics Undergraduates (Irish Universities)
PhD Physics Research (Irish Universities)

Courtesy of Department of Physics, UL (2017)
Irish Leaving Certificate Data

• In 2017, 14% of all students sat Physics and 17% sat Chemistry

• Almost 60% of female students took Biology, while less than 20% took Physics or Chemistry

(STEM Policy 2017)
Fitting in or opting out

• Focus on how a sense of belonging relates to women’s interest, persistence, and achievement in physics.

• Belonging = ‘extent to which individuals feel like a valued, accepted, and legitimate member in their academic domain’

• For all students more belonging correlates to higher self-efficacy, better grades, better persistence, more motivation

• Low belonging = negative feedback loop

• (Lewis et al. 2016)
Some Recommendations for Physics Educators

- Identify and temper cues that perpetuate the “geeky” scientist stereotype
- **Endorse effort and hard work over brilliance**
- Teach physics in an engaging fashion
- Create expectation that anyone can do physics
- Help young people understand the contribution that physics makes to society and can make to their lives

More generally:
- Raise students' awareness of gender stereotypes
- Review the options process through a gender lens

(Gill and Bell 2013; IOP 2012, 2015, 2017; Lewis et al. 2016, 2017a)
Tempering the cues...

• Role models should be within reach of students

• Combatting unconscious bias:
  ‘Is anyone’s dad an engineer?’
The Concept

• Aimed at lower second-level females
• Info on female physicists, what physics is about, diversity of careers in physics, demos.
• University students (female and male) telling their stories
First Steps...

Question 1 Do you think you know much about what physics is about? (n = 187)
Question 2: Do you enjoy learning about physics and physics-related topics, eg, astronomy, the weather?

Not at all, 1 to Very Much, 5

Pre-Workshop %
Post-Workshop %
Question 3 Do you feel confident about doing and learning physics in school?
Do you think you are likely to take physics as a subject for your Leaving Certificate?
Findings

- Overall improved student perceptions of physics, with shift to higher rating on all items.

- Eg, for enjoyment of learning about physics, mode rating was 2 before the workshop (38%) and 4 after the workshop (40%).

- 58% increase in ‘Maybe’ and a 44% increase in ‘Yes’, re intention to take physics for Leaving Certificate.
In short

• Preliminary evaluations of pilot very promising re positive impact of school visit

• Unknown whether this translated into better outcomes for subject choices/Hawthorne effect

• Need to upscale and diversify intervention
Next Steps

• More ambitious school visit programme
• Student competition for projects
• Showcase event for teachers
• Interactive website for parents, teachers and students, with curriculum-linked activities
• More extensive and robust research activities
Thank You!
References