



Education Committee
House of Commons
London SW1A 0AA

21st June 2018

Inquiry: Fourth Industrial Revolution

Thank you for the opportunity to participate in this inquiry about the Fourth Industrial Revolution. The Fourth Industrial Revolution is characterised by the emergence of a range of new technologies including artificial intelligence, robotics and the internet of things. The changes are likely to have a major impact on both productivity and the labour market, with low and medium skilled jobs most at risk. The below response outlines the IoD's analysis of these trends and sets out some recommendations for how Government can tackle the challenges and maximise the opportunities the Fourth Industrial Revolution presents.

About the IoD

The IoD was founded in 1903 and obtained a Royal Charter in 1906. It is an independent, non-party political organisation of approximately 33,000 individual members. Its aim is to serve, support, represent and set standards for directors to enable them to fulfil their leadership responsibilities in creating wealth for the benefit of business and society as a whole. The membership is drawn from right across the business spectrum. 49% of FTSE 100 companies and 45% of FTSE 350 companies have IoD members on their boards, but the majority of members, some 70%, comprise directors of small and medium-sized enterprises (SMEs), ranging from long-established businesses to start-up companies. IoD members' organisations are entrepreneurial and growth-orientated, and more than half (61%) export goods and services internationally.

Fourth Industrial Revolution

We are living in a time of major change in the labour market. The composition of the UK economy is likely to evolve considerably as our trading relationship with the rest of the world changes. Some industries will inevitably decline while others are likely to grow and prosper. The skills demands of employers will consequently change. With IoD members already reporting that the lack of appropriate skills in the workforce is their biggest concern, we need to prepare our education and training system for those coming changes.

Even without Brexit, demographic and technological changes are transforming the world of work.

For the first time, new technologies – driven by rapidly increasing digital sophistication – are reaching into new corners of the workforce. Whereas previous job-replacing technological change has been limited to tasks that were predominantly simple, physical and repetitive, recently,



computers have begun substituting for complex cognitive skills. Consequently white collar services jobs, upon which the UK economy is disproportionately dependent, are now just as at risk of automation as blue collar manual roles. In essence, the next wave of labour-saving technology looks to be replacing human brains, rather than human brawn.

While some are now saying that these forecasts are proof that the Luddites were right all along history shows that, rather than destroying jobs, technological advancement has proven to be a net creator of employment. In every round of technological change, some jobs have been lost but ultimately more new jobs have been created. Efficiencies gained through new practices and technologies reduce the cost and duration of production, which, when passed on to the consumer, increase spending power, therefore stimulating demand and creating new jobs. Rather than making human workers redundant, technology has simply shifted work into other areas. So, while it is unlikely that in the long run the net result of the fourth industrial revolution, as this one has become known, will be a decline in the number of jobs, automation will, however, result in significant changes to the nature of work and the skills required. The fact that roughly 20 million jobs disappeared in Britain between 1980 and 2000 shows that the Bank of England's prediction of 15 million automated jobs would not be unprecedented. The lesson from the 1980s and early-1990s, however, is the importance of enabling those people who have lost their job to re-skill in order to find alternate employment and fill the new jobs being created.

At the same time, we are living through a period of unprecedented advances in human health. British people today are living longer than ever before and many are choosing to remain in work until later in life. 1 in 3 babies born today are expected to live to 100, compared to just 1 in 10 in 1950. Just as the Government is looking to increase preparedness for this by encouraging people to develop their pensions and savings, business leaders and education providers also need to start thinking about how this will affect the workforce.

The IoD has identified four key areas where Government, businesses, and educators need to reform our education and training system to meet the needs of our post-Brexit economy: 1) Curricula, 2) Guidance, 3) Provision, and finally 4) Finance.

Curricula

The modern schooling system began to take its present form with the establishment of our current exam system towards the end of the first Industrial Revolution in 1858. At its core, this system is characterised by competition between classmates, and students learn and are assessed as individuals. Yet, as technology and globalisation progress, working with others is becoming increasingly important. Today, innovation rarely results from individuals working in isolation. Instead it is usually the product of sharing and collaboration so an individualistic approach to education has become outdated.

In an era of skilled factory work, this mass public examinations system was designed to assess and rank school leavers on their ability to recall information and apply the standard methods required to satisfy the needs of 19th century employment. Yet today, as technology alters the demand for skills, method and recall are the very things that are easiest for computers to automate.

Instead, various examinations of the tasks computers are unlikely to be able to perform suggest general behavioural and non-cognitive 'soft' skills such as resourcefulness, creativity, abstract reasoning, and emotional intelligence are the likely domains where humans will retain a comparative advantage. That is not least because these are skills where computers complement our abilities rather than substitute for them. Even though today mobile devices, online social networks, and high-speed wireless broadband make communication over vast distances possible at almost zero cost, face-to-face interactions are still the key engine of innovation, collaboration and growth. Education curricula, and the ways that we teach, should be amended to reflect this.

Recommendations:

1. With the UK Commission for Employment and Skills having ceased to exist in March 2017, Government should examine how to incentivise employers and education providers to collaborate more together and share practical knowledge of employer needs so as to ensure students develop the skills they need to help insulate them against the unpredictability of the future economy.
2. Education curricula need to be monitored, informed and continuously re-examined by an expert body, free from political interference, which would advise schools on subject choice and make curricula more relevant to ever-changing labour market demands.
3. The government should avoid unnecessary distractions such as creating extra grammar schools and focus on more pressing concerns facing schools such as tackling the teacher shortage crisis. The shortage of teachers in key subjects including science and maths threatens to have detrimental knock-on effects for employers. If young people cannot study and do well in these subjects then the pipeline of school leavers and graduates with the skills required to fill shortage occupations will not meet demand and thus hurt our economy.

Guidance

The UK labour market changes, many people, particularly younger generations, will have to move jobs and work in different industries. Most will change jobs multiple times and brief periods of unemployment - for people at all levels - will become more common. Consequently, there is a need to ensure better career guidance support.

A young person today begins to make choices in education that will affect the skills they need for their career as much as a decade before entering the workforce, by which time labour market demands, workplace technologies and consumer preferences will have altered significantly. In UK

schools systems, where learner choice plays an increasingly important role, it is ever more important for students, teachers, and crucially parents, to access good quality and timely information and advice on the likely skills needed by employers in the future.

Big data will likely prove pivotal in developing better forecasting of where the jobs market is moving and where the skills shortages are expected to lie. Part of the onus here will also be on employers, who bear responsibility for helping young people and education providers understand the changing world of work. There needs to be much stronger links forged between schools and businesses.

There is also, however, a need to support in-work progression. Independent recruiters and career guidance councillors must develop a focus not simply on helping people into the world of work, but also to begin offering post-employment support. DWP, the Careers & Enterprise Company, Job Centre Plus and others must start to offer assistance not just to people looking for work but to those already in employment, throughout their working lives, via high quality, tailored, in-work careers advice and job-matching services. Information about education and employment paths and a comprehensive understanding of the labour market, both as it exists today and is likely to exist in the future, will enable people to take the appropriate strategic steps along their career journey.

Recommendations:

1. The Westminster and devolved governments should ensure that every school has a suitably qualified, dedicated, full-time, careers coach whose job is to provide independent careers education and guidance and to co-ordinate employer engagement for students.
2. Research by the government's Careers & Enterprise Company shows that young adults who have greater levels of contact with employers while at school are significantly less likely to become Neet (not in employment, education or training) and can expect, when in full-time employment, to earn significantly more than peers who had no such workplace exposure. Multiple, high-quality work experience opportunities should become compulsory for all students from the age of 13 onwards (Key stage 3, 4, and "5") so that young people can learn from employers and be better informed and equipped to make the right choices to help achieve their future career aspirations.
3. DWP, the Careers & Enterprise Company, Job Centre Plus and other relevant bodies must adapt to cater to people already in employment, helping them to progress their careers, not just young people entering the workforce.

Provision

Education is expensive and with more people working later in life than ever before we need to develop better pathways for workers to continue in and to re-enter education and training. At the same time, the Further Education and skills sector – which has often played a central role in helping employers retrain and upskill their workforce - is under huge financial strain and subject to

considerable policy instability. With the backdrop of Brexit, the likely loss of EU funding, and fewer international students, the university sector is also under considerable financial pressure. We therefore need to find new ways of providing education and training more flexibly and at much lower cost.

Computer based educational technologies (Edtech) offer one obvious solution. The extraordinary growth of Massive Open Online Courses (or MOOCs), Personalised Learning Algorithms, and computer-based collaborative and virtual reality tools are all enabling people to access independent vocational learning more conveniently and cheaply than ever before.

By offering flexible ‘anywhere, anytime’ education, these new technologies are creating invaluable new spaces for developing skills in a way that can be adjusted to meet the student’s individual needs, interests, and abilities.

Computer based forms of learning provision have their limitations and they are not, on their own, a perfect substitute for a traditional forms of education and training. Nevertheless, the cost savings, convenience, and flexibility they afford mean computer based learning has the potential to revolutionise vocational education and training provision.

The IoD are calling for Government to incentivise education providers to expand their provision of computer based, blended, and flexible learning opportunities to enhance access to education at reduced cost, and to capitalise on the growing market for alternative learning opportunities.

Recommendations:

1. Use the new higher education Teaching Excellence Framework (TEF) to incentivise education providers to expand their provision of computer-based, blended and flexible learning opportunities to enhance access to education, reduce the costs of provision, and capitalise on a growing demand for alternative learning opportunities.
2. The WorkerTech programme being run in partnership with the Cabinet Office seeks to seed, find, and back start-ups with promising ideas about how technology can be used for good in the world of work. HM Government, in collaboration with Social Enterprise UK, should explore how the WorkerTech programme can be expanded and enhanced to facilitate the setting up of education and training services to help employees and the self-employed gain new and improve their existing skills.

Finance

Several recent studies have shown that affordability is the biggest barrier to workers enrolling in part-time or further education. On-the-job training and e-learning offer part of the solution but on their own they will not be enough.

We are calling on the Government to explore tax incentives that would encourage continuous engagement in education for adults. An open tax incentive approach would allow workers the flexibility to pursue training to meet their employment needs as and when those needs emerge, and to tailor their studies so as to undertake only as much or as little training as they require.

We propose introducing two versions of a tax nudge — one for employers to train staff, and one for individual workers themselves — to incentivise lifelong learning in a way that would be simple to introduce, align with the existing self-assessment and digital tax compliance systems, and would limit potential bureaucracy. More importantly, however, these tax incentives would represent an initial step towards aligning the UK's fiscal policies with its most significant employment challenges, both for today and for the foreseeable future.

Recommendations:

1. Apprenticeships are not always the most appropriate form of training to meet an individual's or firm's needs. The Apprenticeship Levy should be reformed to employers to utilise their Levy contributions to provide other forms of training, not just apprenticeships, and to train self-employed contractors.
2. The Treasury, HMRC, BEIS, DfE, and the devolved governments should work together to develop workable but simple criteria to enable large and medium-sized employers to obtain an enhanced tax deduction for qualifying lifelong learning courses from accredited providers for their employees which goes beyond training for the business itself. This would not be a new idea from a purely technical tax perspective as expenditure by business to, for example, rectify contaminated land, already receives a tax deduction at 150 per cent of the expenditure incurred rather than 100 per cent. At a corporation tax rate of 20 per cent, this deduction would save 30p rather than 20p for each £1 spent. The IoD proposes that relevant lifelong learning expenditure should qualify for a deduction at a rate of 200 per cent against corporation tax, therefore saving 40p in tax for every £1 spent at the corporation tax rate of 20 per cent. A higher rate would be appropriate because the benefits of lifelong learning inevitably accrue more to the employees concerned than the business itself. For smaller employers, microbusinesses and non-employing (i.e. one-person owner-employee) businesses which typically have more constraints and less flexibility with regard to releasing employees for education or training which is not directly focused upon the short-term needs of the business itself, a higher rate of tax incentive would be appropriate, for example at a rate of 300 per cent against business profits, therefore saving 60p in corporation tax for each £1 spent.
3. Some learners will nevertheless have to rely upon their own finances to fund their personal lifelong learning requirements. The income tax system should therefore be flexed to encourage and incentivise this, recognising that lifelong learning benefits not just the individuals themselves but the broader economy as a whole. A relatively simple way to achieve this would be to provide all learners — over the age of 25 so as not to disadvantage



school leavers who now pay increased tuition fees to go to university — with a ‘shadow personal allowance’ set at, for example, 10 per cent of the current personal allowance, which could be offset against their income tax liability provided that the learner has personally paid for, undertaken and/or remains in, a qualifying lifelong learning programme in that tax year. Any surplus allowance would be carried forward to the following years until so used. This would emphasise that the ongoing need for lifelong learning has no predetermined time limit while still focusing individuals on the need to update their skills to meet the needs of a rapidly changing employment market.

Thank you once again for giving the IoD the opportunity to participate in this inquiry. We hope you find our comments useful. If you require any further information on any of the issues discussed, please do not hesitate to get in contact.

Seamus Nevin
Head of Policy Research
Institute of Directors
Tel: +44 (0)20 7451 3134
Email: Seamus.Nevin@IoD.com