

Shattering Stereotypes Year One - Midpoint Evaluation Findings

24 April 2017

1 Introduction

Shattering Stereotypes is a pilot project operating in 5 schools that is aiming to determine how best a physics specific Outreach Officer can challenge the wider problem of school gender stereotyping using existing resources and based on the Opening Doors report.

This document has been prepared by the external evaluators of Shattering Stereotypes to inform a meeting on 28th April 2017 when the team that is delivering the pilot project will be planning the final activity in school year 2016/17 and reviewing how they will continue the pilot project in 2017/18. It summarises key findings from:

- Baseline survey responses (x403) from Yr8 students
- Baseline (x18) and post-term 1 activity (x19) reflective log feedback from Yr12 students
- Reflective log feedback (x3) and midpoint interviews (x4) with lead teachers
- Reflective log feedback (x4 schools) and midpoint interviews (x2) with Outreach Officers
- Midpoint interview with the SEPnet Director of Outreach
- Observation of 1 x Term 1 and 1 x Term 2 activities

It presents the main learning points identified so far, followed by a summary of baseline data from the survey of Yr 8 students as this information could help inform the specific activities that will be delivered in year two of the pilot.

2 Learning Points

General learning points

1. Yr8 is an appropriate time to introduce messages about gender stereotyping as it is before students make their GCSE subject choices. The Yr8 timetable can also offer the flexibility to accommodate activities delivered by external providers. However, it should be noted that at this stage the students are taught 'science' and may not necessarily know what is meant by the term 'physics', which needs to be recognised in the language used throughout delivery and evaluation of the pilot project.
2. Engaging schools to take part in the pilot is not easy and can be very time consuming for the Outreach Officers and SEPnet Director of Outreach. It would be sensible and efficient to continue year two of the pilot with schools who are already participating in the project. This continuation would also aid tracking of subject choices made by Yr9s in 2017/18, who participated in the pilot as Yr8s in 2016/17.
3. Outreach Officers welcome the opportunity to work as part of a team and to be involved in a continuous project, as opposed to one-off activities. They appreciate the chance afforded by Shattering Stereotypes to share best practice and ideas with one another.
4. Interactions between Yr12 and Yr8 students can be very successful, but they require well-defined facilitation and for Yr12 students to be clearly briefed.
5. Careful consideration needs to be given as to when the term 3 activity will take place to ensure that it can be accommodated in school timetables, particularly with regard to examination timetables and other planned 'end of summer-term' activities.
6. Recruitment of physics graduates is challenging and time-consuming. With this in mind, their role in Shattering Stereotypes should be reviewed. Teachers think school student contact with undergraduate scientists is useful and particularly relevant for Yr 12 students. Consideration

could be given to deploying undergraduate scientists as role models, both within Shattering Stereotypes and other schemes.

Importance of focus and clarity

7. Shattering Stereotypes has relatively-limited human resources. In order to make most effective and efficient use of those resources, the main aim of the project and its distinguishing features, e.g. delivery by physics-specific Outreach Officers and connection to universities, should inform all aspects of planning and delivery and when defining expected outcomes.
8. Teachers and Yr12 students would benefit from clear information at the outset, i.e. the start of the year, about everything that the Shattering Stereotypes pilot will entail and how they are expected to be involved. This will allow them to plan well in advance for activities and their own involvement.
9. The term 1 and term 2 activities include content that addresses both gender stereotyping and STEM career opportunities. Teachers have reported that Yr8 students remembered the latter most from the term 1 activity and it is important that both elements are equally memorable. The 'People Like Me' element is thought to be more memorable than the conversation about gender stereotyping because it is personal, reaches a conclusion and because students come away from it with a tangible output in the form of their own 'People Like Me' assessment. Both elements are useful and the gender stereotyping activity should be amended to incorporate similar features to make it equally memorable.
10. Yr12 students would prefer clearer detail about how the term 1 activity will run and how they are expected to help, e.g. are they expected to have conversations with one or two students, or larger groups, things to avoid etc.

Maintaining continuity and supporting student involvement over a whole year

11. One year is thought to be a sensible time frame for the project. However, in the way it has been delivered to date, Shattering Stereotypes is perceived as a series of discrete activities, rather than a project. Particularly there is little continuity for the Yr12 and Yr8 students who are involved, which limits its potential to have impacts. Providing resources for teachers to use between Outreach Officer-led activities would help address this.
12. The term 1, 2 and 3 activities create natural 'stepping stones' around which participation can be planned and continuity ensured. However each activity needs to be defined at the outset so that teachers can provide relevant and meaningful support in the intervening periods. Most lead teachers are willing to provide this type of ongoing support/intervention, but again they need to know exactly what they will be expected to do from the start. It may be useful to consider referring to the schools as 'partner schools' in the project so that they feel fully involved and on-board with activities.
13. Physics teachers are a natural entry-point for a gender stereotyping project as physics is a subject where post-16 choices have a significant gender bias. They are also a natural match for physics-specific Outreach Officers. However, greater continuity can be created by involving other relevant teachers who will engage with Yr8 students throughout the school year e.g. PHSE, careers, form heads.
14. Yr12 involvement should not be restricted to Physics students, in order to recruit as diverse a cohort as possible and to ensure deployed Yr 12s are motivated and fully engaged in the project. With this in mind, the use of the term 'Physics Ambassadors' should be reviewed.

Opportunities for wider school involvement

15. Whilst parents are an important audience, their engagement is difficult to secure and any Shattering Stereotypes-only activities may only connect with the most-engaged parents, or those who are already aware of gender stereotyping issues. It may be more realistic and easier for Shattering Stereotypes to focus within schools, i.e. other teachers, students and support staff, in order to widen the message.
16. Unconscious bias CPD training related to Shattering Stereotypes affords an opportunity to extend engagement with more teachers. However, we are yet to obtain feedback from a school where this was delivered as part of an INSET day and cannot comment at this stage on its effectiveness or impact.

3 Year 8 students' baseline questionnaire data

403 students¹ completed baseline questionnaires to establish their feelings, attitudes and intentions with regards to physics and physics and gender.

Physics and gender

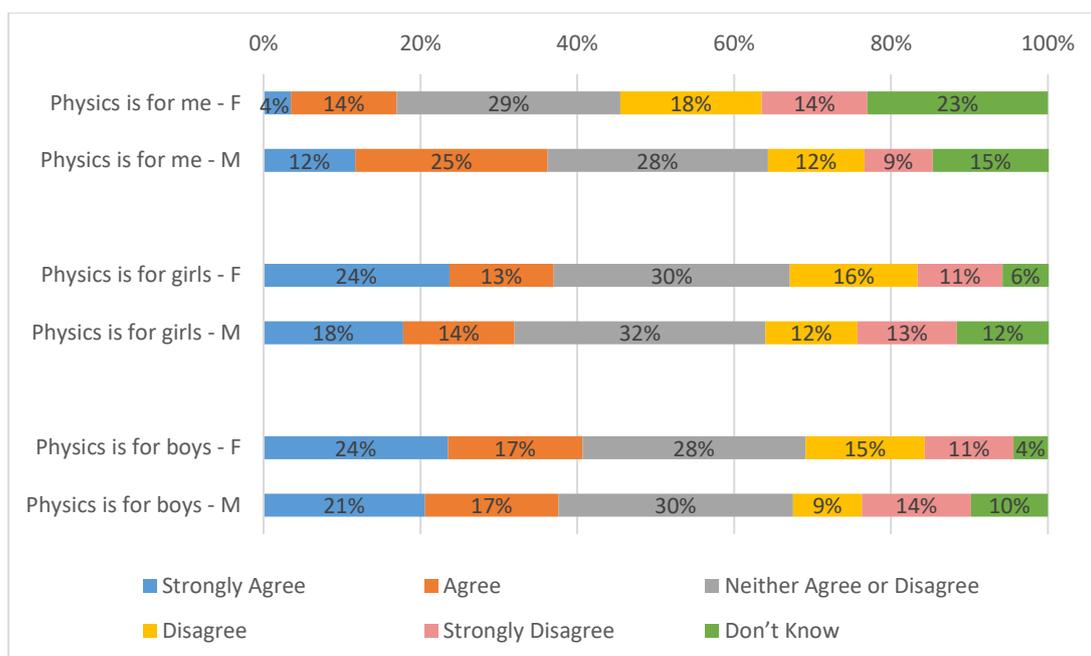
The following table and graph overleaf show the extent to which, prior to any Shattering Stereotypes intervention, female (F) and male (M) Y8 students agreed with three statements about physics and them and gender. There was a significant relationship between gender and thinking 'physics is for me': based on a comparison of response in all categories males were statistically more likely² than females to agree or strongly agree with this statement. However there was no significant relationship between gender and thinking 'physics is for girls' or 'physics is for boys', where females were slightly more likely than males to agree with both statements.

Statement	Gender	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Don't know	P value
Physics is for me n=396	F	3.5%	13.5%	28.5%	18.0%	13.5%	23.0%	0.00**
	M	11.7%	25.0%	28.1%	12.3%	8.7%	14.8%	
Physics is for girls n=400	F	23.7%	13.3%	30.1%	16.3%	10.8%	5.9%	0.51
	M	17.8%	14.2%	32.0%	11.7%	12.7%	11.7%	
Physics is for boys n=398	F	23.5%	17.2%	28.4%	15.2%	11.3%	4.4%	0.39
	M	20.6%	17.0%	29.9%	8.8%	13.9%	9.8%	

**Denotes significance at the 99% confidence interval

¹ Students self-selected which questions to complete and therefore sample sizes vary for different question and the number of respondents (n=) is shown in every case. Percentages have been rounded and thus when totalled may be slightly greater or less than 100.

² Pearson Chi-Square.

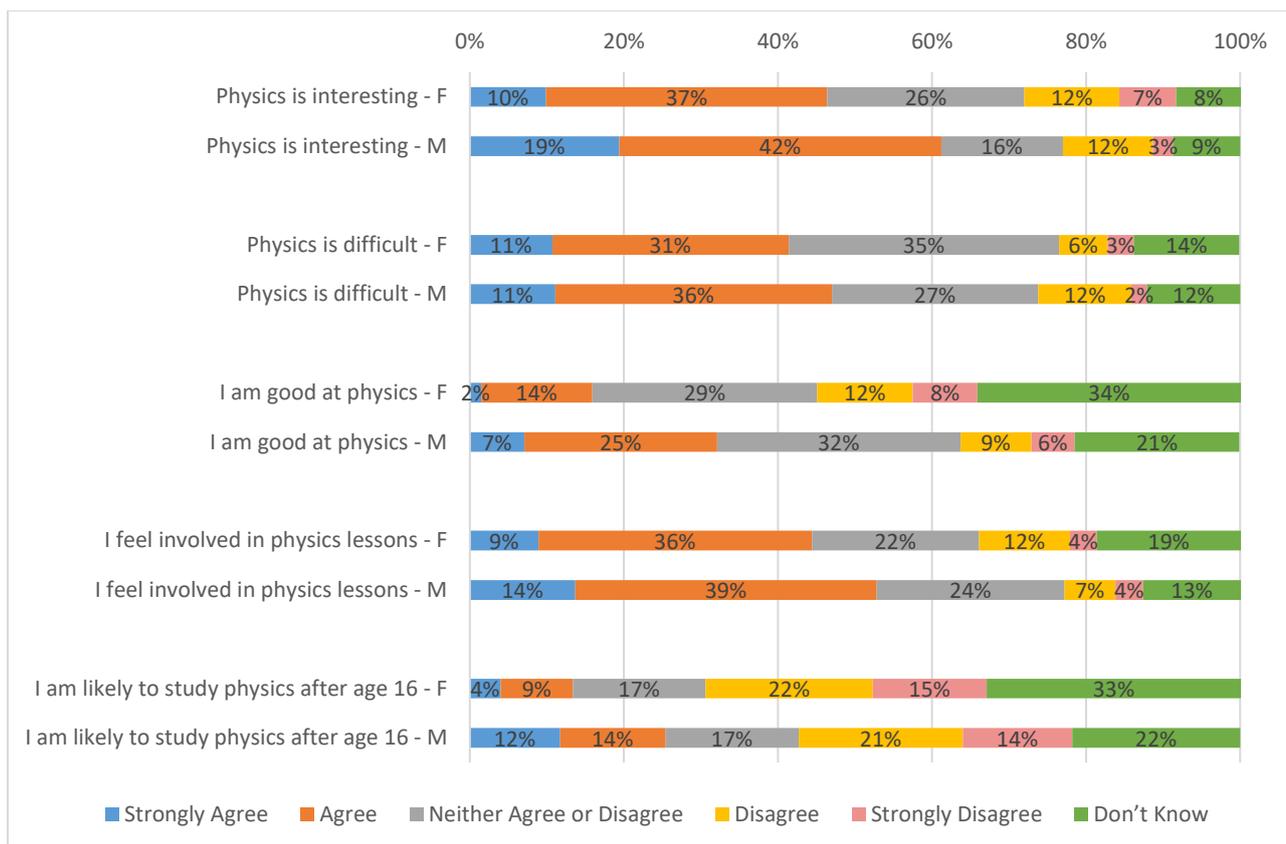


Attitudes and intentions towards physics

The next table and graph overleaf shows that there was a significant relationship between gender and thinking 'physics interesting' or 'I am good at physics': males were statistically more likely to agree with these statements than females. However there was no significant relationship between gender and thinking 'physics is difficult', feeling 'involved in physics lessons' or being likely 'to study physics after age 16'. Although not statistically significant, more males (47%) than females (41.4%) agree or strongly agree that 'physics is difficult', more males (52.8%) than females (44.4%) agree or strongly agree that 'I feel involved in physics lessons', and more males (25.4%) than females (13.1%) agree or strongly agree that 'I am likely to study physics after age 16'.

Statement	Gender	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Don't know	P value
Physics is interesting n=399	F	9.9%	36.5%	25.6%	12.3%	7.4%	8.4%	0.00**
	M	19.4%	41.8%	15.8%	11.7%	2.6%	8.7%	
Physics is difficult n=403	F	10.7%	30.7%	35.1%	6.3%	3.4%	13.7%	0.12
	M	11.1%	35.9%	26.8%	12.1%	2.0%	12.1%	
I am good at physics n=398	F	1.5%	14.4%	29.2%	12.4%	8.4%	34.2%	0.009**
	M	7.1%	25.0%	31.6%	9.2%	5.6%	21.4%	
I feel involved in physics lessons n=400	F	8.9%	35.5%	21.7%	11.8%	3.5%	18.7%	0.26
	M	13.7%	39.1%	24.4%	6.6%	3.6%	12.7%	
I am likely to study physics after age 16 n=400	F	4.0%	9.4%	17.2%	21.7%	14.8%	33.0%	0.10
	M	11.7%	13.7%	17.3%	21.3%	14.2%	21.8%	

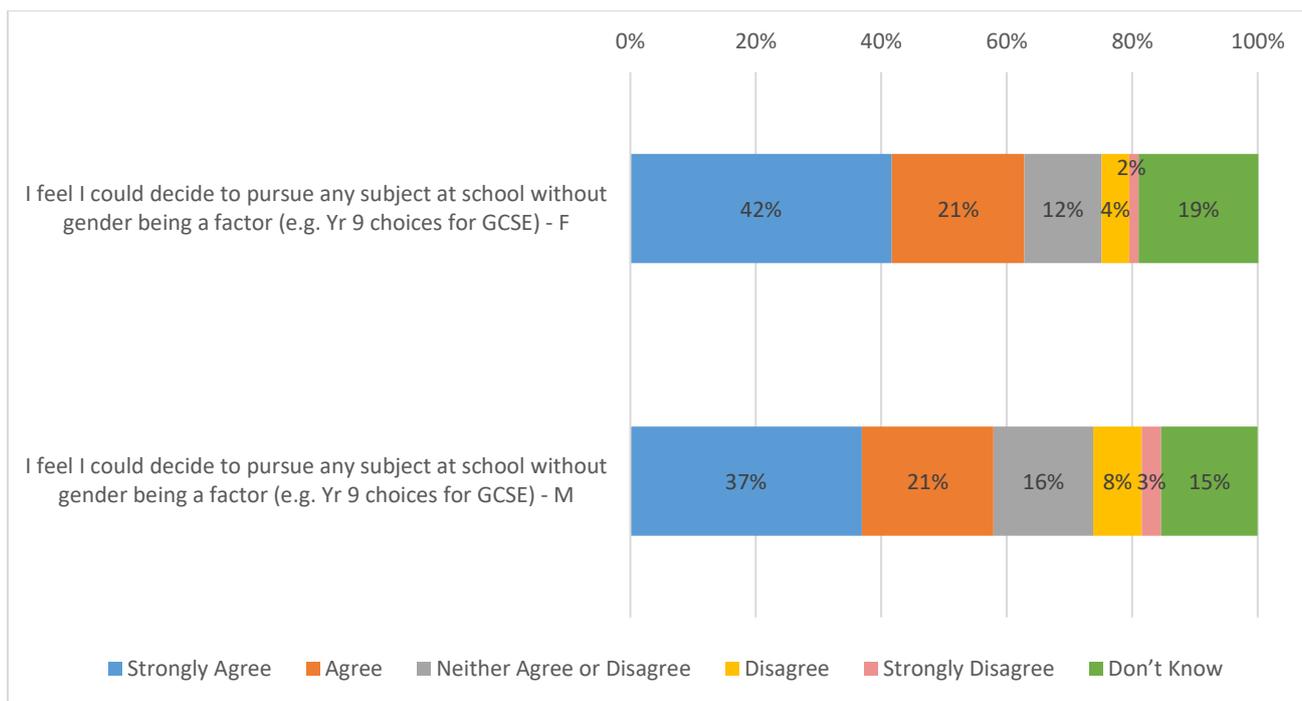
**Denotes significance at the 99% confidence interval



Gender and subject choice

The following table and graph overleaf show there was no significant relationship between gender and students feeling they could pursue any subject at school without gender being a factor. Although not statistically significant, more males (47%) than females (41.4%) agree or strongly agree that 'physics is difficult', slightly more females (62.8%) than males (57.9%) agree or strongly agree that 'I feel I could decide to pursue any subject at school without gender being a factor (e.g. Yr 9 choices for GCSE)'.

Statement	Gender	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Don't know	P value
I feel I could decide to pursue any subject at school without gender being a factor (e.g. Yr 9 choices for GCSE) n=399	F	41.7%	21.1%	12.3%	4.4%	1.5%	19.1%	0.37
	M	36.9%	21.0%	15.9%	7.7%	3.1%	15.4%	



Summary

These baseline data suggest that female students in this cohort are less likely than male students to feel that 'physics is for me' and that gender is also a significant factor in thinking that 'physics is interesting' and feeling 'I am good at physics', where males significantly outnumber females in agreeing with these statements. However gender is not a significant influence on students finding physics difficult or their intentions to study physics at post-16 level.

Sarah Jenkins & Elizabeth Jeavans
24 April 2017