



Select Committee on Economic Affairs

Corrected oral evidence: The Economics of Higher, Further and Technical Education

Tuesday 16 January 2018.

3.35 pm

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Members present: Lord Forsyth of Drumlean (The Chairman); Lord Burns; Lord Darling of Roulanish; Baroness Harding of Winscombe; Lord Layard; Lord Sharkey; Lord Tugendhat; Lord Turnbull.

Evidence Session No. 9

Heard in Public

Questions 98 - 110

Witnesses

I: Dr Robert Hancké, Associate Professor, London School of Economics; Professor Ellen Hazelkorn, Professor Emeritus and Director, Higher Education Policy Unit, Dublin Institute of Technology and Education Policy Consultant, BH Associates.

II: Martin Donelan, Regional HR-UK, Rolls-Royce; Martin Hottass, UK Skills Partner, Siemens; Nigel Whitehead CBE, Chief Technology Officer, BAE Systems.

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Examination of witnesses

Dr Robert Hancké and Professor Ellen Hazelkorn.

Q98 The Chairman: Professor Hazelkorn and Dr Hancké, welcome to the Economic Affairs Committee. We very much appreciate your taking time to help us with our inquiry. Perhaps I could start off with an easy question. What would you say are the main differences between the English education and training system and that of Germany and Ireland? If you could give a short answer, it would be appreciated.

Professor Ellen Hazelkorn: The British and Irish systems have some commonalities. Obviously, the German system is quite different; it has a long history of student selection at an early age. Think 11-plus, where students make decisions at around 13 to 15. Obviously, the 11-plus was exactly what it was: an exam at that age. The main characteristics, in Germany, the Netherlands and Austria to some extent, are that students follow completely different paths. Depending on those paths, there is a very close relationship between vocational training and industry. One set of students goes that way; another set of students takes the academic path.

In the Irish system, that does not really happen. Students make a choice at the end for their leaving certificate, which is equivalent to A-levels but larger; there are six exams, as opposed to three for A-levels. There is an opportunity to do an applied leaving certificate, and then students make choices as to whether or not they take a more vocational route. They might do an apprenticeship programme; they might go on to do a further educational programme; or they might go on to higher education. In that case, they might go to universities or institutes of technology.

The Chairman: I was struck when I heard the principal of Trinity College Dublin say during a radio interview that in Ireland they had been much more successful in getting children from poorer backgrounds to go into higher and further education by getting universities to run a year before starting university for children who perhaps had not acquired the right approach to university or the right skills. Is that widespread? Has it been successful?

Professor Ellen Hazelkorn: It is widespread in the sense that there are access programmes for most of the institutions. Some of them work as a consortia, but in all those cases there is an access route in particular for students from what are DEIS-designated schools.¹ They come in through that route. They are small cohorts of students.

The Chairman: What sort of schools?

¹ DEIS: Delivering Equality of Opportunity in Schools. Further information available at <https://www.education.ie/en/Schools-Colleges/Services/DEIS-Delivering-Equality-of-Opportunity-in-Schools/>. See also National Plan for Equity of Access to Higher Education 2015-2019, <http://hea.ie/assets/uploads/2017/06/National-Plan-for-Equity-of-Access-to-Higher-Education-2015-2019.pdf>

Professor Ellen Hazelkorn: DEIS. I forget the terminology, but it refers to schools in designated socioeconomically disadvantaged areas.

The Chairman: Are they poorly performing schools?

Professor Ellen Hazelkorn: It has to do with the socioeconomic make-up of the area where the school is; it has nothing to do with performance per se. Designated schools get extra money, have certain pupil/staff ratios and so on. There is an access route. Some students go through a further education route as well.

At the same time, when you look at differentiation by socioeconomic status or postal code, you see that postal codes with high or middle socioeconomic status are fairly well saturated, whereas those that have low socioeconomic status have participation that in some cases is as low as the mid-teens. So, yes, there is greater involvement, but we still have this huge issue of socioeconomic disadvantage.

Dr Robert Hancké: I will not talk too much about Ireland; Ellen knows much more about it than I can even imagine. In the research I have done over the last 25 to 30 years, I have looked a lot at how education and training systems in Germany and France prepare workers, so to speak, to become part of the economy. One of the truly interesting things that came out of it was that in many countries these days, or at least over the last 20 years, you became a worker if you failed in everything else in your educational life. If you tried university and community colleges and it did not work, you ended up being a worker. It always struck me, from both the research we did from outside and the work I did with interest groups, managers and so on in Germany, that becoming a worker is as much a positive choice that you make at some point in your life as it is the outcome of a set of pressures that you face. I am sure we will talk more about that in a few minutes.

I am not saying that streaming by the time you hit 11 or 12, when you are put in a vocational training system, is in itself a good idea, but once you are in there you acquire the skills and the type of professional competencies that are necessary to become a proud manual worker. The idea is that there is a career, first as a worker, and then, as you get higher skills, as a master technician. If the company selects you, you might even become an engineer and a manager along the way.

The big thing that I picked up from those comparative studies was that in Germany the educational system is organised in such a way that it becomes a positive choice for people to do vocational training and everything associated with it. I have not really seen that outside what I call loosely the German influence, which is Austria, Switzerland, Belgium and some parts of Scandinavia. I have never really seen it anywhere else.

The Chairman: Is that driven by teachers or parents?

Dr Robert Hancké: The way it works is very authoritarian. I do not want this to sound too much like a cliché, but it is very authoritarian. The old

system was that the teacher would decide where you belonged at about the age of 11 and there was no way back. That is probably still true in some states in Germany. I am talking about if I had been in that situation. Things have changed a bit in the meantime.

First, the vocational layer has been reduced quite significantly, because they now train technicians rather than skilled workers. Secondly, and of equal importance, there are more bridges between technical education and general academic education than in the past. In part, it is driven by the aspirations of students, which have changed along the way, but a significant part of a cohort—I would guess 20% to 25%—would still go through some kind of technical education and come out the other end.

Professor Ellen Hazelkorn: First, the German system comes from within the society itself; it is not something you can transplant from somewhere else. You might think of further and higher education in a very different way, and we can discuss that. Secondly, in the 19th and early 20th century, when the system emerged, there were fewer choices. People's educational systems were different and there was a narrow understanding of what we know as ability and knowledge. We know a lot more now; people do a lot more things and there is a lot more change in the system. The German system has changed a lot as well. In university education, because of Bologna, because of changes and transparency, there is more flexibility in students' education, and in adult learning.

In the question you pose, we are looking at 16 to 19 year-olds, or the standard 18 year-old going into college. We also need to look at the system as dealing increasingly with 25 year-plus adults. We need to ensure that people have the opportunity, not just a first chance, to come in and out of the labour market as they age. The idea that people will have one job, or will take one bite of the cherry, has gone out of the door. A lot of changes have happened in society, in the labour market and in our attitudes towards things and reality, which the educational system needs to reflect.

Q99 **Lord Layard:** I suppose the general view would be that in Britain the university system is quite good by international standards but the intermediate level is awful. You say that we cannot copy somewhere else, but it would be interesting to know what you think would be the way forward for building up the intermediate level in Britain. Can it be done without a much clearer organisational and funding structure than we have at the moment? For example, if people over 19 want to get part-time intermediate-level 3 education in Britain they have to pay, or their employers have to pay. What is the German approach to funding? How far is our shortfall related to funding? How far is it related to poor organisational clarity, or lack of it, with 17,000 qualifications and so on? We may not be able to transplant, but what are your reflections on how we can learn from countries that are doing this better, and what is the way forward for us?

Professor Ellen Hazelkorn: The UK spends about 0.05% of GDP on FE, as I understand it. The Germans, the Australians and so on spend about

1% of GDP. Whatever one thinks about the pluses and minuses of the German, Australian and Canadian systems, they are much more coherent. The UK system is hugely disparate. You have lots of different organisations providing a mixture of different skills. There is no common governance of the system and no common approach to funding.

To put it in some context, so that not everyone is beating themselves up, these are issues that lots of countries are looking at. We have spent a lot of time looking at our universities; there is more coherence around higher education broadly, for example through universities, but in the case of Ireland there are also institutes of technology. There are Fachhochschulen in Germany and universities of applied science in other countries. Higher Education is much more coherent in so far as we know what the student cohort is. They are 18 year-olds who go through and come out with a degree in a range of subjects, whether a BA, masters or PhD.

The FE sector is much more divergent. This group is upper secondary in some cases, and moves on until 19 and maybe a bit older. You may be dealing with vocational education; you may be dealing with first efforts by a student who has not made it or has not done very well; you may be dealing with professional/vocational training; you may be dealing with re-entry; or you may be dealing with basic literacy and numeracy skills. By and large, you are dealing with a cohort of students who are more socially and academically disadvantaged. Contrary to common sense, we end up giving less money to this group, which is much more diverse and has more problems, and give more money to the higher-level students who go to the universities.

Lord Layard: Most of our students go for three-year degrees. Would you be in favour of some system of incentivising both students and universities so that more of them take two-year degrees and then perhaps build on them later?

Professor Ellen Hazelkorn: I do not think the length of the programme is the issue. Even at university level, probably about half the programmes, as a very rough universal statement, are professional or vocational in some form or other: engineering, teaching or social work. Any of those are, effectively, vocational programmes at university level. What we see increasingly, including in Germany, are dual-type qualifications where people do more internships, specialised work experience and work and study. That is becoming a common form. We see that in Germany; in Ireland, we have quite a lot of them. The EU—if I can mention it—promotes a lot of industrial-based doctoral studies; people working in companies are doing doctorates. There is a lot more of that going on, so it is not the length of the programme; it is the curriculum and the orientation.

Dr Robert Hancké: The answer to your question depends a bit on what you think the problem is. If you think of it as access to education and the effects of that on life chances, it is a different story from thinking that the

problem is the need for a set of skills that will, let us say, increase productivity levels for the jobs associated with that.

I have worked here for 17 years. I think the UK has a slightly unhealthy obsession with the German type of education system and industry and the link into everything, for the very simple reason that, in order for the German system to work, there are loads of other things, which the UK does not have, that have to work too. At the first level of institutions, you need employers' associations that define what skills are about and what training systems are about; you need trade unions that understand that as part of their role; you need companies that are willing to train individual students so that they alternate between one and the other; and you need chambers of commerce that organise networks of companies in a region, so that they are geared towards what is going on. Those are just the first-order institutions that you need to support something else. As all those things, in some form or other, are lacking in the UK, it strikes me that the idea of looking at Germany all the time is an interesting exercise, but it will not give you nearly as much as you think.

The interesting twist is that there is one other country that has tried to emulate the German-style apprenticeship system since I was in shorts, and that is a lot longer than it looks. That country is France. France has a labour productivity rate twice as high as the UK's without a German-style apprenticeship system underpinning it. If I were in your shoes, I would look at what France is doing. That makes sense, because in France they seem to be ending up in a position where we would all like to be, or at least some of us. One of the really important things is that they have a very high level secondary education system. The UK has that too. Nowhere in the OECD are there massive variations from the average.

The Chairman: I am sorry to interrupt you, but do they not also have very high youth unemployment?

Dr Robert Hancké: Yes. Can I come to that in a moment? I do not think that is a problem of the labour market; it is a macroeconomic problem, but we can talk about that. The point I was going to make is that probably nowhere in the OECD is there truly bad secondary education. France is probably on average roughly the same as the UK, but the UK has a variation around the mean in secondary education that is much, much bigger than anywhere else in the EU and in the OECD as a whole. I would start by thinking about that. What is the effect of it?

At the moment, a cohort in France goes through the entire secondary education system, finishes with the baccalaureate and then does what you are talking about: two or three years of higher non-university education. Those people come out with a reservoir of skills, both in different areas and at different depths, which is probably impossible to find here under any of the arrangements we can think of at the moment. It means that the student/employee has the investment in skills paid up front by the state, and there is no problem for the company about what it has to pay or contribute for those skills, because it needs only between three weeks and three months to top up that reservoir.

Q100 **Lord Tugendhat:** You set out very interestingly the sort of conditions that have to apply for the system to work. What proportion of German students go to a university within range of their home and live at home, and what proportion leave home and go to a university in another part of the country?

Dr Robert Hancké: I do not know the numbers, but I would guess that it is about 50:50 or 60:40. It is a large enough number.

Professor Ellen Hazelkorn: It is about 50:50 between the vocational side and the university side, or a bit less. I do not know the numbers on mobility of students. My guess is that most would tend to be proximate to where they live.

Dr Robert Hancké: If I may hijack the question for a moment, it would be important if there were universities in Germany that were head and shoulders above all the others. There are probably one or two, but, on the whole, there are not. There are no truly bad ones, with a few exceptions, and no truly exceptional ones. As a result, it does not really matter for students individually.

Lord Tugendhat: I do not know about that. In Britain, people seem to regard leaving home as an important part of going to university. I suppose it derives originally from the Oxbridge tradition. A striking feature of university education in this country is the extent to which it involves leaving home and living away from home and going somewhere else. David Goodhart has written very interestingly on the implications of that in his book *The Road to Somewhere*. When I pressed some of the student representatives we had here about whether it would be easier for people to make do on the money and overcome some of the other problems if they went to a university nearer home, I got rather ticked off by them. They said that the great thing about going to university was leaving home. That is why I am pressing you on the point about whether or not leaving home is an integral part of the university experience in Germany.

Dr Robert Hancké: This is a very difficult question, so Ellen should answer it.

Professor Ellen Hazelkorn: I cannot say that it is part of it, but the educational experience is wider than just learning particular information; it is about social and cultural development. One of the things that is happening in the German experience and elsewhere is that we are beginning to realise that we need to ensure that people go beyond learning narrow skills and have sufficient knowledge to be what I call responsible citizens who are able to participate in and understand the issues. That is why even our vocational programmes are increasingly widening their curriculum. It is not just about learning the technical skills, which we know will change over time; we must look at how the system needs to evolve.

I will put two other issues on the table. I mentioned governance of the system. It seems to me that there is no clear governance in the UK of what we would call the tertiary education system. FE and HE are part of the same department but within silos. We find that elsewhere.

Management of the governance of the post-secondary education system is becoming a big issue in a lot of countries. We can look at what they are doing in New Zealand. Scotland has had that issue, and we have it in 18 states in the US, where community colleges and universities are part and parcel of the same governance arrangements. It means looking at the mobility and flexibility of learning, what is possible and how it works, not just for first-entry students but over time.

The next general observation is that our graduates are the sum of the parts of the educational system. The second issue around governance is that we are looking increasingly at a whole-of-education approach. The students going into university or further education are the product of our secondary system. If we have problems with the readiness of our students, what is going on in the secondary system? How is the primary system feeding into the secondary? Unless we look at it as a whole, we will have difficulties in segmenting parts of it.

The Chairman: You have just extended the scope of our inquiry rather alarmingly.

Q101 **Lord Tugendhat:** To what extent do you think the make-up of a country's education system is a response to the needs of its economy? In other words, does Germany have a strong technical education system because of the strength of its manufacturing sector, or vice versa?

Dr Robert Hancké: There is no quick answer to that question.

The Chairman: Do try.

Dr Robert Hancké: The German apprenticeship system we see now, which is one of the key drivers of the whole thing, originated in the 14th or 15th century as a guilds-based training system. The reason that is important is that under a guilds-based system, but far less true under a craft-based system, you can become a trained worker and then a master and set up your own company. The distinction between a worker and an employer is organically far less complicated than it would be in a craft system where you are on either one side or the other.

Why is it important? By the time of German industrialisation, which, as you know, happened much later than in the UK, those training systems had already mushroomed into something considerably bigger than they were at the start, but with the same underlying philosophy, whereby people accumulate skills and with the skills come more qualifications and responsibilities. Therefore, someone who started as a skilled worker can become an engineer at some point.

The reason that is important is that there is not one thing going on and then the other latches on to it; education and industry seem to co-evolve,

as we call it. I do not like the term all that much, but they move, look at each other and begin to adjust. At some point, I suspect after the First World War, the educational system was entirely reorganised to match the prowess of German industry, which was growing quite rapidly at the time, as we know. They restructured the training system to become an industry-based vocational training system to match what was going on in very large companies. I would hazard a guess that in the 1980s, when the mass production system, which even the Germans were engaged in at the time, was reaching its limits, one of the possibilities it offered, and why Germany is now considered such an industrial powerhouse, with very sophisticated products in the strong and stable niche markets where companies are operating, is that they could reorganise the skills system again to be the ones who moved ahead of the pack. When Korean and Japanese manufacturers were competing on cost, Germany moved up to compete on quality. Switzerland is even more like that, probably a bit too much, but, in essence, that is it.

I am giving you 600 years of history in about 10 minutes, so there will be some broad brushes. There is no single directional logic. The two things co-evolved and then began to reinforce each other. Sometimes the causality can change. That is exactly what we have seen since the 1980s. The period we are looking back at was when Germany reinvented itself. To a large extent, Germany reinvented itself because the vocational training system it had at that moment allowed it to do so.

Professor Ellen Hazelkorn: The Germans introduced what are called the Fachhochschulen at that stage because technical and vocational education was seen as too narrow. They introduced a variation of what you might call polytechnics, or what are euphemistically called across Europe universities of applied sciences. They include the Fachhochschulen, the HBO sector in the Netherlands and the institutes of technology in Ireland. They have them across Scandinavia, and in most countries. They are organised under the umbrella of EURASHE.

The Fachhochschulen have a strong vocational side, but on the academic side they have a close relationship with employers, both in content and in work experience. They are different types of institutions and there is a breakdown of about 50:50 between students going to vocational- and academically- oriented institutions. They have evolved. That kind of institution evolved across Europe, broadly in the 1970s and 1980s, and we see them all over. They are reasonably successful—very successful. Professional vocational education is a huge growth area, but the traditional boundaries between what makes up an academic programme and what makes up a vocational one are disappearing; they are not as rigid as we might once have thought.

Lord Tugendhat: In this country, we pride ourselves on having a flexible labour market. Am I to understand, particularly in view of Dr Hancké's answer, that the way the Germans were able to combat the rise of the Japanese and Koreans, by moving up the quality chain, reflected a very great degree of flexibility on the part of workers within the existing

structures? Although the system was not flexible in the way ours is flexible, moving from one job to another, it was very flexible in adapting skills.

Dr Robert Hancké: It is often forgotten that there is a big difference between what we could loosely call numerical flexibility, which is hire and fire and a volume of work according to market demands, and what you refer to, which is functional flexibility. German job classifications used to make British job classifications look like a walk in the park; they were even more rigid and difficult to change. At some point in the 1980s, the period I was talking about, trade unions and employers sat around the table and said, "This is impossible. We can no longer tell the difference between something that is mechanical and something that is electronic, and that mechanical is that degree and electronic is that degree, so we need to think about how to merge the two". I have forgotten the number, but they went from about 250 different job classifications to 50 basic ones.

That was the moment when the functional flexibility you were talking about became ingrained in the type of training workers had at the time. Unions and employers understood exactly the stakes in the game. The unions understood that it could be exploited, so they needed assurances from the employers that that would not happen, and employers understood, because people hold each other over a barrel in that situation, that the workers could exploit it. They built a very carefully crafted quality control system that made sure that workers could be redeployed within a broad set of qualifications for those job classifications.

The Chairman: I am conscious that we do not have a lot of time.

Dr Robert Hancké: Excuse me.

The Chairman: It is very helpful and very interesting, but we have a lot of ground to cover.

Lord Darling of Roulanish: Dr Hancké, you described how German training has very much matched the demands of German industry, albeit in different phases of industrial development. What is the mechanism by which the transmission of what is required takes place? Is it a direct one between employers and academic institutions? I think you referred to the fact that Germany has a greater tradition of unions and management sitting down together to decide what they are going to do and so on. I am just wondering what the transmission mechanism is.

Dr Robert Hancké: These kinds of questions are best answered by looking at when the system fails, because then you understand what is going on. One of the reasons why the French training system never really took off when the French were trying to do what the Germans did was that it had no mechanism for aggregating the functions that the system was looking for. What would they be? Basically, in regions, employer associations cover all the firms; they are an aggregation mechanism for

what all the firms do, and regional trade union officers are an aggregation mechanism for what all workers do.

If those two systems are in place, they can talk to each other. The union makes sure that the qualification is transferable across jobs within the same industry, and the employers' association makes sure that it covers more than basic needs, and that it covers the interests of the companies. That is the way the whole system works. Each time there is a problem—

Lord Darling of Roulanish: They communicate with the academic side of it.

Dr Robert Hancké: Exactly.

Professor Ellen Hazelkorn: Both in the German situation and in others, when programme design and developments happen there is a broad range of stakeholders on those committees. That is where the dialogue is happening. There is much greater involvement of employers on committees with academics and so on. We also have to step back and say that it is not always clear that employers know what kinds of skills are required. In some cases, they require what I might call oven-ready skills; you walk into the job next day. How much are employers involved in helping to train their own staff? They have an immediate need, but they do not necessarily have a long-term need, so there is a need to mediate those different issues.

Q102 **Lord Burns:** I want to pursue the point you made earlier that the UK has a wide variation around the mean compared with other countries in the way higher education turns out. You also mentioned that we spend a lot more money on university education than we do on other forms of higher education. One of the things we are very interested in is the extent to which it is possible to have greater integration between higher and further education with regard to both funding and other mechanisms that would enable us to have a smoother transition for people moving from one to the other, so that there is something where the diversity looks a little less stark. Can you tell us about other countries and systems that manage integration better than we have done?

Professor Ellen Hazelkorn: That is absolutely the issue. We have tended to be very unclear about what we mean by further and higher education. The boundaries between them have blurred over time, and the groups of people we are talking about have blurred. The exact issue you are pointing to is what for a long time the OECD has talked about as tertiary education. That term was displaced by higher education. The word "tertiary" is coming back into vogue, and we are thinking a lot more about that.

I would look at New Zealand, which is quite interesting. They have run a very large public consultation on the reshaping of the tertiary landscape, and produced a wide range of papers on it. Obviously, there is the Scottish experience, where they have one integrated council for that. I wrote a report for Wales, and currently the Welsh are involved in doing

that; they have a consultation paper out at the moment for what they are calling the Tertiary Education and Research Commission. They have a detailed technical paper out for consultation with legislation coming up next year.

Lord Burns: Do any of those countries come close to having a single funding arrangement?

Professor Ellen Hazelkorn: Yes; that is exactly what they are doing as well. In the US, where community colleges have the FE role—there are pluses and minuses about how they work—18 states have a single governing structure. The SUNY—State University of New York—system is a good one to look at; it is one of the largest systems per se and covers, I think, two research universities, plus other four-year colleges, community colleges and hospitals all within a single system. It allows the system to put its arms around the whole thing and look at articulation between different parts of it. It looks at student mobility and flexibility.

Parts of Ontario are looking at these issues too. Ontario has a commission on flexibility of transfer of credits, which is another issue. Students can accumulate credits and move on to another institution. In the US, nearly 50% of students are transfer students. There are examples of the way it works. There are pluses and minuses, but it is certainly a big issue on the agenda.

Q103 **Lord Turnbull:** Can I come back to schools? One of the points made about the UK system is that people specialise very early; in particular, they can drop maths very early on and, having done so, they find that various technical options are closed off. It is claimed that only 20% of students have qualifications beyond GCSE in maths. Is the UK unusual? It is said to be unusual, but do you believe it is also unusual in our lack of training in numerical ability, all the way through to 18 and beyond?

Professor Ellen Hazelkorn: Literacy and numeracy are certainly big issues. We have been looking at an OECD PIAAC report. Even for students who graduate from college or university, the percentage of those who have very poor literacy and numeracy is still in the 20s. That is an issue for the whole educational system. I would not lay the blame just on A-levels; it is an issue about the education system as a whole, but certainly A-levels are narrow and allow a high degree of specialisation. I come from the US system, which is on the other side of the spectrum. There is almost a smorgasbord of programmes that you take in high school. You follow that through into university, so the systems are coherent in themselves.

Lord Turnbull: But in that smorgasbord is maths one of the things you have to do and then you can choose lots of other things on top?

Professor Ellen Hazelkorn: In the US system?

Lord Turnbull: Can you drop maths pretty early on?

Professor Ellen Hazelkorn: You can drop maths after your third year of high school; you do not have to follow through. There are lots of things we want to put into the curriculum, and we need to work out what they are for both primary and secondary. Certainly, maths is one of them; coding is another. The more we add to the curriculum, the less room there is for other things, but the view is that educational studies should be as broad as they can be going into secondary, to open up the options, because we need our citizens to understand a broad range of issues. Think of our understanding of climate change, which the Government here have indicated is a big issue. The ability of our citizens to understand that requires a breadth of understanding in the school system.

Lord Turnbull: Dr Hancké, in your first intervention, you used the word "authoritarian" in a context where a choice is being made quite early about where one child goes and where another child goes. That was exactly what our 11-plus was like. People hated it and that was why it was eventually got rid of, principally because if they went down the technical route it was regarded as very much inferior to what they could otherwise do. Do the choices involve going to a different kind of school, or is it a different course in the same school?

Professor Ellen Hazelkorn: It is a different kind of school.

Dr Robert Hancké: Both can be true. We just had lunch with a bunch of German students and we were discussing this, in the knowledge that I was going to talk about it here. They were at school 10 years ago; some of them said they were in the same school. What is important is that German schools reproduce social inequalities in exactly the same way as many other educational systems, but they have one big advantage: if you are in what would be considered, in the language you just used, an inferior segment of the school, your life chances do not necessarily suffer as a result, because, first, you acquire the necessary qualifications to do a job afterwards; and, secondly, that arrangement is policed by collective bargaining systems and trade unions, to make sure that your life chances stay at a high level. That is not necessarily dramatic.

Lord Turnbull: If, at the end, the decision is taken by the school that their son is going down that line, parents do not feel angry about it.

Dr Robert Hancké: No. It is nothing compared with what you talk about here, if I may put it like that. There is not pure joy.

Lord Turnbull: We met a group of students. One thing they said to us was that, once you indicated you wanted to go down a non-university channel, people lost interest in you. You were definitely opting for, or being pushed into, something inferior, with, eventually, inferior life chances.

Dr Robert Hancké: Here?

Lord Turnbull: Yes; whereas I think in the German system, even if you

go down that route, they look after you pretty well.

Professor Ellen Hazelkorn: Yes and no. It has a different status within society. You cannot manufacture a new status in a different country. It is policy learning, not policy copying. The term “non-university” has fairly widespread use. Generally, we do not describe people as being non-something. In the past few days, we have seen where that got us. The difficulty is that describing institutions as “non” is not a good start.

The other area is that the vocational side has tended to be less well funded; it is for a less academic and lower socioeconomic class, so it has been class-defined from the beginning, with fewer resources and poorer outcomes. It is very difficult to remove that status. The big issue is how we look at further and higher education systems as having equal value and different ways forward. We need to start from that premise as to how we can move forward. Indeed, there are people who take university degrees and then go on to take a vocational qualification. We need both.

Q104 **Baroness Harding of Winscombe:** I would like to take you back to your earlier comments about lifelong learning. I take the view that, as we look forward over the next 10 or 20 years, the fourth industrial revolution, the digital revolution—call it what you will—will drive the need for significant lifelong learning for whole cohorts of 20, 30, 40, 50 and 60 year-olds. I am interested in your view on what policy interventions you think we should be considering to stimulate and encourage that in the system.

Professor Ellen Hazelkorn: I am really big on the idea that we have to look at further education for 25 years-plus and people in their 40s, 50s and so on. I put the issue in the following way. My grandchildren are quite young; they are four and five. They will live into the next century. That is quite mind-boggling. The way in which we look at the education system needs to be able to cater for people for the duration of their changing lives. It is not just 10 years; we are looking much further ahead, and educational systems are quite slow to change. If you are thinking of doing something, you need at least a 20, 25 or 30-year horizon. That horizon, even with the demographics that will hit most western European countries—Ireland is a bit of an exception at the moment—hides the ongoing issue of people coming in and out of the labour force.

We need to look at the education system from both the university and FE side as providing many more opportunities for retraining. I do not necessarily mean people coming in for hobby education or deciding to take literature; I am talking about a range of different types of retraining programmes. Types of funding opportunities for mature students are a big issue. They are less likely to be mobile. Fees may be an issue, but there is also maintenance if people take programmes. This is an issue to some extent in Germany, where employers have largely abandoned the idea of training their staff. They may train them within one employment, but the person may not want to be in that one anymore; they may want to train to move to a new field. Who provides that training?

People with families and other life commitments are largely abandoned. There is very little funding for them. In this country, that kind of funding has been reduced. In the Irish case, it does not really exist. A new resource allocation model has just come out from the Government in Ireland. It is going to prioritise adult and mature education, but, by and large, that group has been ignored. That is a problem in many countries that have adult education. It is about funding and looking at the types of programmes offered and the delivery models. It is looking at greater connectivity. A consortium of institutions might work together to provide sets of programmes that are more viable and attractive. It is a package of issues within a wider look at the system.

Lord Sharkey: When we talked to students, a lot of them were more concerned about their maintenance loans than about tuition fees, for understandable reasons. Have any other jurisdictions had the experience of replacing maintenance grants with loans, and, if so, what happened?

Professor Ellen Hazelkorn: The Welsh have just done that. The Diamond report that came out in Wales coincided with the report I wrote for the Welsh Government. That is exactly what Diamond recommended. They are looking at €1,000 per student, with additional money based on income. They have preferenced maintenance rather than tuition support.

I agree with you; maintenance is a major issue. Even where there are loan schemes, maintenance should be part of the system. Whether students are mobile or are still living proximate to their home, maintenance tends to be one of the biggest issues. Even in the Swedish case where tuition is free, maintenance is not, and students have huge difficulties with debt because of that. You might have a look at the report that has just been written on Wales.

The Chairman: On that note, I thank you both very much. We have not managed to cover all the questions we would have liked to cover, but, if we may, we will write to you and perhaps you could respond to some of the other points. We have covered a great deal of ground and we are extremely grateful to you for coming to help us with this inquiry. That completes this part of the session. We can now hear from the employers how they respond to one or two of the points you made about training.

Examination of witnesses

Martin Donelan, Martin Hottass and Nigel Whitehead.

Q105 **The Chairman:** Mr Hottass, Mr Whitehead and Mr Donelan, thank you very much indeed for coming to give evidence to us today. You have observed how we proceed.

Could you briefly outline the main priorities for training and recruitment in your respective organisations?

Martin Hottass: Thank you for the invitation. I am head of skills for Siemens in the UK, and I am also one of our expert team members for vocational and technical education globally. I am responsible for the Middle East, Africa and Europe, so, hopefully, I can contribute to the conversation.

For Siemens in the UK, the main driver is continuous learning and development of our staff to execute our mainstream business. We are a conglomerate and we operate in a number of engineering and science sectors. As such, we have a relatively big order book that we need to execute. For that, we need to continue to upskill our existing workforce and attract young people into our business to execute our orders profitably. The digitisation agenda is of course gaining in importance, but at the moment it is an add-on to our existing portfolio rather than the main driver.

Nigel Whitehead: I am chief technology officer of BAE Systems, but I have spent the last decade running our defence businesses in the UK: submarines, ships, military aircraft, armoured fighting vehicles and munitions. We have some 33,000 people across the UK, and that population is swollen by apprentices; about 7% of our population are apprentices.

Our priorities are essentially to find the right human capital: the raw material we can bring into our organisation and train and develop continuously through their working lives to produce the most complex machines conceived, developed and built anywhere on the planet. We do that directly from the education system, and we recruit apprentices and graduates each year. We have done so for decades. Typically, we recruit twice as many apprentices as graduates.

Martin Donelan: I am from Rolls-Royce. The themes are similar. We probably have three or four key priorities. One is that we are hiring quite aggressively right now for areas of our business where we are experiencing growth, or foreseeing growth three, four or five years out. In our civil business, in particular in Derby, we have quite big hiring plans under way. We have a drumbeat of what I call demographic replacement hirings. Rolls-Royce is quite a long-service business; people have long careers. We need to service our needs when retirees leave us, to keep the skills pool refreshed.

That leads to the third of the four priorities, which is that we are very active in what we call the early career recruitment and development area covering graduates, interns and apprentices. To give you the order of magnitude, this year in the UK we will be looking for just over 300 graduates, which is up 20% on last year, and we have 370 or 380 apprentices. That is close to 70% up on last year, so there is real growth in apprentice hiring.

Finally, there are the things we need for the future. The business is changing and evolving, and we need to keep track of some of the new skills we will need in time. That is particularly the case for us right now.

Electrical engineering, digital and IT are growth areas for us. The other area is new manufacturing technologies as they come on stream. For us, those are things such as composite technologies, new materials and some of the new additive technologies that are coming along. We need to factor those in, knowing that they are coming, and start to develop and train for those kinds of things. Lifelong learning was mentioned. We invest heavily in developing our existing employees, because they have the same challenges in keeping fresh and keeping their skills up to date for the future.

The Chairman: Having set out your objectives, do you think universities are providing a suitable supply of people to enable you to realise them?

Nigel Whitehead: The universities, in part, and further education colleges in conjunction with employers create the apprenticeships. The ratio I gave of two-thirds apprentices and one-third graduates reflects the way we feed the organisation. The talent that comes out of universities is a great starting point for what we then do with our employees, developing them to become employable and make a contribution in our complex workplace.

We get great people from the school system on the apprenticeship schemes. Increasingly, they have great English and maths, computer skills and communication skills. It is a good starting point. We then invest in 42-month apprenticeships. That is three-and-a-half years of pretty difficult training to get them to a position where they can slot into our workplace and make the contribution we need them to make.

The education system in the UK works for us. As a multinational company, BAE Systems chooses to set up its business in the UK; it services the needs of UK customers. About £4 billion of business goes to the UK MoD, but we also use it as a base from which we export about £4 billion a year. We develop intellectual property in the UK that we can exploit in many geographies around the world. The UK is, therefore, seen as a great foundation on which we can generate that intellectual property.

Q106 **Lord Sharkey:** Can I ask about the general provision of technical education in England compared with other countries? We have heard evidence that England is extremely peculiar—presumably in many ways—in the sense that it concentrates on graduate tertiary education at the expense perhaps of technical education. Do you experience that yourselves, and is it your general experience elsewhere?

Nigel Whitehead: Within our company, I have experience of how it operates in the US, Australia and increasingly in Saudi Arabia. The UK is unusual in that it puts such emphasis on higher education. However, that effect is largely masked when it comes to our recruitment process. We are oversubscribed for our graduate programmes by a factor of 36, and oversubscribed for our apprentice programmes by a factor of 15. We therefore get to choose the best of the best. In many cases, we pass applicants to our suppliers and business partners when they are not

successful with us, because many of them would make the grade. As we recruit something like 800 or 900 people in early careers every year, that level of oversubscription means we have choice.

If I was to make an observation, by and large the UK is not producing enough people at the intermediate level through apprenticeships, and has overemphasised higher education, which has led to high levels of underemployment in the workplace, although not in my company because we deliberately will not do that. Overall, I think there is a case for rebalancing.

Martin Hottass: I would mirror that. We operate in 191 countries. I am responsible for apprenticeship provision in a number of those. In the UK, we have an inadequate supply of graduates with the right skills in engineering technology for our business as a whole, but, more importantly, we do not have enough people leaving further education with engineering subjects. That leads to the side-effect that we recruit people with academic qualifications to technical roles for which they are not equipped. This is something the Committee has outlined already.

I chime exactly with what Nigel said. We need a greater supply of high-quality apprentices to the system. The ratio he outlined is exactly the same for Siemens; it is about two-thirds apprentices and one-third graduates—about 150 and 80 a year. Our provision is also oversubscribed, which allows us to select the best. If I was running an SME, I would probably have a completely different experience.

Lord Sharkey: Like Mr Whitehead, do you share the view that the provision of intermediate technical skills is deficient?

Martin Hottass: It is not for a big business, because we have a brand name and we can attract, but, in general, yes.

Martin Donelan: I share that view. Clearly, we benefit in the UK in that we have the gold standard of the university degree route. It can also become almost a default standard. Some people who may be much better suited to more technical vocational routes do not think about them, or do not get advice to look at those opportunities. We are blessed that we are cushioned from that a bit. We have a very good brand in the market for what we do, so we can attract well. We can attract international students, which gives another dimension.

There is a point about lack of parity of esteem. There are still disappointing numbers in gender diversity in our hiring. Last year, our graduate intake was 22% female; our apprentice intake was 17%. Those are probably pretty good statistics in the sector, but it just shows what opportunity is being missed by people not thinking about this as a stretching, rewarding career route and ruling themselves out, or not getting very good advice somewhere about ruling themselves in.

The Chairman: Who is responsible for that? Is it the schools or the parents, or is it the employers for not going into schools?

Martin Donelan: It is a systemic issue; it is all of that. We all do a lot of outreach work to get into schools to try to do our bit. We have set the target of reaching 6 million people through our STEM outreach activity by 2020. We are on track to do that, but where do young people get their advice these days? Teachers are a big influence, and careers teachers, if they have them. Parents are a very big influence, as are peers. Probably the two big things we do are internships and work placements, so that people can see what jobs are like in places like ours.

The Chairman: Do you use social media?

Martin Donelan: We do, and we need to get much better at it.

The Chairman: It is hard.

Martin Donelan: These days you see young people walking around with communication devices in their hands. TV is another one. How do you get into homes and parents? That is a route in. They are very powerful influences. There are some not always very well-informed views about what those routes are about and who they are for.

Baroness Harding of Winscombe: You talk brilliantly about your graduate and apprenticeship programmes being oversubscribed. Where are the skills gaps? Where do you struggle to find people to fill vacancies, or are we lucky enough to be talking to three businesses that are able to recruit at any level in any function?

Martin Hottass: We can recruit. We are big businesses and because of that we have a relatively flexible reward mechanism, but it is difficult. We would prefer to grow our own, but the supply is not enough, especially in electronic engineering and its digital derivatives. Some of it is down to the systemic issues Martin talked about. For example, entry requirements for universities typically include physics at A-level. It is difficult to teach that; many schools do not teach it, which automatically excludes people from the marketplace. There are some attempts to put education on a better footing, for example with Raspberry Pi computing and coding in primary schools. That is great and they are the right steps, but we need to look at how we can make entry to further or higher education equal for everybody.

Nigel Whitehead: There are some areas where we have to create proactively the supply. Nuclear engineering would be one of those; systems engineering is another. In particular, systems engineering might not be so intuitively attractive to people who have not been exposed to it. We have had to work with the education system to come up with great courses and sponsor people through them, and, therefore, satisfy our demand. In that sense, it is fair to say that all the engineering companies are proactive. We do not wait for problems to arise.

Our outreach process goes into schools in the communities around our major sites around the UK. Every year, we make our schools roadshow available to 130,000 people. We do that in the late primary stage before

maths and science get difficult, giving them a reason to want to study them when it gets difficult. It is a slow burn, because it takes the best part of a decade before those individuals apply to us as either apprentices or graduates. Doing that and making our schools roadshow heavily biased towards waking people up to the gender opportunity, in particular to appeal to young women who want to do engineering, has a profound effect on our recruitment. Our numbers are now at over 30%, whereas the national average might be 12%, because we have targeted those messages in schools, in particular girls' schools.

Q107 Baroness Harding of Winscombe: You have talked entirely about recruiting people at the beginning of their careers, whereas I look forward to the next 10, 20 or however many years. The digital skills you talk about not being able to find we will have to build in the whole of society, not just in people who are under 21 today. Do you agree that lifelong learning is something we need to crack as a society? If you do, who should be driving it? What are you doing in your businesses, and what do you think society should be doing to help you?

Martin Hottass: I agree. Our apprenticeships are all-age programmes. We have apprentices who are not just at the beginning of their career; we also have career changers who go through a formalised education programme that leads to qualification and then a full-time job. All of us only hire to retain, which is important because there is a moral contract between the learner or the person who changes their career and the employer, such that, if they perform to the level required, they have a career with us. I think we all do that.

With our workforce of 14,000 people, the most difficult part of my job is to make sure that we keep their knowledge current and give them lots and lots of opportunities to develop. Ultimately, all our competitors have similar equipment, but what makes us unique is how we use our human capital, if you will excuse that term, and we can do that only if we keep people's curiosity alive and give them different learning opportunities and deployments to different parts of the business where they may not have expertise, but, because they bring a different perspective and a different skill set, they enrich our overall competitiveness.

Nigel Whitehead: We have the same approach. We have a large workforce but we constantly need to refresh. We have internal mechanisms in the company where every function has a "Developing You" website where people self-assess. They can take a series of courses online, or specific training courses provided by specific providers, to help improve their skills. On average, our employees get about five days of training a year throughout their professional lives, but that might be intense. It might be a month of specialist training to achieve levels of capability. We have to do it for our workforce all the time, starting at the most basic levels in some cases, with literacy and numeracy, and at the most profound levels of peak leadership and management skills at the other end of the scale, but the majority of it is around technical skills.

Martin Donelan: We have the same view. The reality is that, with new technologies and with businesses changing, roles are changing all the time. New roles are coming along that we had not even anticipated. The roles we have are going away because we do not need them any more. Once you put all that effort into hiring really good, capable employees, particularly in knowledge-based industries where they develop a feel for the technology and so on, it makes good sense to keep investing in helping those people evolve and grow with you.

Like my colleagues, we invest a lot of money in the training of our population. The bit that is often understated, but where I would almost double the money, is that in places such as ours most of the learning goes on with individuals sitting next to very skilled people who teach them. That goes under the radar a bit, but in places such as ours a lot of that goes on all the time. Very skilled people help others to learn their profession and come through.

We also see a role for professional institutions. A very big issue for them is continuous professional development. We support people in joining institutions, using them to keep their skills fresh in the wider environment, build networks and keep in touch with what is happening in their profession.

Lord Turnbull: Can you clarify the entry level for apprentices? Is it 16, 18 or 21? What is the typical age? Where do they come from? Is it from school or FE?

Martin Hottass: In our case, the distribution is skewed heavily towards the younger age range of 16 to 18. We have about 60% to 70% per annum in that age range, but, like British Aerospace and Rolls-Royce, we have a school outreach programme that starts at primary school. We also have a free website with the whole STEM syllabus for all the nation states on it, which anybody can download and use; it has all the teaching materials on it. That is our contribution to keeping STEM alive in the UK.

We have learners who are 30 or 40. Typically, they are people who change career or who may have been made redundant and wish to acquire a new skill set. With the advent of new technology, there is an opportunity to use that. To use a historical example, when wind power came to this country 10 years ago we had an awful lot of service leavers who did fast-track apprenticeships at Siemens to become service technicians. They had skill sets that were relatively close to what we needed, but they did not have the full skill set, so we put them through an apprenticeship. We also have people who leave professions where they do not see a future and wish to become part of the digital journey. They go on a formalised programme through an apprenticeship.

Lord Turnbull: Is the principal age group for you 16 to 18, Mr Whitehead?

Nigel Whitehead: In our case, yes. Three-quarters of our apprentices come in with five good GCSEs at 16; the other quarter comes in to do

degree level apprenticeships at 18. What a fantastic package that is. We pay for them to get a degree. They work while they learn; they have no student debt and they sort out all their behavioural stuff ahead of the graduates who come in. They will never look back. I was the product of such a process, courtesy of Rolls-Royce, when I was that age.

Lord Turnbull: Is it the same for you, Mr Donelan?

Martin Donelan: It is absolutely the same. In the past and from time to time, we see apprenticeship as a great way of training or retraining mature employees, and we will continue to do that. We have had some issues with the brand. The more mature employees think that apprenticeship is a young person's thing. You have to explain that it is a great way of learning. If it has the kind of academic stuff people need to do a bit of off the job, and the on-the-job learning with a qualification to go with it, it is good for anyone. It is a really good way of developing skills.

The Chairman: Mr Whitehead, what did you mean by behavioural stuff?

Nigel Whitehead: The workplace is quite a complex environment, and it is difficult for anybody to know how to make a contribution to a project that may have 12,000 people working on it. Learning to work as part of a team is important. Being able to communicate clearly within that team and present your ideas, interact with people without harassing them and bring your skills to that team in a way that other people find acceptable is really important.

Being able to arrive at work at half-past seven in the morning, ready to work and focused, fed and able to stand at your bench all day, study all day, or interact as part of the team all day, and make that contribution every day and grow your skills and capabilities and be receptive to the feedback you get, are the sorts of behavioural things we look for. When we select from our oversubscription, we look for those innate capabilities, and that is what we bring into our organisation. By the time they have been through their apprenticeship, they have those things sorted out; they are ahead of the rest of the pack and they never look back.

The Chairman: You might find a job down at the other end of the building, but that is another matter.

Lord Turnbull: It is a wonderful description of what is not the university student world.

We are conscious of the fact that we are talking to engineering royalty. All of you have apprenticeship programmes way in excess of what you are actually paying into the apprenticeship levy.

Martin Hottass: No. Obviously, I cannot speak for my colleagues, but the size of our respective organisations means that we pay a very high levy. In the case of Siemens, we will only start to recover that tax fully in 2020. We recover it now. Like BAE Systems and Rolls Royce, we have a 42-month apprenticeship programme. We have about 650 learners. We

currently have 500 in the scheme who started over the last three or four years. There is a timing issue; there is a lag in recovery of the levy. There is no opportunity fully to recover it until there are no residual learners in the system.

Lord Turnbull: Does that change the incentives for your companies and elsewhere to find people you can call apprentices, or are you basically doing all the things you did before the apprenticeship levy came in?

Martin Hottass: Apprenticeships have been part of Siemens since its inception and we will not change that. Where we change, or utilise new apprenticeship standards as they become available, is with the advent of degree apprenticeships, because they give us an additional way to market and they give young people a different choice. They can have a classical university career, which has a lot of benefits but also a lot of disadvantages; they can have a classical apprenticeship, which may not be right for them, or they can have something in between. We utilise that and a form of apprenticeship for reskilling where appropriate, but we will not “game” the system because we believe in doing it in the right way.

Lord Turnbull: You are not taking graduates and calling them apprentices.

Martin Hottass: No. They will be in a degree apprenticeship programme and they will have two-thirds vocational learning and one-third curriculum.

Lord Turnbull: In general, do you or people in other business forums you go to think the system is going to work, or does it still have to be refined?

Nigel Whitehead: The apprenticeship scheme that I work in thinks it is a good idea. It has put the whole issue of apprenticeships very much on the map. Those of us who already have schemes expect to recover our levy, notwithstanding the time lag in the system. I paid £7.5 million this year, and a proportion of that last year pro rata for the number of months the scheme was running. It will be the end of 2019 before I get that back from the system, because it is time phased. I just have to accept that. We will recover that money and we will use it wisely, but it will not change what we are doing and how we are doing it.

That will not necessarily be true for the 8,900 businesses in my supply chain, 2,500 of which are SMEs. They look at the accessibility of the schemes and try to work out whether they dare commit themselves to an apprenticeship not knowing whether they will be able to attract some of that levy funding to fund their activities.

Martin Donelan: Unfortunately, there is a lot of bad press right now saying that the system is not working. It is a bit early to say that. All sorts of things are going on that are entirely predictable. People who are not used to doing apprenticeships are probably still a bit confused and trying to work out how they can benefit from them. Others are just slow

adopters; they are waiting to see whether it works. There are probably others, like ourselves to a degree, who understand apprenticeships and are used to doing this kind of thing, but, as the system changes, we have to adapt and work out what we want to do and how best to respond. That will be going on as well.

The key drivers are those we spoke about earlier. Our apprentice numbers are driven by our planning needs. What kind of people do we need in the future? We know that an apprentice hired now is not competent now. We are looking at three, four or five years' time. What do we need from people in the organisation? That is our key driver. Funding, standards and that kind of stuff is part of what we have to deal with to do it.

The difficulty is how you cost an apprenticeship. For us, the all-in investment cost per apprentice is close to £100,000, but we factor into that salary while they are there, because they are not effectively delivering what a fully skilled person would deliver for those three years; they are learning, rightly so. There are lots of costs around the infrastructure you have to hold to recruit and develop apprentices and use your brand to find them. That takes investment too. There is the cost of all the supervision you have to do when they are with you in the organisation. Loads of extra costs are not funded through the levy. It contributes. I would say that the chances of our fully recovering it are slim, unless we are doing very big numbers.

Lord Tugendhat: I was very struck when Mr Whitehead talked about getting to work at 7.30 am, fed, focused and all the rest of it. At your company, how many people who start as apprentices, as distinct from having gone to university, rise to the top ranks of the company by comparison with those who have gone to university?

Nigel Whitehead: This is a particular hobby-horse of mine. The answer is that those who come directly from school, often from backgrounds where you would not expect a great degree of social mobility, make up about a quarter of the most senior ranks in our company. Many of my managing directors, who run multibillion-pound businesses around the UK, started as craft apprentices filing at the bench, and have continued to learn. They consider themselves to be apprentices now; they learn every day. It is a mindset. It is probably the greatest vector for social mobility in the UK. Large businesses take people from around the sites where they operate, and work with pure talent and potential. In any meritocracy, that talent comes through. It is one of the most inspiring things in the workplace.

Lord Tugendhat: That is very interesting, and it marks you off from a number of other sectors. A man called Dennis Weatherstone, a Brit, became head of JP Morgan in New York. He began as an office boy in London at 15 and rose to the very top, but I think that now it would be inconceivable that anybody could start at that level in financial services, for instance, and rise to the top. What you say is very interesting.

The Chairman: When you say it is a quarter of your senior staff, what is that relative to the number of graduates? Does it mean the apprenticeship route is proportionately more?

Nigel Whitehead: I am talking about 1,000 people in the UK who are in those senior leadership grades. Of those, 250 started as apprentices on our sites.

The Chairman: I understand that, but I am trying to get information as to the relative balance of success compared with the numbers who come as graduates. I suspect they do rather better on these numbers.

Nigel Whitehead: In our expectations, there are more rungs on the ladder and therefore it is remarkable. The rest of that population is made up of either direct-entry graduates coming into our graduate scheme or people we have recruited in the market thereafter, who are typically graduates.

The Chairman: You have not quite answered the question.

Nigel Whitehead: Perhaps I misunderstood it.

The Chairman: What I am trying to get at is this: if a quarter of your senior management came via the apprenticeship route, what is the ratio of the number of apprentices you started with compared with the number of graduates? I am trying to find out whether the apprenticeship route as a proportion is a more successful route to senior management than the graduate route and, if not, what the relative balance is.

Nigel Whitehead: The balance would be that two-thirds would be graduates and one-third would be apprentices. In that sense, it is not equal. The graduates are more successful, but in relation to the starting point, given that the people we are talking about typically start with five GCSEs, it is more remarkable that they have climbed so many rungs on the ladder to get to those points.

The Chairman: If they were equally advantageous, you would have a third rather than 25%.

Nigel Whitehead: We would. To complement that bit of information, 60% of our apprentices, after their apprenticeship, go on to further qualifications, and about 15% end up with first-class degrees.

Q108 **Lord Tugendhat:** To what extent do you think apprenticeships can solve the shortage of people with intermediate skills?

Martin Hottass: If you define intermediate skills as three to six GCSEs up to an undergraduate qualification, which the UK needs for the majority of its workforce in the future, I think apprenticeships will play a major role. That is the only way we can get sufficient supply into the system. The advent of degree apprenticeships will probably blur university education somewhat. Without a doubt, we will always need master's students or graduates who have excellent academic skills and excel at

research and development. No organisation can survive without that, but bachelor degrees might migrate more into the vocational technical route over time.

Martin Donelan: I would not like to say that they absolutely have the potential to solve the shortage. There are still lots of things around it that will impact the extent to which that happens. You are back into a whole range of things around the quality of teaching. For us, it is about the availability of good STEM teachers through to careers advice. Whether people are going to get balanced advice that opens up those options is something to look at. Those need to be in place as well. The apprenticeship concept is a really good way of solving the issue.

Lord Tugendhat: Do you feel that the schools provide a sufficient standard of education appropriate for embarking on an apprenticeship scheme?

Martin Donelan: Broadly, yes. We may be a little privileged because we target really capable people and we tend to attract them, so it might be a bit of a skewed view. To the extent that we see anything that surprises us, or things we would hope were better, some apprentices need the input of extra learning, in mathematics in particular. For some of the mathematical demands of their apprenticeships, we have to help them reach a higher standard. With our graduates it is different. They are pretty well suited, other than the need to adapt to the work environment. If anything, we need to do a bit more with our engineers on the practical application of their academic knowledge. For years, we have run something called a design and make project. That gets them to take their theories and knowledge, and cut metal and work out how to solve problems, which is probably something they do not do as much of in university as we would hope.

Q109 **Lord Darling of Roulanish:** This is a question I put to the previous witnesses. What is the transmission mechanism between industry, and what you want as industry, and the people becoming available through FE colleges, schools or universities? As you know, the Government have the target of 3 million apprenticeships. We have seen some evidence that the figure was plucked out of the air, because three sounds better than two and it was good for the manifesto and all that. Do you think those numbers are realistic? How do we decide about skills? The German example is quite interesting; ours is not like that. I was wondering how it works.

Nigel Whitehead: This is a large and complex area, so I will paraphrase it to get the conversation going. There are two markets in the UK. There is the regulated skills market on which typically the Government spend about £2 billion to £3 billion each year; and there is the unregulated market.

Lord Darling of Roulanish: Could you explain the difference?

Nigel Whitehead: The vocational skills market is further education colleges producing people with a vocational qualification, such as HND or HNC, labelled in some way that apparently makes them employable. That system has been running for many years. The other model is where employers do not wait or mesh with that system. Typically, they are spending £40 billion a year generating the skills they need for their businesses through private providers, often without awarding qualifications associated with that.

The sadness is that the two systems do not really mesh. There has been some work in the last half-decade to try to make the whole system employer led. Where that works, employers have good relationships with local further education colleges and universities. They work with them on the syllabus and on the selection of people to go through those courses, and as a result they end up getting what they need. That is not a complete demand signal from the entirety of business and industry.

Lord Darling of Roulanish: Can you give an example of where it works and where it does not?

Nigel Whitehead: An example of where it works would be Furness College, next to the Barrow facility in Cumbria where we build submarines. We have worked very closely with that college. You could say that we are the principal employer in Barrow and, therefore, it would be in their interest to listen to us.

Lord Darling of Roulanish: It did occur to me.

Nigel Whitehead: Indeed. The reality is that they have worked with us to a point where we are happy to put our apprentices into the college knowing that the safety culture in that college, for example, will align entirely with what they would expect in our workplace, so there is no negative training or negative learning associated with their time spent outside our factory gates. That works well. We have worked with the syllabus and the college provides what we need, so we are in lock step.

Other colleges, which it would probably be rude to name, are less interested in providing something so bespoke for particular companies. They tend to produce something that they think is good for the market.

Lord Darling of Roulanish: Why? I can see that as a company you would be reluctant to name them, but as a matter of public policy it would be quite good to know. I do not want you to end up falling out with the people you work with.

The Chairman: Perhaps you might want to write in confidence, Mr Whitehead.

Lord Darling of Roulanish: What about Mr Donelan and Mr Hottass? What do you have to say to that?

Martin Donelan: I go back to the starting point. For me, a target of 3 million is quite arbitrary, and partly risky. There are so many things

that come under the apprentice umbrella that you could probably get to that target just by badging lots of things as apprenticeships. It would just be counterproductive. To go back to other things we said, you could confuse people about what apprenticeships are and what good ones look like. With a target such as that, unless you police the standards well and how they are applied, there is a risk that you could get poor provision that gets you to the number but does nobody any service whatsoever.

Martin Hottass: I am German by birth. My A-levels are German, so I went through the German educational system until I moved to the UK in 1989. I can give you some sort of comparatives. The biggest advantage of the British system is its flexibility. English apprenticeships done well are no worse than their peers. I am more than happy to have my apprentices stand up and be counted against any German apprenticeship schemes or Swiss apprenticeship schemes, which arguably are the most celebrated apprenticeship programmes globally.

The flexibility of the British system is very good when it comes to applying new technology and creating occupations, but it is also its biggest problem. The flexibility means that we have a provider market where there is more than one awarding organisation that can give a qualification, and that leads to inequalities. About 900 engineering qualifications are available. A big employer such as Siemens has somebody like me who does this for a living, but for smaller organisations it is very difficult to choose what is right, and, because it is driven by price, there is sometimes a race to the bottom rather than to the top.

In all other countries, with the exception of former colonies and Commonwealth countries, there is only one awarding organisation and it is typically run by the state. That gives stability. The German system has been stable for 150 years, but its downside is inflexibility. For example, in the UK there are 14 to 15 new occupations in digitisation with prescribed routes as to how school leavers or career changers could become qualified and have a career; in Germany, there is not even one.

Lord Darling of Roulanish: How would you reconcile those differences? You suggest that we may have too many and the Germans have too few.

Martin Hottass: Ironically, it is a societal issue. An education system is based on the society it serves. The answer for Germany is probably right, although I suspect it will give the country problems in the future, because it will not be able to respond to a changing environment quickly enough. In the UK context, we need some stability. We now have the Institute for Apprenticeships, which is an independent body. We should give it some time to become embedded and not change horses midstream all the time. I have done this job for six years; I am on my eighth Skills Minister and the sixth policy. That is the nub of it.

The Chairman: When we went to Birmingham, we talked to employers. One of the things that slightly surprised me was the number of standards for apprenticeships that were being compiled and the timescale to achieve them. Is that an issue, and how could it be resolved?

Martin Hottass: I am on the panel for the Institute for Apprenticeships, so I take the blame for that.

The Chairman: That is why I am asking you the question.

Martin Hottass: In the early days of apprenticeship standards, we had no policy or guidance, and decisions were made ad hoc, which led to a proliferation of standards. Now that we have the IFA, we will probably find that it goes back to a manageable system. For example, in mechanical fitting there are five different standards that were compiled by five different groups of employers because those were the rules at the time. With the IFA and a framework in place to manage the system, we will get to a point where we have the right level of qualifications of the right quality. Quality is the main thing.

We have enshrined the length of an apprenticeship in law. My personal opinion is that a year and a day is too short. The period of learning comprises academic learning, and, in our case, a period of time in a training centre to make people safe and give them basic skills, plus experiential learning in the workplace, so in my view we should extend it to two years. That would also drive out a number of the bad behaviours we alluded to, where people can make a return on their investment quickly by putting hundreds of people through a quasi-apprenticeship. That is not in the engineering sector, but there are 14 other routes, some of which have had a bad press.

Lord Sharkey: Is the problem not even worse in FE in general? There is a proliferation of qualifications that are difficult to decipher and confusing, and there is no overriding body to do anything about it.

Nigel Whitehead: In the broadest sense, yes. The last time I counted, there were 19,000 recognised qualifications in the FE sector in the UK, of which 1,780 constituted 90% of the actual turnover in qualifications—people qualifying. There needs to be a cull. I was involved in recommending a cull of those qualifications. The concept Martin was highlighting will bring that under a degree of control, in that, unless you have an approved standard, you will not be able to recover your levy. That will focus people's attention. It is a healthy mechanism.

You catch us at a moment when there is a bit of frustration in the engineering sector because there has not been a standard agreed for engineering apprenticeships since last April. We are working to achieve that with the IFA, sorting out some fundamental approaches on who is qualified to accredit and how the accreditation is to be done. Is it going to be done through continuous assessment? Is it going to be done by an endpoint assessment? Those issues will be crunched over the coming weeks and months. You catch us at a moment of frustration.

Lord Darling of Roulanish: Mr Whitehead, earlier in your evidence you referred to two sorts of apprenticeships. One is where colleges produce people with qualifications they think the market wants. You contrasted that with employers deciding what they want. As regards the first

category of students, one of the things we are interested in pursuing is what choices are being made available to students, and how informed those choices are.

Are you saying there is a risk that a student could go along to a college, be trained up with a certain qualification and believe they will get a job at the end of the day, but could find themselves in a position where, although the college authorities thought it was the right thing, employers in the area might say it was not, because they wanted something different? Therefore, the student ends up spending time being trained in something for which there is no demand.

Nigel Whitehead: It is not just a risk; it has been a reality for decades.

Lord Darling of Roulanish: How widespread is the problem?

Nigel Whitehead: It is across the country and it materially affects people's lives. Employers scratch their heads wondering why it is going on.

Lord Darling of Roulanish: This takes me back to the earlier questions I asked you. There is presumably no mechanism between firms such as you and FE colleges, or whoever might be doing this, to say, "There is no point in turning out students with these qualifications because they are of no use to us", or any formal mechanism between you and the Government to say, "Why are you funding all this, directly or indirectly, when it is not what we actually want?"

Nigel Whitehead: There has been no way of sorting out the national arithmetic on that to match supply to demand. Where it is done, it happens by people entering into a coalition of good will to say, "Let's see what we can do".

Lord Darling of Roulanish: You mean on a local basis.

Nigel Whitehead: Usually, yes.

Martin Hottass: For my sins, I am a college governor. It is a voluntary engagement of local industry with a college of choice, but this is where the marketplace comes in. In the north-east of England, where I live, people are lucky that in Newcastle there is a choice of five colleges that offer engineering to the right standard. In London, it goes down to one college. There is no mechanism that would allow us to have systemic improvement. The Government's approach of putting it through local enterprise partnerships may work to an extent, but, if you want to implement the industrial strategy, you need a root and branch review.

Lord Darling of Roulanish: It is quite a big hole in the system.

Nigel Whitehead: Yes.

Lord Layard: The previous witness—of German descent—was asked by us how we could deal with the shortage of intermediate skills, which is so

glaring in our country. He said we should not try to follow the German example, which is the apprenticeship route, because it depends so much on the social institutions of the country. He asked why we did not go down something more like the French route, which depends more on full-time education than a part-time link to an apprenticeship. That is a widespread view. I think it is fair to say that that was the view of Tony Blair, for example. Now we have had that view coming up again in the form of the Sainsbury proposals and the T-level.

I wonder whether the remarks Mr Whitehead just made will apply equally to the T-level, which is an attempt to solve the problem by full-time education. Is your advice to us to give priority to the part-time route, where college education is linked to an apprenticeship, rather than college education preceding whatever employment experience a student might have?

Nigel Whitehead: My personal view is that there is no substitute for genuine work experience in the workplace, being trained while you are employed. If we think we can substitute for that by adding something to the education system, we are missing the point. It may be that the T-levels help individuals better prepare for what then becomes their apprenticeship and world of work, and I would encourage that. It may bridge the gap between the bottom rung of the ladder and where they start. That would be a good thing. Equally, the university technical colleges that are being established will help the apprenticeship pipeline. We are enthusiastic about those, but they are no substitute for being in the workplace, being trained.

Martin Hottass: I agree wholeheartedly. The T-levels are a good attempt to get rid of the 960 different qualifications in engineering, or the 17,000 that you counted. The big risk with T-levels is that the guided learning hours, which are the academic content, are relatively low. They focus predominantly on maths and they rely on employers providing work experience.

The main business for the average employer, and I include Siemens, is to keep the infrastructure going to provide goods and services. Our main raison d'être cannot be to provide work experience to T-level students. Vocational education that consists of a blend of academic learning and basic skills acquisition in a safe environment, typically a training centre, followed by two years of on-the-job learning where people can practise those skills, is the way forward.

Martin Donelan: I share Martin's view. It is right that we should benchmark every system and try to find out what is good about it. It is hard to lift systems out and transplant them. We recruit, hire and train in all sorts of countries. I have yet to see one that has a monopoly on talent. We find talented people everywhere. The only thing I envy in the German system right now is its stability and consistency, which would go a long way to help here.

T-levels are a really good idea. To go back to what Lord Darling said earlier, with T-levels you have to be in a close partnership with industry to be able to deliver them. They are vocational in concept, and there is a big piece about getting work experience with employers. Delivering institutions and employers will have to become very close on that if they are to be a success. The challenges of delivering up front 45 days of workplace-based learning will take a lot of partnership. The system is still not a formal one, but it will force the industry-education partnership, and that is really important.

Q110 The Chairman: Mr Whitehead, a few moments ago you referred to UTCs. Lord Baker gave evidence to us about the UTCs and was extremely enthusiastic, and the figures for their ability to get people into jobs were very impressive. He implied that they were not being encouraged with as much enthusiasm by the Government as he would like. When we went to Birmingham and met some students from a UTC, one of the things that came out—a point Lord Turnbull brought up earlier—was the idea that there was not the same enthusiasm on the part of teachers and others for the UTC route. From your experience, which was described earlier as royalty in engineering, it would be interesting to know whether you think they should be encouraged and how they could be encouraged.

Nigel Whitehead: I have already nailed my colours to the mast by being actively involved in UTCs in Portsmouth, Medway and Humberside, and we see our company being involved elsewhere as well. UTCs bolster the apprenticeship pipeline. For many people who at the age of 14 do not necessarily mesh particularly well with the traditional education system, a UTC can be the very outlet that causes them to re-engage.

Many people who start on our apprenticeship schemes are there because it is their second start—their second chance—because they did not mesh with the school system. They are often brighter than everybody else, but it just has not been going fast enough for them and they have disengaged. The UTCs offer a fantastic opportunity. Many teachers I have talked to who have become involved in UTCs are fantastic converts; they are evangelists for them because they see the light being switched on for a large cadre of people who otherwise might be left behind.

The results speak for themselves, in the small number of NEETs coming out of the UTCs, the greater number going into university than the national average and the employers soaking up the opportunities with youngsters coming out of those schemes and moving directly into apprentice schemes. I for one am very enthusiastic about them. The trouble is that they are not happening on a big enough scale to have the national effect they need to have.

Martin Donelan: For us, it is the same. We are very supportive of UTCs as a concept. We are currently actively supporting six across the UK, and we are very active in ones that are close to where we have a big population, in particular Derby. In Derby, it is helped by the fact that there is a hub and network of engineering companies and a tradition in the area for those kinds of skills. That helps with people esteeming that

route in the locality. Referring to Nigel's point, in part it is about big companies nailing their colours to the mast and saying, "We think it is the right thing; we are engaged with it and we will support it". To a degree, you have to go that route, because some of the things we do and need require quite heavy investment in kit, machinery, teaching skills and so on. The UTCs are well positioned to build the facilities that can deliver that.

Martin Hottass: I agree with the comments of both of my colleagues. We have been supporting them since 2012. We support seven UTCs in the country, but, as has been said, to do it properly you need to engage, and that requires a lot of resource from a company's point of view. The results, however, are very good. We are partners in Humberside, where we have a shared specialism.

For me, the biggest problem with UTCs is that they take students at the age of 14. I have had this discussion for a number of years: it would be much easier to make the proposition to the parent, who ultimately makes the decision, that students should join a UTC at the age of 12. If they go from a primary school to a secondary school, or from a middle school into a secondary school system, they have had two years with their age group in one school and then they are asked to leave to join a different school that has a longer working day and fewer holidays, and is run more like a business. That is a really difficult proposition. It would be much easier if the transition came two years earlier.

The other problem is that I have never met a secondary head school teacher who was prepared to let any student go, because obviously they get outcome payments. Typically, it is gifted students of difficult subjects such as STEM who go and they do not want to lose them. Especially in the early days of the UTC movement, it was a very difficult proposition.

Lord Turnbull: One of the problems is that head teachers do not want to lose their capitation payments. If you go to 12, you are effectively reinventing the missing gap—the technical schools in the Education Act 1944 that never got going. It may well be the right thing to do.

The Chairman: It might be a tad controversial.

Lord Turnbull: It would be about convincing parents that the outlets from those schools are as good as going to what would be the local comprehensive.

Nigel Whitehead: This may be out of sequence, Chairman, but given your collective enthusiasm for the subject, I will open the doors and allow you to meet our apprentices. I will welcome you to look round our facilities, meet the apprentices and bring the whole thing to life. It is quite a dry subject unless you meet the people involved. They are just wonderful.

The Chairman: We have quite an innovative scheme where we invite a number of different people. We have done it with students, and we did it

with some people from the UTCs when we went to Birmingham. We want to do it with people doing apprenticeships. Each of us on the Committee sits down with half a dozen of them and they talk. I have to say that when we went to Birmingham, although there is a lot about this subject that is depressing and there is a lot to be done, it was very stimulating to hear from youngsters who had been through UTCs and were doing apprenticeships. We found it quite uplifting.

Nigel Whitehead: I am only a phone call away. I am happy to open the doors and let you come to see us.

The Chairman: Thank you so much. On that happy note, I thank you for what has been a really interesting session, and congratulate you on everything you are doing in this area, which is very encouraging.