

Dr Kirsty Ross

About me

My name is Dr Kirsty Ross, BSc (Hons), PhD. I am completing this submission in a personal capacity based on my experiences as a public engagement professional (PEP). My undergraduate Honours degree was in Biological Sciences: Microbiology & Infection at the University of Edinburgh, and I completed my PhD in *Streptococcus pneumoniae* vaccine development at the University of Glasgow. I completed 4 years of postdoctoral research in immunology and autoimmunity alongside a diversity of public engagement with research activities, sharing my research with the wider community at science festivals, online, and at school events.

What is an 'Outreach Officer'?

I am currently an Outreach Officer based at the University of Strathclyde. I am one of a growing group of individuals within universities called public engagement professionals or PEPs. Until approximately five years ago these roles were rare, but they represent a growing profession dedicated to ensuring that the knowledge created by our institutions isn't locked away in journals, but available to all those who stand to benefit, and who could contribute in return.

Who are Public Engagement Professionals?

We go via a variety of different titles (outreach officer, knowledge exchange fellow, public engagement officer/manager, impact officer, schools' liaison etc.) but our roles are typically linked to where we work inside our universities. Depending on where we sit inside our home institutions, we perform a variety of roles:

- For those based at Departmental level, we support local researchers in their public engagement with research (PER) activities by providing advice, training and logistical support, identifying audiences and routes to impact. *This is where I currently sit.*
- For those based in a central team, such as Research and Knowledge Exchange Services (RKES), we are project managers delivering platform events for researchers across the institution, for example [EXPLORATHON](#) as part of [European Researchers' Night](#), or delivering researcher training in public engagement.
- Other PEPs might be in Widening Access or Schools teams, delivering STEM workshops for schools and teachers on campus as well as with partner schools to support young people to consider Higher Education as a destination, or facilitating our researchers one-to-one mentoring via the [Social Mobility Foundation](#) and [MRC Pathways](#), or tutoring in their subjects via [the Brilliant Club](#).
- PEPs may also be working on discrete, partnership working projects alongside their day-to-day roles. These partnerships can include many different organisations, from businesses to charities and others in the third sector.

We compete for funding in a similar way to the researchers we support, typically for small pots but occasionally for larger grants that support cross-institution projects. For example, the Wellcome Trust currently fund a project called [Cell Block Science & Beyond the Walls](#), led by St Andrews and supported via Strathclyde, Aberdeen and

Edinburgh, along with our partners the Scottish Prison Service and Fife College. I am one of the Project Officers, involved in supporting the researchers delivering informal STEM learning based on their research at HMP Low Moss and HMP Shotts.

Hopefully I've demonstrated that we are a diverse and resourceful group within Scotland's universities. There are also others working freelance who employ similar skills.

Context and audiences that PEPs work with

At the 2013 British Interactive Group conference at Glasgow Science Centre, the Wellcome Trust shared their research investigating which audiences their Research Centres worked with. Schools were massively over-subscribed, so much so that they were turning researchers away. However, they also identified groups that were engaged with significantly less often: those in institutions such as prisons, care homes and hospitals, low SIMD areas, working age adults, rural audiences and the under 5s. This report, alongside conversations with my sister who works in the early years' sector in England, convinced me that this was a gap that I could help fill in my professional public engagement practice.

Why is this relevant to the STEM Enquiry?

This is relevant to the STEM Enquiry as I have chosen to work specifically with the under 5's and Early Years Professionals (EYPs), as one of my under-served audiences. I've taken every opportunity to work in this space since 2013, and I believe that my experience at this intersection between early years, universities and STEM is quite unusual for PEPs. For example, I have specifically built these groups into public engagement strategies that I wrote for my researchers.

Under 5's

Most of my work with the under 5's has focused on the children themselves. In 2013 I set up a Wee Science Club at the University of Strathclyde Nursery, providing low cost and simple hands on activities for the children. This grew (pun intended) into my "[Apples for All](#)" project, funded by the Researcher Development Programme at Strathclyde to create a legacy from the Commonwealth Games. I gave 150 heritage apples trees to nurseries in low SIMD areas of Glasgow to improve their outdoor learning environments. Subsequent activities around bionanotechnology and optical medical imaging were adapted and delivered as part of EXPLORATHON '17 and '18 in nurseries and primary schools around Glasgow, or as part of the Strathearn Science Festival in Crieff in 2019. I also worked with Edinburgh Libraries to adapt my activities for a [Baby STEM session at Bookbug at Granton Library](#) in 2018, making the top 10 list for Bookbug week 2018. At the end of every single session, I am asked by the children when I am coming back!

Early Years Professionals

I also provide STEM CPD at the bequest of the EYPs. Most of my activities take a '[STEM on a shoestring](#)' approach and use common household ingredients that can be purchased from any local shop. A benefit of working with EYPs is that CPD suggestions are very rapidly implemented! One activity I do involves '[catching rainbows](#)' (place a piece of black card in a bowl of water, drip some clear nail polish on the surface which spreads out into a thin film, then lift the card up and the film will

stick to it). After a single CPD session, they'd caught rainbows in a puddle in the garden with the children!

Service evaluation from my STEM CPD sessions has revealed a lack of confidence when it came to STEM. Most were ok when it came to Science and Maths, but struggled with Technology and Engineering. They also stated that access to resources and the time taken to find and adapt appropriate activities was a burden. However, feedback after the sessions revealed an increase in confidence and a general excitement around STEM that they were looking forward to putting into practice (see Figure 1).

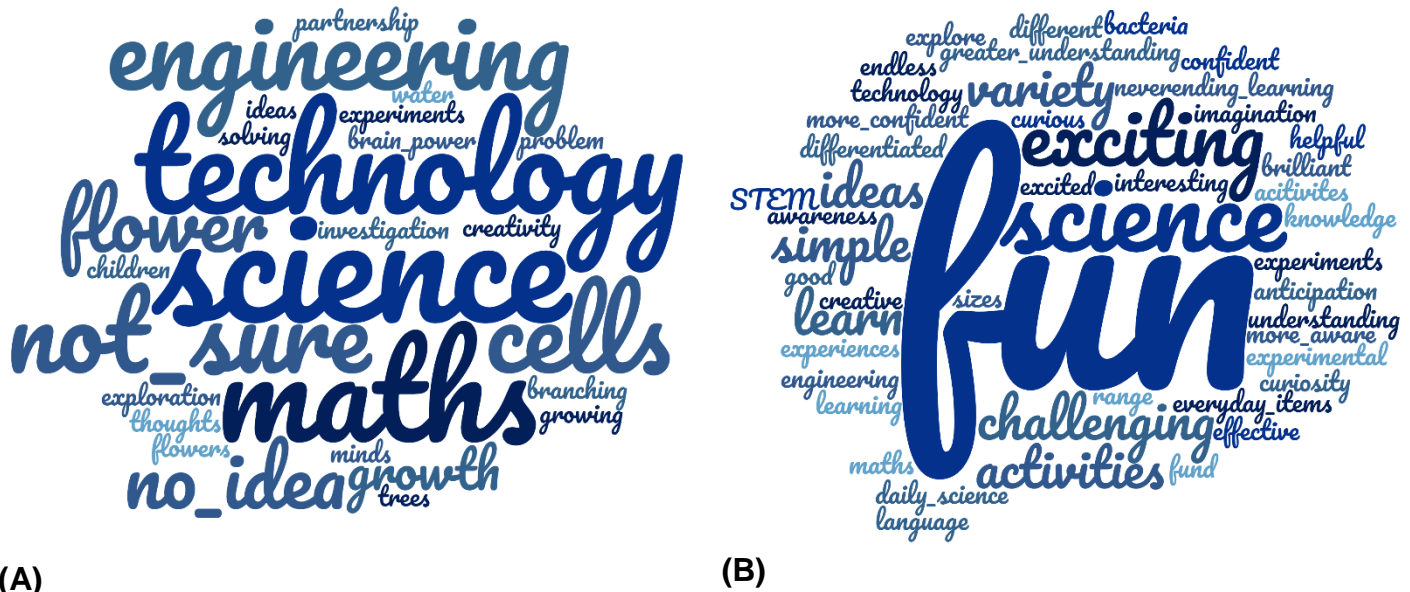


Figure 1 Word clouds of feedback from Early Years Professionals (EYP) before and after delivery of a STEM CPD session at Glenberrie Kindergarden, Larbert in 2017. (A) Before the session and (B) after the session. All participants were asked “what comes to mind when you think of the phrase ‘STEM?’”

Conclusion

EYP are the ‘gatekeepers’ to our children’s earliest experience with STEM. Given recent research on the impact of gender stereotyping¹, or that girls at 6 years old already associate ‘brilliance’ with boys rather than themselves², **sustained** early intervention is crucial to ensure that all choices and opportunities remain open to all children until they decide what they want to do. Gender stereotypes slip in at such a young age but expanding existing support to all EYPs could minimise this effect, for example via [Improving Gender Balance Scotland](#).

Moving forward, I strongly believe that PEPs could be a cost-effective source of resources, activities and support for our EYPs, supporting their professional development from initial training in college to postgraduate study. It would be a win-win for all concerned if PEPs could be brought in to the conversation around STEM in the early years, particularly as I know that I am not the only individual working in this area! There is absolutely no point reinventing the wheel, especially when there is so much enthusiasm and expertise in adapting STEM research for different audiences in our universities. We could achieve so much more by working together in partnership.

References

¹ Improving gender balance: Literature review. Education Scotland website. Accessed 12/04/19.
<https://education.gov.scot/improvement/Documents/sci38-IGB-a-literature-review.pdf>

² Lin Bian, Sarah-Jane Leslie and Andrei Cimpian (2017) "Gender stereotypes about intellectual ability emerge early and influence children's interests". *Science*, Vol. 355, Issue 6323, pp. 389-391.
<https://science.sciencemag.org/content/355/6323/389>