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XMaS Scientist Experience: Promoting Careers for Women in Science

XMaS ran a project taking 14 female Physics students, aged 16-17 years, to Grenoble, France in April 2015. They visited the EPN Campus where they were introduced to possible science careers at such research facilities, as well as introducing them to the inspirational scientists working there. As a result of the trip, the students were truly inspired, their perceptions and stereotypes of people working in STEM careers were changed. The most influential part of the trip was meeting the scientists, who were honest about their experiences and life choices and the students gained confidence to follow similar paths. The trip impacted a far wider audience than the group of students who went. A highlight of the project was a public evening where the students presented videos and presentations on 'what scientists do' to Warwick staff, teachers, parents and peers. It was clear the activity had enhanced the enthusiasm and engagement of all of those who attended. Many of the students had not heard of synchrotron science before and were surprised and delighted by the opportunities and the amount of collaborative work. As a direct result of the interactions with the inspirational and passionate people they met, the students strongly agreed that the activity made them more likely to choose to study STEM related subjects in the future. We report how the project aims to continue supporting these students and plans for future projects.

additional information

The issue of diversity within Science Technology Engineering and Mathematics (STEM) subjects, especially those within material science, is well known and has recently been highlighted within the academic sector by the National Science Foundation in the USA and the latest Higher Education Statistics Agency diversity data published by the UK funding councils, RCUK . This set of data shows consistent under-representation of females; women are under-represented in all STEM disciplines (typically 10-20%). Whilst these data relate to academic careers and engagement, the picture is replicated within industry, although the data is harder to obtain and quantify. The number of females in STEM careers is a long standing issue and there have been numerous efforts to address it at both national and international levels; with most emphasis being placed on inspiring young girls to choose science subjects at school. A recent House of Commons report by the Science and Technology Committee on 'Women in scientific careers' reports on gender perceptions and biases being present throughout all stages of STEM study and career. The report quotes from both academic and business sectors that "recognised factors influencing gender bias include:

- a) stereotypes, for example, "70% of people around the world associate being a scientist with being a man";
- b) a popular misconception amongst students and parents is that particular STEM careers, particularly those in the physical sciences, are masculine;
- c) a lack of inspirational, or even approachable, female role models with available knowledge about STEM careers."

The report comments that the uptake of STEM is impacted by a lack of focus on supporting and highlighting career choices for women within STEM as well as tackling the wider gender bias issues within society, arising from peer groups, families and the general media. The historical absence of women highlighted in research, or in the media, reinforces the perception that STEM is a career choice for men. Such attitudes fuel stereotypes and popular misconceptions, undermining the wider STEM uptake effort. Thus, the lack of inspirational, or approachable, female role models in successful careers is a critical issue that needs to be addressed to further the uptake of women into science.

To tackle some of these issues, the EPSRC funded XMaS mid-range facility, in partnership with the Department of Physics, University of Warwick as well as the European Synchrotron Radiation Facility (ESRF) and the Institute Laue-Langevin (ILL) ran a project taking 14 female Physics students, aged 16-17 years, to Grenoble, France in April 2015 .

The students were selected through a competition with an age group identified as being the most receptive to a program supporting STEM careers. The students visited the EPN Campus in Grenoble to introduce them to the possibilities of science careers in these world class leading research facilities, as well as introducing them to the inspirational scientists working there. The quotes below are taken directly from students who attended the trip.

As a result of the trip, as well as being truly inspired, the student's perceptions and stereotypes of people working in STEM careers were changed. They realized the collaborative nature of working in sciences, whereas many of the students imagined life as a scientist being a solitary career choice. "It was interesting to see how scientists from a wide range of different disciplines (biology, palaeontology, medicine, etc.) all use the ESRF and ILL"- F. Woolley. They also saw the careers as within their grasp "I guess I had the impression that you had to be extremely intelligent (borderline genius) to do a PhD in physics and doubted whether I was smart enough, but speaking to the scientists here has helped me to see that hard work, determination and passion for physics are equally important and as long as I was willing to put the work in it was something that I could do"- S. Eastabrook.

It also provided an inspirational setting to see science 'beyond the classroom'but with direct relevance to the school curriculum and the 'real world'. "I really enjoyed being able to apply the information we had received to what I've learnt in school. It allowed me to place the A level syllabus into context and made me realise that there is much more to science than mark schemes"- M. Correa.

The most influential part of the trip was when the students had the opportunity to talk to scientists and discuss in formal and informal settings. The scientists were honest about their experiences and life choices and the students gained confidence in their own abilities to follow similar paths. "My favourite part of the trip was talking to the scientists; they were really friendly and they honestly wanted to answer our question, give us advice and insights into the world of physics". -S. Eastabrook.

The project changed the perceptions of the students attending the trip and impacted on a far wider group than simply the 14 students who went. A highlight of the project was a public evening where the students produced and presented videos and presentations on 'what scientists do'to University of Warwick staff, teachers, parents and peers . It was clear that not only had their perceptions been changed about careers for women in science, but the activity had also enhanced the enthusiasm and engagement of parents, peers and teachers.

The trip provided the students with new insights into possible careers drawing on STEM subjects and the links between different STEM areas. Many of the students had not heard of synchrotron science before and were surprised and delighted by the opportunities and environment of teamwork that it held. The students agreed that the activity made it more likely they would choose to study STEM related subjects in the future, which is a direct result of the interactions with the inspirational and passionate people they met. The project aims to continue supporting these students and their schools by keeping in contact by inviting students to further outreach activities. "The trip made me more confident in pursuing my scientific aspirations as a female scientist and helped me to see that STEM industries were open to females. I am more likely to become a scientist because of this trip."- A. Couzens.

We would like to take this opportunity to thank the ESRF and ILL as well as all the staff involved in making the XMaS Scientist Experience such a success.

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