

DEMOS

# THE AI GENERATION

HOW UNIVERSITIES CAN  
PREPARE STUDENTS FOR THE  
CHANGING WORLD

RICHARD BROWN

NOVEMBER 2023

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Any errors remain the author's responsibility.

**Richard Brown**

Visiting Fellow at the School of Advanced Study, University of London

November 2023



## AN INCLUSIVE ECONOMY

This project is part of Demos's work to help create an **Inclusive Economy**. This programme investigates how we can build an economy where everyone participates and contributes to shared goals and where, as a consequence of that contribution and participation, there is an equitable distribution of the benefits.

An inclusive labour market is essential for an inclusive economy. Good jobs provide both economic and social value, being one way in which people can contribute to society and supporting people's financial security, health and wellbeing. Enabling as many people as possible to find and retain high-quality work is therefore a key objective for policy makers.

The large numbers of people that go to university means that ensuring that higher education has a critical role in helping people to flourish through gaining access to meaningful careers.

# FOREWORD

## BY PROFESSOR WENDY THOMSON CBE



I am delighted to introduce this thought-provoking report, looking ahead to how technologies are likely to transform labour markets and the skills that our students will need to prosper.

The future that Richard Brown describes is in some ways an alluring one. Shouldn't we embrace a world where routine research, writing and organisational tasks are automated and 'softer' skills involving judgement, creativity, teamwork and interpersonal understanding, become more important? Would it not be wonderful if technology gives us more time to devote to the things that we find most fulfilling in work, as in life?

But it is easy to describe less rosy scenarios, where AI and other technologies widen inequalities, increase precarity or narrow access to the opportunities that universities can offer.

And one thing that is clear from this report is that universities could have a pivotal role in determining whether AI works to create a more equitable and fulfilling future economy, or a more divided one.

The University of London is a world leader in higher education. Our 17 member institutions vary enormously in size and focus. Some focus on one or two subjects, whether in the arts or sciences, and some work across the whole range of academic disciplines. But Richard Brown's analysis suggests that new technologies will present very profound challenge to all of them and demand that we think again about we teach and the way we teach – and even more fundamentally, about the ways we operate and our business models.

This report is a testament to our shared commitment, at the University of London, to understanding the shifting dynamics of our world, and ensuring that we evolve alongside it. But *The AI Generation* is not just

a blueprint for our own institutions but a call to action for all universities. Together we are not limited to simply adapting to future tech and economic developments but shaping them.

I would like to express my gratitude to everyone who has contributed to the creation of this report and in particular to Richard Brown, to colleagues at Demos, and to the experts who participated in a roundtable held at Senate House, at which we explored and tested its arguments.

**Professor Wendy Thomson CBE**

Vice-Chancellor, University of London

# FOREWORD

## BY POLLY CURTIS



This report comes during intense debate about the impact of technology on the UK and around the world. Demos has been at the forefront of thinking about these issues, through our recent research such as the *Employability Badge* and *Open Sourcing the AI Revolution*. We are delighted to partner with the University of London on this timely report.

Rapid technological changes, particularly in AI, will have significant implications for the world of work. How we can balance technological change with creating good jobs and careers is one of the biggest challenges of our time.

As half of our young people now go to our universities, and many more return to university later in life, these institutions have a critical role to play in the future.

Demos' previous research and this paper highlight that these will make education more important, not less. A greater focus on transferable skills and socialisation will give institutions that bring people together, to learn and develop collectively, a vital role in shaping the future. It will, however, have profound implications for how universities work and how they support their students.

The good news is that this paper shows that there are practical steps which universities can take to help their students have meaningful and successful careers. There is also engagement from across the higher education sector and a willingness to explore the implications of technological change on the sector.

Government and policy makers need to put in place a supportive environment to enable universities, and other educational institutions, to adapt. This means a stable funding environment that encourages universities to wraparound support for students, create more bespoke courses and degrees based

on individual capacities. It means more co- and extracurricular activities with civil society and employers. It also means smart regulation which ensures that changes do not negatively impact the most disadvantaged whilst avoiding perverse incentives and jumping through hoops.

As important is the need for a cultural shift in the way that we think about universities and how students acquire the skills they need. In this report we talk for the first time about General Relational, Analytic, Social and Personal skills - GRASP skills. Universities need to adapt to deliver these alongside academic learning. They need to reformulate education for the new technological age.

*The AI Generation* provides a useful guide to universities, students and policy makers on how we can make sure technological change helps us to build an inclusive economy where everyone can participate and share the benefits of prosperity.

**Polly Curtis**

Chief Executive, Demos

# SUMMARY

Preparing students for their working lives has been at the heart of universities' function since the 1960s. Recent decades have seen rapid changes in the workplace, and technological advances such as AI and automation will accelerate these in years to come. This report considers how universities can continue to fulfil their employability function in this context of rapid and radical change.

**Participation in higher education in the UK has grown as the knowledge economy has expanded...**

- Half of young people now go to university, one of the highest rates among advanced economies
- Knowledge economy sectors have grown from 25 to 42 per cent of jobs since the late 1970s
- Government analysis projects that the proportion of workers who are graduates will rise from 36 per cent in 2020 to 48 per cent in 2035 (and from 52 to 69 per cent in London).

**...and there is a growing focus on the 'employability value' of a university education.**

- Higher participation rates mean more competition for 'graduate' jobs
- Students who are paying directly for their education are more interested in maximising their 'return on investment' in career terms
- Government policy has focused universities' performance measures on graduate employment

**Technological change has placed a premium on non-academic skills which in this report we identify as "general relational, analytical, social and personal" (GRASP) skills...**

- Digitisation of knowledge has made databases and algorithms widely available, reducing demand for lower-skilled professional labour

- The abilities to analyse and communicate information, to listen and persuade, and to manage one's own career and learning are increasingly highly prized, with demand for these expected to increase

**...but there is limited good evidence of what works in acquiring these skills (or consensus on how success should be measured)...**

- What is taught – generic employability content has little impact but more course-tailored content can be valuable, as is content that helps develop entrepreneurial and commercial skills
- How courses are taught – traditional lecture and reading approaches are out of favour, with 'active learning' leading to better degree results and employability outcomes
- Beyond the classroom – extra- and co-curricular work experience, placements and participation in clubs and societies all seem to have the most positive impacts

**...and students from disadvantaged backgrounds are less likely to participate in and benefit from some of the more effective interventions.**

**The development and uptake of generative AI is likely to further disrupt graduate careers potentially removing the "bottom rung of the ladder" for those starting their careers and needing to gain vital experience...**

- Generative AI extends automation into areas such as preparing, summarising and communicating content, developing computer code, images, sound and video, and potentially undertaking research.
- It is likely to increase demand for some GRASP skills (for example, critical analysis and social skills) but also to create new demands
- Early research suggests that AI's productivity

boost might be greatest for lower skilled workers, requiring greater differentiation for graduate skills, and may reduce demand for labour traditionally undertaken by professional services trainees hampering their ability to gain skills that later benefit their careers

...with profound implications for universities and career development.

**Universities should:**

- keep employability strategies under review, to support students in acquiring GRASP skills through course content, teaching methods, and engagement with employers and entrepreneurs
- integrate AI into learning and teaching, including through richer hybrid learning experiences
- extend co-curricular and extra-curricular activities, while ensuring that all students are supported to take advantage of these opportunities
- develop their relationships with employers and civil society organisations to ensure that both students and society can benefit from the skills acquired by students

The dramatic changes ahead call for a fresh dialogue; universities should lead discussions with government, professional bodies and employers on the workforce and skills that we will need to flourish individually and as a society in coming years, and to identify how to give today's young people the best opportunity to fulfil their potential.

# INTRODUCTION

## HIGHER EDUCATION AND EMPLOYABILITY

University participation has grown sharply in the United Kingdom. 34 per cent of children born in 1986 had started university courses by the time they were 20, while 46 per cent of those born in 2000 had done so by the same age.<sup>1</sup> Participation in tertiary education is the seventh highest among 37 OECD countries and only three of our EU neighbours<sup>2</sup> rank higher.

Heralding the need to compete in “the knowledge economy”, then Prime Minister Tony Blair committed to increasing participation in 1999, lifting caps on student numbers and setting a target of 50 per cent of young adults going into higher education (using the measure in force at the time, this target was met in 2017/18).<sup>3</sup>

The growth in student numbers has been driven by demand as well as policy. A university degree has come to be regarded as a minimum entry requirement for a widening range of jobs, including many that previously took on school leavers, but particularly for those in fast-growing knowledge economy sectors. To use one of the most graduate-intensive sectors as an example, the ‘professional, scientific and technical services’ sector almost doubled employment numbers between 2000 and 2023, and now accounts for almost ten per cent of workers in the UK.<sup>4</sup>

But these careers are themselves increasingly exposed to disruption from accelerating technological change, with many more graduates competing for them, suggesting that now is a good time to review the role of universities in preparing

young people for the world of work. Preparing young people for their working lives has always been one of universities’ missions – though not their sole reason for existence. The Robbins Committee, which recommended the 1960s expansion of higher education, identified “instruction in skills suitable to play a part in the general division of labour” as one of the four objectives for universities (the others were “to promote the general powers of the mind”, “the advancement of learning”, and “the transmission of a common culture and common standards of citizenship”).<sup>5</sup>

### **More than 50 years later, the Augar Review identified six purposes for post-18 education providers in similar terms:<sup>6</sup>**

- Promote citizens’ ability to realise their full potential, economically and more broadly
- Provision of a suitably qualified workforce;
- Support innovation through research and development, commercial ideas and global talent;
- Contribute scholarship and debate that sustain and enrich society through knowledge, ideas, culture and creativity;
- Contribute to growth by virtue of post-18 institutions’ direct contributions to the economy; and
- Play a core civic role in the regeneration, culture,

1 <https://explore-education-statistics.service.gov.uk/find-statistics/participation-measures-in-higher-education#releaseHeadlines-charts>

2 OECD (2023), Population with tertiary education (indicator). doi: 10.1787/0b8f90e9-en (Accessed on 03 August 2023) <https://data.oecd.org/eduatt/population-with-tertiary-education.htm>

3 Labour Party Conference speech, 28 September 1999, from [http://news.bbc.co.uk/1/hi/uk\\_politics/460009.stm](http://news.bbc.co.uk/1/hi/uk_politics/460009.stm)

4 Workforce by industry, NOMIS.

5 Report of the Committee appointed by the Prime Minister under the Chairmanship of Lord Robbins, Cmnd 2154, London: HMSO 1963 (retrieved from <https://education-uk.org/documents/robbins/robbins1963.html>)

6 Independent panel report to the Review of Post-18 Education and Funding, London: HMSO 2019

sustainability, and heritage of the communities in which they are based.

In each of these formulations, preparing people for their working lives is at the heart of higher education. It is not the only way in which either individuals or society benefit - active citizenship, scholarship and innovation all play a part too – but it is central to universities' role.

This report looks at how university education is enabling students to gain the skills they will need in fast-changing workplaces, as these are set to be transformed by rapid technological change. It draws on a review of academic and policy research, on a small number of interviews, and on a workshop hosted by Demos and University of London in October 2023.

# SKILLS FOR A CHANGING WORLD OF WORK

This chapter sets out how structural changes in the economy have affected the skills, capabilities and capacities needed to thrive in the modern workplace. It explores the growing importance of generic/transferable skills and capabilities, and the extent to which employers find these are present or lacking in new recruits. It then turns to the potential impact of rapid advances in artificial intelligence (AI), which may have a fundamentally disruptive effect both on graduate careers and on university practice, but where the analysis is necessarily more speculative. The next chapter looks at evidence on what works in helping students acquire the skills and capabilities they need.

## THE RISE OF THE KNOWLEDGE ECONOMY

The period since the end of the Second World War has seen a transformation of our economy. Employment in primary (agriculture and mining) and secondary (manufacturing and construction) sectors has fallen by two thirds, from about 47 to 16 per cent of the workforce.<sup>7</sup> Tertiary sector employment (in services) has risen from 53 to 84 per cent.

Recent decades have seen particularly fast growth in the 'knowledge intensive' finance, information and communication, professional, scientific, education, health and arts sectors shown in the chart below. Though the match is not precise, these sectors roughly approximate to the 'knowledge

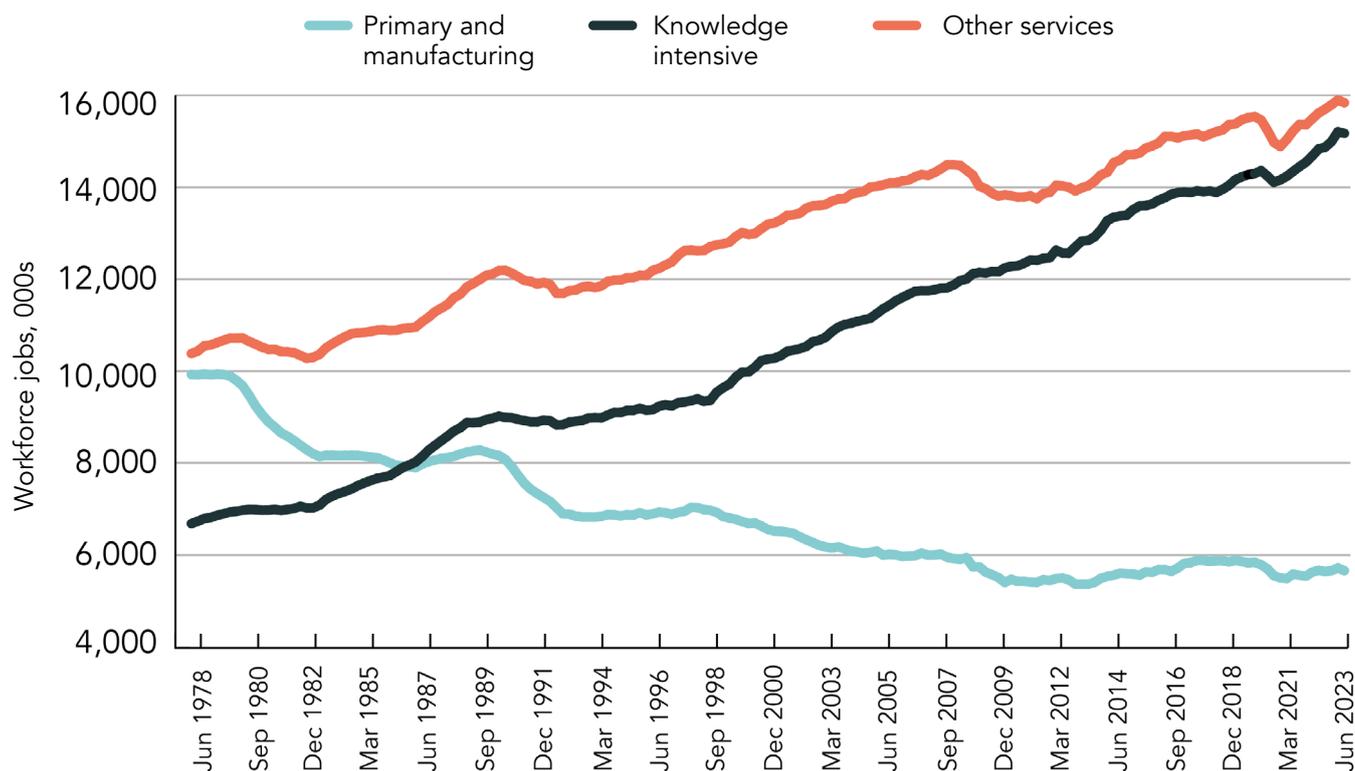
economy', the parts of the service economy whose stock in trade is the production, transmission and application of knowledge and ideas. These are the sectors that place a premium on cognitive skills, the sectors for which university education is commonly seen as an ideal training ground, and those for which a university degree is often a minimum entry requirement.

As the chart shows, in 1978 these sectors accounted for 6.7 million jobs (including self-employed jobs) in the UK (25 per cent of the total); by 2023 this had risen to 15 million (42 per cent of the total). Growth in knowledge economy sectors is forecast to continue, as is the size of the graduate workforce. Government projections forecast continuing growth in the graduate workforce. In 2020, 36 per cent of UK workers had first degrees or higher; in 2035, 48 per cent are expected to do so. In London, the proportion is projected to rise from 52 to 69 per cent over the same period.<sup>8</sup>

<sup>7</sup> ONS, Long-term trends in UK employment 1861-2018, 2019.

<sup>8</sup> Department for Education, Labour market and skills projections: 2020 to 2035. March 2023

**CHART 1**  
WORKFORCE JOBS BY INDUSTRY GROUP, 1978-2023, UK



Source: ONS<sup>9</sup>

## DEEP KNOWLEDGE AND BROAD SKILLS

The specific mix of skills needed in the knowledge economy has changed as technology has evolved. The past 30 years have seen the ubiquitous adoption of information technology, the growth of internet access and extensive digitisation of knowledge. While digital exclusion is a problem in the population at large, most people working in knowledge economy jobs have almost unlimited information (and disinformation) only a few clicks away.

Easier access to digitally stored knowledge means that it is broad skills rather than deep knowledge that is needed in the workplace. For example, where once lawyers, engineers and accountants would depend on deep knowledge of case law, load ratios and taxation, much of this information is now available online or algorithmically, putting a premium on skills such as problem-solving, understanding clients' requirements and making the case for change.<sup>10</sup>

These broader generic skills have been variously described as core skills, key skills, transferable skills, employability skills and survival skills, with definitions

differing slightly between terms and contexts.<sup>11</sup> In this paper they are referred to as 'GRASP' (General Relational Analytical Social and Personal) skills. They include:

- **Analytical skills** – the ability to process, interpret and communicate information in order to tackle problems, and generate new ideas and insights;
- **Social and relational skills** – the ability to understand others' views and perspectives, to work in a team, to persuade and convince; and
- **Personal skills** – entrepreneurial skills; the ability to self-direct, to meet deadlines and cope with stress, to learn and apply what you have learned, to adapt to new circumstances, and to be resilient to change.

In recent years, there has been a growing focus on these skills, and on employability more broadly. This partly results from student expectations. As participation has widened, there is intense competition for 'graduate jobs'. In addition, with most students now responsible for meeting fees and

<sup>9</sup> ONS, Workforce jobs by industry, September 2023.

<sup>10</sup> Kulka B and Brown R, Human Capital: disruption, opportunity and resilience in London's workforce, Centre for London 2018

<sup>11</sup> Suleman, F, 'The employability skills of higher education graduates: insights into conceptual frameworks and methodological options' in High Educ (2018) 76:263–278

living costs, often through loans, many are asking what universities promise in terms of employability and what they deliver – what is the ‘return on their educational investment’? In addition, government performance metrics have also focused their attention on employment outcomes.<sup>12</sup>

Most analyses see the importance of GRASP skills growing in coming years, though some commentators also emphasise the role played by social and cultural capital, particularly in career progression.<sup>13</sup> Research from 2017 by Pearson, Nesta and the Oxford Martin School, drawing on data analysis and expert panels, identified growth occupations and consequentially growing demand for skills in the US and UK. In the UK, the list of skills focused on analytical and personal skills, such as “Judgment and Decision Making, Fluency of Ideas, Active Learning, Learning Strategies, and Originality”.<sup>14</sup>

Research by the Department for Education’s Skills and Employability Board in 2022 drew on projections of employment change to assess current and future demand for GRASP skills. The analysis suggested that critical thinking, negotiation and persuasion, and learning and training were set to grow in importance in the workplace up to 2027, alongside specialist scientific and technological skills for people working in specific sectors.<sup>15</sup> Polling by McKinsey<sup>16</sup> and by the World Economic Forum<sup>17</sup> has reached similar conclusions. The latter found that creative and analytical thinking, technological literacy, curiosity and lifelong learning, and resilience, flexibility and agility were likely to increase in importance in the period to 2027.

Research by Demos earlier this year, *The Employability Badge*, found that 58% of private sector employers valued transferable skills (similar to GRASP skills) more than technical skills compared to 11% of private sector employers who valued technical skills more highly.<sup>18</sup>

## UNIVERSITIES’ ROLE IN SKILLS ACQUISITION – AND DIFFERING PERCEPTIONS OF SUCCESS

Responding to the increasing focus on ‘employability’, universities make much of the transferable skills they help students to acquire. One UK university’s website suggests that studying there provides students with skills in: time management, organization, research, networking, presenting ideas, reasoning, decision-making, persuasion, overcoming obstacles, commitment, self-motivation, confidence, problem-solving, listening and budgeting.

But graduates and employers have different perceptions of graduates’ skill levels, with particularly stark gaps in relation to written and verbal communications, teamwork and critical thinking.<sup>19</sup> Demos research has found that these skills are where employers struggle to recruit most. More than two thirds of employers said they struggle to employ young people with leadership skills, while 61 per cent struggle to recruit people with emotional resilience and 45 per cent have problems recruiting people with teamwork skills.<sup>20</sup> Research by the Sutton Trust has found that 94 per cent of employers value ‘non-academic’ skills (broadly equivalent to transferable skills) equally or more than academic qualifications, but only 52 per cent think that graduates have the skills required.<sup>21</sup>

This is not new; employers have been complaining about graduate skills for as long as there have been graduates to complain about. Part of the issue may be presentational; interviews with university careers and employability experts have underlined the importance of helping students and academics to better communicate the employability value course content and other university experiences.<sup>22</sup> Nonetheless, there does appear to be a persistent gap between employer expectations and graduate capabilities, despite the increasing focus on ‘employability’ at universities.

12 Rees, S ‘Re-imagining employability: an ontology of employability best practice in higher education institutions’ in TEACHING IN HIGHER EDUCATION 2021, VOL. 26, NO. 5, 663–678

13 Roderick, I ‘Recontextualising employability in the active learning classroom’ in DISCOURSE: STUDIES IN THE CULTURAL POLITICS OF EDUCATION 2021, VOL. 42, NO. 2, 234–250

14 <https://futureskills.pearson.com/research/#/homescreen>

15 Skills and Productivity Board, Understanding current and future skills needs, DfE 2022.

16 Dondi M et al, Defining the Skills citizens will need in the future world of work, McKinsey and Company 2021.

17 World Economic Forum, The Future of Jobs Report, 2023

18 Dawson A and Harrison K, The Employability Badge: skills for life, work and a stronger society, Demos 2023

19 Stewart, Carol & Wall, Alison & Marciniak, Sheri. ‘Mixed Signals: Do College Graduates Have the Soft Skills That Employers Want?’ Competition Forum. 14. 276-281. 2016

20 Dawson A and Harrison K, The Employability Badge: skills for life, work and a stronger society, Demos 2023

21 Cullinane C and Montacute R, Life Lessons, Sutton Trust 2017

22 Interview with Kate Daubney, The Careers Group, University of London, February 2023

## THE IMPACT OF AI ON WORK, LIFE AND STUDY

Technological change has already transformed working lives. Automation has reduced the labour intensity of many production and distribution functions, and has also reduced demand for routine clerical occupations (for example, in book-keeping and secretarial roles). In recent years, machine learning and advanced pattern recognition has begun to extend further into these areas, with more extensive automation in sales, administrative and associate professional functions.<sup>23</sup>

The speed at which generative large language models (LLMs) such as Chat GPT have evolved in recent months, and their game-changing ability to draw on input data to generate text and images, suggests that automation and artificial intelligence may affect many more occupations – and faster and deeper – than previously anticipated, overcoming some of the ‘bottlenecks’ (complex manipulation, creative intelligence and social intelligence) previously identified as barriers to automation.<sup>24</sup>

The impact may be most significant for professional, knowledge-intensive and graduate-level jobs. One early assessment of the impact of LLMs suggested that around 80 per cent of US jobs could be affected, with the largest impact on higher-waged workers and those in graduate-level jobs.<sup>25</sup> Another study looked at the use of LLMs to automate research tasks, and found a significant productivity gain, but also speculates that, over time, LLMs could perform better than humans: “we may increasingly just rubber-stamp the output produced by ever-more advanced LLMs. The experience may be deflating.”<sup>26</sup>

As AI evolves, its impact will be felt more widely. AI may quickly become a ‘general purpose technology’, capable of broad and unpredictable application, like steam power or computers. MIT economist David Autor has suggested that AI will put professional level knowledge and decision-making within reach of people who have not received as much formal education.<sup>27</sup> Similarly, a Harvard Business School study, based on a randomised controlled trial of standardised management consultancy tasks, found that using AI increased speed and performance by 25 and 40 per cent respectively, and was particularly beneficial for less competent participants.<sup>28</sup> This

levelling effect may increase equity among workers, but may also challenge universities to equip their graduates with skills, competences and dispositions that will enable them to offer something different in the workplace.<sup>29</sup>

Generative AI and its implications are still being explored, but even these early indications – and reactions such as the 2023 Hollywood writers’ strike – suggest that their impact on professional and creative sectors, and therefore on graduates’ working lives, will be profound. The impact will not only be destructive – jobs may be retooled as much as destroyed – but it will be radically disruptive.

The impact is also likely to be felt at certain career stages more than others. In many professional services (for example, accountancy, management consultancy and law), new trainees spend much of their time undertaking routine tasks – researching, preparing slide decks, compiling due diligence reports – while learning from more experienced staff how to manage internal and client-facing and relationships. As more and more of these routine tasks can be automated, professional development will need to adapt. To quote a participant at our workshop, there is a risk that the “bottom rung of the ladder” could be removed for people starting their careers in these sectors with lifelong implications for their careers.

These changes will affect the skills needed in the future, and will also have an impact on universities. A recent survey of UK employers found that more than half felt that growing use of AI would place a premium on creative and critical thinking skills, though 63 per cent also said that businesses and universities would need to work more closely together to ensure a pipeline of graduates with the right skills.<sup>30</sup>

AI is already affecting the practice of higher education, as reflected in the new principles on the use of AI adopted by Russell Group universities.<sup>31</sup> A recent working paper on responsible AI education argued that the focus to date has been on short-term technocratic issues (such as the propensity of emerging models to hallucinate facts, their use by students to plagiarise or pass off others’ work as their own, their use for automated marking by teachers), neglecting their far-reaching implications for society at large as well as for universities.<sup>32</sup>

23 Kulka B and Brown R, op cit

24 Frey C and Osborne A, *The future of employment: how susceptible are jobs to computerisation*, Oxford Martin School 2013

25 Eloundou T et al, *GPTs are GPTs: an early look at the labor market impact potential of large language models*, working paper 2023.

26 Korinek A, *Language models and cognitive automation for economic research* (working paper 30957), NBER 2023

27 Strauss D, Interview with David Autor, *Financial Times*, 8 August 2023.

28 Dell’Acqua F et al, *Navigating the Jagged Technological Frontier: Field Experimental Evidence of the Effects of AI on Knowledge Worker Productivity and Quality*, Harvard Business School Working Paper 24-013, 2023

29 Strauss D, Interview with David Autor, *Financial Times*, 8 August 2023.

30 Universities UK, *Jobs of the Future*, 2023.

31 <https://russellgroup.ac.uk/news/new-principles-on-use-of-ai-in-education/>

32 Bentley C et al, *A framework for responsible AI education: a working paper*, SSRN Working Paper 2023

# WHAT SHOULD WORK...AND WHAT DOES

The academic literature on the effectiveness of university education in helping students to develop employability skills is limited, perhaps surprisingly given universities' role in research, innovation and critical thinking. In the words of one recent review, the literature suffers from "conceptual incoherence...a lack of clear theoretical frameworks and robust instruments...and indirect methods and materials, such as self-reports of learning".<sup>33</sup>

Using measures of graduate employment or earnings instead is more objective from one perspective. But it creates other challenges, for example in comparing vocational degrees that lead quickly to a lucrative career path, with those that may lead to longer term success, whether measured in terms of remuneration or life-satisfaction, reflecting a deeper problem in identifying and agreeing precisely what is being measured.

Nonetheless, in this chapter, we set out an overview of the evidence from academic papers, together with a small number of practitioner interviews and discussions at a small roundtable of academics, practitioners and policy experts held in October 2023. We then focus specifically on how gaining employability skills can be easier for students from more privileged backgrounds and how this might be addressed.

**We summarise interventions under three headings, though there is some overlap:**

- What is taught – content focusing specifically on employability;
- How courses are taught; and
- Outside the classroom – extra- and co-curricular activity outside formal teaching, from industrial placements to participation in clubs and societies.

## WHAT IS TAUGHT

Approaches to supporting employability include specific add-on modules on finding a job and the skills needed to thrive in the workplace; and models that seek to embed the development and articulation of employability skills in students' core disciplinary study.

Employability add-ons are seen as least effective overall. They are unpopular with students,<sup>34</sup> and a UK literature review by Transforming Access and Student Outcomes in Higher Education (TASO) found that 'employability skills programmes' were "relatively ineffective when compared to interventions such as work experience".<sup>35</sup>

Embedding employability into curriculums is

<sup>33</sup> Tuononen T et al, 'Systematic Review of Learning Generic Skills in Higher Education—Enhancing and Impeding Factors' in *Frontiers in Education*, May 2022

<sup>34</sup> Rees, op cit

<sup>35</sup> Ramaiah B and Robinson D, What works to reduce equality gaps in employment and employability? *Transforming Access and Student Outcomes in Higher Education*, 2022.

identified as better practice by practitioners and in literature.<sup>36</sup> While this may already be implicit in some (more vocational) courses, research at Swansea University shows how the development of employability skills can be seen as complementary to and even emergent from core disciplinary learning, rather than in opposition to it.<sup>37</sup> One example is how Swansea University College of Arts and Humanities has broadened assessment approaches to subjects such as classics and history by including formats such as “such as blogs, web-sites, on-site presentations, journals, critical reviews, heritage site proposals, catalogues of historic phenomena and even the manufacture of an item of ancient technology”.

In embedding employability, different disciplines may need to take different approaches, reflecting the likely working lives of their graduates. Humanities graduates, and particularly arts graduates, may need specific skills that will prepare them for a career that involves precarious employment, continual networking and self-promotion, rather than the relatively stable – at least in theory – world of employment that awaits other graduates.<sup>38</sup>

Participants in our roundtable reported growing interest among students in starting their own businesses after graduation, creating their own jobs rather than applying for them; some universities have begun offering courses directly targeted at aspirant start-ups.<sup>39</sup> They also highlighted the importance of helping students to develop the appetite and commercial skills for innovation and entrepreneurialism. More permeability between teaching and the business world could support this; students whose lecturers are themselves engaged in enterprise outside the classroom are most likely to show an interest in establishing start-ups themselves.

Universities are also showing a renewed interest in inter- or trans-disciplinary study. Its proponents argue that only a few of the jobs of today, let alone the jobs of tomorrow, align neatly with traditional academic disciplines, and that broad skills – including languages, data literacy, design thinking, research methods etc – are the best foundation for successful careers in a world of complexity, start-ups and collaboration.<sup>40</sup> Examples of interdisciplinary programmes include University College London’s

Bachelor of Arts and Sciences degree,<sup>41</sup> the newly-launched London Interdisciplinary School,<sup>42</sup> which brings a range of disciplines to bear on real-world issues such as climate change and ethical AI, and the University of Technology Sydney,<sup>43</sup> where all undergraduates are required to take one transdisciplinary elective, covering subjects such as future thinking, social impact and sustainability.

## HOW COURSES ARE TAUGHT

There’s an old joke about university lectures: “a way of transferring information from the notes of the lecturer to the notes of the student without passing through the brains of either of them.” The grain of truth this contains reflects why this traditional model of teaching has fallen out of favour in recent years. Meta-analysis of 225 studies found that students studying science, technology, engineering and mathematics subjects were 55 per cent more likely to fail their courses if these were taught through traditional lecturing rather than ‘active learning’ models, where students interact more with classmates and lecturers.<sup>44</sup> Other papers have observed, however, that pure “one-way transmission” models of lectures are unusual, and that active learning can comprise everything from more participatory lectures to constructivist learning environments where students ‘discover’ new ideas with minimal instruction of guidance.<sup>45</sup>

Constructivist/active learning environments appear to be most effective in developing many employability skills, through features such as group discussions, learning diaries, project assignments, collaborative work, peer assessment, self-assessment, and feedback and summarising exercises. In research based on students’ views, these approaches were seen to be particularly effective in developing problem-solving skills and the agility to operate in changing situations, but were more weakly associated with critical thinking and other generic skills. Lecturing and independent reading might help develop technical knowledge, on the other hand, but students negatively associated these teaching practices with creative thinking and social skills.<sup>46</sup> Active learning approaches and

36 Interviews with Kate Daubney and David Winter, and Gemma Kenyon, 2023, and Rees op cit

37 Rees, op cit

38 Rees, op cit

39 Prince V, ‘How to support students considering self-employment’ in THES 21 April 2023.

40 Interview with Carl Gombrich, Amelia Peterson and Lara Kinneir, London Interdisciplinary School, February 2023

41 <https://www.ucl.ac.uk/arts-sciences>

42 <https://www.lis.ac.uk/>

43 <https://www.uts.edu.au/study/transdisciplinary-innovation/undergraduate-courses/td-electives-program>

44 Freeman S et al, ‘Active learning increases student performance in science, engineering and mathematics’ in Proceedings of the National Academy of Sciences, 2014

45 Dietrich H and Evans T, ‘Traditional lectures vs active learning – a false dichotomy?’ preprint, 2022

46 Virtanen A and Tynjala P, ‘Factors explaining the learning of generic skills: a study of university students’ experiences’ in Teaching in Higher Education, 24:7, 880-894

environments are also seen as embedding a culture of entrepreneurialism among students, even if some researchers frame this as an unfortunate reflection of the precarious conditions of the modern workforce, rather than as a desirable outcome.<sup>47</sup>

These findings are echoed in other studies, which find an association between developing generic skills and active learning methods that emphasise students' role in the process. Teamwork, peer interaction, online tools and project-based learning were all judged as relatively effective. The review also noted the significance of students' initial skill levels and their own orientation towards learning, as well as the value of integrating generic skills into the core content of disciplinary courses (as discussed above). Teacher-focused instruction, poorly structured courses and lack of interaction were all seen as inhibiting factors.<sup>48</sup>

Many universities go a step further, seeking to tailor learning to students' own learning styles. For example, Queen Mary University of London's 'Active Curriculum for Excellence' programme mixes taught and more interactive content, but also prepares individualised learning plans for students, based on students' specific learning approaches, with more support for less confident students who might otherwise struggle with group-based learning. In the view of Eranjan Padumadasa, Deputy Dean for Employer-led Education, tailoring teaching for students is a vital part of universities' added value: "you can get whatever knowledge you want off YouTube; what can universities provide that is different?"<sup>49</sup>

## OUTSIDE THE CLASSROOM

It is what happens outside the lecture theatre or seminar room that seems to have the greatest impact – from formal internships and work placements, to paid or unpaid work that students undertake on their own account, to participation in student clubs and societies. Research suggests that these types of interventions are much more effective in developing 'employability' than classroom-based teaching on employability skills – though they also raise issues of equity, which are discussed in the next section.

More industry-facing approaches to learning are being deployed, though sometimes still on what

Denise Jackson and Ruth Bridgstock call a "what should work" basis, rather than based on evidence of what does.<sup>50</sup> In their survey-based study, Australian Business and Creative Industries students reported on the impact of a number of "embedded learning interventions", including internships, project work, virtual placements, mentoring and start-ups, as well as undertaking paid work. Most interventions were seen as helpful in developing skills and broadening experience though less effective in helping with employability and developing professional networks.

'Planning for Success', a large-scale tracker study of UK graduate outcomes commissioned by Department for Education, found that around half of students had done some form of work experience (including paid or unpaid work to improve career prospects, as well as structured placements and internships) either at or immediately after university.<sup>51</sup> Alongside having a clear career plan and focusing job applications accordingly, the study found that work experience had an impact on both the likelihood of employment and the type of job secured. Those who had done work experience were more likely to be employed, and to be employed in professional roles, than those who had not. Work experience led directly to a job offer for around one in four students undertaking internships and placements.

At City, University of London, influenced by Planning for Success's findings, the credit-bearing Career Activation Programme mixes professional experience modules with classroom-based career focus modules, and is offered across disciplines. Project options include microplacements, industry-led consultancy projects (which mix students from different disciplines), mentoring, volunteering and internships. Career activation modules are bespoke to subjects, and help students with career options and competitive applications.<sup>52</sup>

The TASO review of effectiveness found "strong evidence" that work experience (comprising internships and sandwich courses) had an impact on students' employment outcomes (including being invited for interview, having higher salaries and experiencing lower likelihoods of unemployment six months from graduation), and that it was also regarded favourably by employers.<sup>53</sup> It also identified value in advice and guidance, and sports and volunteering opportunities. European

47 Roderick, op cit

48 Tuononen T et al, op cit

49 Interview with Eranjan Padumadasa, January 2023. See also <https://www.qmul.ac.uk/queenmaryacademy/the-queen-mary-education-approach/>

50 Jackson D and Bridgstock R, 'What actually works to enhance graduate employability? The relative value of curricular, co-curricular, and extra-curricular learning and paid work', Higher Education, April 2021

51 Shury J et al, Planning for success: Graduates' career planning and its effect on graduate outcomes, DfE 2017

52 Interview with Gemma Kenyon, May 2023. See also <https://studenthub.city.ac.uk/careers-and-employability/career-activation-programme>

53 Ramaiah and Robinson, op cit

University Association research also notes the value of internships and work placements alongside formal course content, but underlines the need for institutions to work with students to maximise the value that can be generated by these.<sup>54</sup>

Research by the Sutton Trust had similar findings.<sup>55</sup> The research assessed recent graduates' views of which activities (including their course, work experience, student societies, study abroad and paid work) had done most to build their communication, confidence, motivation, resilience and leadership. Work experience scored highest in improving communication and confidence; participation in student societies did most to build leadership skills; and overseas study was most effective building confidence and resilience. Paid work, which two thirds of students undertook during vacations and around 50 per cent during term, was also seen as valuable in developing communication and confidence skills, but scored less highly in developing leadership and motivation than course-related work experience.

The studies described so far present a reasonably consistent picture. Participatory models of learning help to develop several employability skills, as does structuring courses to embed such skills, and help students understand and to be able to articulate how they are acquiring them. Specific employability content can be valuable, but is more likely to be if it is fully embedded into courses, and reflects the differing career paths that may be sought by students in different disciplines.

However, it is the broader university experience – including formal work placements, study abroad, and participation in clubs and societies – that makes the biggest difference to students' confidence in their skills and, by some measures, in their employment outcomes. But, as many of the reports cited above also mention, this does present problems of equity and inclusion, and these are discussed in the next section.

## **EQUITY AND INCLUSION**

Structural disadvantage can affect any aspect of students' university experience, but the impact seems particularly acute in relation to co- (activities that take place outside of the classroom but support learning, e.g. work-placements) and extra-curricular activity. Sutton Trust research found that students from higher socio-economic classes (ABC1) were

more likely to have studied abroad, undertaken work experience or participated in student societies – particularly sports or creative arts societies – than those from C2DE backgrounds. Those from ABC1 backgrounds were also more likely to say they had benefitted from some activities, particularly overseas study. Paid work levels were similar among students from different classes, though students from C2DE backgrounds were more likely to have worked during exam periods or in their final year.

The Sutton Trust study also looked at barriers to participation. Students from lower socio-economic classes were more likely to cite paid work commitments and affordability issues as reasons for not undertaking work experience. They were less likely to join clubs and societies owing to paid work and the costs of participation, and on account of being made to feel unwelcome. And they were less likely to have studied abroad, because of affordability, and lack of experience of travelling overseas.

The risk that students from less privileged backgrounds may be excluded from some of the most beneficial aspects of higher education is noted in other research too. Planning for Success found that students from professional and managerial backgrounds were twice as likely to have undertaken an internship as those from families in semi-routine and routine occupational groups,<sup>56</sup> and the issue was also raised in the European University Association research. Previous Demos research has found similar participation gaps in extra-curricular activities for school age children.<sup>57</sup>

Universities are aware of these issues and seeking to address them. For example, at City University of London, the integration of mandatory microplacements or similar industry-focused programmes into degree courses is intended to give all students the opportunity to benefit from these, without incurring more debt or extending the time taken to complete their course. While the placements are credit-bearing but unpaid, hardship funds are available to support any students who would struggle financially, and many placements can be undertaken part-time to enable juggling with other responsibilities.<sup>58</sup>

At Queen Mary University of London, students have a free afternoon each week for extra-curricular activity, but with flexibility to enable students with other demands on their time (including caring responsibilities, which of their students have) to take part.<sup>59</sup>

54 McSweeney P and Zhang T, Meeting skills and employability demands: thematic peer group report, European University Association 2021.

55 Montacute R et al, The University of Life: employability and essential life skills at university, Sutton Trust, February 2021

56 Shury J et al, op cit

57 Dawson and Harrison, op cit

58 Interview with Gemma Kenyon, May 2023

59 Interview with Eranjan Padumadasa, January 2023

# AGILITY, EQUITY AND AI IMPLICATIONS FOR POLICY AND PRACTICE

Considering how universities can equip their students with the skills they will need in the future is complicated by the rapid changes that we are likely to see in coming years, but do not yet fully understand, as a result of generative AI and other technological disruption. So what follows is necessarily speculative and tentative, but may inform the debates that are already underway.

Technological change has already restructured many careers, and even before recent advances seemed set to widen its impact on routine knowledge economy functions (from customer service to market research). The growth of AI that is able to generate new content dramatically widens the potential impact. It is likely that working with AI will increase the need for some GRASP skills, and reduce the need for others, rather than completely changing employability considerations. Indeed some skills that have received a lot of attention in recent years, such as coding, may soon become relatively arcane, though 'coding literacy' and 'coding criticism' may be more universally required.

## **In addition:**

- Using AI is likely to place a premium on critical thinking skills, including the ability to challenge and interrogate knowledge, and identify hidden or encoded biases.<sup>60</sup> This needs to be coupled with an ethical awareness, a consideration of how

AI should be regulated and constrained, and how specific algorithmic behaviours might cause harm to and benefit different groups.<sup>61</sup>

- The increasing use of AI will increase the value of interpersonal skills, from understanding needs and motivations, to inspiring and enabling change – the skills that can intermediate and make human interaction with AI as highlighted by Demos' recent research.
- AI is also likely to disrupt traditional career trajectories, requiring workers to operate in a way that is self-reliant, particularly in terms of personal and professional development.

These potential changes have implications for university teaching, and for the transition between university and employment. As suggested in a working paper published by a team from Kings College London and other institutions in summer 2023, group-based 'open enquiry' approaches to learning may be valuable, helping students to switch from problem-solving to problem-formulation – the "ability to identify, analyse and delineate problems". Alongside these, universities should seek to develop students' socio-ethical understanding, including different models of fairness and civic virtue, of power relationships between different groups and classes,

<sup>60</sup> Bentley C et al, op cit

<sup>61</sup> Brown R, What ChatGPT and rapidly advancing AI could mean for working life and skills, LSE Policy Blog, 23 March 2023.

and of how these can be either embedded in or challenged by AI algorithms and guiderails.<sup>62</sup>

The growing use of AI in the workplace may, as discussed previously, automate many entry-level jobs in professional services. Over time, this may require increased university engagement in developing the soft skills and understanding that many graduates absorb, as if by osmosis, in their first jobs. Universities may extend their work experience placements, or adopt approaches more akin to sandwich courses or degree-level apprenticeships to smooth the transition from study to more productive graduate positions. There is an opportunity for universities to work more closely with existing professional statutory and regulatory bodies (PSRBs), such as the Architects Registration Board, the Bar Council and the General Medical Council, to rethink the specific and generic skills required within different professions, and to consider how universities, employers and PSRBs can work together to equip future generations with these.

### **Recommendations:**

1. Universities should urgently review and regularly revisit their employability strategy, to reflect the emerging impact of AI on different professions, and to draw together the expertise of careers, teaching and research staff to do this. Critical analysis, critical enquiry and problem formulation, socio-ethical considerations, interpersonal skills, and resilience may all be priorities.
2. Universities should integrate AI into teaching and learning, including in hybrid learning, while also ensuring that the richness of university study can be maintained and that courses can offer high quality interactions (online and/or in-person) between students, their peers and teachers, to develop the interpersonal skills that the modern workplace demands.
3. There needs to be smart regulation through the Office for Students to maintain oversight of AI's impact on university pedagogy and workplace skills, identifying and disseminating effective practice examples to help universities adapt to a rapidly-changing context.
4. Employability content should continue to be embedded into individual disciplines, reflecting potential career paths for students in different areas, with more course input and teaching from practitioners (perhaps through guest lectureships or placements to and from industry), supported

by targeted careers advice.

5. Universities should consider ways of maximising co- and extra-curricular opportunities for all students, while researching, identifying and mitigating barriers to participation. In particular, universities should consider whether paid work should be recognised for the value it can add to formal education.
6. Universities should consider how they can develop their relationships with employers and civil society organisations, including through civic university agreements, to deliver local social and economic benefits, at the same time as enhancing students' employability.
7. Universities should work with government to enable more short courses, flexible degrees and a life-long learning relationships with students.

The next decades promise to be an exciting time for workers in knowledge industries, as generative AI and related technology opens up new possibilities, but also dramatically disrupts current ways of working, learning and developing professionally. Universities' intellectual capital should enable them to generate clear and challenging thinking about everything from applications of new technology to its ethical implications. As civic institutions, universities are uniquely well-placed to convene government, employers, professional bodies and civil society organisations, to understand the economic and social impacts of new technology.<sup>63</sup> And as educators, universities need be at the forefront of helping citizens acquire the skills and characteristics that will enable them to thrive in the years to come.

<sup>62</sup> Bentley C et al, op cit

<sup>63</sup> <https://upp-foundation.org/about-us/civic-university-network/>

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