

Improving Gender Balance

Results and recommendations from the IOP's work in schools

The Problem

Girls have long been under-represented among those who choose to study physics beyond the age of 16.

For decades, only a fifth of those taking physics in England have been girls – even though both genders do equally well up to age 16.

This shortfall contributed to an ongoing shortage of workers with highly sought-after scientific and engineering qualifications. But more than this, it also means that girls themselves are denied an opportunity that ought to be open to them, and all too often, are missing out on all the benefits of a physics education.

The IOP has a goal to redress this gender imbalance and make the system more just, and has researched this area for a number of years.

In its 2012 report *It's Different for Girls*, the IOP revealed that the type of school matters – around half of maintained co-ed schools sent no girls on to take physics A-level and single-sex schools are much more likely to send girls on to study physics post-16.

The 2013 report *Closing Doors* presented data on several subjects with gender imbalances and showed that schools that have imbalance in one subject, tend to have imbalances across the board, adding further weight to the notion that the whole school environment affects subject choice.

In 2015, the Government Equalities Office co-funded the *Opening Doors* report, which offered guidance on breaking down the barriers to gender equality in schools. The guide highlights issues that many schools deal with on a daily basis and presents suggestions for schools facing similar barriers, including nine essential features of a school that is actively addressing gender equity.

The Improving Gender Balance (IGB) project ran from 2014–16 and tested different interventions in schools and compared them against one another.

The Drayson Project investigated the cumulative impact of multiple interventions on the progression of girls to physics post-16.

The Projects

Improving Gender Balance

The IOP's IGB project, funded by the Department for Education as part of the Stimulating Physics Network, ran in 20 partner schools, taking three distinct approaches.

• Strand A

Strand A involved working to build confidence and resilience in girls at Key Stages 3 and 4 in eight schools.

This proved to be high-impact and saw an increase in transferable skills and confidence – but only reached a low number of girls.

• Strand B

Strand B involved working with teachers of physics in eight schools to improve girls' experiences in the physics classroom.

It led to an increase in schools' use of data to analyse gender differences. And teachers reported improved teaching, benefits from greater awareness of unconscious bias – and more interest in physics among girls.

• Strand C

Strand C involved working in four schools with senior leaders, governors, students and teachers across all subjects on gender equity and whole-school culture.

Schools increased their use of data to tackle gender inequalities and challenge stereotypical option choices. There was an increased awareness of gender stereotypes (among teachers and students alike) and of gender-atypical careers.

Moreover, staff and students reported feeling empowered to bring about changes in school culture.

Drayson Girls in Physics Pilot Project

A pilot funded by the Drayson Foundation worked in six schools, combining the different approaches from the IGB project.

Remarkably, the number of girls taking A-level physics more than trebled over two years, soaring from 16 to 52 students.

The Lesson

The IOP's work on the IGB and Drayson projects indicate that whole-school interventions work best in remedying gender inequality in subject choice.

This means that to make a significant difference to students' perceptions, work needs to be done across the whole school to challenge gender stereotypes. Good practice in the science department with regards to taking girls on STEM trips and so on may be negated if gender lines are then enforced in other subjects, in breaktimes, or in extracurricular activities.

Full details of the projects and their results will be published in spring 2017. Some recommendations from it are given below.

The recommendations

- **Appoint a gender champion**

For any issue to be taken seriously by a school, someone in the senior leadership team needs to be given responsibility for it, and for impressing the importance of it on the school.

- **Train teachers**

Teachers, like all of us, have unconscious biases, which can affect the experience of different groups in the classroom – what is said to students, feedback on their work, expectations of them and career suggestions.

Training can raise awareness of unconscious bias and its potential impact in the classroom, allowing teachers to reflect on their practice and adjust to ensure the best experience for all students.

It can also help teachers deal with sexist and sexual comments or inappropriate behaviour.

- **Use data and evidence**

By comparing the progression in traditionally gendered subjects to the national average, schools can get an idea how their schools compare to the national average in terms of gender equality in subject choice. This can help identify areas for concern and provide incentives for action.

- **Rethink science clubs**

Science clubs are often quite boy-heavy, which can put interested girls off. Research projects such as Cern@school and Crest awards attract a better gender balance, as do science ambassador schemes – in which students are doing outreach with primary schools.

- **Increase students' awareness and engagement**

Ask students to challenge their biases and the biases of others around them. Engage them in the issues and encourage them to think of ways to combat them.

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