

Pursuing Gender Equity in Science

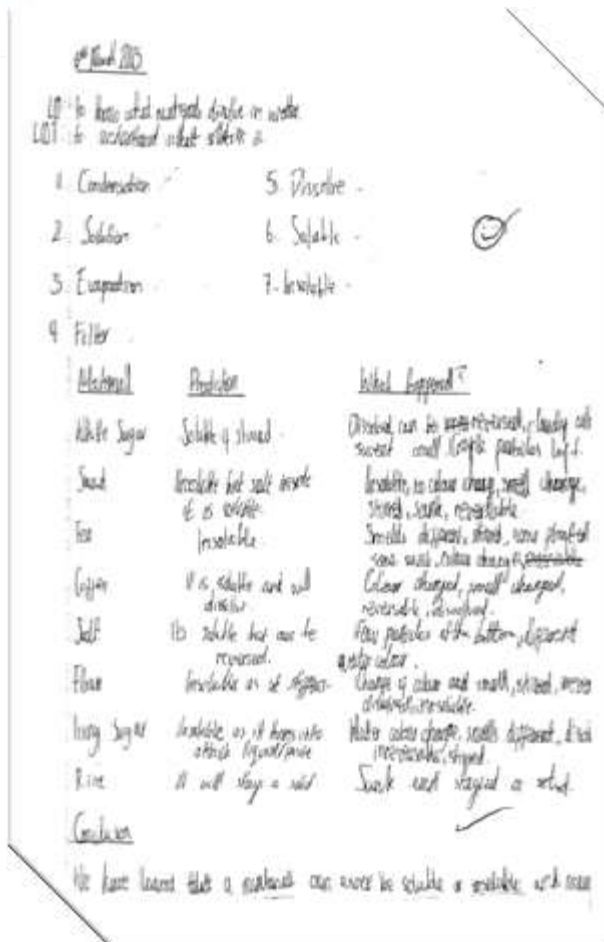
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Outline

- What role does gender play in teaching?
- Key findings from two recent reports.
- What can teachers / schools can do with the findings?

Guess the gender



Look at a piece of science written work from a year 5 pupil.

Using your experience, can you decide whether your piece of writing is written by a girl or a boy?

Give reasons for your answer.

Facts and figures

Boys are 4 times more likely than girls to study physics at A-Level.

On average, men earn 23.2% more than women.

87% of the STEM workforce is male.

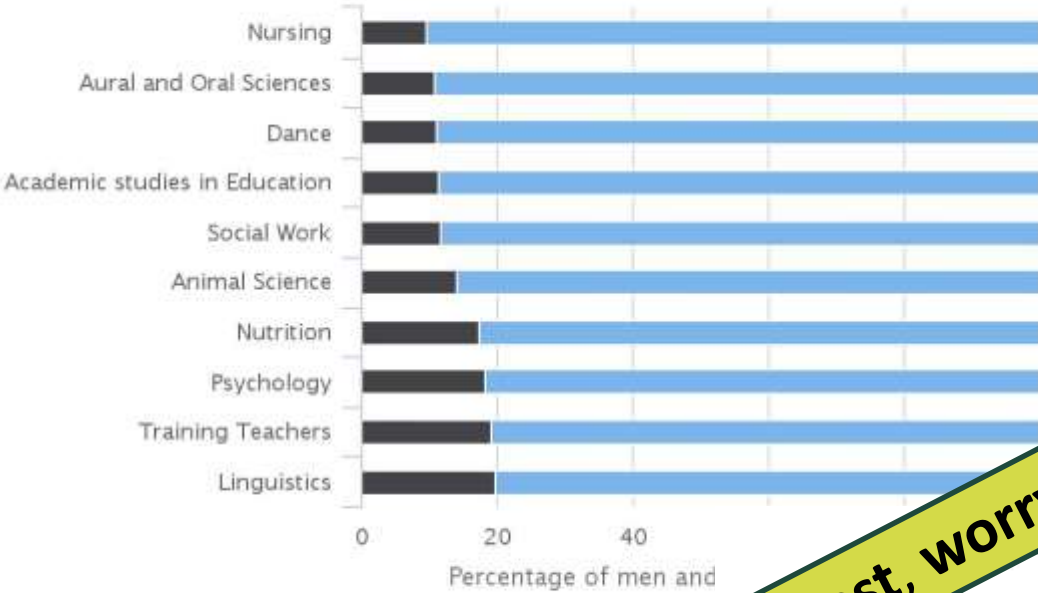
12% of KS3 girls aspire to be a scientist when they are older.

Girls outperform boys in almost all subjects at GSCE.

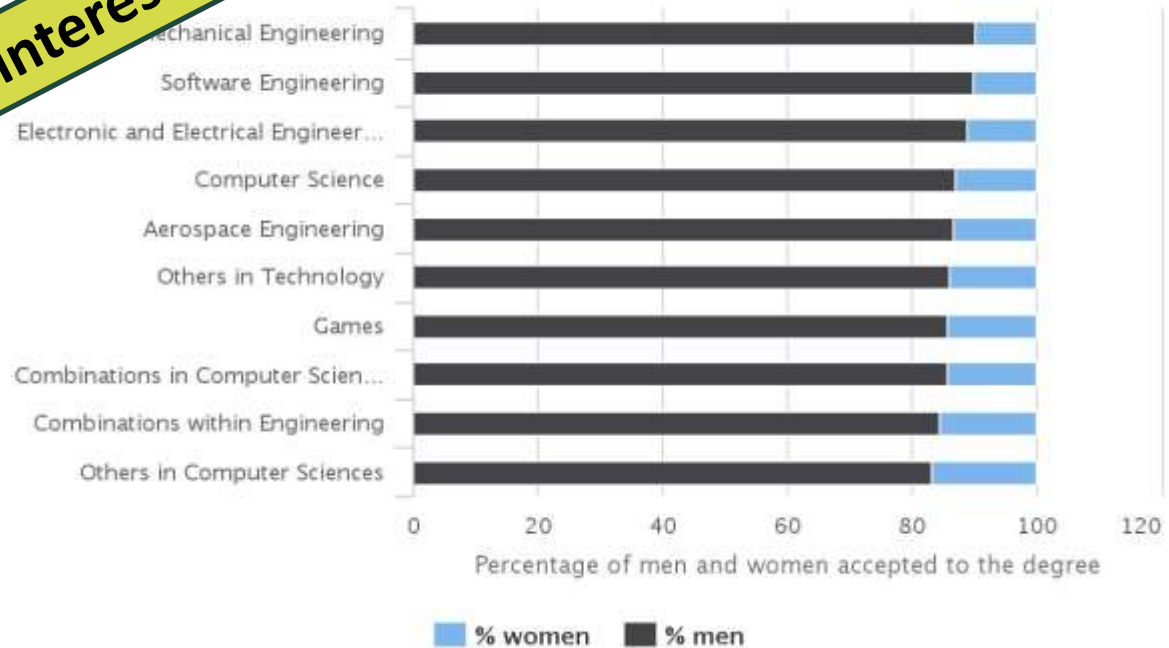
Girls who study Physics A-Level achieved better A*- C grades than boys.

Young women in the UK are now 35 per cent more likely to go to university than young men, and 52 per cent more likely when both sexes are from disadvantaged backgrounds

Top 10 female dominated subjects in 2015



Top 10 male dominated subjects in 2015



Do any of these facts interest, worry, concern or surprise you?

Making assumptions (stereotyping)

What decisions did you make regarding the handwriting?

- On average, teachers give boys more time than girls to answer questions in class.
- Feedback given to girls about their work is usually focussed on presentation, feedback to boys is focused on content and how to improve.
- Boys are more likely than girls to raise their hands in class than girls.
- White males tend to get more attention from the teacher than other groups.
- When teachers are asked to remember their 'best' students, the answers are overwhelmingly males.

Sadker & Sadker, 2009



What can teachers, and schools, do?

The reports

ASPIRES: Young people's science and career aspirations, age 10-14 (2013)

Opening Doors: A guide to good practice in countering gender stereotyping in schools (2015)

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ASPIRES

- Five year longitudinal study by researchers at Kings College London.
<http://www.kcl.ac.uk/sspp/departments/education/research/aspires/ASPIRESpublications.aspx>
- Surveyed year 6, year 8 and year 9 students and carried out interviews with subsection of students and parents.

Key findings for teachers 1

- Negative views of school science and scientists are not the problem - many students like science.
- Family 'science capital' has a considerable influence on student aspirations.
- Students and families don't know where science can lead

Key findings for teachers 2

- Brainy image of science puts students off.
- White, male middle-class image of science careers remains a problem.

What could you do?

- Start early (primary school) and involve parents
- Break the 'science=scientist' link – broaden young peoples' views for science as a stepping stone to a wide variety of careers.
- Make science for ALL.
 - Do you target the G&T/top set for science activities?
 - What about the 'wobbly middle'?

http://sakaedrums.com/en/artists/ash_soan/



Ash Soan



Credit: WPA Pool/Getty Images

Adele



Tom Sherrington



Credit: [JoshIdss](#)

England Team



Picture: Ian Appleby www.ianapplebyimages.com

Blyth and Wansbeck
Sunday League

Walking football,
North Lanarkshire



Credit: NHS

think
physics



Einstein



Rosetta Landing Operations
Mission Control Team

12 November 2014



Credit: Cath Robson

Citizen Science: Hedgehog Survey



We wouldn't limit music to just the 'famous' people.

We wouldn't limit sport to just the top clubs.

Why do we portray the image that science is only for the brightest few in our schools?

What else could you do?

- Embed STEM careers awareness in science lessons.
 - Lesson starters?
 - Career Displays?
 - Information about past students?

Gateshead Millennium Bridge

Relevant areas of Science:

Forces

Moments

Material properties

Friction and slope of the
bridge

Potential career links:

Architect

Designer

Materials scientist

Lighting designer

Steel fabrication

Construction

Structural engineer

Electrical engineer

Accountants

Public Relations



Premature baby in incubator

Relevant areas of Science:

- Homeostasis
- Life cycles
- Health and Disease
- Electric circuits
- Sensors
- Computing
- Thermal properties of materials
- Drug design
- Analytical chemistry

Relevant careers:

- Electrical engineers
- Computer programmers
- Hardware engineers
- Material scientists
- Analytical chemists
- Pharmaceutical chemists
- Environmental engineer



Relevant careers:

- Doctor
- Nurse
- Pharmacist
- Radiographer
- Physiotherapist
- Phlebotomist

But...

“ the demands of the current teaching context may have played a part, in shaping teachers’ expectations and motivations, constraining their available time, and raising the ‘risk’ of trying something ‘different’.

... the pressure of ‘exams’ ... can mean little time or justification for engaging in (anything defined as being) non-core (‘extension’) activities.”

H. King, E. Nomikou, L. Archer & E. Regan (2015):
Teachers’ Understanding and Operationalisation of ‘Science Capital’,
International Journal of Science Education

The reports

ASPIRES: Young people's science and career aspirations, age 10-14 (2013)

Opening Doors: A guide to good practice in countering gender stereotyping in schools (2015)

Opening Doors

- Co-funded by IOP and Equalities Unit
- One year project focused on gender imbalance across the whole school (**not** science specific)
- Building on previous work by IOP:
 - Girls in the Physics Classroom (2006),
 - It's Different for Girls (2012)
 - Closing Doors (2013)

- Worked with 10 schools (in two clusters) and carried out a series of visits looking at gender within the schools.
- Talked with senior leaders, subject staff (including careers and PSHE), and students
- Identified areas of good practice from the visits

Key findings for teachers

The report is focussed at whole-school level, however, there are some findings that teachers can undertake themselves.

- CPD in gender awareness and unconscious bias
- Sexist Language
- Careers guidance

Language in the classroom

“She’s so hard-working, it’s no wonder she’s doing so well.”

“Come on boys, the girls are walking all over you with their answers.”

“I need two strong lads to help me carry the laptops.”

“OK guys, pens down.”

“He’s naturally talented, but doesn’t seem to be reaching his potential.”

“Man up, Josh and stop complaining.”

Useful resources

- [Still Failing At Fairness](#), Sadker, Sadker, Zitterman (2009).
- [Delusions of Gender](#), Cordelia Fine (2010).
- Search 'gender-fair language'

e.g.

<http://www.ncte.org/positions/statements/genderfairuseoflang>

Key findings for school leaders

1. Senior gender champion
2. Training for staff
3. Sexist language or visuals (including in school publications)
4. Use of progression data
5. Initiatives to address problems identified in the school data
6. Subject equity
7. Careers guidance
8. Student ownership
9. Personal, social, health and economic education

Hard-work vs Innate ability

If you work hard at a subject, does that mean that you aren't as good at it?

If you're naturally talented, does that mean that you don't need to work to do well?

Resource: Mindset, Carol Dweck (2006)

Equality or Equity?

“Equity is not the same as equality. It means schools doing more for some children than others in order to create a more level playing field. Recognising that some children have a very narrow experience outside school and providing them with additional opportunities is an important step in ensuring that they can make the most of their educational opportunities.”

John Dunford, TES, 4/1/16

Conclusion

Achieving gender equity in science and education is not an easy task.

Society values play a large part in the attitudes and performance of students.

To have a realistic impact, gender imbalance needs to be tackled at whole school level, and across all subjects.



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