



Science and Technology Committee

Corrected oral evidence: People and skills in UK STEM

Tuesday 11 October 2022

11.15 am

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Members present: Lord Krebs (The Chair); Baroness Brown of Cambridge; Viscount Hanworth; Baroness Rock; Baroness Sheehan; Baroness Walmsley; Baroness Warwick of Undercliffe; Lord Wei.

Evidence Session No. 4

Heard in Public

Questions 24 - 30

Witnesses

Kate Shoesmith, Deputy Chief Executive Officer, Recruitment and Employment Confederation; Dr Clive Hickman, Chief Executive, Manufacturing Technology Centre; Andrew Croydon, Director of Skills and Education Policy, Association of the British Pharmaceutical Industry.

USE OF THE TRANSCRIPT

This is a corrected transcript of evidence taken in public and webcast on www.parliamentlive.tv.

Examination of Witnesses

Kate Shoesmith, Dr Clive Hickman and Andrew Croydon.

Q24 The Chair: I would like to welcome our witness panel to this fourth evidence session of our inquiry into people and skills in UK STEM: Andrew Croydon, director of skills and education policy at the Association of the British Pharmaceutical Industry, Dr Clive Hickman, who is joining us virtually, chief executive of the Manufacturing Technology Centre, and Kate Shoesmith, deputy chief executive at the Recruitment and Employment Confederation. Thank you, all three of you, for agreeing to come along and give us your views and evidence this morning.

The session is being broadcast on the parliamentlive.tv channel. A full transcript will be taken and, in due course, not too far off, you will be sent a copy of the transcript of the witnesses, and you will be able to make any editorial corrections that you would like to at that point.

Without further ado, I am going to move on to our questions. We have quite a bit to get through in the next hour, so I would like to kick off and ask each of you in turn to comment briefly on the following question. From your perspectives, which specific STEM skills is the UK most lacking at present and which is it most likely to need in the future? Just as a supplementary to that, is the gap that you identify widening or narrowing over time? Where does business find it hardest to recruit people with the appropriate STEM skills? Are we losing out to international competitors?

Andrew Croydon: Good morning. The Association of the British Pharmaceutical Industry—the ABPI—represents companies of all sizes that are researching and developing cutting-edge medicines. It is our ambition that the UK should be the best place in the world to develop those medicines and to use those medicines now and in the future.

For us, access to a sustainable skills pipeline is paramount. We have been surveying our membership since about 2005 in relation to skills gaps and employment trends, so we have a very good, robust evidence base over those years to understand how skills needs are changing over time, but equally, to know what they are as of today.

Our latest report, which we published earlier this year, identified a reduction in the breadth of specific skill disciplines that are needed. For example, in 2017, we identified 19 top priority skills areas. Two years later, we identified 15 and, this year, we identified seven. Those seven top-priorities fall, essentially, within three key areas, which are digital, data and engineering. That is reflected in the fact that digital and data-driven technologies are so important to the development of and use in innovative industries such as the pharmaceutical industry.

That observation in terms of those three key areas being important is all the more significant knowing that other sectors within the UK, but equally globally, are looking for digital, data and engineering talent. Effectively, it is a very competitive market in terms of accessing skills at the moment.

Thinking ahead to what other skills may develop in the future, our evidence base suggests that green skills would be the fourth area of key significance over the coming years. Those are certainly the areas that we are focused on at the moment.

There are lots of initiatives in place to try to support development of those skills, but, clearly, skills are not a static target. The World Economic Forum has shown that the half-life of skills is reducing in time. It is currently estimated to be approximately four years; if you are acquiring a skill today, that skill is half as valuable in four years' time as it is today. So we must bear in mind that it is not a static target.

We have seen this borne out in the evidence we have collected from our membership. For example, we saw genomics and immunology emerging as top-priority skills gaps in less than two years. Our skill survey is biennial and, from one to the next, those two areas emerged all of a sudden as high priority.

To the second part of your question, about whether the gap is narrowing and how we access those skills, there are a number of ways in which we are looking to support skills development, whether that is from entry-level individuals or those who are already within the workforce through upskilling and retraining. We view as important a diversity of routes into those fulfilling STEM careers. Traditional academic careers are really important and remain so, but, equally, apprenticeships are very important, which I know was alluded to by the witness in the last session.

We have just published data that shows, yet again, a year-on-year increase in the number of apprenticeships delivered across our industry, and they are being delivered from level 2 through to level 7, covering R&D and manufacturing, so science areas. Other non-STEM areas, such as legal, finance and marketing, are equally important. Since 2013, we have seen an approximate sixfold increase in the number of apprenticeships being delivered in our industry. Level 6 and level 7—bachelor's and master's degree apprenticeships—account for more than half of those.

Where we are struggling is with the current apprenticeship levy system as it stands. The inflexibility of it means that we are not necessarily maximising the potential of that particular route. I am happy to discuss that further later on.

The Chair: Thank you very much for a very fulsome response.

Kate Shoemith: Thank you very much for the invitation to be here. The Recruitment and Employment Confederation represents UK recruitment businesses across all geographies of the UK and across all sectors. There are over 3,000 businesses in our membership. To give you a sense of the proportion in STEM, about a quarter of those recruit for the engineering and technical industries, about 20% for IT, computing and technology skills, 5% for life sciences, and about 15% in the financial services industries. Of course, there will be other recruitment businesses that overlap with STEM skills. If you think about nursing and medical care, some of those businesses recruiting for staff will be looking at scientists,

for instance. It is a huge proportion of the UK recruitment industry and contributes over £36 billion to the UK economy every year.

I have been at the Recruitment and Employment Confederation for coming up to 10 years now. We have collected data on job vacancies and postings, but also on the recruitment of people into those roles. In the 10 years that I have been there—and, in fact, the 25 years that we have conducted our monthly report on jobs, which is done for us by S&P Global—we have never seen recruitment as difficult as it is now, particularly in some of the key skills areas we have been discussing this morning around STEM.

At present, there are around 300,000 live job vacancies for engineering roles and about 275,000 for IT roles. In our written submission, we can give you more numbers on that. It is a particularly difficult market. To Andrew's point, if you look at the data, some of the particular skillsets that are very difficult to recruit for have, over time, become much broader. Eight or nine years ago, there were very particular programming skills coming up as being in short supply over and over again. Businesses were saying to their recruitment partners that they wanted to recruit people with particular programming skills, such as C++ or Java, which are probably a little old now. They will now just say that they want programmers; they are not as specific.

If you think about the engineering side, there will be very particular disciplines within that, whereas, in the last few months, recruiters have said that there is just a shortage of engineers generally. Some of it is caused by external factors. If I think about the life sciences sector, the pandemic has caused a huge uplift in interest in working for pharmaceutical companies. There have been great big job opportunities. Thinking about a particular life sciences recruitment business that is in our membership, it was desperate to recruit people for everything connected with pharma, from the research side to the vaccination programme and track and trace.

A recruiter in the IT sector was saying to us, at the start of the pandemic, that there had been a massive uplift in the need for digital marketers and people who work on UX—user experience; that is, the customer journey of how you buy things online, because that is how we were all shopping and communicating. They said to me, two and a half years ago, that we will next see an uplift in need for people with skills in cybersecurity, and our data this month shows exactly that. So the skillsets we need are changing over time.

Dr Clive Hickman: I would like to support what has already been said. For me, particularly digital, engineering and manufacturing skills are where we have a significant shortfall. Particularly as we move towards digital manufacturing capabilities and integrating the internet of things for the future, that gap is getting bigger and bigger, and is becoming much more difficult to fill. I talk about that at graduate, postgraduate and, in addition, apprenticeship levels. The gap is certainly widening.

Within my organisation alone, we have 60 vacancies currently that have taken over three months to fill. To try to address that, we have

established our own apprentice training programme. We are now training 800 apprentices at the MTC. We are the sixth-largest trainer of apprentices in the UK, which is really surprising for me. At 800 apprentices, that is not a big number, so there is clearly a big gap on the apprentice skills area that we need to push further, and most certainly in the number of engineering graduates and postgraduates who are available for employment.

Q25 Baroness Walmsley: Could you say what measures you see the Government currently undertaking to address any STEM skills gap? Are they sufficient to address the requirements of government policy, including net zero? Perhaps you can give us any examples of initiatives that have been successful and should be repeated on a wider scale. Are there any mechanisms for spreading that knowledge and, if so, what are the elements that make a successful skills initiative?

Dr Clive Hickman: The Government are doing quite a lot to try to support the initiative to drive skills, but, as we look to move towards net zero, we have a really significant challenge that I am not sure we have addressed yet.

In the West Midlands alone, 53,000 people who are currently making engine components will be displaced from those roles. We need to have a plan to retrain, reskill and upskill those people to take on roles that are appearing in battery manufacturing, in the manufacture of electric motors, and in battery management and vehicle management systems. There are three big areas where we have a skills shortage. We have a skilled workforce, but it is skilled in the wrong things, and we need to find a way of addressing that to move forward for the future.

Kate Shoemith: Some of the government programmes around training, particularly for young people, have been supportive in opening the eyes of children and young adults to the types of jobs that are out there. There is currently a huge amount of development going on in T-levels, but one of the problems we have is that there seems to be quite a bit of churn in terms of those qualifications and that training programme that are available to young people.

Just in my time working in education and employment, I have worked on GNVQs, NVQs BTECs and 14-19 diplomas, and now there are T-levels. I am very aware that employers will often recruit based on the qualifications they are familiar with—either those that they have taken themselves or that their children have taken, or that they are now recruiting for and working with young people on.

Some of that churn does not help us, because it is very difficult to keep up to date with what the right qualification is and what is required. While the intentions are very positive, there is a sense that there needs to be some stability and a little more coherence around that, because it takes a whole generational shift before people start to recruit for the qualifications that they were educated in. Those tend to be, in our experience, the ones that they trust and think are the right ones for a particular area.

To pick up on Andrew's earlier point, there has been some sense of allowing businesses to invest in training themselves, and we need to do more of that. There is a responsibility on employers. A number of businesses will be paying into the apprenticeship levy. For example, our businesses in recruitment pay it on their payroll, including those people who they put out on to an assignment. That might be for a freelancer, a contractor or an agency worker who is doing a much shorter period of assignment of work than a 12-month apprenticeship, for instance, can be.

That apprenticeship levy money that they are paying into the system cannot be used for training that would really benefit those people who are doing those short-term assignments, so some flexibility in those funds would enable more businesses to invest in better qualifications that would really support the day-to-day realities of what is happening in the jobs market.

Baroness Walmsley: Do employers really understand the difference between the T-level and anything else that went before? Is there anything that can be done to improve that situation?

Kate Shoemith: It is very easy for people who have worked in the system to see the nuances and the differences. From the outside, I do not think that you necessarily do. Far more important to most employers that we work with are the skills levels demonstrated by a candidate or a jobseeker, and whether they can see the reality of how they are applying those skills.

Most recruiters say to us that the businesses they work with will recruit on the basis of somebody's attitude and the fact that they are willing to learn, adaptable and have a set of skills that they know they can inform and teach. They are less bothered about the hard skills, apart from where you need to show that baseline level of what that person knows in order to enter the jobs market. After that, it becomes about experience.

Andrew Croydon: To cite some initiatives that have been brought to the fore and released by government—some of which we feel are potentially really positive—there are institutes of technology and skills bootcamps. These have the potential to be a very positive contribution to the skills area. There is also the DfE's emerging skills programme, which I know has been piloted with the High Value Manufacturing Catapult and received a lot of positive feedback in return. The pharmaceutical industry has a lot of appetite for that being potentially piloted with our sector, if it becomes feasible. There are certainly positives from those examples.

There is also the launch of the Unit for Future Skills, which we see as, again, a positive step. If we think about the number of government departments that are involved with the skills agenda, whether that is DfE, BEIS or the Home Office, to name just a few, we feel that the Unit for Future Skills could play a really strong role in bringing together the skills agenda, so that skills policies are developed on a cross-departmental basis and the potential of those policies can be maximised.

As an industry, and representing our membership, as I have mentioned, since 2005, we have this rich dataset with really granular data on skills needs, recruitment trends and so forth. We would happily share that data with the Unit for Future Skills to help it achieve its objectives. We are very much in favour of collaboration between industry, government, the education sector and academia to make sure that we are equipping people with the right skills, whether those who are entering the workforce or those who are already in the workforce, who, clearly, in this fast-paced world, need regular upskilling.

The Chair: I am aware that time is running by. Could you just keep the final bit short?

Andrew Croydon: I will just share one skills initiative, which we feel that the Government could support and roll out on a wider basis. This is where we put together the Clinical Pharmacology Skills Alliance. In 2015 and 2017, we identified a shortfall of clinical pharmacologists across industry. We also noticed the need for clinical pharmacologists in the NHS. As a result of that, we put together this alliance by working with the British Pharmacological Society, the Faculty of Pharmaceutical Medicine and Health Education England.

I will share with you a couple of highlights from that alliance. We put in a response to the Migration Advisory Committee consultation on the shortage occupation list, and successfully had clinical pharmacologists put on the list at the end of 2019. We worked to set up an employer-led trailblazer group, where we developed a level 7 clinical pharmacology scientist apprenticeship standard, and we are really proud that, as of this academic year, that standard has gone live at King's College London.

Q26 **Baroness Brown of Cambridge:** I would like to pick up on something that Dr Hickman started to talk about earlier, which was retraining and new skills, for example, for the green economy. I would also like to pick up on the points that people have made on whether we could be using the apprenticeship levy more effectively. I would like to understand what industry would like to see in terms of being able to retrain workers, for example, for the green economy, in order to improve their STEM skills.

How would you like to see the apprenticeship levy made more flexible? How could this help us address the skills gap? Indeed, could we be bringing together public, private and individuals? Could we be bringing together the lifelong learning entitlement with the apprenticeship levy to get something where the worker and the employer were both perhaps contributing to funding retraining opportunities? Are there initiatives that we could be building on to do something much better here and what would it take? Let me start with Clive, who might have the most skin in this game, so to speak.

Dr Clive Hickman: The apprenticeship levy is a little too rigid and inflexible at the moment. If we were able to use it across a wider range of activities, such as the reskilling activity, that would be a significant step forward for the future. We have to recognise the importance of the apprenticeship levy. It is important that we bring apprenticeships through

the system and that we start to think about people from deprived socioeconomic backgrounds who do not get the opportunities that might be available if they were aware of them.

How do we then promote that? If we get the flexibility to use the funding more widely, how do we promote it to enable some those youngsters who have never had that opportunity to get it for the long term? This opportunity to retrain people who will be displaced mid-career, as we—

The Chair: He has frozen.

Baroness Brown of Cambridge: I wonder if we could move on to Andrew, who was making a similar point about the inflexibility of the apprenticeship levy. Are there things that you would like to see in terms of retraining and upskilling, and its use?

Andrew Croydon: Absolutely, yes. Our industry is using the apprenticeship levy at the moment to deliver apprenticeships. As I have said, we have had that year-on-year increase. There are a number of examples such as bioinformatics or clinical pharmacology—areas where those standards are being used to upskill. Certainly, by no means is the whole levy being used on apprenticeships. Of course it is not. That has been seen across many sectors. We find that the levy system is inflexible.

We have been looking into this and have made some suggestions for small tweaks to the current system that would have high impact. They are quite technical. We have outlined them in our response to this particular consultation. I am happy to follow up with further information on that. They include mergers and acquisitions, front loading and various technical aspects.

We are also keen to make sure that enough of the unspent levy is shared with smaller companies. The way in which that can be shared could be improved, but that still leaves a portion of yet further unspent levy. We need to open that up to support accredited training that is upskilling, reskilling and retraining individuals as they go through their careers.

Baroness Brown of Cambridge: Can I come back quickly to Clive? In retraining people for new jobs in a new green economy, you will have people who need to move from one employer to another. Therefore, the apprenticeship levy may be more challenging. Are there things that the Government should be doing in that area?

Dr Clive Hickman: We have to recognise that employers will need to change their market sector as well. It may be that we have to look at how we can link a retraining or reskilling programme to helping employers, particularly in the SME community, transition from one industrial sector to another. If we take these things in isolation, I am afraid that we are going to get it wrong. We have to do them in a joined-up way.

Baroness Brown of Cambridge: Kate, I do not know whether you have any quick comments in this area of retraining and reskilling to improve our STEM skills.

Kate Shoemith: I have two relatively quick points. You have heard the message loud and clear that the levy could be more flexible, which would enable businesses to train more people, because the money is being collected and then not used.

If we think about some of the things that help incentivise investment in training and development, the right information needs to be put behind them. I will share with you a quick story. One of our recruitment business members is based on the south coast. They are an engineering firm. They are focused specifically on supporting businesses around green skills, so carbon neutral. When the last Prime Minister said that there was going to be more investment in heat pumps, this recruitment business was inundated with employers asking for heat pump engineers and apprentices in heat pump engineering.

There is no such thing as a heat pump engineer or a heat pump engineering apprentice. What you need is one electrician, one plumber and one labourer. He was trying to find out whether he could use the apprenticeship levy money to support that training and development. He knew that the appetite was there because people wanted heat pumps in their home, simply as a result of that announcement.

Reskilling and retraining are so important. The job stats that are out today show us that we have over half a million more people who are economically inactive than there were pre pandemic. Those people are not necessarily going to walk into a jobcentre as a first port of call. We know from our work over time that that is not necessarily the first place that people walk into, but it is where a lot of the attention is focused in terms of how you support people back into the labour market. If you are going to retrain, reskill and encourage people to come back into the job market, you have to put that support in the places where they are, and it may not be the jobcentre.

Baroness Walmsley: Where is it then?

Kate Shoemith: Some of it will be about the community groups that they are operating in. Some of it is about the connection with the NHS. There is a connection with very long waiting lists. If you look at what the numbers today are saying to us, there is a sense that ill health and burnout are causing people to opt out of jobs right now. They may not be of retirement age; they are far too young for that, but they have chosen to draw down a pension early. They are thinking about care. Some of it will be about their caring responsibilities. They will be involved in education and training. They will be volunteering in different places. People do not want to retire and do nothing. They are acting as trustees or governors of schools, et cetera. Those connections with our local communities need to be supported.

Q27 **Baroness Warwick of Undercliffe:** From your experience, and particularly from what you have just said, are there currently enough educators with STEM expertise to fulfil the demand for skills training? If not, is there a role for government in ensuring that this problem is addressed?

Kate Shoemith: The witnesses in the previous session were much more adept at saying what the level of education was and the number of teachers, and I do not know those numbers. What I do know is that we have a number of job vacancies that are really difficult to fill. In talking to recruiters, almost all of them are saying that it is taking longer to fill jobs now than it did pre pandemic. Three in five were saying that they have more vacancies to fill, not only in STEM subjects but across the piece, than they did pre pandemic.

Teachers have a very difficult job. They are there to teach. They are there to ensure that the curriculum is delivered and that the exams are passed as best as possible, so there must be a role for industry to come in there. If they have the right information about the careers that are available, that is not necessarily something that teachers can deliver on the ground, but there should be that partnership. We have seen it work quite well where local skills improvement plans are facilitated by employer groups working with colleges and schools. There, you can share the information and they get up-to-the-minute jobs data that feels far more effective in equipping young people and their teachers for the types of jobs that are available right now.

Andrew Croydon: Equally, I do not think that I am necessarily best placed to comment on whether there are enough STEM educators on the front line. However, let us not underestimate the importance of the role of those individuals. We, as an organisation, deliver free resources to support the front line, but that is not enough. You need to have enough people in the class.

I say this as a former mainstream education leader. The role of STEM educators such as classroom teachers and college lecturers is really important in driving achievement and attainment, inspiring the next generation of scientists, and informing career choices, which we have not yet mentioned. It is important that they (pupils, students) can make informed career choices, even more so given the unfortunate level of lost learning during the pandemic.

Q28 **Viscount Hanworth:** Are STEM graduates sufficiently prepared for the job market or are there particular efficiencies that can be identified?

Kate Shoemith: Graduates are often prepared for the subject area that they know. As for whether they are necessarily prepared for the full world of work and how it works in practicalities, I am not sure that that always happens. Some of it is about how they have more experience of work while they are still in education. Particularly if I think about it from a recruitment place, that is about trying to ensure that people understand what it takes to find and get a job. They need interview experience. They need to know what they need to put in their CV. We can see very clearly that some young people do not necessarily get taught that. Why would you know it, unless you had those connections that could help and support you with some of that?

As I said earlier, a lot of the recruiters that we work with will say that businesses are far more inclined to recruit for attitude. If they can see

that somebody is willing to learn and that they have that basis of skills and knowledge, they will train for the rest. That is far more important to them than being able to tick every single box, particularly when we have such systemic skill shortages within the UK. They are very clear that they are not necessarily going to be hiring exactly the person they need on a job description that lists every essential skill. They know that they will need to invest in training for some of that.

Viscount Hanworth: That is reassuring. Andrew Croydon, do you hear complaints from employers that people do not have skills that are specific to the tasks they need to perform? Is that part of what you are hearing, or are people as tolerant and broadminded as Kate seems to imply?

Andrew Croydon: We have an evidence base for this, and it falls within our skills gap analysis. In recent years, there has been an improvement in respect of the transferable skills that graduates are coming out with. By that, I mean problem solving, communication and scientific knowledge. On the whole, our survey respondents are telling us that there is not an issue with the quality of the graduates, but with the quantity. Put that in line with the fact that we have made a commitment to work with higher education institutions on the development of courses.

We have also made a commitment in terms of employer engagement. We have just published our latest data that show that, within this last year, the pharmaceutical industry supported 79 UK institutes with year-long industrial placements for undergraduates. There has also been a 10% increase in the number of collaborative PhD studentships since 2019. It is really important that industry works with academia to make sure that those graduates get the skills as best they can to come out with, but there simply are not enough of them.

Viscount Hanworth: The status of further education colleges, where a lot of this should be taking place, is rather parlous. Would you agree? Is there not something to be said about improving the facilities there and expanding the sector?

Andrew Croydon: Again, I am not sure if I am best placed to talk about the facilities that are there, but we know that people come through both vocational and traditional academic routes, and we have many examples of people pursuing fulfilling careers having come through either.

Kate Shoesmith: Picking up on the further education point, as a previous governor for two further education colleges, I saw their funding being dramatically cut over the last 10 years, which has really held back further education colleges' development over time.

Dr Clive Hickman: When we take graduates, we put them on a two-year development programme before they become totally useful to our organisation. We participate in the Year in Industry scheme and have done for many years. When Baroness Brown was at Aston University, we took a number of students from Aston to do that, and we continue to do so, which reduces that training time. We find that, where a student has gone through an apprenticeship programme and then gone on to do a

degree, the roundedness of that individual is far greater than somebody who comes straight from academia.

Viscount Hanworth: Your experience is within the automotive industry. Is it well organised in respect of training its employees?

Dr Clive Hickman: Yes. As an industry, we take graduates based on their academic capability and their aptitude, and then we address the skills that they need to deliver the engineering programmes based on the aptitude that they demonstrate. We do that through a two-year development programme. Most companies in the automotive and manufacturing sector do that.

Viscount Hanworth: So those companies undertake to engender the specific skills that are needed. You do not expect them to originate within the universities.

Dr Clive Hickman: No.

Q29 **Lord Wei:** We heard extensively in the previous inquiry about the value of interdisciplinary careers—those that cut across scientific disciplines, academia, industry, government and other sectors. What more can be done to make this easier? Are there examples of initiatives that have been successful in enabling cross-cutting careers?

Kate Shoesmith: We are very aware that people have multiple careers within their lifetime. Some previous studies have said that we have as many as seven or eight careers within our lifetime, instead of that sense of a job for life, and that people do change sector. That is very accepted in the recruitment industry when people are looking to hire. They are often saying that they look across the breadth of what somebody has done and look for that transferability to understand whether somebody will be suitable for the role.

Encouraging that understanding of what the job market is right now is really important, so that people are equipped to know that they can change roles. When we look at our jobs data, we can see that the demand for skills is very high, but the supply of people to fill those jobs is quite low, some of which is caused by people not putting themselves forward. In the last couple of months, we have seen jobseekers less willing to change jobs than they were previously, purely because they are concerned about the current economy and the cost of living. They worry that, if they change jobs, they are leaving a secure role right now.

Some of the information we need to be sharing is about the realities of the jobs market and how to support that movement across jobs. That is a role for industry to play, but it is also about how you get that wider information programme out there. That has to be led from government.

If we think about the Kickstart and Restart schemes at the level of supporting people who are furthest away from the jobs market, we need a communication programme aimed at the people intended to be the recipients of those programmes, rather than the employers. Employers were engaged fully and had that communication from government, but some of it needed to be aimed at the people who could fill those roles.

There is that disconnect that we need to fill in terms of interdisciplinary careers.

Lord Wei: Just to follow up on that, is there an issue, particularly in recruitment, around the algorithms that are used on websites, where people are put in different boxes and they do not come up on the search queries? Therefore, employers think that there is no one to fill that role, because the lack of interdisciplinarity in the database makes it quite hard to find people who would be a great fit but do not fit your box.

Kate Shoesmith: That is a really good point. The use of recruitment technology has grown exponentially. It grew particularly over the pandemic. People had to turn to that more. We have been working with the Centre for Data Ethics and Innovation on how you enable the technology to work in harmony with humans, so that there is a better recruitment journey, which is ethical, and that you are not discounting any individuals where a human would look at an application and be able to pick out and see the transferability of those skills.

We have been doing work around AI and algorithms to understand more about what we can do. All these systems are designed by people at the outset, and the information input into them comes from people. Enabling a wider sharing of information around what triggers a job application to be longlisted or shortlisted is a much better idea, because it broadens that pool. Some of that has to be done by human intervention right now, and it is done very effectively, but you are right that more could be done to educate people on how those tools are used in recruitment.

Dr Clive Hickman: When you look at the mobility of engineers across sectors and geographies, that is quite common for the people who have had higher levels of education—graduates and postgraduates. When it comes to apprentices, the people who have gone through an apprenticeship route and have achieved an apprenticeship qualification are much less mobile in moving between sectors and regions.

Andrew Croydon: A collaborative approach to this is absolutely key. For us, the interface between industry, academia and the NHS is really important for that porosity of skills. We have just recorded collaborations between industry and academia being at an all-time high, for example. There has been an almost twofold increase in the last couple of years in the number of industry and academia collaborative postdoctoral positions. I have cited a couple of examples from clinical pharmacology and bioinformatics where roles are transcending both industry and the NHS, so it is really important that we remain open to collaboration and fuel this porosity and sharing of skills.

Q30

Baroness Sheehan: The skills gap has been with us for some time. Dr Hickman, is there anything that the current Government can learn, either from international competitors or from successful policies pursued by previous Governments, to address this gap?

Dr Clive Hickman: An area that MTC has looked at, which the Government could probably look at as well, is the model that is used in Germany. Students will spend time in industry and time in university. It

takes them longer to get their degrees and it is spread over a longer period, but it reduces the cost of doing the degree, because you are earning for a semester, then at university for a semester, and then earning for a semester. That is really useful looking forward.

The apprenticeship programmes that are available are very rigid in what they offer. The skills we need for the future are different from the skills gained on a traditional apprenticeship, particularly in manufacturing. From an MTC perspective, we have had to deliver that standard manufacturing apprenticeship and then bolt on the extra parts of the curriculum that we need for the future—things such as additive manufacturing, 3D printing, robotics and laser processing. Those skills are not covered under a traditional apprenticeship programme but will be needed for the longer term in manufacturing.

Baroness Sheehan: To follow up on the apprenticeship programmes, who devises them? Is industry asked for its input?

Dr Clive Hickman: There are some standard programmes that are recorded, which you can draw funding against. If you deliver a programme, it has to meet the criteria that are set out there, but as long as it meets those criteria you can add other factors and aspects to the training programme. When we work with manufacturers, we look at what the manufacturer needs for the future, rather than for today. We have a saying that, if we continue to train people the way we have done for the last 20 years, we will still have a skills gap in another 20 years' time. We have to bring these high-value manufacturing skills into the training programmes.

Baroness Sheehan: Are there any successful policies by previous Governments that you would like to see reprised?

Dr Clive Hickman: I am not sure that I am the best person to answer that question, to be honest. If the apprentice levy was more flexible, it would be a much better programme than it is currently.

Andrew Croydon: The first thing to acknowledge is that the UK has underinvested in skills, as evidenced by the OECD, and that needs to be worked on. Certainly, our membership is committed to supporting the training of its workforce, and we have shown in an innovative industry how important it is for that to be continuous.

From our perspective, there are certainly ideas for policy changes, which I have alluded to today and which have also been put into the submission to this important consultation, that would improve that state of affairs. That is one aspect on the international side.

We also need to look at the offering that we have. When I am thinking about international competitors, I think about the visa system. Access to international talent, particularly for science, being a global endeavour, remains critical for the success of the sector. We need to look at the visa system that we have, the costs of the visas and the speed of processing. An awful lot of work has been undertaken by the Royal Society to analyse this and how we compare with other countries, and we do not necessarily

compare as favourably as we should when we think about the compelling offer we need to have for international talent.

Kate Shoemith: Over the summer, we did some economic modelling about what skills and labour shortages were costing us as an economy. We wanted to look at whether there were any examples internationally that we could draw on. The economic modelling showed us that, if demand continued to uplift as expected around the need for labour, that would cost us around £30 billion to £39 billion per year by 2024, which was the same as the annual defence budget, so we know that we have a significant issue.

We looked at what we could learn from elsewhere. To Clive's point, one of the countries that came up in our analysis was Germany. I agree entirely with what Clive was saying, but what was working there was that the system is deeply entrenched in collaboration. The social partners—the federal Government, local government, business voices and unions—come together on the education programmes, which allows that development to take place in a way that supports industry. Everybody understands their role in all of that.

There is another place that was particularly interesting. We were trying to compare, as much as we could, like with like, so we took the G7 as the basis. In Canada, there have been issues around skill shortages for a long time. It is a very similar tone to the issues that we are seeing. There, the investment in an immigration system was very clear to see, and there was an acceptance that they needed to bring in talent from overseas while they developed homegrown talent.

To pick up on the visa point, when businesses are recruiting people, they are dissuaded from sponsoring visas right now. If you think about the graduate system, yes, we need to increase that pool of graduates in STEM subjects. That is absolutely first and foremost—just the quantity of it. But the UK graduate visa system allows sponsorship for two years, which many employers say is quite short, because, by the time you get somebody two years into a job, that is the time when they are performing in that role. You really want to keep them, but then, according to the visa system, they should be going home. Many of the businesses we speak to say that they would much prefer it to be a five-year system. You could really benefit from that. Those people will then be hiring for themselves and creating new businesses, so there will be a return on that investment.

Baroness Sheehan: There seems to be untapped talent in disadvantaged areas. That came up in some of the evidence that was submitted to us. Thinking about apprenticeships, is there scope to do more in using apprenticeships to reach out to people in disadvantaged areas and to bring them into areas where we need skills?

Kate Shoemith: The simple answer is “absolutely”. I have already shared my experience of further education colleges. They do a really good job of knowing their local community and the students within it. They do not necessarily always have the best links with the schools, so the college might be the place of last resort for many, because it is seen

as the place you go once you have failed everything. It is then really hard for those students to have the courage to walk back through the door, having been told that they failed at school or that they failed in the education system in some way.

There has to be more outreach to understand that there are second chances and that there are opportunities around this. It does not mean to say that, at 16 or 18, you have failed. We have to be doing far more about that and ensuring that people can see that businesses will take people on if they have those different experiences.

Baroness Sheehan: Are there any examples of outreach of this nature?

Kate Shoemith: I have seen it. We have recruiters working in different sectors—one in an engineering capacity. In fact, I can think of a couple straightaway that have really worked on school leaver programmes. They did a summer programme, where they were just opening up the doors and showing people the careers that are available.

I can think of one in Preston, where they do a huge amount with the local FE college, trying to get people work ready. They know that it is the college's job to be getting them the academic qualifications, but they can play their part in saying, "This is what employers need right now". We have seen it work. Those partnerships exist. There needs to be a more sustained structure, because they seem to be based on local relationships and who you know.

Andrew Croydon: From our perspective, apprenticeships hold the key to levelling up, absolutely, and combine that with the ability to make informed career choices. We need to look at the geographical spread of provision, but certainly our sector welcomes and wants people from diverse backgrounds, because it brings diversity of thought.

Baroness Brown of Cambridge: Could I have a quick follow-up with Andrew? You mentioned that the UK is underinvested in skills, and I was interested to know whether that is underinvestment from government or from business and industry, or both? What is included in that definition of "skills"? Is it simply training post education, at whatever level that education ends for people, or does it include undergraduate and postgraduate training as skills training?

Andrew Croydon: This is, effectively, investment in skills once you are in the workforce, and thinking about the government systems that are in place that facilitate and support that.

Baroness Brown of Cambridge: So it is just the government part of the spend on skills.

Andrew Croydon: No, it includes the business spend.

Baroness Brown of Cambridge: Is it the business or the government part that is lagging?

Andrew Croydon: The business part is lagging. There is no doubt about that; the OECD data shows that. Equally, we need to think about the Government's role within that broader picture and the framework they

put in place that supports it. We have talked about the apprenticeship levy, and I know that many people would say that we are putting money into the levy and putting that on skills, but if we are not then drawing some of that back, because the levy is not flexible enough, then, effectively, I am not using that on skills myself. There is the support for smaller businesses and so forth, but that still leaves that proportion that is unspent.

The Chair: Viscount Hanworth has one tiny question.

Viscount Hanworth: It may not be tiny, but it is for Clive Hickman, about the regionalisation of the workforce. Do the recruits to your apprenticeship schemes come predominantly from the areas in which the factories are located and do they run in families, or do you have a wider network? In particular, how does Britain compare in this respect with other, competitor countries?

Dr Clive Hickman: We now have a number of centres around the country and we recruit locally for each of them. We do not tend to get apprentices who travel across the country to take an apprenticeship in the way that an undergraduate would move from the Midlands maybe to the north-east or down to London to take a degree. We tend to get people staying in their local catchment area.

Viscount Hanworth: Would you see it as an improvement if people were more flexible regionally and geographically?

Dr Clive Hickman: It would widen the outlook of the individual and would give us a more balanced capability. When we originally set up the training programme, we wanted to have accommodation here at MTC, so that we could recruit nationally, but we could not get the funding to do that, so we ended up with a catchment area where people can travel from their home to MTC on a daily basis.

Baroness Brown of Cambridge: Clive, would it be better if we made the apprenticeship offer more like an undergraduate offer and gave young people—or, indeed, older people taking up apprenticeships—that chance to move? You said earlier that apprentices tended to be less likely to want to move industries or to have that flexibility about locations and different sectors. We were talking about that porosity being valuable in a science and technology workforce.

Dr Clive Hickman: Yes, and moving nationally as well. They tend not to do that. As for where we are being successful, we run the apprentice programme for Amazon, which recruits nationally and brings all the people centrally here.

Baroness Brown of Cambridge: So there might be some value in treating apprentices more like we treat undergraduates, in a way.

The Chair: Thank you very much indeed. It is now time to draw this session to a close. In doing so, I would like to thank our three witnesses once again for their very helpful contributions to this inquiry. Just to remind you again, the transcript will be sent to you if you wish to make any minor corrections. Also, if there are any points that you wish to send

to us in writing in order to extend the evidence that you have given us, we would be very happy to receive it. With that, I am going to close the formal proceedings and thank our witnesses. Thank you.