



Education Committee

Oral evidence: [Supply of teachers](#), HC 199

Wednesday 8 June 2016

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Written evidence from witnesses:

- MillionPlus ([SOT0017](#))
- Royal Society of Chemistry, Institute of Physics and others ([SOT0016](#))
- Design and Technology Association ([SOT0051](#))
- Gatsby Charitable Foundation ([SOT0043](#))

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Members present: Neil Carmichael (Chair), Ian Austin, Michelle Donelan, Marion Fellows, Suella Fernandes, Lucy Frazer, Catherine McKinnell, Ian Mearns, Stephen Timms.

Questions 96 – 158

Witnesses: **Dr Robin Bevan**, Headteacher, Southend High School for Boys, Essex, **Dr Jane Courtney**, Head of Education Division, School of Law and Social Studies, London South Bank University on behalf of MillionPlus, The Association for Modern Universities, **Professor Sir John Holman**, President-elect, Royal Society of Chemistry, **Andy Mitchell**, Curriculum Director and Assistant Chief Executive, Design and Technology Association, and **Charles Tracy**, Head of Education, Institute of Physics, gave evidence.

Q96 Chair: Welcome to you today to the second part of the inquiry into the issue of the supply of teachers. Today we are going to be focusing on two key issues. The first is the relationship between continuous professional development and the recruitment and retention of teachers. The second one is the quality of the Government's data on teacher supply, retention and quality, because we need to be absolutely certain of the facts as we see them.

Could you introduce yourselves and say briefly who you are representing, starting off with Charles?

Charles Tracy: I am Head of Education at the Institute of Physics and I am representing the Alliance of the Institute of Physics, the Association for Science Education, the Royal Society of Chemistry, the Royal Society and the Royal Society of Biology.

Andy Mitchell: I am Andy Mitchell. I am the Deputy Chief Executive of the Design and Technology Association, which is a subject association supporting design and technology teachers in schools.

Dr Bevan: Dr Robin Bevan, Headteacher of Southend High School for Boys, a real maths teacher as well. I am here because I foolishly made public comments about teacher supply, but also I am a national executive member of the Association of Teachers and Lecturers representing school leaders throughout the country.

Dr Courtney: I am Dr Jane Courtney. I am Head of the Education Department at London South Bank University and I am here representing the Deans of Education Network, MillionPlus, which is an organisation supporting post-modern universities across the country.

Professor Sir John Holman: John Holman. I am President-elect of the Royal Society of Chemistry. I was founding director of the National Science Learning Centre and I am chair of the Teacher Development Trust. I am representing the Royal Society of Chemistry today.

Q97 Chair: Thank you all very much indeed. We have an hour to get through about six key questions that we think are relevant to this whole debate.

I am going to start off. Several witnesses to this inquiry criticise the education sector for not having a clear CPD framework for teachers and not being entitled to development opportunities. Why is that? Why would people be criticising the profession in that way and is it justified? John, would you like to start?

Professor Sir John Holman: I assume we agree the premise that precedes that, which is that we do have shortages in recruitment of certain categories of teachers, particularly in STEM subjects. The critical determinant of shortages is retention as well as recruitment, so this is about incomes of new stock and how to get a steady state sort of situation going. Therefore, I infer that the Committee is interested in the link between CPD and retention. I think it is excellent that you are because you can be much more cost effective by improving the retention rate than by having to keep recruiting and training new teachers, so it is great that you are getting to look at that. Maybe at some stage we will talk about the evidence for CPD having an effect on retention, which I strongly believe it does.

To answer your question directly, Chair: are there shortfalls in the availability of CPD for teachers around the country? The answer is yes. But in the case of the sciences, and indeed in all cases, it is the subject specificity that you need to think about because it is possible to have generic professional development and it is possible to have subject-specific professional development. By and large, schools put a greater emphasis on generic things like behaviour and supporting special needs—very important things. There is less of an emphasis on subject-specific development. Certainly, the National Science Learning Centre has found that when they want to recruit teachers for subject-specific professional development—chemistry, physics, biology, mathematics or whatever—it is harder to get

released from their schools for that. I think it is important that we talk about subject-specific development today.

Q98 Chair: That is an interesting point. I wonder if you think there should be more focus on the subject and I assume from your comments that you do.

Professor Sir John Holman: Sorry, could you—

Chair: More focus on the actual subject—the subject-specific training—as opposed to the generic?

Professor Sir John Holman: Yes, that would be my view. This is not to diminish the importance of generic training such as behaviour and special needs. Obviously it is hugely important, but you can do it through a subject. It is perfectly possible to train someone in chemistry, provide professional development in chemistry, but within it give them information, guidance and training in how to do better with their behaviour management, just to take one example.

Q99 Chair: Robin, you are a maths teacher so—

Dr Bevan: It is interesting because I am going to take John's point and I am going to expand it a little before bringing it back in. If I had been the first to answer your question I would have given a slightly different answer, so I am going to give that straight away.

Once again we can come back to specific evidence and sources of evidence, but I am going work from the EPI studies, which are probably one of the more authoritative. We know that if you want to have an impact on pupil outcomes then the CPD that you need to have in schools has certain characteristics. It needs to be sustained and the duration is 12 to 18 months. It needs to be collaborative, based on real problems—and this is where the subject-specific stuff comes in—that teachers are facing, and involve some degree of choice or at least agency. The teacher needs to be an active participant in what they are doing. It needs to involve external expertise and it needs to end with some kind of solution-focused understanding. I do not wish to spend too much time on that but those are the broad characteristics.

If you now jump from that to the real experience of most teachers in most schools, you fail on almost every single one of those counts. That is the key problem because nearly all—and I am going to be a little mischievous in my description but I think it is fair—CPD currently being provided is driven by regulatory or statutory frameworks, so that is curriculum change, Ofsted, Prevent training. It is of that kind, driven by that. It is transitory and very rarely designed to bring about permanent change. It is about how to accommodate the latest thing, to be brutal, and it is profoundly inefficient as well, in the sense that you are bringing large numbers of people together to effect minimal change.

To jump back to the motivation in your question, we know that the teacher effect in classrooms—the extent to which the teacher has an impact on pupil outcomes—is about 20% of the effect; most of it comes from socio-economic background. That is not causative, that is not that constrained, but we know the teacher effect is about 20%. If we spend time on CPD that is related to transitory, regulatory, temporary elements we have an

impact within our teaching cohort of 1%, 2%, 3%. We are wasting our money—that is the bottom line.

If you shift the CPD in schools so that it is related to teachers' professional autonomy and professional expertise, and related to their classrooms, which is where the subject-specific component comes in, and so that your principal interest is their efficacy as teachers—notice that wasn't anywhere in the list of what is actually happening—you have the capacity to transform the experience of CPD and to increase autonomy for those teachers. I am going to finish on this, which is the next twist of it.

Chair: If you could.

Dr Bevan: Yes, understood. The next twist of it is that we know that when it comes to retention of teachers, professional autonomy is the single biggest controlling factor. You have this kind of wonderful blend of things that link together if you get them right. I will stop there.

Q100 Chair: Thank you very much. Jane?

Dr Courtney: If I had answered your question I would probably have come in slightly differently as well. One of the criticisms at the moment has come about because of the brevity of initial teacher education. It becomes briefer in terms of the university element or the academic professional element that builds professional autonomy. I think the particular issue here is primary, because primary has been shoehorned into a secondary model. A secondary person might have to get subject-specific training in perhaps one or two subjects, with all the professional understanding, but in primary we are trying to train people to cover 16 or 17 curriculum areas. If we look at some of those areas, we might be sending people out into the system with as little as three hours' taught input in a subject like PE. Interestingly, then what schools have to do, because they know their staff are undertrained, is provide either CPD for PE—and I think the Government have started to address this with primary school PE specialists—or they provide coaches. This brings back some of the points. If you provide coaches, children are getting fragmented education. A little bit of coaching from this coach, a little bit of something else, and you have no holistic progression and continuity. That is the first point I want to make.

The second one is around teacher educators. There is a complete silence on it in all the reports that have come out. The first thing I do is ask, "Well, where are the teacher educators?". I do a lot of work in many different countries where I am looking at how we upskill teachers. In a lot of the countries I am in, they certainly do not have the skills because the teachers are underqualified, with not much training themselves. The first question is, how do we upskill teacher educators—where are they? We have teacher educators in this country. We have to find them and we have to do something about it to make sure that their expertise is not lost. I guess the attrition rate is similar to head teachers. That way, we are focusing on how we create quality CPD.

Q101 Chair: A short contribution, Andy, because we have six questions and we are only on question 1.

Andy Mitchell: I will be very brief. We do an annual survey of provision and we asked a number of searching questions on CPD in connection with that. In the response, we found that 70% of CPD that our members were getting was generic and only 30% was subject specific. What is really worrying, though, is that if you ask them what top five priority areas D&T professional development needs and their department needs, they seem to have been convinced that those are planning and assessment, improving examination performance and key stage 3 planning. Those all reached over 50% in the survey, whereas there is a desperate need in respect of many others, such as new technologies, electronics, computer-aided design, manufacture and control. We now have written into the national curriculum new GCSEs that children have to learn about in which they use programmable components. The vast majority of design and technology teachers know nothing about that and they do not have the expertise in schools to either train themselves or, more worryingly, take up the responsibility to train new teachers. What is going to happen is we get perpetuation of recycling the old, and none of the new technologies and the knowledge about new materials and ways of working are infiltrating the practice in school, even though it has been written about and required by documents like the national curriculum.

Finally, the reason why it is worse now and it was never quite like that before is that we used to be able to rely on major centres of research and development, which tended to be universities. Loughborough, Nottingham Trent, Keele, Exeter—all of those that I have just listed have now withdrawn from initial teacher education, and with them have gone the staff who used to rub shoulders with the engineers, the art designers, the chemists, or whoever it was, to develop that expertise and lead the CPD.

Q102 Chair: Good point, well made. Charles, do you have anything? I am slightly relieved about that because I have a supplementary that loops this up a little bit. Given that you need the right culture and the right attitude towards CPD in a school, and there needs to be some direction of who does CPD and the type of CPD given, are we saying that we need the right kind of leadership or that the leadership needs to be formed within the school to direct that CPD? John, would you like to comment on that, briefly?

Professor Sir John Holman: I do not want to take time away from my colleague.

Chair: Charles?

Charles Tracy: I think that is essential. You mentioned the word “culture” and that is at the heart of all of this. There needs to be a culture in schools, in the school system, that when people have finished their initial teacher education, that is the beginning of their learning rather than the end of it. They have a lifetime of professional learning ahead of them, whether it is in physics, how to talk about physics to children, how to manage a class or deal with children with special education needs. It is just the beginning. We shouldn’t assume that they are coming into the system with all the physics knowledge that they need; they can always get better.

I completely agree that part of that is head teachers modifying their approach to CPD. They should think of teachers as professional people who they are going to develop, rather than a resource that they are going to use up and dispose of a few years later, so when someone arrives at their school they will need to have further professional development. It will, of course, help them locally as well as nationally. If they provide a culture of professional development and professional support for their staff, the staff will stay in the

school and it works for them as well as the national system where they will stay in education.

Chair: Thank you. Does anyone want to add to that quickly?

Dr Bevan: A very quick one. First, I think we have a situation in which many school leaders do not know what high quality CPD can look like, so I think there is an issue there about modelling it. The second is that because we are in a difficulty in relation to professional development in schools, what ends up happening is that new leaders come through and replicate the bad practice. The third part of it is I think we need to be acutely aware of the displacement effect that comes every time there is significant assessment reform or curriculum reform. Andy gave us a list and the reason his D&T teachers are saying that is because they are yet again having to go through a process in which nearly all their planning, preparation and development time is being swallowed up by curriculum reform. Certainly that is the context in my own school in which it is incredibly difficult to do CPD that relates to improving teaching performance, pedagogic CPD, because nearly everybody is spending all their time preparing for—and forgive me—a shambolically introduced new curriculum at GCSE and A Level. Shambolic is a polite word.

Chair: Yes, thanks Robin. Don't worry, we do not want any swear words. John was going to make a contribution.

Professor Sir John Holman: I think we need to acknowledge that the changes we are talking about are not going to happen overnight. It would be really good if this Committee and others could set a direction of travel over five to 10 years. It is a long period, but by the end of that time horizon the teaching profession could reach a standard of professionalism that matches that of, for example, medicine, the law and accountancy. If that happened, the retention of teachers would be improved because that feeling of professional standing that has been referred to would be enhanced and also teachers would be attracted into it because they would see themselves entering something that truly was of professional standing. Professional development, CPD, is part of that.

Q103 Chair: Can I ask you one question, and yes or no is the answer: do you think the College of Teaching proposal that is being developed is the answer to that in part?

Professor Sir John Holman: You wanted a yes or a no and the answer is yes, but there are some qualifications that we might explore later on.

Q104 Chair: Thank you. We are going to have to move on to question 2, if you don't mind. Jane, do you have one little contribution?

Dr Courtney: One little point, to build on what colleagues have said. A lot of CPD has become superficial, with a three-hour session here or there, whereas a lot of research would say that a teacher needs a minimum of 30 hours' cyclical input with practice in between to make a difference to classroom practice.

Chair: That is the culture issue that I introduced and Charles saluted earlier.

Dr Courtney: Yes.

Chair: Just finishing your point, John, you can be absolutely sure that this Committee will be thinking strategically. We believe as a Committee that is absolutely essential as an underpinning to any proposals.

Professor Sir John Holman: Good.

Q105 Suella Fernandes: On the provision of CPD, I have been a barrister for 10 years and there was a diversity of providers of CPD, all subject to a national accreditation framework. It seems that in teaching, it is either the higher education institutions that provide it or now schools or multi-academy trusts. What do you think should be the right balance of provision of CPD and how should it be delivered?

Andy Mitchell: The first point I would make has been stated already, but it is this business that just because you are a good teacher and you have lots of experience of teaching in schools and maybe in being a subject leader, it does not necessarily make you a good teacher educator. There is a real craft to doing that. Your practice needs to be informed by research and you need to be up to date and so on. The culture of schools does not facilitate that because the majority of teachers are spending the vast majority of time doing just that: teaching, preparing, assessing and so on.

Working on their own, they do not make the best providers of CPD. That is not to say they can't, but what needs to happen is we need experts from outside, particularly in areas that require new subject knowledge. Again, using my own subject areas as expertise, some of the qualification that I acquired over four years studying at Loughborough University all those years ago would still be very relevant if I was back in the classroom. If I had not made it my business to keep up to date and not been able, through my career, to engage with professionals—mostly university-led CPD or local authority-led CPD—I would not have been able to do what I did in the classroom. It is possible for it to happen in school but it needs to have injections from outside, so we need bodies outside. Universities in the past have provided that.

Picking up on John's answer about the National Teaching College, I think it is absolutely essential there will be linking with subject associations who are the people who know where that expertise lies and with their consultants, many of which are local authority advisers, teachers who are doing things or people who are doing research.

Q106 Suella Fernandes: Isn't there an argument for saying that since there have been serious concerns raised about the quality of CPD and many concerns raised by schools, when new graduates arrive, what they have learnt at university is not relevant to what they are supposed to be doing in the classroom, but growing and maintaining your own in-school teaching and continual peer collaboration is very valuable?

Andy Mitchell: I understand that but in growing your own, if you are a gardener, you have to give it fertiliser every now and again, otherwise it withers. That is what is happening. The problem with graduates entering the profession is that they spend so little time developing subject knowledge. You have heard about primary: four to six hours for design and technology is not unusual. Even in the secondary one-year PGCE there is so little time now to develop subject expertise, whereas those graduates may be coming in from architecture, art and design, ceramics, engineering, microelectronics—a whole background—and they need much longer to develop that.

Dr Courtney: I guess to add to that, there has been an ideological shift in England—and particularly in England—to a practice-based apprentice type profession and now we need to question whether that is appropriate. In terms of the whole of Europe, it is shifting in the other way. There has always been a problem with how much teacher education should be theoretical and how much should be practice, but we have moved to a system—and I think again this affects primary considerably—with the idea that if you sit in a classroom and you watch a teacher and then you do what that teacher is doing, you will become a great teacher. That relies on you sitting with an excellent teacher in the first place, and that excellent teacher being able to move on your practice. Then if we are saying, with the brevity of ITT for starters, your student has gone in with as little as four hours’ design and technology, and they are taking that lesson with a teacher who has had as little as four hours and is now expected to be educating the new teacher. Within five years, this system is non-sustainable.

Q107 Chair: Robin, you wanted to say something and then Charles.

Dr Bevan: Two challenges to the way that you put the question. The first is the notion of CPD providers. That notion itself suggests that CPD has a particular form and the problem is the form. Within my own school we have done a lot of work on this; we are at the stage where roughly a third of the teaching staff have access to or have completed masters level training. They have been involved in a sustained programme of relationship with an expert that is focused on an issue in their own area of teaching. That is quite a different thing from giving me a two-hour update on a particular issue where I need to have a briefing. The question about providers is an interesting one but I think processes is the more important question and the role of external expertise. Whether that is coming through the subject associations or from HEIs, that is the next key piece. The biggest problem in the arena of providers are those who I refer to as snake oil salesmen who do fabulous charismatic presentations that essentially have no long-lasting impact or content.

The second part is you asked a question about growing your own. If I can use that analogy, I think the model of growing your own teachers has become a model in which what we are essentially doing is forcing the plants so that they look good for nursery shelves. What we are not necessarily doing is creating the hardy stock that is going to sustain, if the analogy works, over a number of years to come. This links with the point that I was intending to make later but could make now, which is about the fact that CPD need varies significantly in its form and content across the professional life of a teacher and the idea that the one year of training is sufficient to make a competent lifelong teacher is nonsense. That one year has to be an induction into a set of practices that predicate later growth, and then the CPD in schools needs to provide for that growth. I can talk more about that later if needs be.

Q108 Chair: If we have time. I think Charles wanted to have a quick contribution?

Charles Tracy: I fully take on the point that there are many forms of CPD, but if we stick with the external expert for the moment—and that may be someone who is at another school, it may be school-led CPD as you have mentioned—there is a need for quality assurance. It could be that that is the place that we start to build the culture of professionalism by building a culture of professionalism among CPD leaders and providers. We know what good CPD looks like: it is described in the submissions to the

expert panel on CPD and it will come out in the standards, I would imagine. We know what that looks like and, as professional bodies, we know what good physics, good chemistry, good biology looks like and we are also chartering organisations, so we charter professional physicists. If there is a person who holds themselves out as being a provider of physics CPD, they should reckon that they are a professional physicist and they should be chartered. We think that will be the beginning of a culture of professionalism in the system if the supporters and providers can show their professional qualification.

Chair: Thank you. Suella, have you finished your line of questioning? We have only half an hour and we need four areas covered, so pithy answers would be appreciated.

Q109 Lucy Frazer: I will roll all my questions into one, if that is helpful. It is a really interesting discussion and you clearly have a huge amount of expertise, so thank you. What I have heard so far from all of you, but particularly Andy and Robin, is that we definitely need subject-led CPD. We have heard that message loud and clear, so I want to ask about the other element of improving pupil outcomes. We are looking at teacher retention so I also want to explore how we use CPD, as Sir John mentioned, for teacher retention. For teacher retention, Sir John mentioned that it is necessary for there to be a professional feel, so that people will want to go into the profession, but is it more than that? Do teachers need to learn the soft skills about teaching through CPD or do they need to learn something else in order to want to stay in the job, not only to be good at teaching? That is my first question.

My second question is in relation to teaching in school. To the extent that we teach this in school, because there will be an element of CPD in school, how do we improve it in school? My third question is about timing. We have heard we need to do 30 hours in a year. Can we do that in holidays or does it all need to be in term time?

Professor Sir John Holman: I can pick up one or two of those questions, but obviously I will not cover everything. Those are three very interesting questions. I think you might have said the “softer outcomes”, the more generic outcomes that professional development would provide, and of course you can get them absolutely through subject-specific professional development. I have just been looking at a number of countries and how they teach science and it is very interesting. There is a huge emphasis in countries like Germany, Finland, the Netherlands and Singapore on the subject and how to be a highly skilled practitioner in that subject. Science is a practical subject and practical work is very important. You need a lot of very specific skills and a lot of confidence in order to do practical work well. One of the reasons why primary teachers do not do as much practical work as many people would like is that they do not feel confident about it.

It is that kind of highly specific skill that comes out if you are providing subject-specific professional development but, of course, an awful lot of it is developed in the initial training. Another thing you see overseas is that when the teachers do their initial training, a lot of it goes on in the physics department or the chemistry department of the university. There is a very fertile overlap.

Q110 Lucy Frazer: Are you assuming in this that teachers leave because they do not feel they are good enough teachers, rather than the pressures on them and the classroom behaviour and all those other things?

Professor Sir John Holman: The two are linked. If you look at what teachers say about why they are considering leaving the profession, it might be to do with behaviour, it is very much to do with workload, and it is to do with imposed requirements that they have no control over. If the teacher feels confident and has a high ability to do their job as they have to do it day-by-day, those factors are diminished in the teacher's view because they have the feeling, "I am highly competent in what I do". That is why I keep coming back to subject-specific development. Perhaps others might answer the other two parts of your question.

Andy Mitchell: I will try to put it all together in one answer, rather than three, and be brief. The point I might make is it seems to me that a lot of people think that CPD is something that is done to teachers, and it is not and you have already said it. They have to be very involved, obviously, but they need to take control of it, and need to feel that they have some say in what they engage with. In some countries in the world, New Zealand for instance, there is a requirement for you to take on that responsibility so that you have to, as your professional duty, identify for yourself what areas you want to develop and what you need CPD in. Then you have to get that signed off by, usually, your principal, head teacher, and so on, and that is what you are going to do throughout the year.

In, I think, 1988 Lord Baker introduced five days—the Baker days. In the early part of that, most of it was given over to departments to develop. They could use it and plan a year in advance for it, and I certainly did that when I was working in school. Now, most of those days get taken over by generic CPD and it is school led.

How can we improve it in school? One of the ways I would say is to give responsibility and make it a requirement that teachers do engage with CPD. Also, we need to make sure that there is appropriate CPD out there to access. For about 10 years, I ran a masters level programme for design and technology teachers around the country. That brought through hundreds of teachers who could learn from others on a sustained year-long course or a three-year part-time course.

That is the other thing about it—it is about learning from others. That is the big problem with ITE; you only have maybe two or three others in your group, if you are in a small School Direct model. You need to learn with others, but you need to learn from experts and be supported by online learning. Maybe we can come back to that.

Dr Courtney: I am building on those points, really. I think it is a mixture of entitlement and responsibility. There should be an entitlement, as there is in other professions, to CPD, because that is how you feel valued. We know from experience that when you have had good quality CPD you go back into the classroom with new energy, new confidence, and new enthusiasm. Why do most teachers we know go into the profession? They want to make a difference. Why do they stay there? When they stay there it is because they get the "wow" moments. They get those moments when kids light up when they have got something. It does not matter where you are in the world and how poor the system is—that is generally what keeps people there.

What is happening is those "wow" moments are getting fewer and fewer for the teacher, partially because of energy levels. It is a high-performance profession. You have to perform all day, and then if you are spending all evening accounting for your performance of the day, your energy is depleted for the next day. A lot of this is about putting

professional values back into the system and saying, “Look, our teachers are worth that. This is what they need in order to be those individuals we want them to be”. They have responsibility to keep themselves powerful and energetic in classrooms. We have to help them, because at the moment we are not.

Dr Bevan: You asked for the comments to be pithy; I will be as pithy as I can. The first thing to note is that about 70% of those who leave the teaching profession do so in the first three years. Clearly, a key component is about what happens in years two, three and four. This then links to Huberman’s work on teachers’ life cycles and the fact that we know that in the first few years of teaching the driver is survival—it is an incredibly demanding job—and learning the tricks of the trade, even if those tricks later have to be unlearned because they are not the right tricks, and just getting to the end. You get a period of survival, followed by a period of mastery that runs for a further three to seven years. Then, if all is going well, from about 10 years into the profession you get this fabulous exploratory phase, the phase that I am in. The fact that I love my job and delight in what I am doing is because I am constantly refining what I am doing and have access to the support to do it.

The reason I am saying that is because each of those phases needs different forms of CPD. Those forms relate back to your question about whether or not the teachers need only subject-specific work. It needs to be focused on problems they have. Those problems may or may not be subject specific, but it has to be real to their classroom, in the first few years focusing very much on the apprenticeship skills associated with teaching, later on developing into reflective and refining activities. I refer you to the work that showed that in schools that have the right culture, teachers continue to improve right through until 10 years. In schools that do not have that culture, teachers stop improving after about three years.

To finish, I assume you were being mischievous with your question about holidays, and I assume you know the numbers. The average secondary school teacher works 55 hours a week for 40 weeks of the year, 2,200 hours. If you divide that across the 52 weeks of a whole year that means that the average secondary school teacher works the equivalent of a 40-hour week with no break all year. If you want to solve this problem it has to be within teachers’ existing working hours.

Charles Tracy: I agree with that. I will pick up on the early-career teachers. We have been running a mentoring scheme with early-career teachers, and we think we have reduced the attrition rate to more like 30% or 40%, although the figures are quite small at the moment. If we look at the reasons why teachers are leaving teaching, top of the list is workload. There is a problem with adding to the workload, so it would have to replace something else if we are running CPD in holidays or in school time. We run a programme where we work with schools for two years intensively, mainly twilights, working with whole departments on their physics knowledge and pedagogy content knowledge, and we do run summer schools as well. Teachers are committed people; they will come out to summer schools and continue to learn the profession.

Q111 Lucy Frazer: Can I ask a quick follow-up question? I was really interested in your 70% figure. Sometimes when you start a job you realise in the early years that that job was not what you were anticipating. What proportion of that 70% can be solved by trying to

help people ease into the job, and do we know what percentage of that are people who are not suited to teaching?

Dr Bevan: I cannot give you a number, but I can give you a short observation. I know the focus here is retention, but because we have a teacher supply problem, certainly in my experience schools are frequently faced with selection from applicants numbered one or two. The result is that what you want is a filtering process that says, “I have given it a go, and it is not for me”. That should be happening during the initial teacher training and during the move from there to NQT, to the first year of teaching.

At the moment that does not happen. Almost everybody who completes their training and wants a teaching job gets one. A significant proportion of them should not. That is a very blunt statement. They are then in the system; some of them are part of the 70% who then disappear in the first three years; some of them stay in the system. Until you oversupply you will not be able to address that problem. All my understanding of teacher supply modelling is that it only ever models to meet the need, not to exceed the need.

Chair: That is a very interesting point, so thank you for making it.

Dr Courtney: Could I add to that because of the initial teacher education thing? I think teacher education institutions have become better and better at trying to recruit people into teaching who are going to make the grade, who are going to want to be teachers and be good teachers at the end. The problem they have is they are required to get 99% of the people that are coming in to “good” and “outstanding”. If you don’t, it means you are judged “requires improvement”, and if you are judged “requires improvement” you lose all your numbers and your department closes. Everybody is supporting students as much as they can, and we do put the support in, to make sure they are “good” and “outstanding”. When they get to the schools that support mechanism has gone away and they have to survive. Then the schools have to pick up the pieces.

Q112 Marion Fellows: Can I very quickly thank you for my wow moment this morning? I experienced it as a former teacher and I know exactly what you are talking about. It is wonderful to have so many committed people here to answer our questions. I am going to talk again about the demands for CPD relating to the Government’s basic changes in curriculum. Are we going to have enough CPD providers? To follow up on that quickly, I know that many subjects end up being taught by non-specialists. Do you think that PE teachers can teach geography or design and technology if they receive good subject-specific CPD? That is two things: are we going to have enough of them and, if we do and if we do enough CPD, can it enable people to teach what is essentially not their subject?

Professor Sir John Holman: I want to answer that from the supply or demand side. I think it is demand that matters, because if there is a demand from schools for high quality professional development then the providers will provide it as long as there is something that defines what the quality of good CPD is. I understand that the working party has been working to define professional development standards. I very much hope that they will be taken up, assuming that they are the right ones. I hope that the Government will provide incentives, because it is one thing to have standards there; it is another for schools and providers to have the incentive to follow them.

To answer your question, “Is there enough?”, I think it will be there, provided we have minimum standards and provided we have the demand from schools. At the moment the

issue is the demand from schools for professional development that is other than what you might call “reactive” professional development.

I will make one other point about non-specialists. This is particularly relevant to the sciences, because in the sciences it is much easier to recruit biology teachers than it is to recruit physics teachers. Therefore, a lot of physics and chemistry is taught by people who are qualified in biology. That is great, they might be outstanding teachers, but they might not know enough to teach that subject to GCSE, let alone A Level. Programmes to enhance subject knowledge, subject knowledge enhancement programmes, are very important. I understand the Government fund them for people taking them pre initial teacher training, but it is very important, after initial teacher training, to have subject-knowledge enhancement available. If you are a biology graduate, you never know when the head teacher is going to ask you to teach some physics or chemistry. Things change in the schools. Subject-knowledge enhancement and Government support for it is important.

Charles Tracy: I completely agree with that. There should be about 10,000 physics teachers in the system. We are probably 3,500 short, so about one-third of physics lessons are taught by a non-specialist. In some cases they can be retrained to be a physics specialist, but it is not a given that you can train everybody to be a physics specialist. Many of these people have not done any physics since they were 16. If they have an A Level in physics they are clearly at an advantage and they are suitable, certainly, for a pre-ITE subject-knowledge enhancement course or a post-qualification enhancement course. They make good physics teachers. Often they are evangelistic because they had a bad physics teacher themselves and realise what they missed out on.

Andy Mitchell: Not so long ago, 20 years or more perhaps, it was deemed that if you are going to move from being a geography teacher to becoming a design and technology teacher, for instance, you would take a one-year secondment and do a full-time course for a year. We have come a long way from there now to think that someone who has been doing up their house for the last 10 years, or is into car maintenance or something, can teach technology. No, it is not like that. I do not think that it is a matter of just because you are a good teacher you can teach anything. In certain subjects where subject knowledge is changing all the time, as I have already said and I am not going to repeat, you have to keep up to date. That does not work.

In terms of enough providers, we do not have enough providers. I am sorry, but in design and technology it is a major problem. The reason for that is the routes that have probably enabled people on the table here. I don't know, but certainly I worked through initially very quickly a local authority, then into higher education, to learn my trade in teacher education, to lead and develop others and undertake and lead curriculum development projects with teachers. To do that you need to learn your craft, if you like. In the days of the local authorities when there was a network of advisers, we would pull out teachers, and get them and support them in presenting and teach them how to run CPD. That has gone now.

Our consultants are very valuable and, as an association, we use them to help stimulate and lead CPD for teachers and respond to requests from schools. I would not like to guess the average age, but most of them are in their second retirement. As they leave, there are no young people coming through because there are no routes through to acquire those skills.

Q113 Ian Austin: I was very struck by what Robin said about how the year of teacher training should be an induction to the profession. Jane, I know MillionPlus was involved in looking at the length of teacher training with the DfE. Could you tell us a little bit about that and what came out of it, and should the length of that be extended, perhaps? Would that deal with this industry problem of 70%-odd of first-year teachers considering leaving?

Dr Courtney: I think that is a very good question. It comes back down to preparation. I am sure we can provide additional evidence about how much initial preparation different countries give to teacher education. I think this question comes from some uncertainties about how a qualified teacher status is going to be awarded in the future and even whether that badge of achievement will be at the start of the profession. From my own point of view, I think it is imperative that there is a clear marker at the end of the initial teacher training period and then there is a clear entitlement and framework for professional development that will take you forward.

At the moment, and I will talk again from primary, you give at best a toolkit. That is what you tell people you are giving them: “I am preparing you to be able to do the basics. In order to be an expert teacher in this area you are then completely reliant on having additional support in your newly qualified teacher year.” It is there in a sense. There was always half a day for people to have additional support, but that was through all these networks that people are now saying are no longer available.

As a teacher myself in London for 15 years, I did benefit from 10-day courses on design and technology, and I did go on and was able to lead in that area. The youngsters at the moment are not getting that steer. I guess what we are proposing is that we need not a very tight framework but a framework of entitlements with responsibility and that it is staged, as colleagues have been saying, at the different points of your career and different models.

We need to think about the mentoring, the coaching, as education as opposed to training. I think that is where things have become very blurred. You can train somebody to rewire a plug. It is not quite so easy to train somebody how to teach the concept of probability, and what that looks like from age five to age 18, and unpack it all. There has often been an assumption that because you are teaching children of five or six you do not require that much knowledge. Of course you do. You have to be able to unpack all your own knowledge stage by stage, misconception by misconception, all the way back to the beginning. You can't do it sitting in a classroom with one age group.

Q114 Ian Austin: At the beginning of that you mentioned something about international comparisons and countries where teaching is rightly regarded as a high status profession. That is an interesting issue I have not really thought about. What can we learn from that? In those countries is it about CPD, or is it about a whole range of other things? What is it in Finland or South Korea or wherever that makes teaching truly high status? Is it really that CPD?

Dr Courtney: I think it is a mixture of giving value. I have recently spent a month in Myanmar, which is just opening up, and the first thing that really strikes you is that teaching is considered one of the five jewels. Teachers are incredibly highly valued. Their system is the complete opposite end of the spectrum from ours. You do five years' training

to be a high school teacher that is totally theoretical. One of the things that people have picked on that is quite useful is that you are learning the subject and the pedagogy at the same time, whereas traditionally in our system you do an undergraduate degree, say in physics, and then you train to teach afterwards. Unless your undergraduate degree is giving you models of good teaching as well, which is where we get a disparity in the system, you are not learning how to teach. All the research says a teacher will teach in the way they have been taught.

I am studying how Buddhism affects pedagogy. It does. I go into a classroom, it does not matter where in the world, or who I see teach, and I can almost identify which country they have come from because they will reflect the values, the beliefs, the culture and the pedagogy of that country. That is why I would argue that people do need to develop this as a profession and spend more time on it and begin to unpack all those things.

Professor Sir John Holman: Could I add on the international point that you have to be very careful in making international comparisons, as you well know, not to just cherry pick the appealing bits and leave out the cultural differences. It is hugely culturally determinative. Singapore has a national religion called education. In Finland, it is deeply embedded in the culture and the history of the country, and that is why it is so great. If we want to go from where we are now to where we want to be, which is something more like Finland—a highly respected, highly valued, highly trained, very professional workforce—we have to do something about it.

We cannot change our culture overnight, but I think we can set a direction of travel that says we will, in time—and it could be five or 10 years—spend more time on initial training and more time throughout the teacher’s career adding highly-focused, high quality professional development that is relevant to them at that stage in their career. That would drive us towards the situation that we have in these other countries where teachers are highly respected and highly professional. It would take time.

Andy Mitchell: Just very quickly, I think what we have to do is think about teacher education as a continuum, not something that happens in initial teacher education and then you go and teach and you might get a bit of CPD. We do need a framework, and the two meet; they are staged. As has been said several times, teachers need different CPD at different stages in their career to take them in different directions within schools even. It depends which way you want to go.

It is possible to set that out for both generic and subject specific. In fact, that is what we are setting out to do at the moment. It is a blurring of where you get to on this continuum when you pop out of a system that says, “Okay, you have QTS to you and you can teach now,” to, “Later on in your career you are still learning.” You do not retire not learning, because in my area new technologies and new ways of doing things come on. You have to keep learning. I think we have to think of teacher education as a continuum.

Chair: Can we move on to the last question, please? Charles, you will have a shot at answering Ian’s question that he is about to launch into.

Q115 Ian Mearns: We have only just strayed into it there. I suppose the definitive answer we are looking for is: to what extent would a national framework and/or a national curriculum for CPD be useful?

Charles Tracy: It would definitely be useful. I think we talked earlier about non-specialists. There are two aspects to continuing professional development. One is getting better at doing the job you are doing. If you are a physics teacher you can carry on becoming a better physics teacher. But there are people who come out of teacher training as biology teachers and will be asked to teach physics. At the moment there is no way of checking, reporting, or knowing that, because when they have come out of initial teacher education they come out with QTS, qualified teacher status, in the near future, but there is no subject or level attached to that. They are not QTS in physics or in science. They are just QTS; they can teach anything.

Another aspect is accreting certification throughout your career so that if your head teacher wants to deploy you to teach physics to key stage 4, you should be trained to teach physics to key stage 4, and they should report on that. They should report on how many of their staff are teaching lessons that they are qualified to teach. That will be another driver of improving the quality of—

Q116 Ian Mearns: Does everyone agree with Charles's initial answer about the framework for the curriculum being useful? Can I add a second question before you answer, in that case? If it is useful, how should it be funded and who should design it?

Professor Sir John Holman: I think that brings us to the National College for Teaching suggestion that, if it came about in the way that it is hoped, then could provide that framework. They could provide a framework of expectations for teachers' professional development and for their professional status. Critically, what you need is a national standard for where a teacher is expected to be when they arrive. We might call it a chartered teacher.

Ian Mearns: Level 4, key stage 2.

Professor Sir John Holman: A bit higher than that, I think. I have been a head teacher, I have recruited a lot of teachers, and it is quite difficult to work out where the person that you are interviewing is in terms of qualifications. If we had a national standard that defined this is a person who has arrived, had sufficient experience, and so on, that is called a chartered teacher, that would make the head teacher's job a lot easier because it would mean that they did not have to learn every single subject variation. I think the College for Teaching has a place in this.

One last point about the College for Teaching. The analogy has been drawn with medical royal colleges. We have to remember the numbers. There are about 450,000 teachers in the country, and the largest medical royal college, the College of General Practitioners, has 35,000 members. The College for Teaching would have to be a very big tent into which would be clustered a number of smaller subsections, if you like. One might think of special needs specialists, chemistry specialists, physics specialist, and so on. I think there is a real opportunity within the coming College for Teaching, assuming it arrives, for subject associations like the Institute of Physics, the Royal Society of Chemistry, the Design and Technology Association, within that broad umbrella of the College for

Teaching, to be responsible for the professional standards of subject specialists within their specialty.

Dr Bevan: I want to answer your questions specifically and throw a few other things in. In the UK we do not have a capacity, as has already been said, to assess how well pupils do depending on whether or not they have a subject specialist or not. We cannot track that information in England. It has been done in American high schools. In American high schools they have shown that if, across the five years of high school, you have a non-specialist you end up a year behind those who have specialists. That is the Alabama dataset that tracks individual pupils and teachers. That is a hugely significant fact. It is not that those people are not doing a good job, it is not that some of the non-specialists are not better, but on average you are consigning a pupil to a 20% worse secondary experience if you are giving them a non-specialist.

We know that one in five secondary maths lessons in the country are taught by a non-specialist. In London and the south-east it is worse than that. I think the impact that has on people's learning is hugely significant and worth noting. National framework: yes to the proposal. It needs to be progressive, have accreditation, have status attached to it, and avoid being constrictive. You asked a specific question: who should design it? The answer is the profession because the profession must own it because, right at the moment, we do not need anything else that is thrust thereupon.

The final thought is about cost. I know that you have expert witnesses from the National Audit Office speaking shortly. It is the cost of not doing it that is probably the more potent question. As long as you are funding this process in which we train and then lose and train and then lose and train and then lose teachers, we are pouring money into a pipeline that would be so much better if that investment was going into a structure that people wished to come into and stay within.

Andy Mitchell: Very briefly, because I concur with everything that was said, it is needed. It sets up an expectation and gives us consensus on that expectation, which we currently do not have about CPD. It implies there is some sort of quality assurance process applied to it, which we do not have at the moment and is absolutely crucial. It gives a structure for providers and for schools working themselves to hang their CPD around and identify what they should be doing perhaps.

Finally, if you have quality assurance, there are obvious links to accreditation in there. In the White Paper, there is not much on even graduate teachers. We have had in this country before the notion of a higher degree educated profession. I would certainly welcome a return to talk of that happening as other countries do.

Dr Courtney: I think within that we need to consider childhood teachers, as colleagues have said, but certainly childhood teacher educators so that people know that they are getting people and they are not invisible, making them invisible in the system. Also looking at how the system is restabilised. Colleagues have talked about the loss of partners in universities because of allocation issues. It has to go hand in hand. The other thing it has to go hand in hand with is it has to be embedded into the profession. Therefore, you are thinking about your whole performance management systems that have been developed. It comes back to entitlement, so that people and managers know that their teachers are entitled, and to teachers' responsibility to engage with it.

Chair: I want to thank all five of you for some very enlightening answers to our questions. Some of the questions were answered in a different order than we expected but it was very good. John, I would like to write to you to flesh out of some of your thoughts on the College of Teaching, if that is all right. Thank you all very much indeed.

Examination of Witnesses

Witnesses: **Jenni French**, Programme Manager in the Education Team, Gatsby Charitable Foundation, **Joanna Hall**, Deputy Director for Schools, Ofsted, **Chris Husbands**, Vice-Chancellor, Sheffield Hallam University, **Mark Parrett**, Audit Manager, National Audit Office, gave evidence.

Q117 Chair: Good morning and thank you very much for coming to our session. I think you were all in the audience for the previous one, so you know we have covered CPD. We want to now get a proper handle on how we measure these things and where we go from there. Could you say who you are and what you are representing?

Chris Husbands: I am Chris Husbands. I am now Vice-Chancellor at Sheffield Hallam University, which I was informed this morning is now the largest provider of ITT nationally. Previously, I was Director of the Institute of Education until December 2015.

Jenni French: I am Jenni French and I am representing the Gatsby Foundation.

Mark Parrett: I am Mark Parrett. I am a manager at the National Audit Office responsible for our value for money work with the Department for Education and specifically responsible for our report in February on training new teachers.

Joanna Hall: Good morning. I am Joanna Hall. I am Deputy Director for Schools at Ofsted and I also have initial teacher education in my brief as well.

Q118 Chair: Very useful, and thank you all for coming along. The Committee has received evidence that the Government's data on vacancies is not representative of the real situation. Is that correct, Mark?

Mark Parrett: I think from what we concluded back in February, the Department has been focused on the national picture and has been approaching this from a national perspective. I think what is most important is there is a lot more to be done to look at the local picture and the pressures that schools are facing to fill teaching posts. The national perspective tells you one thing. It does not tell you enough about what is happening locally and I think that is the most important thing.

Q119 Chair: Do you think we should break things down into regions?

Mark Parrett: Whether it is regions or local authorities or another definition—if you break things down into regions, there is still significant variation within a region—yes, it should certainly be more local than it is now.

Chris Husbands: Schools are run by very clever people and by and large they cover vacancies, so what the data that comes out on vacancies tells us is simply the very small number of schools who are holding vacancies that they have not covered. That is quite

different from whether you are covering vacancies with, as people were saying in the previous session, appropriately qualified, appropriately trained people.

Jenni French: Yes, especially given that the vacancies are collected in November, by which time schools will have done something and there will not be a classroom without a teacher in front of it.

Q120 Chair: Yes, because it is a question of live time versus historic, essentially, and that is something that you would want to see perhaps more up to date.

Jenni French: Yes, and also think about collecting the data in a different way. One way might be to look at job adverts, for example, which I know TeachVac already do, but if you monitored the number of times people are advertising for positions, that might give you a good idea whether the vacancies are being filled or just simply covered.

Q121 Chair: Yes, but measuring the problem that Chris has alluded to, filling a post with somebody who is not necessarily fully qualified for that post, a temporary measure, is something else we would want to get a handle on. How would we do that, do you think, Mark?

Mark Parrett: There are various measures out there at the moment. We have the vacancy levels, the number of positions filled temporarily. Another significant indicator referred to in the previous session is the number of lessons that are being taught by teachers without a post-A Level qualification in their subject. That reflects, in large part, the choices that schools are having to make, and the extent to which that has happened is increasing. Between 2010 and 2014 it has increased from 14% to 18% for EBacc subjects. To put that in context, for maths, 20% is being taught by individuals without a post-A Level qualification. That is 99,000 hours, so it is quite significant. What we recommended is that the Department should talk more with the profession about pressures they are facing locally and then use that intelligence, together with data, to come up with solutions.

Chris Husbands: I agree with Mark. It is worth putting a footnote on that, which is that the data on no higher than post-A Level qualification normally completely excludes people who have taken subject enhancement programmes after and much later. There is a sense in which some of that data might be self-defeating, so I think you need something that picks that up.

Q122 Chair: Joanna, I was going to ask you about the difference between simple data and qualitative data, because obviously with your Ofsted hat on, that is highly relevant. Do you think that is an important question and, if so, how do we set about getting that data?

Joanna Hall: Yes, I think it is. In the last few years, through our “Unseen children” report, Sir Michael’s speech last year in June 2015 and most recently in our annual report, Ofsted has continued to raise concerns about the granularity of regional and local data about supply and demand and also our research in three regions that we looked at last year. When we spoke to head teachers in those regions, there was a very clear message that they were struggling to recruit for particular subjects and the picture on the ground supported some of the findings in the National Audit Office report earlier this year.

Q123 Ian Mearns: The Committee has been told that there may be problems with under-reporting of vacancies due to increased competition for teachers. How would it be best to incentivise and reassure leaders to share accurate information? Go on, jump in.

Chris Husbands: It is a really difficult question. Whoever wrote it needs a lot of credit. I am not going to answer your question directly, Ian. I am sorry about that. It is in the interests, for all sorts of reasons, of head teachers to be able to say that all their vacancies are covered and all classes are being taught. Schools are in highly competitive local environments. The consequence of that is that it is probably unlikely that you could devise a sufficiently granular local reporting system that picks this up. The local variables are too great. You would probably have to rely on periodic reports from the National Audit Office to tell you that at a less granular level. I can't realistically see how you would get to something that tells you what you want there.

Q124 Ian Mearns: But Mark has already told us that we know there are significant numbers.

Chris Husbands: Yes, he has.

Ian Mearns: 20% of maths lessons are not being taught by subject specialists and a rise from 14% to 18% of EBacc subjects are not being taught by specialist teachers. I think the crucial question is: how do we best incentivise and reassure leaders to share accurate information? Without that accurate information, it is very difficult to do national planning.

Chris Husbands: Agreed. To reframe it slightly, we have an incredibly diversified school system, with the emergence of school autonomy and MATs. It is much more diverse than when the system was administered through 150 local authorities. There is a root question I think for the Department, which is that in a diversified, autonomous system where does data collection sit? Who holds that responsibility and how is that responsibility discharged in a way that for planning purposes of the system intelligence, we have confidence in the data? I think what comes out of the vacancy stuff is tough, technical and very complicated, and we do not have it at the moment. At the moment, nobody is holding that responsibility.

Q125 Ian Mearns: For instance, we already know some of the best data available on teacher vacancies is not collected by the Department.

Chris Husbands: Precisely.

Mark Parrett: The data is published, so one way is to put it out there in the public. The second way is to challenge it; I do not know the extent to which it is being challenged. The third aspect could be the definition of what is being reported and I do know there are very precise definitions about some of this that may affect the way it is being reported, but that is a guess.

Q126 Ian Mearns: A number of witnesses for the inquiry stated that vacancy data might be the wrong measure to use altogether when estimating and planning teacher supply. What other measures could be used, do you think?

Jenni French: I think if you look at the school workforce census and start looking at how many lessons are taught by non-specialists, that ought to give you an idea of the need for

backfilling within the system. Then you need to start looking at teachers leaving the profession. I think that we do not know enough about that at the moment to know how many are leaving and how many, in turn, we need to train.

Q127 Ian Mearns: In your written evidence, you propose to use the A Level data to estimate the existing teaching workforce. Would you like to expand on that?

Jenni French: I think what I said was that you can use the A Level data as a proxy of how well a subject is taught within a school. For example, if a school is sending no pupils on to study physics at A Level, you could assume that physics has not been taught that well pre-A Level and wherever they go on to study on A Level, whether they are a—

Chris Husbands: The school workforce census tells you a huge amount. It gives you a snapshot. It doesn't necessarily give you very good planning data. When I was doing some work for the Department on this a few years ago, one of the questions I asked myself was: how is this handled in other countries? The answer is that nobody does this terribly well. Almost all countries, at that stage, were citing the teacher supply model in England as being a pretty good way of doing it. What we know is that the teacher supply model is flawed in a number of ways, but at a system level it is not bad. It more or less did what it said on the tin.

If you want to solve the problem at system level, look at other countries. They do one of two or three things. The first is they carry vacancies and assume that you are going to have non-qualified people teaching in the system. More or less, that is the sort of direction we may be going in. The second is that there are systems—Ontario is a very good example—where they are very happy to oversupply the market. The consequence of that is that Canadian MPs are perfectly used to their mailbags being full of letters from constituents complaining that their children do not have jobs in teaching, having trained as a teacher. But if you are oversupplying the market, you have to carry that. The third is you go for a very clear central planning model where a very activist ministry does an awful lot of detailed planning, and that is what is done in Singapore and also in Shanghai.

Ultimately, you end up with one of those three models: oversupply, carrying undersupply or very tight planning.

Q128 Ian Mearns: But given the levels of attrition that we have within the teaching profession anyway, oversupply would seem like a good thing to do, wouldn't it?

Chris Husbands: Oversupply is a good thing, and I read the evidence you took from the Minister just before Christmas. The view of the Treasury and the view of the Department has always been that oversupply is a waste of public resource because there is a cost to public spending. We have always been pretty tight on that and we have also been very uncomfortable with having unemployed teachers.

On attrition, there is something that you can build into supply models. This is a largely feminised profession. If you are recruiting significant numbers of 20-somethings into a feminised profession, you are going to be carrying quite a lot of maternity and attrition through that route. There are some things that are built into the demographics of teaching that you have to ride and that is why the teacher supply model ends up being more complicated than pure demographic planning.

Q129 Ian Mearns: Do you want to come in, Joanna?

Joanna Hall: I support absolutely all of that about the teacher supply model. Our evidence suggests that if you look at the location of a new accredited school and providers, the SCITT provision, the HEI provision, and understanding where there are those geographically-isolated cold spots across the country, that can then support the teacher supply across different partnerships and different teaching alliances. I think we have particularly picked up in the annual report that that has to be a focus in order that even if we went to a model where there was oversupply, actually understanding the impact of that in those rural areas that are quite isolated, the coastal areas we have reported on, there is another layer there of the picture that would help us maybe tackle some of the vacancies that we might be seeing.

Mark Parrett: We commented quite a lot on the teacher supply model in February, and I would add a couple of things from that. First, the model does contain a number of uncertain inputs, projections, and what we would normally expect with such modelling is that the Department would come up with high and low estimates, estimate the probability of different scenarios occurring and, from that, select its most likely. The model does do that and we presented the results of that in our report, but the Department does not assess the likelihood of those scenarios occurring. It does not choose. It believes that the high and low estimates are unlikely and chooses what it thinks is the most likely. We would like to see more assessment done of the outputs of that model.

On oversupply, in terms of recruiting to training, the Department has allowed a couple of subjects to recruit over need in English and history. It does that on the assumption that schools will be able to use teachers flexibly once they become teachers.

Jenni French: On the problem with oversupply, that is great if you can recruit enough in the first place. There are a number of subjects where that is not an option and it has never happened.

Chris Husbands: The shortage of mathematic teachers and science teachers is global.

Q130 Chair: I was just about to make that point, that it is all very well talking generically about regional differences but there are significant differences in subjects and the supplies. Mark, do you have any detailed analysis of that or any explanations to help us along?

Mark Parrett: We did present a picture of the 2015-16 intake for teacher training. There was quite a significant range in what the teacher supply model said was required and what we ended up with as trainees, from design and technology, where they filled 41% of training places, up to history, which was 113%, the overfilling I mentioned. We have got to a point now where out of 17 subject groups, only three have managed to fill or exceed the requirement for attracting trainees to start training. That is almost all subjects were not able to recruit enough people to start training.

Q131 Chair: On Jenni's point about a school not having much action, for example in physics A Level, because they simply have not done very well up to A Level—perhaps

because of a shortage of teachers—is that something that Ofsted is thinking about looking at in a pretty forensic way across the piece and in individual schools?

Joanna Hall: Obviously, when we revise the leadership and management areas, one of the key questions we might ask particularly of leaders and leaders of teaching is most definitely that about teacher supply, how many subjects might be covered by temporary cover, and the longitudinal picture of that and how it affects the school. In terms of things that we may report on—it is not a requirement to report on that at the present time—that would be a key thread that we might look at under the new common inspection framework.

Chair: That would be quite an interesting area of focus, wouldn't it?

Joanna Hall: Yes, absolutely. Yes, it would.

Q132 Lucy Frazer: Can I talk about that, because I find it very interesting? If the provision is inadequate, you would then say, “Well, it is inadequate but we are going to waive what we would usually say because it is not your fault.”?

Joanna Hall: I think it is about the balance of all the evidence on any inspection in terms of how well do leaders understand any issues they face in their school and their provision, how best are they managing to support the children and the students in that school in order that their progress does not stall. That would have to be balanced, like many other factors on inspection, to look at the impacts on the young people and their progress. Certainly, it is a key part of our judgment for leadership.

Q133 Lucy Frazer: I think what you are saying is if they do not understand it, they will be marked down rather than they will be marked up because it was not their fault. Have I understood that correctly?

Joanna Hall: How you manage your own teacher workforce and how you deal with those particular issues, one would hope all leaders and governors have a clear picture of the impacts of whatever they are facing in their school. But certainly in terms of good leadership and good, high quality teaching, one would expect that we can see evidence of that in how those kinds of subjects are taught, even if it be by a non-specialist.

Q134 Chair: You would be looking at a school and thinking what kind of plan do you have to resolve this particular problem and so on?

Joanna Hall: Absolutely and talking to governors about that as well as leaders, and I think that is a great opportunity. We reported in our annual report that, among the partnership work, one of the big things we have seen in initial teacher education over the last two years is that where those partnerships work well—across teaching schools and the work with HEIs—there is a good shared understanding of how to support those schools where they are sharing subject expertise. That is something that, in our two-part model for inspection, we do clearly look at under that leadership strand for ITE but also in school inspections as well

Q135 Stephen Timms: I would like to pick up the issue of more geographically granular data that you have already raised in your evidence. The Department does acknowledge, in its evidence to us, that there is an issue here. They say there are limitations to the value of national statistics since they have the potential to mask regional and local variation. What kind of geographical data do you think ought to be collected?

Jenni French: I think in the first instance it would be helpful to know where people are doing their teacher training. Although the Government do collect data on the locations of teacher training, they do not release that publicly. We do not even know, for example, where people are doing their teacher training, which makes it quite interesting if you are looking externally at what is going on. We could do some work, as external organisations, perhaps matching up vacancies with that data, but it is not being released.

Q136 Stephen Timms: The data is there. It is just a question of publishing it.

Jenni French: Yes, it must be there. It is just not published.

Q137 Stephen Timms: Do you think that ought to be published by region, by local authority?

Jenni French: To be honest, it could be. There are not that many places where people study teaching training, so it could be published in—

Chris Husbands: Although there is a growing number.

Jenni French: Of course, of schools, but even so, it could be published by region or local authority. I think anything would be—

Chris Husbands: Stephen, once upon a time I was on the board at the TDA, which was the NDPB responsible for teacher education and development. We did an awful lot of work on regional teacher labour markets and subregional structures. The conclusion that the agency came to is that the cold spots are subregional rather than regional and that regional mapping did not do very much because, by and large, you end up with artefacts of somebody's mapping system and it does not really influence where people move.

I think we can connect up the school workforce census. Longitudinally, we know where people train, we know where they teach. We can do some work on attrition rates and longevity rates by provider and by route. That data is there. It tends to be rather detailed and complex data. It is a bit indigestible, but for planning purposes, it does exist. What I would have wanted to see was the Department preserve the teacher supply model, because the National Audit Office do not have many strengths, and supplement it with some of the other datasets that we have now. That is going to be worth quite a lot of sufficiently granular data to tell us where we need to be going.

Q138 Stephen Timms: Is it generally the case that you think the Government have the data and it is simply a question of presenting it, or do you think there is some additional data that needs to be collected?

Chris Husbands: I think there are sufficient datasets out there. Not all of them are collected by Government vacancy datasets. What the Government have rather lost over the

last five years is the capacity to analyse and make use of those datasets with sufficient granularity.

Mark Parrett: One of the things that the Department has told us is that it is working on linking the datasets between training and then out into the profession, so you can track individuals or cohorts and see how they are doing. We looked at the training being provided by region and we know there are links between where people live and where they train and then when they work as teachers. You have quite a big disparity between where training is taking place around the country, which is lowest in the east of England and highest in the north-west.

We also know, and presented in our report, that not all types of training are offered on an equal basis across the country, so if you want to pursue a salaried teacher training route, for example, a lot of that is more available in London and the south-east. But Chris is right, there is a lot of data out there. A lot of it is already published down to school level. It certainly is in the census and there are other sources of data.

The other thing that the Department told us it is concentrating on is engaging at a more direct level with schools to understand the challenges they are facing and how best to measure and deal with these issues. The caution we have given there is that a lot of the conversation has happened with schools involved in School Direct, which is less than half of the school population and is not representative, necessarily, of primary schools or schools in rural areas or in areas of high deprivation. That would be the caution around that sort of engagement. All of that is good.

Q139 Stephen Timms: You said the data that is needed is already being gathered. Is it being gathered by the Department from individual schools? Is it being collected by local authorities and handed on to the Government?

Mark Parrett: The census is gathered from schools directly and from local authorities that may submit on behalf of maintained schools. That was introduced in 2010 and combined a whole series of datasets. It is a statutory responsibility to fill it in; 99.7% of schools completed it last year. It is a national statistic. It has particular quality controls around it. There is an awful lot of data in there and it is published, so that is why.

Q140 Stephen Timms: One of the issues that has been raised is that local authorities perhaps do not fully know what is happening in academies in their area. Is that an issue? Is there any data that is gathered for maintained schools that is not being gathered for academies or is that not an issue?

Mark Parrett: It is not an issue because academies will submit it directly and the response rate is as high for them as it is for local authorities.

Chris Husbands: I wanted to say something that I guarantee is unhelpful, but it is a non-data point. It is worth remembering that the way the teacher labour market operates in England is almost unique internationally. We very unusually now, and academies explicitly, employ teachers at the level of the school, not at the level of the school board or school district, and teachers decide whether or not they want to apply for jobs, so it is a free market on both sides. If you look at most public education systems—and the situation that we have got into there is a consequence of policy decisions taken since the 1981

Education Act, the 1986 Act and beyond—in most jurisdictions somebody is intervening to move things around. In Ontario school principals do not even know whether their leadership team this year will be the leadership team they have next year because the school board might shuffle people around to places where they are needed. In France, teachers will be moved around regionally at least.

I do not think that is a helpful thing to say because I do not think it is desirable for us to row back on school autonomy. I certainly think the way the teacher labour market operates works sufficiently well. But it is worth remembering that this is a global problem. How do you get enough teachers and how do you get the right teachers in the right places? We are trying to do it with a set of tools that almost nobody else is deploying globally and that puts us into an odd position.

Q141 Catherine McKinnell: We have talked about the regional variations but also we know there are significant variations in attrition rates in respect of subject areas. If the Government had better data on that, how would you see that data being used to good effect? Let us go back a step. Do you think we should be selecting data on attrition rates by subject and how would that information be used?

Jenni French: I think that we should be collecting that information. In the teacher supply model the subjects are grouped rather than individualised and I think that hides quite a lot of differentiation between subjects, so it is not predicting accurately in different individual subjects how the attrition might fall. But also it could be done, as Mark mentioned earlier, if we had the linked teacher training profile with the school workforce census. We would start to be able to see if there are some subjects with higher attrition rates and then we might be able to direct early intervention. We talked about those first three years but we could direct it specifically at those subjects with the higher attrition rates and help to look at keeping some more of those teachers in the profession.

Q142 Catherine McKinnell: It has been done to some extent in the past, particularly where there has been a glaring shortage in the sciences, for example. It would be interesting to hear how more could be done.

Joanna Hall: That would be a useful piece of information in order that where schools are struggling, whatever partnership they may be working in, whether SCITT or an HEI, to understand what that picture is by subjects. We reported last year that we continue to be concerned about the level of understanding, particularly at subregional level, what is the big picture in region and subregion by subject attrition and how can we best support and use that data then, particularly for schools that are in challenging circumstances. They report to us that it is very difficult to attract and then retain the very good quality teachers that they need in order to improve their schools. I think that kind of information would help us to tackle some of those issues we hear as well.

Mark Parrett: We are particularly focused on initial teacher training and that aspect, but this comes on to something around evaluation of what works as well, which we have not discussed yet. We said to the Department that you need to be evaluating the various initiatives that have been put in place to attract new teachers but also to set those against the relative cost effectiveness of measures to retain teachers. It has not been done, so that sort of information would be useful in the evaluation.

Q143 Catherine McKinnell: Are there other areas that we are not collecting data on that you think would be helpful? You have mentioned the route into teaching and the attrition rate and cost effectiveness. Other potential factors could be where bursaries are being provided, the social background of teachers and what the attrition rates are. Is there anything else that you think of that we should be collecting that would give us a better picture?

Mark Parrett: On bursaries, the Department did some qualitative analysis in 2012-13 and some quantitative analysis in 2013-14 that showed some link between bursaries and people wanting to apply to train as teachers and that did show some positive relationship. However, they have not extended that to look at whether people went on to apply, completed the training and then went on into teaching and how well they did, which comes back to these data-linking points. The Department has a general understanding of the impact of bursaries but needs to do a lot more. By the end of 2016-17 they will have spent nearly £1 billion on bursaries so we would expect a greater degree of evaluation around whether that is working.

Chris Husbands: My recollection is the TDA did look at the cost effectiveness of bursaries about 10 years ago and concluded that it was very easy to overspend.

Jenni French: I think it is also worth thinking about if you are applying, particularly in physics, to do a School Direct course you have a much lower chance of success than if you apply to an HEI. It would be interesting to know, by looking at retention, is that because the schools do a better job of picking the people more likely to be successful or are they turning away lots of people who could go on to be good teachers? I think if we knew a bit more about how long people stayed in the classroom it would help us hone the interview techniques and think about the type of people who could go on to become teachers.

Joanna Hall: You asked about any other kinds of data. Having heard the first panel and this notion of a continuum—as you join the profession and progress through your NQT year and receive, one would hope, high quality CPD—how do we track the profile of those students who become teachers and move on to middle and senior leadership positions? You asked earlier about the new College of Teaching. Our evidence would suggest that understanding how we get those leaders through into our schools who can work with our young people to drive improvement would be beneficial and that is something that would be very helpful as a longitudinal picture.

Q144 Catherine McKinnell: A lot of what we are talking about here is measuring quantity, but the other key factor is quality. What do you think would be the best way to monitor the quality of the teaching workforce?

Joanna Hall: I will start with that one. The key message from us at the moment in terms of initial teacher training inspection outcomes, as you will have seen in the NAO report, is well over 95% good or better providing strong initial teacher education. I think our change in June 2014 to a two-stage inspection model particularly wanted to recognise that end stage point for trainee teachers at the end of their training and then the progression into the NQT year is our second stage in the autumn term, working with their employing schools to see on the ground how ready they are to join the profession. In the quality coming through we have seen, particularly over the last five years, a real marked improvement in that partnership working between the employing school and also the transition from ITE

into the NQT year and beyond. Colleagues this morning said there is still more to do and I think that is absolutely true when we look at CPD on our school inspection: is it piecemeal; is it well structured; does it develop people's subject knowledge to the level we would want it to? We have some positive quality indicators from inspections, definitely.

Chris Husbands: I agree with everything Joanna has said. Let us be clear that of the in-school factors that we know about, quality of teaching is the biggest driver of pupil attainment. Against that, it is worth getting a little bit real about the capacity of the initial teacher training to impact on that in the short term. A very quick bit of mental arithmetic: there are 500,000 teachers in the profession and about 30,000 trained each year. Let us imagine that we could identify the weakest 5,000 of those and not recruit them and let us also imagine we could somehow recruit 5,000 a year who are definitely going to be better than the remaining 25,000. These are incredibly heroic assumptions. If we did that it would take about 20 years to have more than one standard deviation impact on pupil attainment because the impact of the flow on the stock is relatively small. We should have high quality teacher education but we should be a bit realistic about its capacity to influence the system in the short term. CPD is a much bigger lever, and certainly in schools facing challenging circumstances, CPD is an absolutely massive key to bringing about change.

Mark Parrett: Another aspect I will bring out is that the approach that has been taken is to increase schools' inter-training and school-led provision so that schools are more involved in selection and training and that has expanded a lot, as we said in our report. There is a risk we brought out in the report that the Department needs to assess, that if you have schools involved in School Direct are recruiting individuals to training, they will cherry pick the best ones and keep them. Given you had 57% of schools at the time we reported not participating in School Direct and only 29% of primary schools in rural areas, and there are other statistics around that, there is a risk that any quality benefits from this approach are not evenly spread. We have highlighted that as a risk that needs to be assessed and addressed.

Q145 Chair: I want to probe the position about the subject. Sir John in the first panel was taking about the importance of the subject and you all mentioned—Jenni in particular and Joanna as well—the importance of understanding the subject in terms of data, both quantitatively and qualitatively. I wonder how we might explore that in more detail and come up with something that is going to be helpful. Mark, could you talk us around that? It is important to get a clearer understanding of each individual subject in terms of supply and of those people expressing interest in entering the training arena. That is just as important as the number of people in training because then you get a clearer idea of flow.

Mark Parrett: I go back to what I said earlier about the huge variation in the extent to which training places are being filled by subject and bursaries are being differentiated by subject. There are higher bursaries available for physics, for example. Bursaries in other subjects where there is less of a need have reduced a bit, so there is some differentiation there. We need to know whether they are working or not and we need to see the evidence on that.

Jenni French: Particularly focusing on physics again, there are about 3,000 graduates a year and we need to recruit about 1,000 teachers a year. It is not going to happen if we go

for appointing only physics graduates. I think the subject knowledge enhancement has been key for pre-initial teacher training, recruiting people from a wider background, and unfortunately that is drifting away a bit with the changing system and that is not going to help until we get it sorted out. We are never going to get anywhere close to the targets with some of the more difficult to recruit subjects.

Chris Husbands: I agree with that. We may come on and talk about School Direct and the impact on higher education, but one of the things that you need if you want good quality subject training is a critical mass of scale that enables you to recruit a cohort of physics teachers, a cohort of mathematics teachers, and then you can put some high quality subject training around them. Once you fracture this across an entire schools system you abuse that.

Q146 Chair: Joanna, would you concur with that?

Joanna Hall: I do, and I think the point that was made earlier about learning the craft to become a teacher educator is a very different path from just in the classroom as a practitioner. Subject expertise has to be a really important focus to take forward because it is a very different set of skills and knowledge.

Q147 Chair: You would like to see this Committee think very carefully about how we can enhance the focus on the subject?

Joanna Hall: I think it would be of great benefit and it would also reflect some of the concerns we have raised about the lack of real integrity in some of the subject knowledge work. I think that would be really helpful.

Chair: Do you all agree with that? Yes.

Q148 Ian Mearns: It begs the question in my mind—it might be a barmy question—are there enough places in universities for physics undergraduates? Are the university courses fully subscribed or could we create more places and help solve the problem that way?

Chris Husbands: I am absolutely delighted to say for your sake that that is a BIS issue not a DfE issue. But by and large we have moved away from what we used to call manpower planning in relation to higher education development and we have gone for demand-led growth and that has happened. It costs a lot of money to train a physics undergraduate. You need a lot of kit to do it appropriately. There are stats on the number of physics departments there are in UK universities now and there were 25 years ago and I did not do my homework on that because I did not think I would be asked it today. But it is a different sort of question. How do we make sure that at graduate level we are producing enough scientists and technicians? Jenni's figure is dead on. It is 3,000 physics graduates a year. The school system could take 1,000 of them and you would have just about enough to meet the supply need. You are not going to get 35% of physics graduates coming into teaching, so that is a big set of issues there for national strategy in relation to science and technology.

Q149 Lucy Frazer: How is the data for how many teachers we need affected by the independent sector? When you were talking earlier about the maintained sector, do you chop

out those from national teacher training who go into the independent sector to count your figures?

Mark Parrett: The teacher supply model is forecasting the requirement for the publicly-funded sector.

Q150 Lucy Frazer: I presume people who go and teach in independent schools go through similar training.

Mark Parrett: Yes.

Q151 Lucy Frazer: How do you know which sector they are going to go into?

Mark Parrett: First, there is some movement from having completed training. Some go on to the independent sector. Some also come back from the independent sector to the maintained sector. There is not good quality data available on the extent to which that is happening.

Chris Husbands: I think there is a reasonable hypothesis that in the context of the teacher supply equation it is a relatively constant number year by year.

Q152 Lucy Frazer: Is that taken into account?

Chris Husbands: You can account for it and more or less it looks after itself.

Jenni French: Although I think there may be some subject variation and I am not sure that is—

Chris Husbands: Especially around physics.

Jenni French: I think particularly around physics where more teachers might feel that in the independent sector they can teach just their subject so be attracted to the independent sector, so you may find it is disproportionate.

Mark Parrett: Although the sort of numbers we are talking about are that of the numbers recruited to a teaching place in England within six months, about 7% went to the independent sector in 2013-14.

Q153 Lucy Frazer: When you are working out how many we need, chop off 7%?

Chris Husbands: That is roughly consistent with the number of pupils in independent schools, which is around 7% or 8%.

Mark Parrett: The calculation is an assumption around other numbers entering the workforce. The Department assumes that a number will come back from the independent sector so they are not forecasting for the independent sector.

Joanna Hall: In Sir Michael's commentary in February this year, the teacher brain drain commentary, Sir Michael called for a better understanding of those who do exit and go to work in independent schools abroad, so that we would have a tighter dataset of what the profile of those qualified teachers looks like—it could be by subject—and how many of

those do come back and work in the UK. I think it was with caution that we need more analysis of that, and that was very much a key part of Sir Michael's commentary this year.

Chris Husbands: That is not a constant. The phenomenal growth in international Anglophone independent schools over the last 15 years has created a pretty large globally footloose workforce.

Q154 Lucy Frazer: The White Paper suggests, I think quite rightly, that we should have a national database of vacancies. If that goes ahead, will it give the Government any more of a handle on vacancies than the data? It is real adverts that are going in in real time for real places. Would that help inform the data they are putting together or is it too unstructured?

Jenni French: I think it could do. There are people already doing similar things. TeachVac is already doing a database so that is worth looking at first. But also it would help if there was a number associated to each post so we could track a job: do we have a constant churn within a school or is it the same post not being filled that we have to re-advertise? At the moment, the vacancy for a science teacher in a large school does not tell you, very easily, whether or not it is the same teacher.

Chris Husbands: I agree with that. There are ways in which the teacher labour market is structured. Beyond initial training, the market for classroom primary teachers is local. The market for secondary heads of department and primary deputies is probably subregional. Only the secondary head market is probably genuinely national. There are variations around that, so there is a question about if you can run a Government-led free vacancy service but you cannot necessarily guarantee that we would require all head teachers to use it.

Q155 Lucy Frazer: You mentioned TeachVac and the National Association of School-Based Teacher Trainers gave us evidence and praised the work they have done in relation to the data vacuum, as they say. Do you think that TeachVac should be centrally funded to deliver data or do you think there should be a centrally-funded independent body for that role?

Chris Husbands: I don't know the answer to that. I do know that for the last 100 years the economics of running *The Times Educational Supplement* has depended on its job advertising, so if we are going to have a public intervention in the market we do need to understand why we are doing it, who we are funding to do it and on what basis. I think there are some quite tough policy issues there for a country that has largely become pro-market in its public policy.

Mark Parrett: We do not have a view on who and how it should be funded. Particularly with regard to initial teacher education, we believe that the information available in the market should be improved. Just about everyone told us that the routes into teaching are confusing and applicants need much better information on where they can train, how much it is going to cost and what sort of quality of provider they might go for. Equally, on the other side, on the supply side, it is much longer-term information on what the demand might be and from me as a provider over time rather than an allocation model that changes each year and gives no certainty. It is not just advertising of teaching vacancies in schools,

which one would think is a good thing, but also the broader information that is available to enable the market to operate.

Q156 Ian Mearns: The problem is when we have significant specialist teacher shortages in certain subjects is not the whole idea of spending huge amounts of money to advertise teacher vacancies just inherently wasteful? It has to be, because I am aware of schools who have had to re-advertise the same position two or three times and that becomes quite expensive on a unit cost basis. There has to be a more rational way of doing this, surely. I do not know what the editorial independence of *The Times* is, for instance.

Chair: I think you have made your point.

Chris Husbands: Yes, is the answer.

Chair: Can we move on to the final question?

Q157 Marion Fellows: Various bits of data are already available from different public, private and not-for-profit sources. Can the answer be to create a single portal for sharing all the data collected across all these areas on teacher supply?

Mark Parrett: As I said, the census did that to a certain extent in 2010, when it was brought in, in bringing together sets of data. One of the drivers behind that was also to reduce the burden on schools in having to produce different sets of data at different times of the year. That is available online. The results of the census are available online, as are various other bits of information. Bringing them all together in one way where you can access them in a consistent way in theory would be a good thing, yes.

Q158 Michelle Donelan: Does that mean that all the data collectors should work together collecting that data?

Mark Parrett: We have said the Department should work with the sector on this to improve the information available.

Jenni French: That needs to be linked. At the moment there are datasets but it is impossible to draw them together, whereas they could be drawn together and published in their entirety so that people are able to analyse them and not subsections of the data.

Chris Husbands: The data linkage is complex but can be done. In my previous job, we ran a series of big projects on administrative data linkage. There are techniques. It takes resource, it can be done, but the benefits for policymaking are considerable.

Joanna Hall: From Ofsted's perspective, it is the accuracy of the data. No matter who pulls it together and how they do so, it is the level of accuracy within that data that informs us about what is happening across the teacher workforce but also clearly then in terms of our inspection frameworks and provides a piece of evidence that we can look at and track and report on. It does not matter who does it and how it is done but the real accuracy is important.

Mark Parrett: The Department has said a number of times to us in the Public Accounts Committee how that data linking is going to help with some of these issues. You could, for

example, look at the results of that work when it is completed, which I think will be quite beneficial.

Chair: We literally got to the bell and we have asked all our questions and had some absolutely excellent answers and some excellent panellists to give those answers, so thank you very much indeed. The whole morning has been incredibly instructive and I think we have some interesting ideas, not least this issue about seeing what is going on in schools in responding to the challenges of teacher recruitment and supply of teachers. It is all excellent stuff, as well as this focus on subjects as opposed to just simply generic training. Thank you all very much indeed.