F5 | Bridging the gap – tackling skill shortages in the fourth industrial revolution

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Tackling skill shortages in the fourth industrial revolution

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What 4.0 entails

• Artificial intelligence
• Machine learning
• Virtual reality
• Augmented reality
• Mixed reality
• Trans-humanism
What 4.0 entails

• Robotics
• Voice and face recognition
• Quantum computing
• Collaborative learning
• Internet of Things
• Big data
• Blockchain
Our schools and universities in June 2019 are preparing our young people brilliantly.....

For the 20\textsuperscript{th} Century
Metal & coach workers pose in front of the Benz & Co factory in Mannheim.

“AI is coming. To understand the stage we are with its arrival, we can draw an analogy from the car industry in 1886. Karl Benz had just invented the internal combustion engine. People had no idea how the invention would take off, or that it would transform human life across the planet. The comparison is wrong though in one respect. AI is far more wide-ranging than the car, and will carry humans much further.”
AI is infinitely seductive. It will know us better than our best friends, our parents, our partners. It probably already does. Under the guise of plausibility, is it opening our eyes, shielding our sight, or blinding us?
“AI will be 'either best or worst thing' for humanity”

“Every aspect of our lives will be transformed. In short, success in creating AI could be the biggest event in the history of our civilisation”

Stephen Hawking
“Artificial intelligence is the biggest risk we face as a civilisation and needs to be checked as soon as possible”

Elon Musk
The First Revolution - The *Dawn* of Learning some five million years ago
The Second Revolution – *Organised* Learning
i.e. 5000 years ago, cities sprung up on four rivers
The Second Revolution: 
The first schools and the first universities
The first University, Bologna, 1088
The Third Revolution – The Printing Press

Mass Learning: 500 years ago
and mass education at the time of the Industrial Revolution
The Fourth Revolution – AI
AI/digital is already transforming

• Healthcare
• Transport
• Shopping
• Law firms
• Accountancy
• Agriculture
• Banking
But in Britain, it is not seriously begun to transform teaching and learning in our schools

- Nor the jobs we are preparing young people for
- Nor the higher education
- Nor the society in which they will live
What is human intelligence?
Narrowly defined in 1912 as *intelligenzquotient*, first used at the University of Breslau
Physical

Cultural
The British Government understands

• The impact of AI on transport, health, industry etc.
• It fails to understand the impact of AI on education
• And on the jobs that education is preparing our students for
• And on the kind of skills that our students need to cope in life

i.e. with AI we are talking

• The way universities teach/students learn
• The jobs and society they will go onto
Because we are influenced overwhelmingly and without fully acknowledging it by:

• The Past

Not

• The Future
We are not even preparing our students for the world of work

- Oxford Martin School 2013
- David Deming - Harvard working paper 2015
- Richard and Daniel Susskind – *The future of the professions* 2015
- McKinsey Global Institute January 2017
- IPPR, Carys Roberts, 2017
- PriceWaterhouseCoopers March 2017
- Oxford Martin/Pearson/Nesta 2018

- Future of Work Centre 2019 – half life of a skill in 1995 was 26 years: now 4.5 years McKinsey – by 2030 workforce will spend 55% more time using technology. AI is advancing 10X faster and at 300X the scale of the Industrial Revolution.
Two 2019 reports on Future Employment and AI

1. OECD: *The Future of Work*
   - 14% of jobs at *high risk*: 31.6% at risk
   - But new jobs will replace lost jobs
   - Low skilled are most at risk – so HE is well – placed

2. Chartered Institute of Personnel and Development/PA Consulting
   - One third of 759 UK companies had invested in AI since 2014
   - A majority of these see job increases not losses.
Impact on society
Impact on *Society* - London in 2035

- Computing power one million times more powerful than in 2019
- Ubiquitous ‘invisible technology’
- Ubiquitous sensors at work, in the home and in our clothes
- Implants in our body, including molar mics, neural, ear and eye implants.
- Smart glasses/contact lenses replacing smartphones.
- Ubiquitous drones in and outside buildings
- Health transformed for those of all ages, with real time monitoring and alerts.
Skills that education currently emphasises

• Logical/linguistic intelligence over wider intelligence
• Solo working over collaborative learning
• One right answer, written down over spoken responses
• The abstract rather than the real world
• The intellectual over the emotional
Skills employment currently needs

• Team working/ collaborative skills
• Interpersonal skills, including empathy
• Communication and presentational skills
• Problem – solving skills
• Reliability, honesty, punctuality, presenting self
Skills employment will need In the future

• Data / digital/ 4.0 literacy
• Technological literacy
• Human literacy
• Transferable literacy
Why the Mismatch Education and Work

- Our schools and FE and HE are fixated on exams
- The DfE does not understand, nor does OFSTED, the world of work
- World tables e.g OECD / PISA emphasise academic exam skills
- Employers and educators do not talk together enough
- Neither educators *nor* employers are preparing properly for the 4.0 work
What can employers do

• Be clearer still about the skills you need
• Talk to schools and colleges more
• Talk to universities more
• Lobby Government to help them understand
• Every company to open up its doors to placements from teachers and university staff – and vice versa!
The End