

Diversity in Science & Engineering

28 November 2017. Mercure, Cardiff Holland House, Cardiff

#NRNdiversity



ENGINEERING RESEARCH NETWORK WALES
RHWYDWAITH YMCHWIL PEIRIANNEG CYMRU



LIFE SCIENCES RESEARCH NETWORK WALES
RHWYDWAITH Gwyddorau Bywyd Cymru



LOW CARBON, ENERGY & ENVIRONMENT
RESEARCH NETWORK WALES RHWYDWAITH YMCHWIL
CARBON ISEL, YNNI A'R AMGYLCHEDD CYMRU

Cyngor Cylido Addysg
Uwch Cymru
Higher Education Funding
Council for Wales

hefcw



10 Myths I'd like to bust about science, engineering and leadership

(AKA 10 popular excuses to avoid
doing anything about equality and
diversity!)

1 “Girls are not naturally good at science and engineering”

Really? Facts show this is **not true**

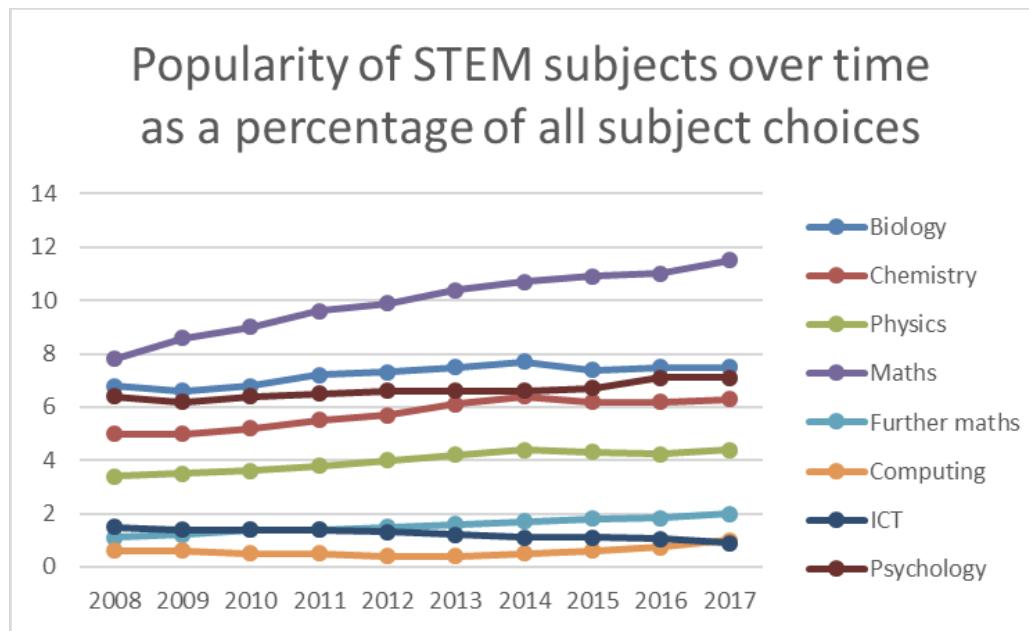
At GCSE, girls continue to outperform boys –
66% of girls achieved A*-C (or 9-4) grades compared with 62% of boys
(Source; WISE Analysis of GCSE STEM entries and results August 2017)



SUBJECT	%girls	%boys
Construction	100	76
Additional Maths	96	94
Physics	91	90.5
Biology	91	89
Chemistry	91	88
Computing	66	60
Design & Tech	73	54
Additional Science	62	55
Engineering	66	42
ICT	72	64
Maths	59	60

A*-C (or 9-4) grades in STEM subjects:

Neither is this true at A level – and there is good news on uptake of STEM



There has been a rise in the uptake of STEM subjects for boys and girls and in 2017 girls made up 36.7% of candidates

The overall share for top grades in STEM subjects **is found to be equal among boys and girls** at 24.3 % (Source WISE)

2 “There’s nothing we can do to attract women into science and engineering”

Really? We have done loads of things that work!

'SOAPBOX SCIENCE' taking female scientists to the
streets across WALES





Revolutionary approach to engaging girls with careers in STEM

Uses the natural tendency of girls to articulate their self-identity using adjectives

Shows girls that people like them are happy and successful working in careers in STEM

Explorer

Manager

Persuader

Service Provider

Policy Maker

Trainer

Entrepreneur

Regulator

Developer

Communicator

Supporter

Investigator



ScienceGrrl

A network of people - passionate about passing on our love of science on to the next generation

Because science is for everyone

Local ScienceGrrl chapters; **informal, friendly** gatherings provide **peer support** and setting for **developing events & programmes which encourage girls & women from local community to consider a future in science.**

8 REASONS WHY KIDS SHOULD SCIENCE MORE

The teachings of science perfectly complement children's natural curiosity and help them to develop important life skills. Here are just a few of those skills:

1 CRITICAL THINKING

The ability to thoroughly and objectively evaluate information is one of the greatest skills that you can possess. Critical thinking opens up new pathways of thought in the brain that are vital for a child's cognitive development.

2 RESILIENCE

The feeling of accomplishment that comes from conquering difficult subjects gives a child confidence that will last through their entire life. Resilience is now known as one of the most important markers of life success.

3 CONSTANTLY LEARN AND IMPROVE

Scientists are constantly trying to disprove their own theories in order to improve the validity of their findings. Kids studying science learn to love learning for learning's sake, whether succeeding or failing.

4 BECOME A SUPERHERO

Scientists discover things that improve people's lives all of the time, whether they set out to or not. Scientists get to apply their energies and their efforts to causes that really matter to them, and many times see the results firsthand.

5 PRESERVES SENSE OF WONDER

Science is about pursuing big questions about the world in very specific ways. In order to be a good scientist, it's vital to maintain the sense of wonder and the curious questioning about the natural world that kids are born with.

6 PROVIDES A METHOD OF QUESTIONING

One of the very first things kids learn about science is the Scientific Method, which is about determining what is true by forming hypotheses and testing them with experiments.

7 BECOME A BETTER CONSUMER

The ability to intake information claimed to be scientific fact and to evaluate its credibility is important. Children are much more likely to grow up savvy consumers in a world increasingly governed by statistics.

8 BECOME A BETTER PERSON

The scientific method of questioning and testing everything is not just for academic research. Through studying science, kids will learn to better their health, to never stop learning, to better understand the world around them, and to find a way to make it better.



3 “Engineers are super-humans”

Actually not!



We work on discrete elements which come together and it is the multidisciplinary and team approach which makes engineering brilliant

4 “Retention of women in STEM
is a women’s issue”

No – it's a business imperative



campaign for
gender balance
in science, technology
& engineering

10 STEPS

- Understand the starting point so you can monitor progress
- Educate your leaders, give them accountability for change
- Change mindsets by challenging bias and sexism
- Be creative in job design
- Make flexible working a reality for all
- Increase transparency of opportunities for progression
- Sponsor female talent to the same extent as male talent
- Demonstrate to women that you want to retain and develop them
- Approach this like any other business improvement project
- Share learning and good practice

5 “Diversity initiatives cost too much”

Not true!

Diversity's dividend

What's the likelihood that companies in the top quartile for diversity financially outperform those in the bottom quartile?¹



Gender-diverse
companies

more likely
to outperform



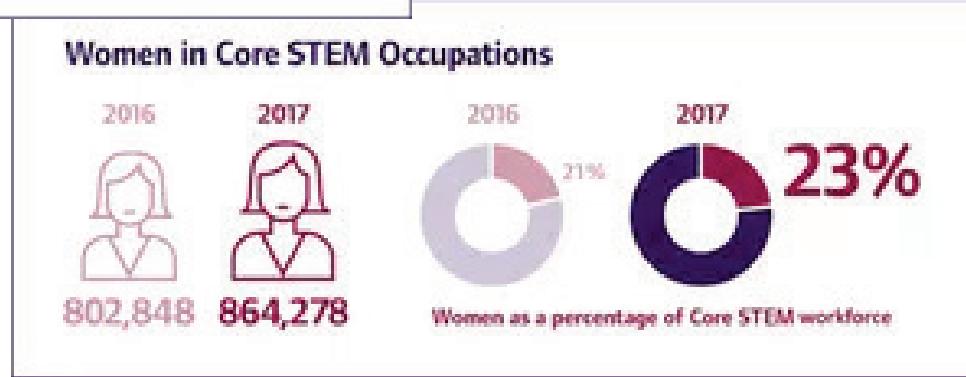
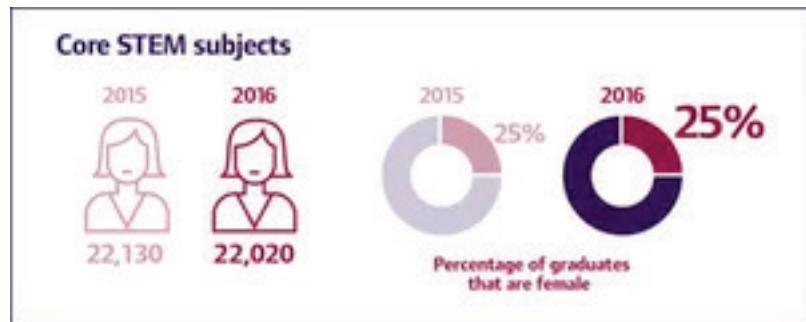
Ethnically diverse
companies

more likely
to outperform

¹Results show likelihood of financial performance above the national industry median. Analysis is based on composite data for all countries in the data set. Results vary by individual country.

6 “The pipeline isn’t there”

Outdated and rapidly changing!



7 “Women leak out of the system
and nothing will change that”

Tips for an inclusive culture to retain women in STEM

- Consider how YOU support inclusivity in STEM e.g. encouraging PARENTAL LEAVE and men to work part time if they wish
- Always call out bad behaviour; the standard you walk past is the standard you accept
- Encourage men and women to be mentors and sponsors; and lead by example
- Ensure panels and keynote speakers reflect to diversity of the community
- Consider imagery in your workplace. Represent diversity
- Run unconscious bias training – especially for appointment and promotions panels
- Support School teachers to encourage people to study maths/computing/science/technology/engineering

8 “Leaders never fail”

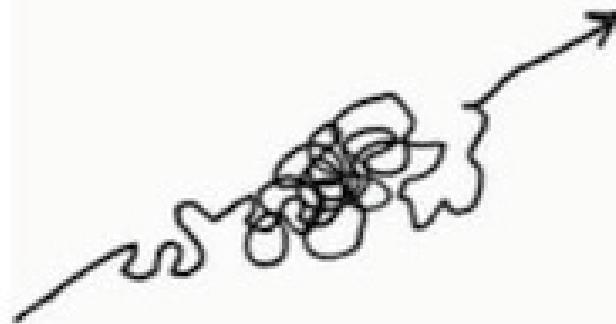
They do – and they learn!

Success



what people think
it looks like

Success



what it really
looks like

9 “Leadership happens at the very top of the organisation”

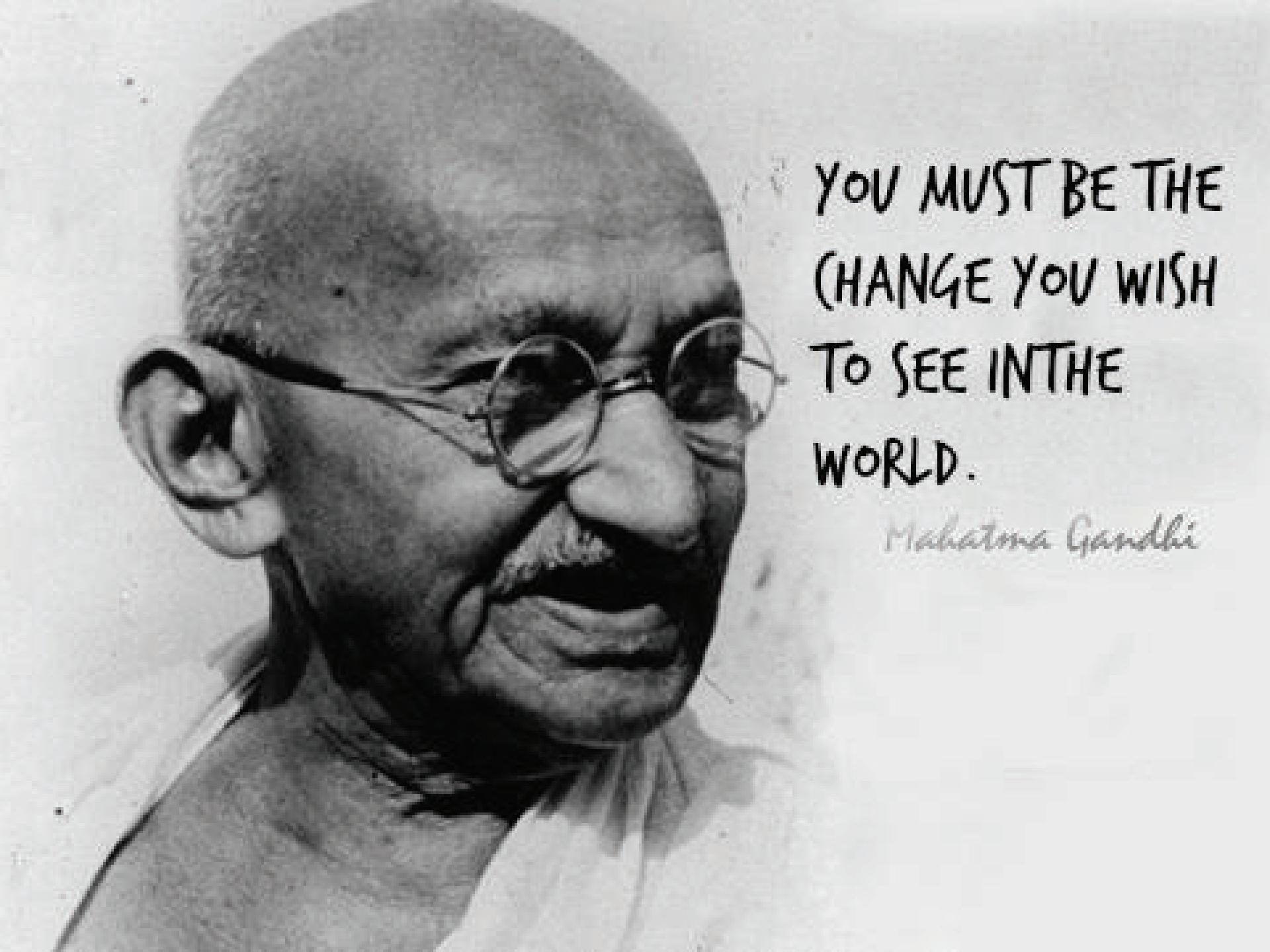
No – it happens throughout

WHAT LEADERSHIP SKILLS DO YOU NEED MOST?

These competencies were voted the most important for all management positions.



10 “Nothing I can do will change anything”



YOU MUST BE THE
CHANGE YOU WISH
TO SEE IN THE
WORLD.

Mahatma Gandhi