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BUILDING OUR INDUSTRIAL STRATEGY

RESPONSE TO THE GOVERNMENT GREEN PAPER



GATSBY

SUMMARY

- We support the aims of the Industrial Strategy and wholeheartedly endorse making ‘Developing Skills’ one of its pillars. We also welcome the government’s continuing commitment to implement the recommendations of the Sainsbury Review.
- Although significant effort has been expended to increase the number of STEM graduates, insufficient attention has been paid to the supply of skilled technicians, leading to a chronic shortage. The government, working with partners in the STEM community, needs to do more to highlight the importance and secure the supply of technicians.
- We welcome the recent commitment to increase the funding available for 16-19-year-olds following technical education routes. But we urge the government to move away from a one-size-fits-all funding approach, towards a system that funds study programmes according to what they actually cost to deliver. Programme funding levels should also acknowledge that training programmes targeting different occupations require different numbers of taught hours. Such a differentiated funding model also provides a straightforward mechanism to incentivise skills training in areas of most need.
- A key weakness in our current skills system is the paucity of technical education provision at Levels 4 and 5 (higher education below Level 6 bachelor’s degrees). If we are not to lose out to our economic competitors, the UK must improve the supply and quality of technicians at Levels 4 and 5. To achieve these improvements, significant policy intervention by government is needed. The government should commission a focused, independent review of the higher technical education landscape to define the nature of government intervention required, building on the recommendations of the Sainsbury Review.
- FE training providers should be encouraged to work more closely with local agencies (eg LEPs and Combined Authorities), who understand the needs of the local economy, to plan their curricula. Offering training providers conditional longer-term funding arrangements would help to drive this behaviour.
- More needs to be done to ensure that the FE system contributes to innovation and knowledge transfer, including incentivising partnerships between colleges and employers.
- The government should consider how to tackle the need for technician skills in emerging industries. A positive first step would be to give Catapults a clearer remit in this area, and encourage them to work with Institutes of Technology to ensure there exists appropriate training provision for technicians in the emerging industries.
- Data collection around skills demand and supply in the UK compares poorly with what is available in other countries. The current 4-digit SOC unit groups used by the Office for National Statistics (ONS) are too broad to be helpful in identifying skills requirements. This is a significant failing in our ability to understand and meet the country’s skills needs. The government should task the ONS, as a matter of urgency, to improve the data it collects on skills.
- The framework of Gatsby benchmarks for good career guidance, which enjoys widespread support among schools and colleges, should be placed at the heart of the government’s forthcoming career strategy. The new strategy must also drive an improved understanding of the new technical education system and the opportunities it will provide.

INTRODUCTION

- 1 **This response focuses mainly on the ‘Developing Skills’ pillar of the proposed Industrial Strategy, although it also touches on issues relevant to ‘Investing in Science Research & Innovation’.** In particular, this response addresses question 11 in the consultation, discussing elements of the vision for technical education, and question 13, discussing skills shortages and how to align skills needs and skills provision in local areas.
- 2 Gatsby is a foundation set up in 1967 by David Sainsbury (now Lord Sainsbury of Turville) to realise his charitable objectives. We focus our support on a limited number of charitable areas:
 - Plant science research
 - Neuroscience research
 - Education & skills
 - Economic development in Africa
 - Public policy research and advice
 - The Arts
- 3 Gatsby is committed to strengthening technical education in the UK. We have two motivations for this: firstly, a significant group of individuals who follow technical education pathways – STEM technicians – are critical for building the country’s productivity and growth; and secondly, high-quality technical education opens a world of opportunities for many people who have been poorly served by this country’s education system.
- 4 The government’s consultation represents a welcome break from the past, recognising that technical education is a vital ingredient in delivering the skills required by any industrial strategy. **We welcome the government’s continuing commitment to implementing the recommendations of the Independent Panel on Technical Education, chaired by David Sainsbury, which will not only improve, but transform, technical education in England.**

PUTTING TECHNICIANS AT THE HEART OF THE INDUSTRIAL STRATEGY

- 5 **Technicians are the linchpins of our economy.** They are skilled people who use their science, engineering or technology knowledge to identify and solve practical problems. Typically requiring qualifications at Levels 3, 4 and 5, technicians are crucial to the success of many of our country’s future growth areas, including the aerospace, chemical, digital, engineering and manufacturing industries. Furthermore, beyond the obvious skills needs of technology-heavy sectors, many areas of our national life, from the NHS to our armed services, depend on skilled technicians to operate efficiently.
- 6 **However, while there has been significant effort and investment over several decades to increase the number of STEM graduates, successive governments have turned a blind eye to an equally critical shortage of technicians in these same disciplines.** Estimates suggest that UK industry needs to recruit at least 70,000 new technicians every year to replace those retiring and to fill new positions. Addressing our lack of technicians is a central element of enhancing national productivity.
- 7 Technicians are skilled individuals who work as part of a team and apply their STEM knowledge in a practical setting. Technicians are typically responsible for overseeing production and solving practical problems, but many also work in R&D environments and will often help their businesses to develop new products and processes.

- 8 To take just one example, software technicians work within digital electronic companies to design, develop, test, debug and improve software. This might be in anything from computers and mobile devices, to virtual reality simulation and artificial intelligence security, to wireless technologies and apps. They work in highly interactive, team-oriented environments, using their problem-solving skills and attention to detail, to deliver software solutions. If the Industrial Strategy is to succeed in improving the digital infrastructure in the UK, many more software technicians are required to upgrade digital performance, for example by establishing a 5G network across the country.
- 9 But it is not just in the digital industries that technicians are essential. Gatsby commissioned a series of investigations looking at the role of technicians in a range of industries that are critical to the UK economy, including aerospace, composites and biotechnology¹. Across all the sectors, we heard a similar story. **UK industry is struggling to fill technician roles. Technician shortages are causing our firms to turn down orders and are limiting their ability to expand. The government, working with partners in the STEM community, needs to do more to highlight the importance and to secure the supply of technicians. Otherwise we face a future in which our country's productivity will inevitably suffer.** Gatsby would be pleased to partner with the government to support such action, building on our recently-launched 'Technicians Make it Happen' campaign².

DIFFERENTIAL FUNDING WITHIN THE NEW TECHNICAL EDUCATION SYSTEM

- 10 **The greatest challenge facing technical education in England is a lack of funding.** High-quality technical education requires significant investment, but it is an investment that pays handsome dividends in the form of increased national prosperity and improved social mobility.
- 11 The funding commitment in the recent Budget, to allow technical education study programmes for 16-19-year-olds to be increased by more than 50%, is a significant step forward for college-based³ technical education. However, it must be stressed that what is required is an increase in average funding, not the funding rate for each and every student. Currently, although there is some flexibility in funding levels for practical programmes over classroom-based ones, provision of STEM courses typically relies on colleges cross-subsidising them from cheaper-to-deliver programmes. **We should move away from a one-size-fits-all approach to a system that funds technical education study programmes according to what they actually cost to deliver. Programme funding levels should be set according not only to requirements for any specialised equipment, but also acknowledge that training programmes targeting different occupations need to be of different sizes (i.e. require different numbers of taught hours).**
- 12 If the training programme required to become an electrician turns out to require more hours' tuition per week over two years than that to become a butcher, then so be it: the different programmes should be funded accordingly. The government, and wider society, is content that a Level 3 electrician apprenticeship is twice the size of a Level 3 butchery apprenticeship and costs significantly more to deliver; why should it be any different for the college-based pathway?
- 13 **The introduction of the streamlined technical education routes framework means that achieving this differential funding model need not be complicated: simply adopting the**

¹ <http://www.gatsby.org.uk/education/reports?term=&filter%5B%5D=221&filter%5B%5D=284>

² <http://technicians.org.uk/>

³ In this submission, we follow the convention of the Sainsbury Review and use "college-based" as shorthand for any post-16 programme taught in an educational setting, such as a general further education or sixth-form college, UTC, university or private training provider, rather than an in-work programme such as an apprenticeship; it is not intended to be limited to FE colleges.

practice currently used for apprenticeships would suffice. As each new qualification came on stream, the government (on the advice of the Institute for Apprenticeships and Technical Education) would just need to allocate it to one of a small number of funding caps. **Such a differentiated funding model would also allow government to prioritise and/or incentivise skills training in areas of most need, including those identified within the industrial Strategy.**

HIGHER LEVELS OF TECHNICAL EDUCATION

- 14 **A weakness in our current education system that is particularly pertinent to the Industrial Strategy is the paucity of technical education provision at Levels 4 and 5:** higher education that is not at bachelor's degree level (Level 6). Technicians at these levels are increasingly required across a range of sectors. They are, for example, likely to be responsible for the highly-flexible mass production processes often cited in the German government's high-tech strategy, *Industrie 4.0*. **Unless the UK can improve the supply, flexibility and quality of technicians at Levels 4 and 5, we risk losing out to our competitors as innovation continues to drive changes in the workplace, including, for example, as the internet of things and cyber-physical systems revolutionise manufacturing.**
- 15 There is widespread recognition that technical education at Levels 4 and 5 is a neglected area of skills policy. This neglect has led to the current situation, where progression routes into and from Level 4 and 5 courses are poorly defined and rarely communicated to individuals who could benefit from training at these levels. It is worth restating that the under-investment – in terms of policy development as well as funding – witnessed at Levels 4 and 5 sits in stark contrast to the efforts of successive governments to drive ever-increasing numbers of students to undergraduate degrees. Similarly, while we would hope that a sizeable number of apprenticeships stimulated by the new apprenticeship levy will be at Levels 4 and 5, we note that greater government attention seems to be focused on Degree Apprenticeships, including the provision of a substantial pot of money from HEFCE to stimulate their growth⁴.
- 16 Furthermore, too little attention has been paid to the impact that the reforms to higher education (HE), currently being legislated for in the Higher Education and Research Bill, will have on higher technical education. The government should urgently examine how the upcoming reforms to HE may inhibit growth of technical qualifications at levels 4 and 5, including modelling the likely behaviours of key stakeholders such as HEIs and further education (FE) training providers.
- 17 If provision and skills at higher technical levels do not increase, and the pool of graduates continues to expand, employers will increasingly resort to recruiting graduates into technician-level roles. Recent analysis by the CIPD⁵ shows that the under-utilisation of graduates, and the percentage of graduates in non-graduate jobs, is higher in the UK than in other European countries. This means not only that graduate skills and capabilities are being under-used, but also that there is an increased risk of the churn of over-educated individuals through roles that should be filled via technical education.
- 18 The emergence of Institutes of Technology, which we strongly support, will go some way to rebalancing government investment towards higher technical education in STEM. But while it is not yet possible to say how big a contribution the Institutes, and National Colleges, will make to addressing skills shortages at the higher technician level, we firmly believe additional action is required.
- 19 **If the provision of, and participation in, higher technical STEM qualifications is to be improved, focused policy intervention by government, and probably some degree of fiscal stimulus, will be required to initiate and drive growth. We suggest there would be value**

⁴ HEFCE Degree Apprenticeships Development Fund: <http://www.hefce.ac.uk/skills/apprentice/dadf/>

⁵ https://www.cipd.co.uk/Images/over-qualification-and-skills-mismatch-graduate-labour-market_tcm18-10231.pdf

in commissioning a focused, independent review of the higher technical education landscape to define the nature of government intervention required. Gatsby would be willing to collaborate with government in leading such a review, building on our work supporting the Sainsbury Review.

- 20 Such a review should examine whether additional incentives are needed for training providers to improve and increase provision in this area, and for learners to choose these courses. We believe such incentives are likely to be required, at least in the short-term, to enable the market to successfully adapt to the supply created by reforms to 16-19 technical education and create sustainable progression pathways, noting that such pathways have significant potential for improving social mobility. Building on the Sainsbury Panel recommendations, the review should consider higher technical provision at Levels 4 and 5 as an intrinsic part of the 15 technical education routes. It should also examine the needs of adults already in the workforce who wish to upskill.

MATCHING TRAINING AND SKILLS TO LOCAL NEEDS

- 21 Introducing differential funding to the new technical education system (see paragraphs 10-13) would help ensure that FE providers do not face a perverse incentive to offer low-cost, high-volume qualifications at the expense of qualifications that the local economy requires. But more must be done to ensure that the education and training on offer is informed by, and aligns to, the local labour market.
- 22 At their best, local decision-makers work with FE providers to shape the technical education in their area to that needed by employers and learners: aligning provision more closely to labour market demand, reducing unnecessary duplication, and investing in greater specialisation of resources. Gatsby has begun to work with a small number of Combined Authorities and LEPs to support their implementation of the new technical education routes, and we have been impressed by their use of local labour market information and collective willingness to ensure that technical education meets the needs of the local economy and therefore benefits employers and individuals.
- 23 **To help embed an approach whereby FE providers design curriculum provision that addresses local economic needs, providers should be offered the possibility of securing longer-term public funding commitments (i.e. at least three years). Such funding agreements, however, should be conditional on the submission of an acceptable business plan which: (a) clearly describes how providers have worked collaboratively with each other, employers, and the relevant local agency (LEP and/or Combined Authority), to develop a curriculum offer that matches the needs of the local labour market; and (b) demonstrates a provider’s capacity to meet the requirements of technical education pathways they plan to offer, including staffing expertise and up-to-date facilities.**
- 24 In such a model, the government would continue to retain responsibility for financial and safeguarding checks, and use measures of learners’ destinations, achievement, and employer satisfaction to judge value for money for the public purse at the level of the individual provider. But the government could and should also hold LEPs to account for the degree to which, for example, capital funding is allocated in a local area to encourage coherent provision of technical education pathways aligned to local labour market needs.

TECHNICIANS AND INNOVATION

- 25 Innovation is frequently portrayed as the preserve of the most highly skilled in the workforce, but the OECD has highlighted that the predominant form of innovation in firms is incremental, which “*involves endless minor modifications and improvements in existing products, each of which is of small significance but*

which, cumulatively, are of major significance”⁶. The OECD identifies that technicians should play a key role in driving incremental innovation but notes that the UK is underperforming in this respect. Our poor performance reflects relatively low skills levels among the workforce, poor skills utilisation by employers, and a tendency to focus on established low-cost production methods with little opportunity for workers to innovate.

- 26 **While the UK has invested successfully in improving knowledge exchange between industry and university, more could be done to develop better links between industry and FE colleges.** Small employers should be able to go to their local college and see the latest equipment in action and be helped to understand how new techniques could be incorporated within their businesses. We have seen examples where apprentices can provide the vehicle for this sort of knowledge transfer, but this is only possible when colleges are using modern, industry-grade equipment. The best colleges develop partnerships with enlightened employers to make sure that equipment and training practices in the college are fully up-to-date. The government should examine ways to incentivise such partnerships, perhaps by encouraging the closer involvement of LEPs. In a similar vein, there is potential for Catapults to ensure that FE colleges are properly connected to the latest advances in technology and hence able to train their students to take full advantage of these advances.

TECHNICIANS IN EMERGING INDUSTRIES

- 27 **Addressing the lack of supply of skilled technicians in emerging industries is particularly challenging.** The knowledge and skills required in these industries are changing rapidly and the absolute numbers of new recruits required in emerging industries will be small, thereby making it difficult to persuade training providers to offer the training required. However, we cannot afford to wait until an emerging industry has grown to a size where it can support a traditional apprenticeship programme. If today’s emerging industries are to have skilled workers in 3-5 years’ time, then it is necessary that they be trained now.
- 28 To take one example, the Advanced Therapies Manufacturing Taskforce has recognised that, if steps are not taken to secure the supply of technicians, then cell therapy will not be able to move from the experimental phase to full-scale manufacturing. Yet the Taskforce has struggled to secure government support to address this issue. If this skills gap was at the postgraduate level, then the Taskforce would have been able to turn to universities, research institutes or the relevant Catapult for help but, because the issue is instead at the technician level, there appears to be an absence of support, from government or elsewhere.
- 29 **As part of the Industrial Strategy, the government needs to consider how to tackle the need for technician skills in emerging industries. A positive first step would be to give Catapults a much clearer remit in this area, and encourage them to work with Institutes of Technology and other FE providers to ensure that there exists appropriate training provision for technicians in the emerging industries.**

USING DATA TO ASSESS SKILLS SHORTAGES AND TARGET INTERVENTIONS

- 30 **Successful action on addressing skills shortages requires good data on what those skills are, and in which sectors and areas shortages are occurring.** The government needs to focus not on who is responsible for the collection of the data, but rather what data are collected. Currently,

⁶ <http://www.oecd.org/innovation/inno/46970941.pdf>

the UK does not have a system that readily identifies skills shortages in a way that makes it possible for the education and training system to respond to the needs of industry. What data there are provide relatively modest information, on numbers employed in occupations, employment conditions and levels of qualification. **Data collection around skills demand and supply in the UK compares poorly with what is available in other countries. The O*NET system⁷ in the United States, for example, surveys employers and collects and publishes far more extensive data on the knowledge and skills requirements of different occupations, allowing for a much better understanding of labour market needs.**

- 31 Gatsby has been working with the Department for Education and the Institute for Employment Studies to produce occupational maps for the 15 new technical education routes. The maps list current technical occupations in the UK, giving a name and level to each and assigning them to a route, and have been constructed based on workforce data and consultation with employers and professional bodies. A starting point for the development of the maps was to link the new ‘trailblazer’ apprenticeship standards to the standard occupational classification (SOC) system held by the Office for National Statistics (ONS).
- 32 This link to the SOC system makes it possible to estimate the potential demand for technical education, although because the 4-digit SOC groups are quite broad, each SOC group has several occupations assigned to it, frequently from different pathways within a technical education route. **Analysis undertaken for the Sainsbury Review highlighted that the current 4-digit SOC unit groups used by the Office for National Statistics (ONS) are too broad to be helpful in identifying skills requirements. This represents a significant failing in our ability to understand and meet the country’s skills needs. The government should task the ONS, as a matter of urgency, to improve the data it collects on skills and provide it in a form that the Institute for Apprenticeships and Technical Education can use to ensure that technical education continues to be relevant to the needs of UK industry.**
- 33 The ONS has, in the past, argued that the benefits of being able to report skills supply and demand information at a more granular, 5-digit, SOC level are outweighed by the cost and effort associated with the increase in the amount of data that would need to be collected. But even if national data were not collected at the 5-digit level, there would still be considerable value in the ONS having the 5-digit architecture in place. Such an architecture would not only make more sense to employers (who struggle to see the relevance of the broad 4-digit groups), it would allow those developing the new technical education qualifications to better map content to the occupational labour market. It would also allow the increasing amount of occupational data being collected by private sector companies, through the scraping of online job advertisements, for example, to be coded in such a way as to link to wider national labour market statistics.

CAREER GUIDANCE AND ACCESS TO TECHNICAL OPTIONS

- 34 **Every young person needs high-quality career guidance to make informed decisions about their future. Good career guidance is a necessity for delivering the technical education reforms.** It is also a vehicle for social justice: those young people without social capital or home support suffer most from poor career guidance. We therefore welcome the news that the government will be publishing a new career guidance strategy later this year.
- 35 In 2014, Gatsby published a report describing eight benchmarks for good career guidance⁸. The benchmarks provide a common framework to help schools and colleges understand and embed high-

⁷ <https://www.onetonline.org/>

⁸ <http://www.gatsby.org.uk/education/programmes/good-career-guidance>

quality career guidance in practice and combat the variation in provision across the country.

By placing the Gatsby career guidance benchmarks into statutory guidance and highlighting the importance of career leadership, the government can lead all schools and colleges across England into the first era of good career guidance. But schools and colleges will need support to reform their career guidance provision. Capacity building in schools and colleges and building a network of regional coordination must be a priority.

- 36 **Technical education reform, as outlined in the Post-16 Skills Plan, outlines a significant shift in the options available to young people. The government’s new career strategy should communicate to schools and colleges that this fundamental change will require a transformation to the messages given to young people.** High-quality academic and technical options should be communicated to every young person, not just those traditionally streamed onto non-academic pathways. A revised career guidance framework offers a substantial opportunity to better communicate the range of skilled occupations and career prospects available through the new 15 technical routes. Messages about the reform to technical education should form part of the vision for career guidance but should also be woven into implementation activity, so that young people and their influencers – parents, carers and teachers – understand the possibilities that arise from technical education.

CONCLUSION

- 37 There is much to commend in the government’s proposals for an industrial strategy. Within the ‘Developing Skills’ pillar, the focus on addressing the chronic shortage of skilled technicians must be welcomed, as must be the reiteration of the government’s commitment to transform technical education by implementing the recommendations of the Sainsbury Review. Our economy’s need for highly-skilled technicians, and the importance of offering these individuals high-quality training, cannot be underestimated.
- 38 In this submission, we have highlighted what we believe are the most pressing issues relating to skills supply and demand facing our economy. We would welcome the opportunity to discuss the points raised in more depth and stand ready to assist the government as it progresses its rightly ambitious skills agenda.

Questions regarding this submission should be directed to:

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