TOP TEN TIPS

How to Add STEM Careers to University Outreach

Written by Denise Eaton and Pat Morton from the Women in SET Team on behalf of the NE Spoke of the HE STEM Programme

		What it Means	Evidence and Impact	Resources to Support Activity
1	**Signpost to Careers Information**	Being able to signpost young people to high quality STEM careers information can provide a long term impact to compliment the short term effects of an outreach activity. The careers information resources will provide answers to many of the questions that outreach practitioners are not equipped to answer.	Evaluations have shown that the impact of enrichment activities is often very short term. By signposting to targeted STEM careers information resources the interest in STEM subjects and careers can be sustained.	www.futuremorph.org www.mathscareers.org.uk www.tomorrowsengineers.org.uk
2	**Link Activities to STEM Careers**	Enrichment activities often focus on a task to make something (a rocket) or a context (managing a disaster scenario), but the careers linked to the tasks are often invisible to the young people. It is easy to provide a short summary handout of the careers linked to the task or for those who deliver the activity to explain how they got to do their job. This small addition can make the activity more meaningful and open up opportunities that young people may not have considered.	Research shows that setting STEM subjects in a real world context helps to raise awareness of the contribution STEM subjects make across society, which helps to make STEM more relevant to a wider audience. Research in the STEM Careers project found that careers awareness and interest in school students increased as the project resources were introduced. The EDT is a leading provider in well designed hands-on STEM enrichment activities with a career element that reach diverse audiences (over 25,000 students each year).	See www.stemnet.org.uk for STEM Careers ambassador training pack with examples of how to include careers in enrichment or the STEM Careers collection in the elibrary of the National STEM Centre. See www.etrust.org.uk also.
3	**Challenge Stereotypical Views**	By taking part in outreach you are demonstrating that you want to make a difference. Challenging stereotypes and prejudice about what STEM subjects and careers are and who can have a career in STEM is part of what your role covers. Use the resources available to help you challenge stereotypes.	Research has shown that stereotypical views of STEM are widespread in young people. Challenge the perception about who can study STEM, make young people aware that STEM widens career choice as well as leading to well paid and rewarding work and at the same time - widen participation in STEM.	See www.stemnet.org.uk for the STEM Careers ambassador training pack with examples of how to include careers in enrichment.
4	**Make the Most of Role Models**	Being an effective role model is a central support for university outreach. To deliver STEM activities communication skills are essential. In addition, to promote STEM careers effectively you need to be able to reflect on your own career, be able to draw out STEM career perceptions of young people and engage young people in STEM, while challenging stereotypes.	Effective under certain circumstances - for instance, same sex role models can help with under-representation. Role models are useful to challenge stereotypes and can provide a useful personal link to young people that helps make STEM real and interesting, especially if the young person can relate to the role model. Training of role models who are engaged in outreach is therefore essential.	Watch the TV programmes in the STEM Careers collection - Choosing Careers the Visitor Experience & Role Models and Work Placements - www.teachers.tv
5	**Showcase Multiple Careers**	Outreach activities can introduce young people to one STEM sector, but they need to be able to explore the really wide range of roles available beyond this immediate experience. For example, running an activity linked to automotive engineering, could also showcase environmental science, ecology, energy, civil engineering and more.	Activities on their own may well be enjoyable, but we know that young people still do not make the connection between an enjoyable learning activity that may improve their exam success and their own potential to take up a similar career. Being able to showcase the wide range of STEM careers linked to just one activity reinforces the breadth of STEM opportunities.	FutureMorph and Maths Careers websites (see Tip 1) cover a wide range of different STEM roles. You can also signpost students to www.icould.com to hear real people talking about their jobs.
6	**Explore Positive Aspects**	Challenge the myths about STEM careers in an innovative way - show young people that STEM careers are well paid, interesting, involve team work, travel and that STEM is a positive place for everyone!	Research with young people continues to show embedded negative myths about STEM subjects, but we also know that once these myths are challenged and shown to be false that they are more open to STEM opportunities and careers.	A range of resources and quizzes are available that help to challenge myths in the STEM Careers collection in the elibrary of the National STEM Centre (www.nationalstemcentre.org.uk) and on FutureMorph.
7	**Make Links to Teachers and Careers Advisors**	Ensuring that teachers / careers advisers are properly engaged with outreach activity is general good practice and achieves better levels of awareness of STEM careers for all students. Resources can be passed on to teachers and careers advisers to disseminate further.	Teachers have low levels of awareness of jobs in STEM, and the STEM Careers project has shown how schools can raise awareness in their students through the resources. The project has also produced a number of resources aimed at careers advisers to ensure they are up to date and informed. Additional poster resources can be passed to schools to inspire and engage.	Signpost teachers and advisers to the STEM Careers collection in the elibrary of the National STEM Centre, and to teachers / advisers resources on FutureMorph, on MathsCareers and on Tomorrow's Engineers.
8	**Encourage Reflection on Career Decisions**	In delivery of outreach activities - how do you respond to questions about your career? Honestly! If you reflect on your own career choices and paths, you can help young people to reflect and consider their own career choices.	Career learning in education can be delivered in different ways. We know that hearing individual 'stories' from individuals can be very helpful to young people in many ways, not least to encourage them to reflect on their own skills, likes, aspirations etc.	See www.stemnet.org.uk for STEM Careers ambassador training pack with examples of how to include careers education aspects in enrichment activities. FutureMorph has a number of activities to encourage careers decision self-reflection as well.
9	**Build Your Own Resources**	Within the STEM Careers project we have found many existing resources and activities that work really well and with a slight adaption or addition, can incorporate a STEM careers element.	Schools that have adapted their own STEM learning materials to include a careers element report that students are becoming more interested in careers linked to the subject. Schools are also starting to see an increase in take up of STEM subjects at post 16.	STEM Subject Choice and Careers Lessons Learned (Part 1 and Part 2, see below) have case studies to illustrate how to adapt resources, and existing resources are available from the STEM Careers collection in the National STEM Centre eLibrary.
10	**Develop a Strategic Approach to STEM Careers**	A strategic approach will begin to raise awareness of STEM careers for prospective and current students as well as through outreach in partnership with schools. Making links to STEM professional societies working in schools will also help to embed STEM careers awareness.	There are many ongoing policy changes that have an impact on university outreach to schools. The STEM Subject Choice and Careers project team has identified a number of legacy elements to safeguard the progress already made in STEM careers awareness in schools - and one of these is to develop sustained long term partnerships between schools and external organisations such as universities.	STEM Subject Choice and Careers lessons Learned (Part 1 and Part 2) are available from the STEM Careers collection in the elibrary of the National STEM Centre (see Tip 6).

TOP TEN TIPS

Ensuring STEM Outreach Tackles Gender Stereotypes

Written by Denise Eaton and Pat Morton from the Women in SET Team on behalf of the NE Spoke of the HE STEM Programme

Women in Science Engineering and Technology — Sheffield Hallam University — National HE STEM Programme North-East

	What it Means	Evidence and Impact	Resources to Support Activity
1 Manage who you Reach	What is the age and gender make up of groups you deliver to? If mixed sex schools don't recruit / select many girls to the talk / activity - they need to be challenged - ask for 50/50 split or girls' only to address under -representation. Make sure girls are taking full part in all activities and rearrange groups if they aren't taking full part. Girl's only schools are unlikely to exhibit this resistance to STEM.	What do girls say about girls' only activities? "We feel more comfortable without the boys" and "we are able to talk about things in a different way." The London Engineering Project insisted on 50/50 breakdown for mixed groups and got it. Teachers who said they recruited the top 20 (who happened to be boys) were asked to recruit top 10 girls and top 10 boys.	London Engineering Project - Getting girls into engineering guide.
2 Contact with Teachers/ Careers Advisers	Teachers and careers advisers need to be aware of gender stereotypes and to tackle them within in STEM classrooms - they can reinforce and support the interventions from outreach. Ensuring that teachers / careers advisers are properly engaged with outreach activity is general good practice and achieves better outcome for all students. A memorandum of understanding or short briefing note and signpost to further resources for schools would assist this aspect.	The Girls in Physics work hosted by IOP found that the input of teacher support has a vital impact on girls' confidence in continuing physics. The STEM Careers Lessons Learned reports and Encouraging equality and diversity report, all illustrate how teachers and careers advisers can improve STEM careers awareness.	STEM Subject Choice and Careers Lessons Learned (Part 1 & 2). Encouraging equality and diversity; working towards equal opportunities in STEM subjects and careers. Girls in Physics project - see www.iop.org & search under Education & Girls in Physics.
3 Setting the Context	Girls are more likely to be engaged with STEM subjects if they see the real world links to STEM and they get the chance to experience hands-on activity. STEM learning in school can seem remote from the real world, outreach talks and activities can help make the learning meaningful. Contexts do need to be meaningful to girls' lives, but not necessarily 'soft and pink'.	Research shows that setting STEM subjects in a real world context helps to raise awareness of the contribution STEM subjects make across society, which helps to make STEM more relevant to a wider audience, including girls and women. The EDT is a leading provider in hands-on well-designed STEM enrichment activities that reach diverse audiences (over 25,000 students each year).	STEM Careers Teachers TV programme - Equality and Diversity. The leading STEM careers websites illustrate STEM in context are: www.futuremorph.org, www.mathscareers.org.uk, www.tomorrowsengineers.org.uk
4 Relevant Ice Breakers	Ice-breakers can be a great way to introduce some of the issues about gender stereotyping to girls and to encourage informed choice...but they need to be fun and informative to work. An activity at the start and the finish can show how stereotypical attitudes have been challenged. Workbooks are a good way of managing additional activities and gender awareness	Positive feedback from those attending a number of national girls' days run for EDT / Bloodhound project and other days reinforces the need for lively, fun but relevant ice-breakers. The workbooks produced to support the activity help to reinforce the learning	For WiSET resources - contact wiset@shu.ac.uk for further advice and suggestions. See Bloodhound SSC Education resources www.bloodhoundssc.com and www.futuremorph.org and www.mathscareers.org.uk for more starters (search under teachers).
5 Inclusive Activities	Activities that appeal to a wide range of young people will obviously engage a wider group. A lateral look at some common STEM activities can adapt them to be more inclusive - see London Engineering Project and Bloodhound or EDT for some great examples.	Findings from LEP and Girls in Physics research, Physics teachers' action research and EDT evaluations confirm that inclusion widens the appeal of STEM.	LEP see Engineering Islam and Young Engineers posters. EDT (www.etrust.org.uk) case study in Encouraging equality and diversity; working towards equal opportunities in STEM subjects and careers. Contact WiSET for more ideas.
6 Selecting and Briefing Role Models	Role models must be aware of gender stereotyping in order to recognise it and be able to challenge it. Ensure real STEM female role models / case studies are included in materials and activity.	The STEM Subject Choice and Careers Project in partnership with STEMNET have developed a training pack to enhance skills of ambassadors in STEM Careers, equality and diversity and in delivering hands on activities. The training has received positive feedback from ambassadors.	See www.stemnet.org.uk for STEM Careers ambassador training (click on STEM Networking). A WiSET HE STEM project funded by RAEng has a number of case studies of women in engineering talking about their subjects and their roles, see www.wiset.org.uk and click on HerStory
7 Challenging Stereotypes	Girls have to make a conscious choice to be different if they are choosing some STEM subjects. They need to be able to see girls and women like themselves choosing and working in STEM careers and they need to believe that they are welcome in STEM subjects and careers. Challenging the stereotypes helps girls to have the belief that STEM is a positive career choice for girls and women.	The STEM careers project and the Timeline project research in schools found that gender differences were most pronounced when pupils were asked to choose from a given list of future careers. Challenging stereotypical attitudes to subjects and careers is a key aspect in increasing the participation of girls in STEM. Giving encouragement, building confidence, using positive role models, case studies, images and language are now well recognised ways of challenging stereotypes.	London Engineering Project - Getting girls into engineering guide. The UKRC offer Gender Equality Training that includes a range of tools and resources to tackle stereotyping (www.theukrc.org). More Maths Grads A level poster challenges maths stereotypes.
8 Confidence and Support	The numbers of girls choosing STEM subjects and careers is increasing slowly, but girls choosing certain STEM subjects at university are likely to be a minority. Being informed about the STEM support and networks available to girls and women can make a real difference. Is there anything in your own university to use as an example?	Research has shown that lack of confidence can be a significant barrier in the progression of girls in physics, maths and engineering. Mentoring is recognised as a useful tool in developing self confidence and in career development. A number of universities run mentoring schemes to provide additional support to students and to aid retention and progression.	The Women's Engineering Society is the oldest organisation supporting women in science and engineering www.wes.org.uk. WISE is the main organisation and website supporting girls with an interest in STEM and built environment www.wisecampaign.org.uk
9 Sustaining the Impact of Intervention	One off outreach events may sometimes have a life changing impact for individuals. However we know that most girls will need a sustained level of encouragement and activity over time as well as success in the subject to make STEM choices post 16. Follow up activities or activities that build year on year are ways of supporting schools to sustain interest in STEM. Long term partnerships between schools and external partners can achieve the best impact.	Women working or studying in STEM do refer to an inspiring event at school (often linked to WISE) or an inspiring and supportive teacher / family member / role model or careers adviser as a starting point for entering STEM. In practice it is usually a combination of these - with teachers and family being the largest influence. Supporting schools and teachers in long term partnerships in gender inclusive practice will therefore achieve the greatest impact. Supporting the CREST Award scheme has proved to be a great way of achieving buy in from both teachers and girls	DCSF Nuts and bolts guide: Gender Equality CREST Awards are a good way of maintaining STEM involvement initiated through enrichment (see www.britishscienceassociation.org and click on CREST awards)
10 Developing a Strategic Approach	Collaboration within the university on STEM to achieve a strategic approach to gender stereotyping will produce the greatest impact. Universities who manage to do this can demonstrate that they are a university of choice for girls wanting to study STEM. A strategic approach to equality and diversity across all strands of equality is best practice.	The Athena Swan Charter is an award scheme for good practice in gender equality in SET. While the main focus of the award is on the staff experience, there are sections for student experience and outreach. A strategic approach to STEM gender equality would support implementation of the Gender Duty under the Equality Act 2010. The WiSET team at Sheffield Hallam University work with E&D centrally, across departments and with WP officers to support a strategic approach	www.athenaswan.org.uk, www.equalityhumanrights.com www.theukrc.org HE STEM has funded a number of Gender awareness Training events across the UK in partnership with UKRC. The events support HEIs in developing a strategic approach to gender equality in STEM.