



Science and Technology Committee

Corrected oral evidence: People and skills in UK STEM

Tuesday 25 October 2022

10.15 am

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Members present: Lord Krebs (The Chair); Baroness Brown of Cambridge; Baroness Blackwood of North Oxford; Viscount Hanworth; Lord Holmes of Richmond; Baroness Manningham-Buller; Lord Mitchell; Lord Rees of Ludlow; Baroness Rock; Baroness Sheehan; Baroness Walmsley; Baroness Warwick of Undercliffe; Lord Wei; Lord Winston.

Evidence Session No. 7

Heard in Public

Questions 47 - 54

Witnesses

Dame Judith Hackitt, former Chair, Make UK; Robert Nitsch CBE, Delivery Director, Institute for Apprenticeships and Technical Education; Professor Paul Lewis, Professor of Political Economy, King's College London.

USE OF THE TRANSCRIPT

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

Examination of witnesses

Dame Judith Hackitt, Robert Nitsch CBE and Professor Paul Lewis.

Q47 **The Chair:** I welcome our panel of witnesses this morning to the committee's seventh evidence session for its inquiry into people and skills in UK STEM: Dame Judith Hackitt, the former chair of Make UK; Professor Paul Lewis, professor of political economy at King's College London; and Robert Nitsch, delivery director at the Institute for Apprenticeships and Technical Education. The session is being broadcast live on Parliament TV and a full transcript is being taken. You, the witnesses, will have a copy of the transcript shortly if you wish to make any editorial corrections.

At that point, I am going to turn straight to the first question and I am going to lead off. I would like each of you to briefly outline your view of the current state of apprenticeships and lifelong learning provision in the UK. Are we adequate, with room for improvement? Are we failing to provide sufficient apprenticeships and lifelong learning? Do we need fundamental reform? As a supplementary, we have noticed in the figures that national apprenticeship enrolment is declining. If you can give us any insight as to why you think it is declining and what can be done about it, that would be a helpful additional point.

Robert Nitsch: Thank you for the invitation here today. We are in a good place with apprenticeships. We are also in a transition programme; we are seeking to put employers at the centre of the apprenticeship system and have made very significant progress in doing that. The transformation is bedding in well. Some 80% of employers are saying that they support apprenticeships at the moment. They find they are delivering what they need. In a recent institute survey of apprentices, 90% felt that they were receiving what they needed to achieve competence in their workplace.

In terms of STEM, it is very well covered. Of the 657 apprenticeships available for use today, 304 are in STEM subjects, so approaching 50% of the portfolio is in STEM. It is an all-age programme. Endpoint assessment, which is the way of checking competence at the end, is bedded in. For future stability, it is really important to see the programme through.

There has been a decline in numbers over time from the previous formation of apprenticeships, framework-based apprenticeships, to the employer-led apprenticeships. In terms of STEM apprenticeships, we have almost recovered to the take-up pre Covid, which was 104,000. We are now at 98,000, after two years of lower take-up due to Covid.

Dame Judith Hackitt: My view would be slightly different, in the manufacturing sector—I mean that in the broadest sense, covering all parts of manufacturing. I am here speaking on behalf of the National Manufacturing Skills Task Force as well as Make UK. The problem for us is not having enough. We need more. We need more apprenticeships. We need to encourage more people into STEM apprenticeship. There is a real concern in industry about the lack of that pipeline of a future generation

of talent to join the industry. There is also a need to address not just the skilling of the next generation but the upskilling of the existing workforce in parallel with that.

Above all else, we need a system that moves as quickly as the industry that it is serving, because the rate of change in our industries is rapid. We need apprenticeships that can adapt and move alongside those introductions of technology. At the moment, while I would agree that we have a good system in place and the good foundations of an apprenticeship framework for the UK, we need to speed up the ability to adapt and change in order to meet the needs of industry.

If you look at the demographic of the people we are bringing into apprenticeships, what really concerns me is the dominance of male young people, with very small numbers of females. We are also failing to appeal to the black and minority-ethnic populations in our community. We need to find ways of attracting many more of those underrepresented groups into apprenticeships. When they do come in, they find very satisfactory roles and satisfying careers, but we are not attracting them into them in the first place.

The Chair: Thank you. Those are two interestingly different views from Robert and from Dame Judith. Professor Paul Lewis, would you like to give us your view?

Professor Paul Lewis: Thank you very much for the opportunity to be here. I am going to confine my remarks to apprenticeships, which is something I know something about. Of course, there are examples of good practice and excellent provision that we could talk about, but overall there are quite serious problems with the system as it currently stands. Those problems, it seems to me, concern the technician workforce, which is to say the workers with intermediate or level 3 through level 5 skills. These are workers who are traditionally trained via apprenticeships.

There are a number of symptoms of problems with the system through which these workers are trained. The first is what we might call the missing middle. The UK has a smaller share of technicians in its workforce than other countries with which we like to compare ourselves. There is a problem with the stock of technicians. The second problem is that evidence suggests that the UK trains fewer apprentices relative to the size of its existing technician workforce than other countries. We have a problem with the flow of new people.

Unsurprisingly given what I have just said, in the sector with which I am most familiar, which is advanced manufacturing, employers often express frustration at the shortages and the difficulties of recruitment that they face. I can give you many examples of that if you wish to hear them.

Another problem, which is symptomatic of difficulties with the system, is that compared to other countries we have a bigger problem with overqualification. What I mean by that is that we tend to employ, more than other countries, graduates to fill roles for which only a technician-level, an intermediate-level qualification, is required. That is a problem because all too often those graduates are overqualified. They have more

theoretical knowledge than they need to do the job, but they are also underskilled. They lack the capacity to effectively apply their knowledge in the workplace.

When employers are faced with these problems—shortages of technicians, frustration with the lack of practical skills and attitudes of overqualified graduates—increasingly, in my experience, they are trying to turn towards apprenticeship training as a means of filling the gap. Then they find that the provision on offer is all too often of low quality or is not there at all. That is especially problematic when it comes to new and emerging technologies.

May I make one final remark about why this matters so much? We have heard a lot in the last few weeks and the last few years, indeed, about Britain's productivity problem. We often hear about the importance of investing in R&D as a means of helping to overcome that problem. No doubt that is true, but it is worth repeating that, in and of itself, new technologies developed through R&D do not apply themselves.

If those new technologies are to lead to all the things we want—better jobs, higher productivity, higher wages and higher national income—they need to diffuse and be adopted widely by firms throughout the economy. Technicians are crucial for that; former apprentices are crucial for that. They have the practical skills that enable them to commission, install, operate, maintain and even incrementally improve new technology. Without an adequate technician workforce, to use the jargon, all too much of British industry will lack the absorptive capacity needed to make best use of new technology.

The Chair: Robert, I wonder whether you would like to briefly come back. We have heard two views. You started off saying we are in a good place, with 80% of businesses employing apprentices and 90% satisfaction. Then we have heard two rather different views from Dame Judith and from Professor Lewis. Do you wish to respond?

Robert Nitsch: Yes, thank you very much, I will make a couple of comments. The first thing is the distinction between supply and demand. The institute's role is to bring employers together to make sure that there is a range of apprenticeships that employers want. That needs to be distinguished from the subsequent comments, which were about the number of people entering and the attractiveness of it. The institute's accountability is very much on the supply side. I would recognise some of the demand and inflow challenges.

On diversity and inclusivity specifically, it is the one common feature across every sector that we work in—the three priorities for each of the bodies that work across the sectors. The one common theme is trying to improve the diversity of the number of people entering occupations. In some areas, it is a particular gender challenge, but that is reversed in other areas where we have a dominance of females in an occupation rather than males. It is right across the workforce.

The Chair: What about the comment that Professor Lewis made that some employers find there is low quality of provision in apprenticeships?

Robert Nitsch: The quality of provision can vary. A third of apprentices, that is all apprentices rather than specifically STEM, are saying they do not feel they are receiving the training that they should within their apprenticeship, which is around a day a week. It does not have to be a day a week, but that is the accumulated total. We are very focused on quality. There has been a significant uplift in quality since the previous incarnation of apprenticeships. There is always room for improvement, but generally we are seeing apprenticeships deliver on what they are setting out to do.

Q48 **Lord Mitchell:** Good morning. You mentioned other countries. Germany's vocational training system is much admired in this country. What are your thoughts about what we are doing differently? Can we learn from other countries? What are the major factors that might prevent us adopting these policies? Is it predominantly cultural, to do with funding, or related to different economic structures?

Professor Paul Lewis: The literature suggests that the German apprenticeship system is underpinned by an interlocking network of complementary institutions. I will not list them all but I will list one or two. The point I really want to make is that it is not obvious to me how that network can be transplanted to the UK. I am not saying we cannot learn anything, but the idea that we can transplant the German system wholesale over here is implausible.

Germany has stronger employer associations and chambers of commerce than we do in the UK. They play an important role in the German system in assessing what skills are needed and, judging on the basis of that assessment, what kinds of training programmes ought to be used. Germany has a stronger tradition of social partnership when it comes to training. Work councils in German firms are a very important means by which the training on offer is assessed. By a works council, I mean a council within a firm whereby representatives of trade unions and of employers monitor the quality of training. The German system of collective bargaining arguably makes it harder for firms to poach trained apprentices from other firms than is the case in the UK.

I could go on, but I hope you are beginning to get the sense that the German system involves institutions that work in conjunction with one another. There is not just one institution that we can transplant from Germany over here.

I am not saying we cannot learn something. I will give one example of where we can learn that perhaps bears on something Dame Judith said earlier. The German and, indeed, Swiss systems have in place very effective mechanisms for ascertaining, in a timely fashion, what skills will be needed to deploy new and emerging technologies so that you get the technician workers you need, not three years after the technology has been developed and firms are trying to deploy it, but in a fashion that helps the firms to deploy that technology in a timely manner. Yes, of course, there are lessons that we can learn, but the idea that one can use the German system as a model that can be transplanted wholesale to the UK is not convincing.

Dame Judith Hackitt: I would certainly agree with that last point. We can learn from other places. We do not even have to go as far as Germany. If you look at the Scottish system, a lot more forward-looking skills foresighting is taking place in the way that they create and structure their apprenticeship systems. There are things that we can learn. In that area, it is particularly crucial for us to do that, because the future of our economy and our success as a nation in manufacturing depend on it.

Robert Nitsch: I would certainly agree with the analysis. I have lived in Germany for 13 years of my working life, so I am fairly familiar with Germany. You cannot just lift a bit of the system. You need to look at the whole of the system when considering interventions. As well as that which Professor Lewis said, I would underline that Germany has greater SME participation in its apprenticeship system. That is a good goal to be aiming for. In terms of the distinctions, ours is an all-sector programme. That is not the case in Germany. Also, we use endpoint assessment as our assessment means.

In terms of what we can learn, we have come a long way with our employer engagement, as I have said, and we can continue to progress that. Stability is very important. We are in a transition programme. It is not just apprenticeships. It is the adjacent T-levels and other qualifications that we are changing. An element of stability is a really important consideration.

On emerging technologies, where we are with the apprenticeship programme is coming off the edge of bringing new apprenticeships into being, to focusing much more on the revision and the amendment of apprenticeships—so the natural rollout of the programme. We are certainly very keen to improve foresighting and focused particularly on sustainability at the front edge of that. We have identified over 200 apprenticeships that we would like to add further sustainability modules to. An example of that would be an electrician fitting electric vehicle charging points in houses. We have identified a small number of occupations that we feel apprenticeships need to be created in, of which retrofit co-ordinator would be one, to take the portfolio forwards.

Q49 **Lord Winston:** What role do you think universities have in preparing people for apprenticeships and in general for STEM subjects more effectively?

Dame Judith Hackitt: We need a genuinely more joined-up system between universities, further education colleges and schools. There are too many discontinuities in our system to make all that function correctly. In particular, we have already identified the roles that things such as catapults are playing as part of that bridge between universities and industry. We now need to pick up alongside that the whole skills agenda, because I absolutely agree with Professor Lewis about the ability to see what is coming in terms of technology. We can implement that only if we change and adapt all our education programmes in lockstep, be that degree courses or be that apprenticeships. That whole systemic joined-up system could be made much more effective.

Lord Winston: You mentioned what we start off with, which is secondary education. Do you think perhaps the accent on the A-level is actually the wrong way to focus our educational system, in the way we do?

Dame Judith Hackitt: Certainly, it is a factor. The reality is that any secondary school that offers A-levels has an incentive to encourage people to stay on and take A-levels rather than considering what is the best for the individuals. For many of them, the answer may well be that they would be better to take up an apprenticeship, because the vocational route would be better for them. The way we fund our education system creates a disincentive for schools to make those correct decisions.

Lord Winston: Professor Lewis, do you want to talk about catapults?

Professor Paul Lewis: Yes, very much so, thank you. I will just set a bit of background, if I might. I mentioned earlier that one of the problems faced by employers in high-tech manufacturing lies in the difficulty they have had finding providers to offer high-quality apprenticeships of the kind that they want.

The proximate cause of that problem lies in what might be called the tyranny of small numbers. These are important parts, and they are going to be even more important parts, of our economy. These industries at this point in time often want to train only relatively small numbers of apprentices. Often, the training in question is expensive. It requires a significant upfront investment in equipment, laboratories, training workshops and so on. Given the current financial rules that are faced by colleges and other education providers, they often do not face an incentive to offer the provision that these new firms that are trying to deploy new technology need.

The question becomes how you can overcome that problem. On the scale of grand policy, you could try to implement some of the recommendations made in the Augar review that would change the overarching set of rules, which would give further education colleges more of an incentive to provide the right kind of training. But that might not be possible. This is where catapult centres come in. If we are not clear that Augar will be implemented, the question becomes, within the prevailing policy regime, what can be done to try to ensure that such firms get the training that they need. Catapult centres arguably have a really important role to play in that.

Why is that? One is that they already have a lot of the relevant equipment and kit that is needed to train people. They also have people who can become trainers who are conversant with the new technology. By having catapult centres do some of the training, that can provide a more cost-effective means of providing the apprenticeships that are needed. It is also the case that the catapults, in virtue of the work that they do in trying to promote the diffusion and development of new technologies, are very well acquainted not just with those technologies but with the kinds of skills that are needed to deploy them effectively at scale.

There are some very good examples of how catapults have done this work. The one that everybody mentions is the AMRC in Sheffield, which does fantastic work. The question that people never ask about the AMRC however, is why it is the outlier within the catapult centre programme. Why is it the case that other catapults do not do as much training? The MTC does some, but why is the AMRC the one that does so much? The argument would be that it needs to be made clearer to the catapults that they have a really important role, not just in technology diffusion but in the development of the relevant skills.

The other example of a really good apprenticeship scheme that has been set up by the catapults is the advanced therapies apprenticeship scheme at the Cell and Gene Therapy Catapult centre. You have there a group of firms that realised that, as they were moving from technology development and R&D towards commercial manufacturing, they needed to fill their manufacturing roles with people with good practical skills. They were people who the firms thought would be best trained via an apprenticeship. Through some support from the Gatsby Charitable Foundation and through the Industrial Strategy Challenge Fund, a really successful apprenticeship scheme has been set up there, taken by 30-odd firms now and approaching 200 apprentices.

That can provide a model of what can be done. The question is whether the incentives facing the catapults are adequate to encourage more of them to do that work.

The Chair: If I can just ask one small follow-up question of you, Professor Lewis, do the catapults have the resources to take on an additional task of training apprentices or would that require an injection of further money?

Professor Paul Lewis: That would probably require an injection of further money. In a time when budgets are tight and there is no prospect of them becoming any looser, in building on existing institutions, relatively small sums of money could make a big difference. It is not just catapults; there are other public centre research establishments that could fulfil a similar role, such as RAL and the Culham Centre for Fusion Energy.

Robert Nitsch: Can I just bring one thing to your attention, which is the existence of T-levels? This is an A-level equivalent qualification that will sit between apprenticeships and the A-level route; 23 of those have been brought into being, 13 of which are in the STEM arena. They have been brought in exactly to try to fill that gap being described between the apprenticeship and the A-level system. It is a very important potential feeder for higher-level apprenticeships. When you look at the destination for graduates in T-levels, it is university, but it is also, most importantly, directly into work and into high-level apprenticeships at level 4 and 5. There is a particular paucity of the latter within the STEM arena.

I would agree with everything that everybody else has said about provision. I would also just highlight the desire to have more flexible apprenticeships to allow multiple employers for a single apprentice and

those type of innovations that are coming through at the moment, which will help some of the problems that Professor Lewis is pointing to.

Q50 Baroness Brown of Cambridge: First, I would like to explore what you think are the major factors preventing companies taking on more apprentices. You have mentioned two of them, which are perhaps the lack of candidates and the lack of appropriate courses for some of the newer technologies. I would be keen to hear whether you might want to expand on those or whether you think there are other factors.

Secondly, I would like to raise something that our previous industry witnesses have made quite a lot of. They felt the apprenticeship levy is too restrictive, and I would be very interested in your views on whether it should be more flexible, so that it could be spent on retraining for green skills or modular skills updating for existing stuff, as Dame Judith has perhaps hinted at, rather than just the full conventional apprenticeship approach.

Dame Judith Hackitt: On some of the factors that prevent companies taking on STEM apprentices, one is matching up the supply and demand balance. It is interesting that Professor Lewis mentioned earlier the AMRC model. I have been on the board of the High Value Manufacturing Catapult for the last seven years, so I have watched that whole system at AMRC grow. One thing that lies at its heart is a matchmaking capability with the local industry community. The reason it can sometimes be so hard to get data on just how big the skills gap is that if you go to big companies, they will tell you that they are oversubscribed—they get too many applicants for a small number of apprenticeship roles—while if you talk to SMEs, they will tell you they cannot find people.

What worries me is the people who get lost in that system, who apply to the large companies and then there is no means of catching them and steering them towards some of the SMEs, which are, after all, in the supply chain of those large companies anyway. They would be working in the same field. We are not good at that. It needs organisations such as AMRC to step into that space and provide that matchmaking. If we do not have a comprehensive network to do that across the country, we are missing a trick.

Baroness Brown of Cambridge: Can I step in there very quickly? Have we lost something that we used to have many years ago, when large companies like Rolls-Royce would take on many more apprentices than they needed, on the assumption they would flow out into their supply chain and, indeed, more broadly? Now, with the financial constraints people have been operating under, they are actually taking just the number they want for themselves and they are very keen to hang on to them. Is there something we could do to recreate that old system or do I just have a romantic view of the past?

Dame Judith Hackitt: You have an accurate view of the past, if I may say so. I remember that too, when I worked in industry for large companies that did exactly that, with that same view that they would flow out in the supply chain. That happens less now. In any case, many SMEs

want to take on their own apprenticeships. They want to grow them within their own businesses. Getting that match at that critical entry point and not losing the talent that applies to become part of the pipeline is so important. The data suggests that girls in particular, if they are rejected at that point, will not go off and look somewhere else. They will choose a completely different route into whatever they are going to do next.

We have to get smarter about the ways in which we recruit people. In Enginuity, formerly Semta, which I am also chair of, we have been doing some work recently with Babcock in Plymouth, where we have been using a gaming scheme to encourage people from less privileged backgrounds to take part in gaming activities that identify their skills and are used as a means of recruitment into apprenticeships with Babcock.

We have to get away from that old model of getting people to write application forms and all of that, because we are screening out large portions of talent that could be nurtured if we identify it via other means, such as gaming, which comes very naturally to some people who would not pass a written test of any description. There are two things that we could do, very easily and relatively quickly, that would change this supply and demand balance.

On levy restrictions, things are getting better. It was very restrictive at the outset. We have moved a long way with some of the flexibilities, but there is still much more room for improvement, in particular for reasons of both adaptation, which we have talked about—people being able to move on quickly and pick up new skills, even as young apprentices—and needing to upskill the existing workforce. It points very clearly to me to that modular nature as being the efficient way forward, because those modules can be used for multiple purposes.

Baroness Brown of Cambridge: Can I move on to Professor Lewis?

Professor Paul Lewis: I might be something of a dissenting voice when it comes to the flexibility of the levy. It is worth thinking a little bit about what happened since the levy was introduced. It was introduced in 2017. It was introduced along with changes that Mr Nitsch referred to earlier: a series of regulations governing the kinds of schemes that the levy funds could be used to support. It seems to me that the large reduction in apprentices that we saw after the introduction of the levy and the associated regulations in 2017 was, in large measure, a very good thing.

All too many of the apprenticeships that were culled after the introduction of the levy and the regulations were, quite frankly, of lamentable quality. They were very short; they had very little educational content and the outcome data indicates that the people who took those apprenticeships gained little by way of wage premia. It is worth saying, therefore, just as background, that the reduction in apprenticeships seen after the introduction of the levy and the associated regulations has not been a bad thing.

Of course, there is scope for tweaking the levy. No one would claim that it is perfect, but one would want to be cautious, given what I have just said about how the levy has improved the quality of apprenticeship

training, about exactly what modular training programmes would be fundable under the levy scheme. Economists traditionally advance certain kinds of arguments about why certain kinds of training are worthy of any kind of financial support from the public. Typically, the types of training schemes, for reasons that I will not bore you with, are ones that impart skills which are general or transferrable in the sense that they are useful to more than one employer.

In looking at modular schemes and in assessing their eligibility, I would want to know whether those modular courses could be of use to many employers. I can certainly conceive of how there could be such courses, but I would be very worried if the regulations were relaxed so much that you could have very specific training, useful to only a small number of firms, funded through the levy.

The other thing I might briefly add concerns what I term overtraining. I did a study of this a few years ago. By overtraining, I mean a situation where large manufacturers train and manage the training of apprentices who are employed by other firms, typically, as Dame Judith said, firms in their supply chain. This is another way of overcoming the tyranny of small numbers, as I put it earlier. You have manufacturers that provide excellent apprenticeships which are willing to provide more, either because it helps them to cover the cost of their training facilities or because it means that they get better and more reliable inputs from firms in their supply chain. That is another cost-effective way of increasing the accessibility of good apprenticeship training to more firms. If the levy gets in the way of that, that ought to be changed.

Baroness Brown of Cambridge: We would need to incentivise large firms to go back to doing that.

Professor Paul Lewis: Actually, where large firms are doing it, that is not as an act of charity. They are doing it either because it helps them cover the cost of their training facilities—they charge for materials; they take the public funding that is already given for such training—or because they perceive that they get a financial benefit, as they get more reliable, higher-quality inputs.

Robert Nitsch: On expanding apprenticeships, awareness is critical. Generally, where employers engage with apprenticeships and apprentices, they find it a very positive experience. Encouraging more people to take it up, particularly in the Small and Medium Enterprise (SME) sector, would be something I would highlight. In terms of the levy, I would agree completely with what has been said by Professor Lewis. I would also underline that one of the effects of the levy has been to get large businesses to buy into apprenticeships in a way that they were not previously. It has really attracted the attention of large businesses and brought them into the space.

They are able to pass on their levy to their supply chain now. Encouraging a greater take-up of that would be really helpful, so that, instead of dispersing the apprentice, so to speak, into the supply chain, the levy fund is dispersed into the supply chain. It is a different approach.

Hence I underline my comments on awareness, take-up, and small and medium-sized enterprises buying into that.

I would also urge caution about using the apprenticeship levy for other things. If we have an ambition to expand apprenticeships and take them forwards, the levy is a fixed sum. About 40% of the draw-down of funds goes towards STEM apprenticeships.

- Q51 **Baroness Walmsley:** Can we go back now to the issue of T-levels? I will go to Mr Nitsch first, because you mentioned them a few minutes ago. Can you tell us what role you think they will play in the education system going forward? Are you concerned that there is too much policy churn in the vocational training system and what effect that might have?

Relative to that, can you tell us what you think about the quality of careers advice available to students? We have been receiving written evidence that there is quite a lot of concern out there about the quality of careers advice and the awareness of the various training opportunities that exist for learners, not just in their early careers but right through their careers. What more can we do to ensure that people are aware of the breadth of options available to them? It appears to be getting more and more complicated.

Robert Nitsch: The institute is responsible for the technical qualification that sits inside a T-level. Just to provide a bit of background on what a T-level is, it is a two-year course of education, potentially with a transition year beforehand, focused on 16-to-19 education. It contains a very considerable industrial placement element of seven weeks. It is based in colleges. Essentially, it is the reverse of an apprenticeship, so four days in a college, one day in an industry setting. The first graduates from T-levels graduated this summer, with one in education and childcare, one in digital and one in construction. We were very pleased with the results of that.

We are pleased with the progress of the programme overall. The objective was to create an educational programme where the output standards were specified by employers. The same knowledge, skills and behaviours that underpin apprenticeships are at the heart of T-levels. The idea was to increase the number of routes into work, into higher education and into high-level apprenticeship. It is part of the suite of changes in technical education.

It is really important to maintain stability and to see the programme through. Apprenticeships started the programme. We then went to T-levels as entry routes, levels 4 and 5, the higher technical qualifications, as access routes, and then levels 3 and 2. There is a substantive programme of change. It is very important that we retain stability and see that through.

In terms of careers advice, there is a "Find an apprenticeship" site that the DfE runs. We provide access, but we can do much more to inform people. We have an occupational match programme to do that. There are different sources of advice and bringing that together. I would completely

agree with an earlier comment made by Dame Judith around transparency and making sure that people can understand the technical education system. There is a lot of work to be done to simplify that and the institute is trying to do that at the moment.

Baroness Brown of Cambridge: Before we move on to the next witness, can you say whether there is a role in the T-levels for the sorts of non-technical qualities that we are hearing from employers that they are looking for? They include being able to work in teams, engagement with different levels within the company and even with clients, although a very young person is not necessarily going to be in contact with clients. Do those non-technical qualities come into the T-levels?

Robert Nitsch: Absolutely, they are at the heart of this. They have been designed by employers. You spend a lot of time in the workplace. There is an employer-set project in your first year as the core component. When people graduate from a T-level programme, the idea is that they have reached a level that is called threshold competence. That means that they are ready to go into the workplace.

You have very helpfully pointed out the key difference in the programme, which is not that it is purely academically rooted. Yes, there is strong academic content. You particularly need that in STEM areas, but actually it is about what employers want and preparedness for employment. It is all about the workplace, and that is absolutely the centre of what it is. When you look at the students who are coming forwards, that is the bit that is really attracting them, because they think they will be work ready. They are getting closer to the workplace.

If I can just illustrate something, my favourite T-level student is one I met in Fareham. I went to see him. He was effusive about his T-level. He was doing a digital T-level. I then tried to change the subject, because he had been so effusive. I said, "What are you doing in your summer holidays?" He said, "I've just done the two weeks of my employer engagement. I'm going back to work for the employer I did it with. He's taking me on as temporary staff and I'm earning £17 an hour supporting him for the next eight weeks". That is the sort of programme that we have on our hands here.

Dame Judith Hackitt: I am very supportive of T-levels. It is a welcome step in the right direction and I absolutely agree we have to stick with it. However, we need to be mindful of the fact that the challenge of getting employers engaged in this process is not insignificant. The very fact that it includes that large industrial placement is great, but we have to help employers see the benefits of that. One way of doing that is to use the case studies of some of the people who have already gone through the system. My experience on HS2, for example, is of seeing some highly successful candidates go through T-levels at a local FE college, who are now moving straight on to the apprenticeship programme with HS2 and its supply chain. We need to roll out those case studies to other parts of industry to show them how well it can work in practice. That is what is going to get them bought into helping to secure the success of the T-level, sitting alongside A-levels.

Professor Paul Lewis: I have not done research on T-levels, so I will not impose my ill-informed speculations on you about that. I would like to underline the importance of something that Mr Nitsch said earlier, which is about stability. One of the reasons why especially SMEs have found it difficult to engage with the apprenticeship system is that it is unstable and very complex. Catapult centres and large manufacturers that overtrain could help manage the apprenticeship and thereby make it easier for SMEs to manage their apprentices.

On careers advice, if you do not change the metrics by reference to which schools' performance is assessed, I am not sure that you will manage to get very far in changing that.

Much of the increase in STEM apprentices that we have seen since the levy has been for older people, often people who were already working at a company. When it comes to career advice, I would want us not to forget that the traditional role of apprenticeship has been to help young people make the transition from school to the world of work. It is not clear to me at the moment that, as it is currently configured, the apprenticeship system does enough to help 16 to 18 year-olds get to take a level 3 apprenticeship.

Q52 **Lord Holmes of Richmond:** Good morning to the witnesses. Thank you for taking the time to be with us this morning. We have heard a lot about the potential of degree apprenticeships to better reflect the combination of academic work in the university and on-the-job training. Do you think this is a good idea? What more could the Government do to encourage degree apprenticeships? For completeness, I set out my register of interests as chancellor of BPP University.

Dame Judith Hackitt: It comes back to my earlier point about having a joined-up process. Certainly, the success of degree apprenticeships speaks for itself in terms of those that we already have. It addresses that issue of work readiness, which is so often a concern among employers at the output of some degree courses. It is that ideal mix of practical and academic qualification that employers seem to like a great deal. We should be doing more of it. There is clearly an important role for universities to play in working alongside industry to deliver that in larger measure.

Robert Nitsch: Degree apprenticeships are a fantastic thing, but we need to make sure there is a balance in the programme. We have talked about level 3. We need to make sure that we think about the whole programme. I would also completely endorse your sense that we need to make sure that degree apprenticeships are genuinely apprenticeships, not degrees that are masquerading as apprenticeships. The institute has recently done quite a lot of work to do just that.

The other thing that we rarely talk about in the context of career apprenticeships, but has come up today, is the importance of being linked with academic institutions, such as universities. The apprenticeships should stay really relevant and on the cutting edge. That is another endorsement for degree apprenticeships. I have explained how we are

seeking to make sure that all apprenticeships are kept completely relevant and future facing. It ought to be particularly prevalent in the degree apprenticeship sector.

Professor Paul Lewis: I can certainly see why degree apprenticeships can be an improvement, if they are genuine apprenticeships. That is to say, if they involve a significant work-based component, they will help to equip graduates with the requisite practical skills as well as the theoretical knowledge. I would also sound a note of caution. They are of course pitched at level 6, not at the levels 3 through 5, where we have such a significant and important gap.

Perhaps more research needs to be done on this, but degree apprenticeships will be taken, presumably, by people who have done quite well at A-levels and are aged 18. They do not therefore do terribly much to help those 16 to 18 year-olds who are seeking to do a level 3 qualification. To repeat my earlier point, we ought not to neglect their interests. We do so too much as things stand.

Lord Holmes of Richmond: Would you not see a route through apprenticeship through to degree apprenticeship, potentially?

Professor Paul Lewis: That has my wholehearted endorsement, but you need to start at level 3.

Q53 **Baroness Blackwood of North Oxford:** I would like to follow up on an answer that came right at the beginning, about comparison to international performance. What I would like to pick up on is our understanding of the fundamental evidence. How good is the data we have on skills shortages in the UK? Where are those skills shortages? What are those skills shortages? How well do apprenticeships and qualifications adapt to the changing needs of industry? How is it decided when a new apprenticeship is needed?

Professor Paul Lewis: That is a really important issue. One thing that the Swiss and German systems do very effectively is to incorporate the views of employers that are seeking to develop and deploy new technology into the process through which new apprenticeship qualifications are developed. We have not been as good at that as our continental counterparts, but through the work of the catapult centres and other similar centres of innovation, some very good work is beginning to be done, whereby the catapult centres are encouraged to see themselves not just as developing technology but as having a role in harvesting the information about what skills will be needed to deploy that technology at scale, and in then translating that information into training syllabi.

Just to give you a quick example of how this could work very well, in Switzerland there are things called universities of applied science. They are a bit like our catapult centres in the sense that they are tasked with working with local companies to help them develop new technology and apply it at scale, but they are also intimately involved in the vocational training of workers.

Recent research work carried out by a very clever lady called Uschi Backes-Gellner in Zurich has shown that, where you have these universities of applied science, innovation understood as the deployment at scale of new technologies is improved. Our catapult centres and other public sector research establishments could play that kind of role here, and I hope they will be encouraged to do so more.

Baroness Blackwood of North Oxford: Dame Judith, could you answer that, as well as whether you think there needs to be a new data infrastructure, maybe a national database for apprenticeship opportunities?

Dame Judith Hackitt: On the question of how good the data on skills shortages is, the data tells us that we have massive skill shortages. When you talk to those in industry, they will tell you that the biggest single issue they have to address is securing that pipeline of talent for now, as well as for the future. What we do not have is the granularity beneath that data to tell us what we are really short of and what we need.

It is about balance. We have talked quite a lot about balance this morning. On one hand it is very good that we now have more employers involved in defining what those skills needs are, but one of the downsides of that is that sometimes we get too specific and we develop more qualifications than we actually need, because much of it is generic.

If we think about the young people we are educating, we are educating them for a future where they will more than likely have to move into other sectors, and we are not giving them the means to carry those transferable skills with them easily. There is a real need to change the way we collate the data and the way we equip people with the skills so that they are able to make those transfers in the future. Yes, we do need to have a system in place that enables people to move around as they move through their careers.

Robert Nitsch: An apprenticeship may not be the right solution to a skills shortage, because it depends on the time period in which the skills shortage emerges and the length of time of the apprenticeship. They are definitely part of the solution, but an apprenticeship is a long-term investment in occupational competence. If a skills shortage emerges in a sector in a very short period, it may well be that another form of intervention is the most appropriate way of doing that. A good example would be HGV driving. Yes, we produce a lot of apprentices, but the solution to the shortage of HGV drivers is probably not a year-long apprenticeship; it is something much quicker than that.

In terms of what my fellow evidence providers have said, we completely agree on the balance between the generic and the specific. The statistics in the STEM area are interesting, as to whether we have that completely correct. We will be looking at that as we do the reviews I have spoken to.

I completely endorse the fact that the catapult centres now have responsibility for skills. It was interesting that when they were first set up they were told not to get involved in the skills environment. Linking technology and skills together is an absolute essential for success of our

system, and we work very closely with the Cell and Gene Therapy Catapult, the High Value Manufacturing Catapult and others that we wish to continue working closely with to move that forward.

My final point is on new apprenticeships, which is a question that you asked. That is absolutely our responsibility. If employers come forward and say they would like an apprenticeship, we facilitate that. That is our job. We have to make sure it fits into the system correctly and it does not overlap with other things. Our first preference would be to amend an existing apprenticeship, but it is absolutely employer-driven. If somebody comes to us with an idea, we will help form employers around that idea. Perhaps with the help of Make UK or the catapults, we will get a group of employers together to say what is needed in that occupation.

Baroness Blackwood of North Oxford: Following on from Dame Judith, what is your view about having this national dataset to provide the geographic perspective and the granularity that allow for decision-making?

Robert Nitsch: Getting better acuity on what is needed would be really important, but it is difficult because people have different perspectives in government depending on where responsibilities lie. Something that you have pointed to there that is really important is thinking about regional as well as national. We really welcome the local skills improvement plans—LSIPs. There is quite a long way to travel with those to get them right. We are piloting them, but there is huge potential there to help drive local provision and to match up this supply and demand problem, which has probably characterised a lot of the evidence you have heard this morning.

Viscount Hanworth: Considering the question of what role universities should play in delivering apprenticeships, Professor Lewis twice mentioned the Augar review without expanding on it. It seems to me that there may be a missing element here, and that a lot of what we require could take place if the further education colleges were expanded and sustained. Is that your opinion or not?

Professor Paul Lewis: I said earlier that the proximate cause of a lot of the failings of our apprenticeship systems seems to lie with the tyranny of small numbers, but what is the underlying cause? The underlying cause lies in the rules governing the provision of funding for various kinds of education. This is what Augar argued, and I think Augar is right. The rules governing the provision of funding encourage universities to provide and young people to demand full-time bachelor's degrees rather than to undertake apprenticeship training, especially at levels 3 through 5.

When you look at the rules governing apprenticeship provision, there were clearly problems with underfunding. The incentives have also encouraged providers to offer lower-level apprenticeships—typically below level 3—in areas such as customer service and business administration, rather than the higher-level apprenticeships, by which I mean levels 3 through 5, which are arguably much more important in generating a proper education and wage growth for young people, and supplying British industry with the skills it needs.

Viscount Hanworth: It is the missing middle.

Professor Paul Lewis: Yes. It would be really good if we could implement Augar. All the rest is trying to deal with the problems that were left because we have the wrong system of incentives.

Q54 **Baroness Sheehan:** Dame Judith, right at the start you mentioned the dearth in women and girls, and ethnic minorities, in taking up apprenticeships. Robert, how are T-levels performing in terms of recruiting women and girls? They are the pipeline, as you mentioned.

Robert Nitsch: It is in the pretty early stages. The programme is quite limited. It is not available nationally. It is in certain colleges. The ambition is that it should buck the trend that you are describing. We have yet to see that pull through. I went to visit a college this week and there were 40 digital students in a room, only one of whom was female. We are very clear that it is an objective of the programme.

In everything we are doing at the moment, we are trying to improve accessibility in all dimensions of diversity, not just around gender, but making sure that we embrace neurodiversity and other related issues. We want to provide a sensible vehicle by which not only STEM but every other sector is seen as being open to everybody.

The Chair: Thank you very much. I thank all three of you for the excellent evidence that you have given us this morning. It has been a very enlightening session for us. As I mentioned at the beginning, you will shortly receive a copy of the transcript. There will then be an opportunity for you to make any minor editorial changes you wish to.