Getting in and getting on: reflections on gender and careers in STEM

Dr Clem Herman
School of Computing and Communications
The Open University

Research on women's underrepresentation in STEM

Meta-study of gender and STEM ability showed no innate differences, instead social and cultural barriers have been identified as the cause of different attainment (Ceci and Williams 2010). Some aspects that effect choice and motivation to study STEM subjects that have been investigated include:

Stereotype threat – where women/girls unconsciously conform to stereotyped expectations (Deemer et al 2014)

Self-concept of ability and expectation of success (Eccles, 2007)

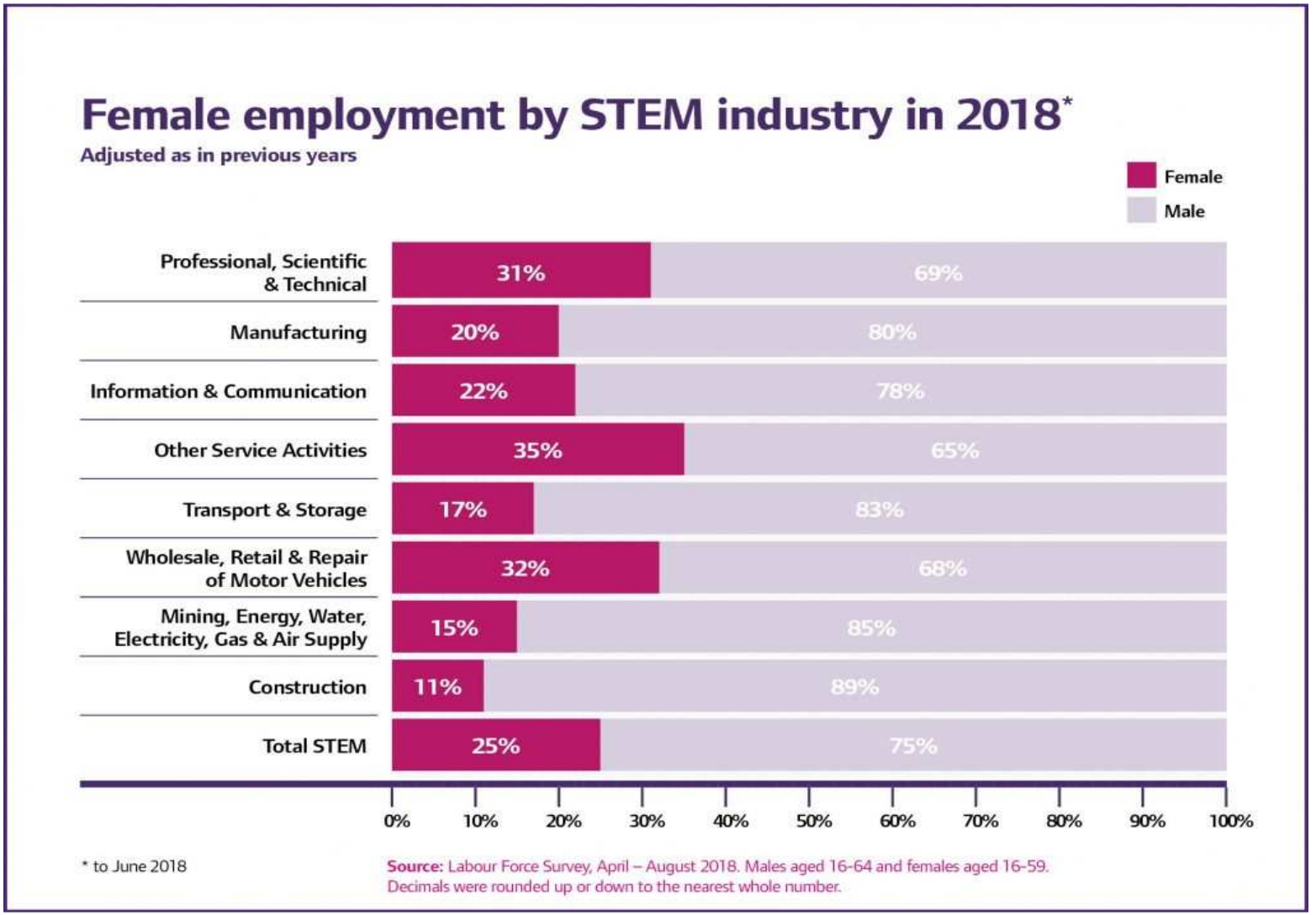
Girls motivated by the social function and context of learning. Self to prototype similarity influences learning to code. (Neuhaus and Borowski, 2018)

Teacher and parental influence (Lazarides and Ittel, 2013)

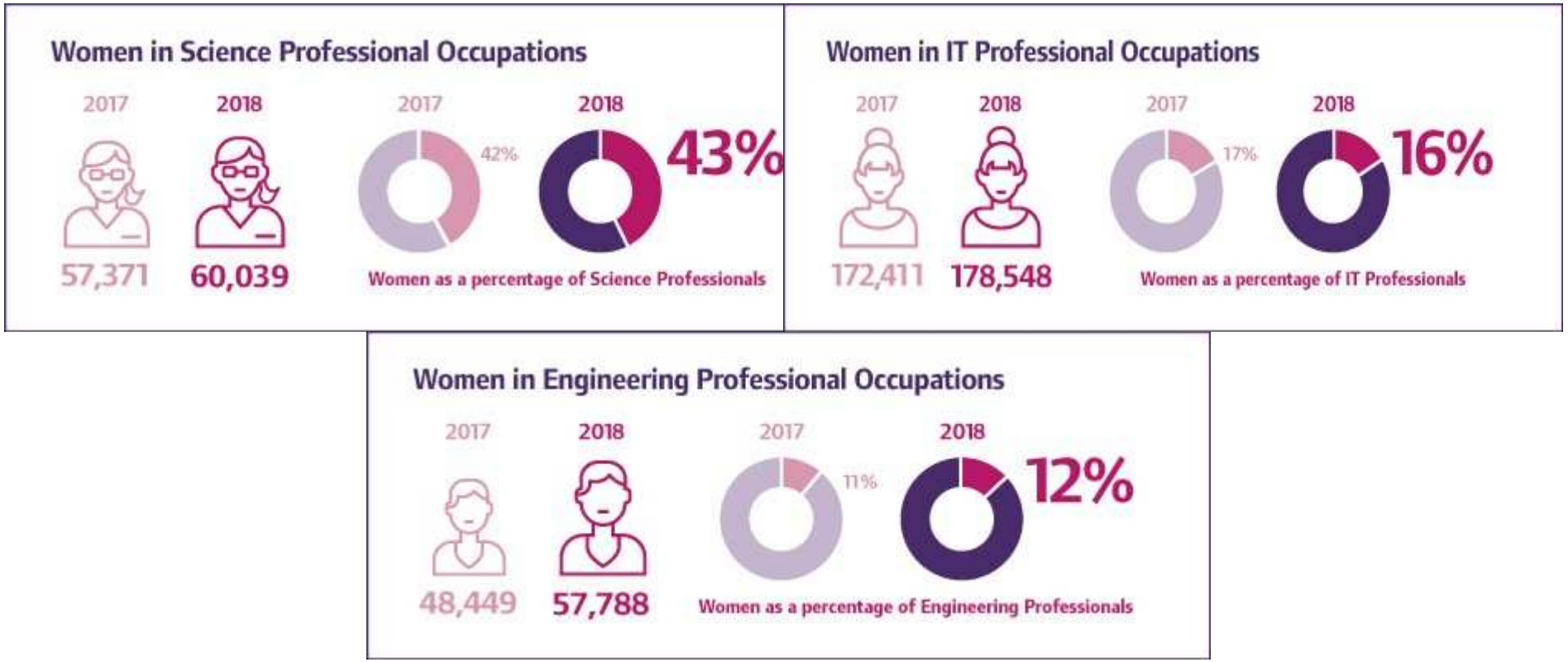
Media representation of scientists and engineers (Whitelegg et al, 2009)

The main reason for the low number of women in engineering is girls' subject choices in school. (Engineering UK, 2011)

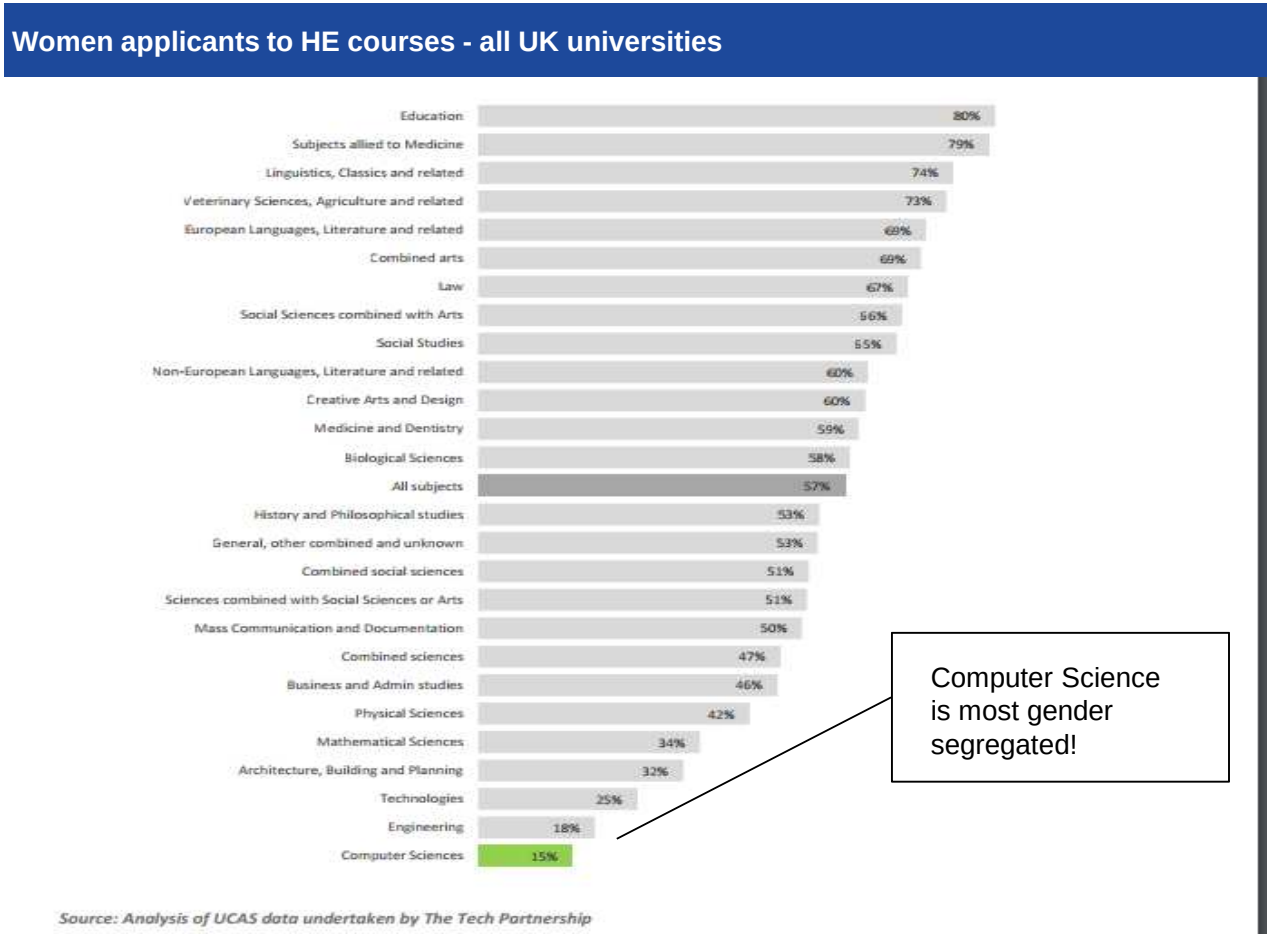
Source: WISE https://www.wisecampaign.org.uk/



Source: WISE
https://www.wisecampaign.org.uk/

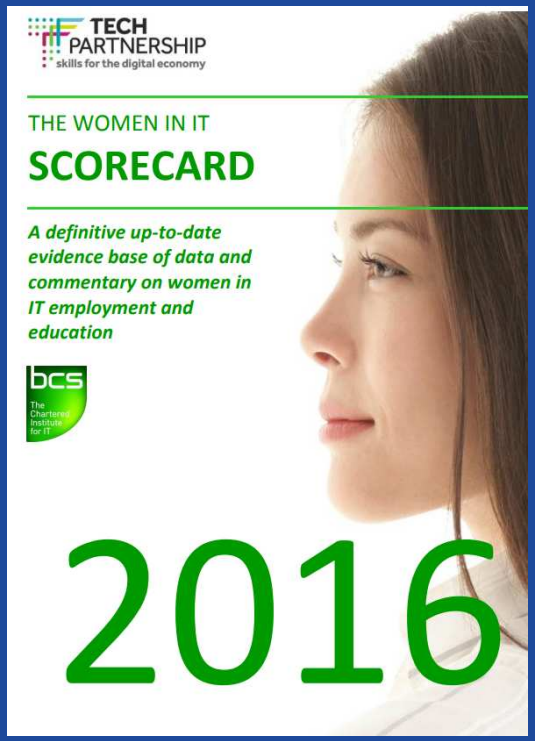


Source: https://www.bcs.org/upload/pdf/Women%20in%20IT%20scorecardv2.pdf

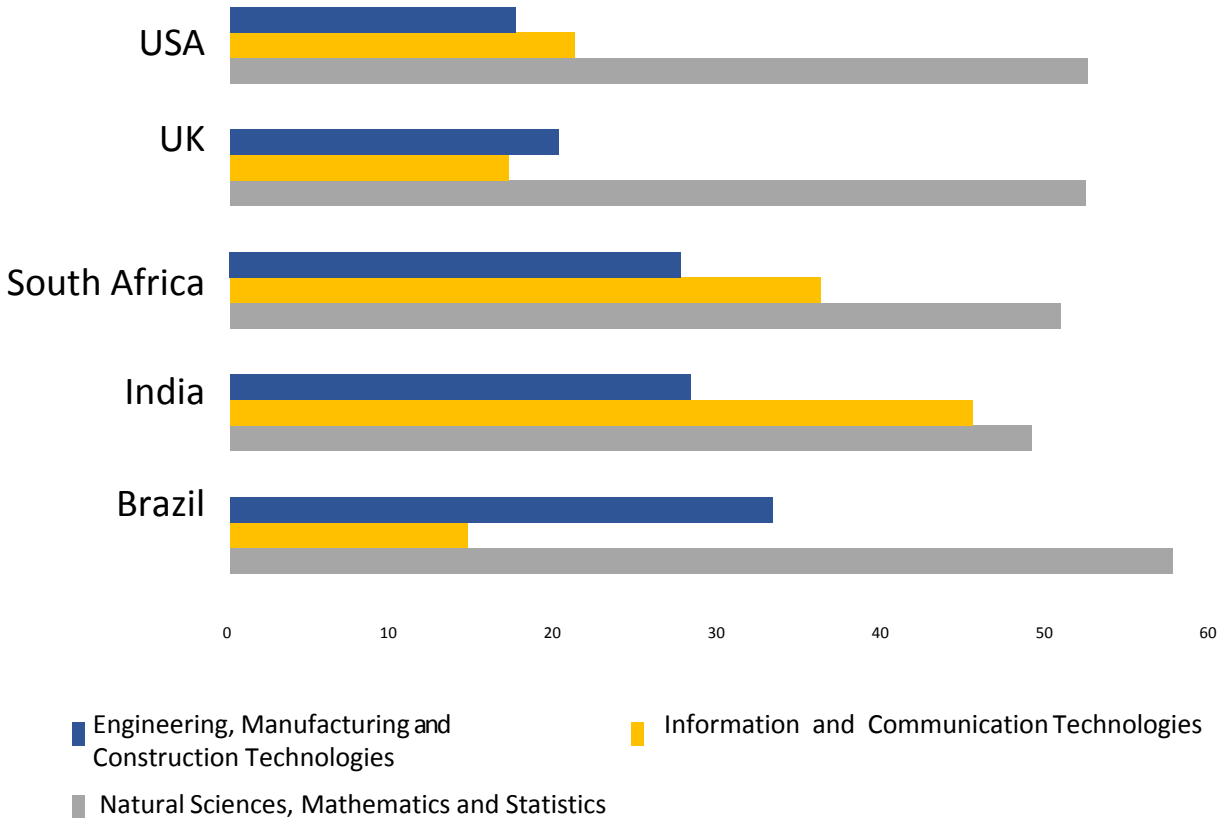


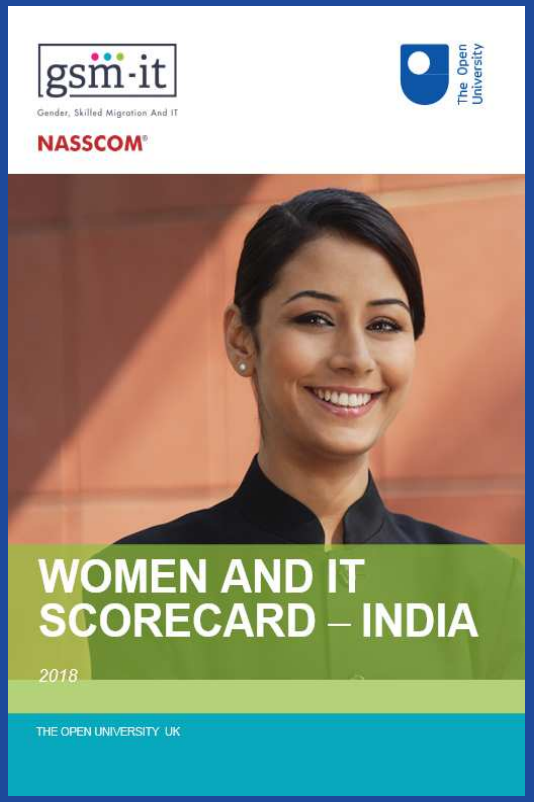
Amongst IT specialists, the lowest levels of female representation continue to be for IT Directors (11%), Programmers & Software Developers (12%) and 'other' IT specialists (13%)

20% of women IT workers in UK are Black or Minority Ethnic (BME) and over half of these are Indian



Women enrolled in tertiary education field of study (%)
(Source: UNESCO Institute of Statistics (2014))





In India IT is perceived as offering a gender equitable workplace and women are acknowledged as producers of India's global success in IT.

Globally, India has the highest percentage of women **enrolled in ICT programs at over 45%** (UNESCO 2014)

IT labour force participation is higher in India (**35% of women in IT are in technical roles**) compared to US, UK and EU countries (Open University 2017, 2018).

Eastern European States – Poland (41.1%) and Romania (41.1%).

Getting in

- Women's careers are often interrupted and non-linear
- Traditional careers in STEM are built around the 'ideal worker' being male and having a full time, uninterrupted, lifelong career
- Women are good at what they do, and like their careers, but progress more slowly.
- Maternity and career breaks have cumulative impact on progression and pay
- Fewer opportunities for part time work in STEM

Getting on

Comparative study of women engineers in European energy companies in Italy, France and Netherlands (Herman and Lewis 2013)

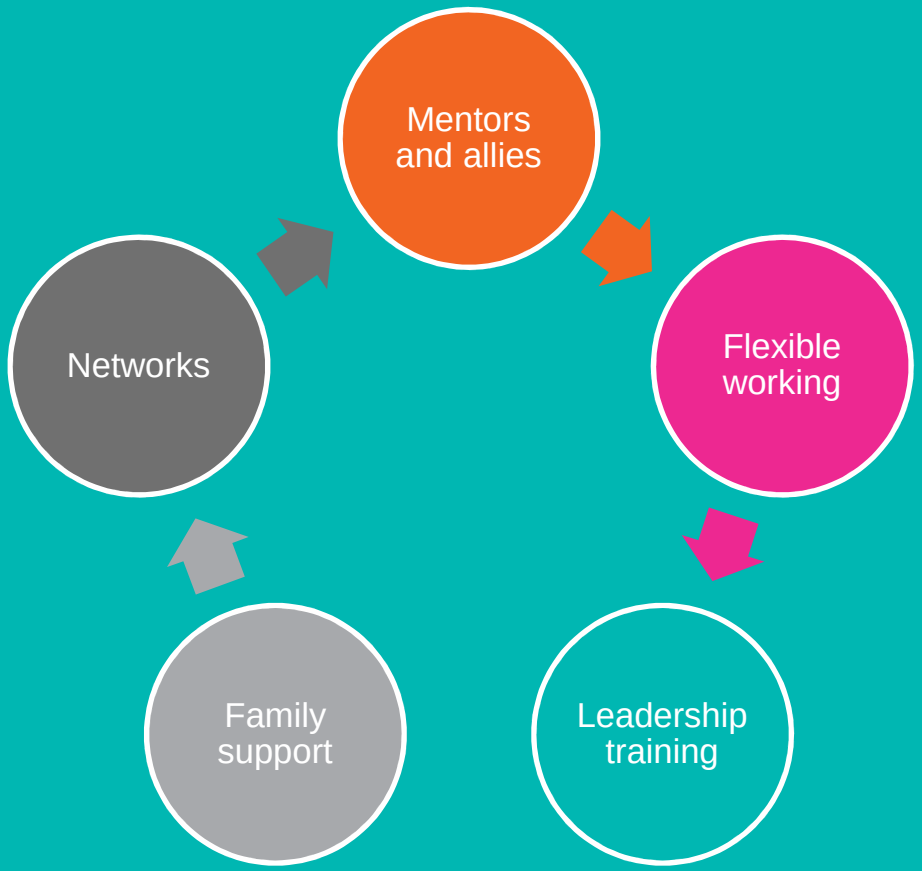
Expectation for mobility and long hours

Organisational cultures and gender stereotypes are resistant to change

Few women in senior roles (in Italian company no women on the ‘top floor’)

No sense of entitlement to combine a successful career and motherhood

Getting on

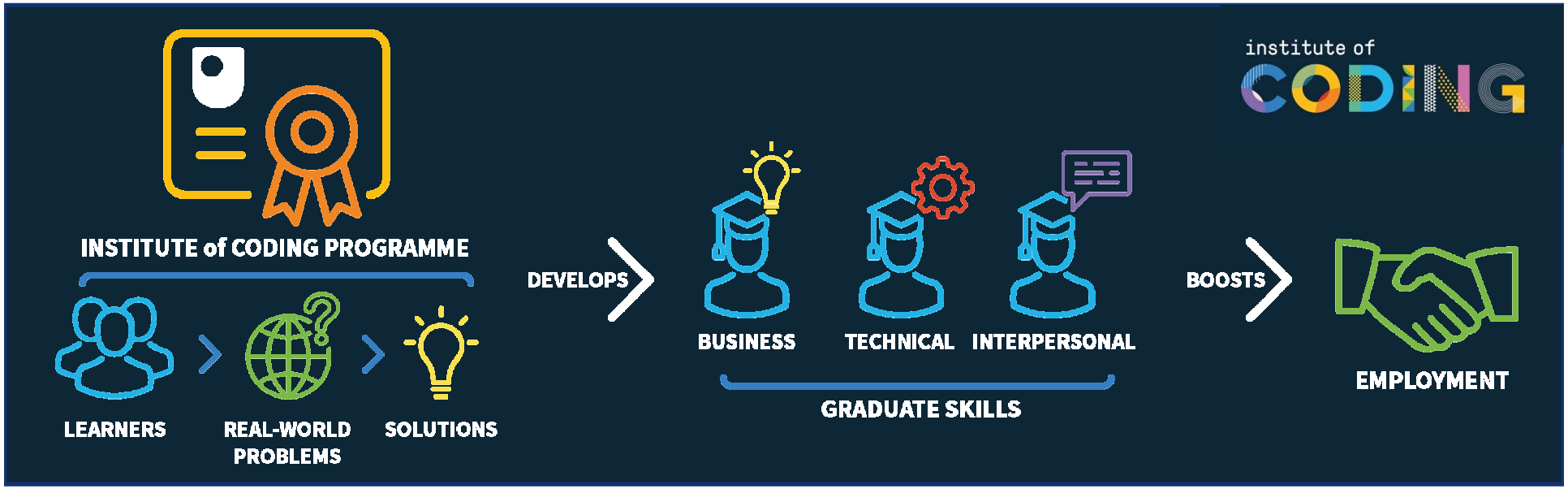

Mentors and allies
Flexible working
Leadership training
Family support
Networks

The fourth industrial revolution could involve ‘a revolution more comprehensive and all-encompassing than anything we have ever seen’ (World Economic Forum, 2016).

The combination of multiple changes, such as through **robotics, artificial intelligence and the internet of things**, looks set to disrupt whole sectors and organisational structures, and is unlikely to leave many jobs untouched. (Universities UK 2018)

INSTITUTE OF CODING

National Initiative to Enhance Digital Skills



https://www.instituteofcoding.org | https://instituteofcoding.open.ac.uk

50.open.ac.uk