



Northern Ireland
Assembly

Committee for Employment and Learning

OFFICIAL REPORT (Hansard)

Inquiry into Careers Education, Information,
Advice and Guidance in Northern Ireland:
Sentinus Briefing

13 March 2013

NORTHERN IRELAND ASSEMBLY

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Members present for all or part of the proceedings:

Mr Robin Swann (Chairperson)
Mr Thomas Buchanan (Deputy Chairperson)
Mr Jim Allister
Mr Sammy Douglas
Mr David Hilditch
Mr Fra McCann
Ms Bronwyn McGahan
Mr Alastair Ross

Witnesses:

Mr Brian Campbell	Sentinus
Mr Bill Connor	Sentinus

The Chairperson: We will now have a briefing from Sentinus. We are joined by Brian Campbell, the chief executive, and Bill Connor, project director. Gentlemen, you are very welcome. We have received your presentation and briefing. You can begin with some opening comments.

Mr Brian Campbell (Sentinus): A logical place to start is with a little bit of background about what we do. Sentinus is a charity and a company limited by guarantee. We have been operating since 1982, but have grown, fairly incrementally, since about 1990. Our main objective is to work with young people, mainly from top-end primary to post-16, 19-year-olds, some further education (FE) colleges and some higher education (HE) colleges. In working with them, we try to excite them, across a range of projects, about the science, technology, engineering and mathematics (STEM) agenda.

Last year, for instance, some 64,000 youngsters went through our programmes. That was a significant experience in respect of the time span. When we measure 64,000, each person measured has to have at least a full day's experience. A lot of those 64,000 people would experience week-long projects; some would have five- and six-month R&D projects; and some would have four- and five-week industrial placements, and so on. Our overall objective is to excite young people about science and technology, so that they will look seriously at moving into those subject areas, and, perhaps, through that, go to university or into apprenticeships as technicians. Then, they could go into the knowledge-based economy, hopefully, at the end of it, to the benefit of Northern Ireland.

The main reason for our response to the careers education, information, advice and guidance inquiry concerns the STEM element. I emphasise that we worked in 620 schools last year, which is a considerable number of the school population — 93% of the secondary schools. So, we have contact with all the — *[Inaudible.]* — in the STEM area and the careers teachers and careers planners in each

of the secondary schools. So, our contact on STEM is extensive and detailed. We think that we are in a fairly good position to make informed statements on what is happening with STEM in Northern Ireland.

We are concerned. Obviously, limited resources apply everywhere. The careers element is an area that a lot of schools and teachers back off from. The reason why they back off from it is very simple: it is an unknown for them. Science, technology, engineering and maths has a fear factor unless you are actively involved in it. So, you come across those sorts of difficulties.

In working with schools and the school population, we realised early on that it is very important that we involve the primary sector, particularly Key Stage 2, which is P5 onwards. In fact, almost half of what we do — half of those 64,000 youngsters — applies to that sector. We realised the importance of contacting young people and getting them enthused early, so that they continue with that into the secondary sector.

We also realised that it is fairly useless and non-productive to talk at young people. You have to involve them. Again, the activities that we deliver immerse young people in real industrial situations and bring them into contact with young ambassadors from industry to help them to follow through in different types of projects. We have a whole range of those types of contacts. For instance, during the summer, we have a four-week industrial placement. Teams of young people go into industry and solve industrial problems. We have five- and six-month R&D projects, through which, again, teams of youngsters work with engineers and scientists to solve problems that are set by industry. Last year, we delivered over 300 individual STEM roadshows in individual schools, again, around the areas that we perceive to be in need.

Early on, another issue that we found to be important was the very big gender imbalance in the STEM industry in general, and we built in things to address that. If you look at recruitment statistics for employment in STEM industries in Northern Ireland, you see that it is predominantly male. Of those 64,000 youngsters, for instance, 31,500 were female students, which is a pretty good hit if you actually break it down. So, gender is a very big issue, and we think that it needs to be addressed in the STEM agenda.

The final thing that I would say about our approach to STEM careers and the resource that goes into that is that we honestly believe that — you might say that we would say this anyway — it is about the future that faces the Province. As an organisation, we believe that there is only one lasting, medium- to long-term answer. It is an emphasis on a knowledge-based economy — small- to medium-sized high-tech industry — driving the economy. We have agriculture, tourism and all the rest. However, they will not bring in high-value income and create the sort of jobs that the STEM agenda can create if we tackle it well and we really get stuck into it. We are of a scale that means that we can benefit from it. The number of schools and the population that we are dealing with is manageable. You can use resources fairly wisely.

As an aside: we get funds, predominantly from the Department of Education (DE) at present, to the tune of £400,000. We turn that £400,000 into additional cash of £350,000. When we add in additionality, or, in other words, factor in the contributions that we have from industry, which are not intangible contributions — they are real — we have an output of somewhere in the region of £1.6 million for the money that we actually get from the Government. Again, we have looked at that model carefully. We think that if we factored it up by two, the impact would be really considerable right across the board. You are not talking about a huge amount of resource in comparative terms to the output that you would get at the end of it.

That is where we are coming from. The main point, I suppose, to summarise all of it is that we believe that you cannot ignore STEM. It will be an answer for the Province. If we ignore it, we do so at our peril. The only way in which you can actually service, grow and do well with it is to have youngsters who can move into industries that want to come, set up and prosper here. We already have massive shortages. The information and communication technology (ICT) industry has real difficulty in recruiting the sort of people it wants, despite the fact that large numbers are coming out with so-called ICT qualifications, and so on, from third-level education. They are not the qualifications that the industry wants. It has to bring in people from abroad, and so on.

I have one other issue. It is an aside, but it is very much government-orientated. Over the past year, we put four major programme bids into Departments. Two of them were cross-departmental bids on ICT and STEM. Invest NI, the Department for Employment and Learning (DEL) and DE were involved. They were all very keen and received the proposals very well. They were also backed by

the industry concerned. We put in another bid that related to parents and STEM awareness with regard to careers. There is a problem with how parents look upon STEM. It was really well received by DEL. However, it hit the procurement wall. Because the procurement wall was there, we could not get the programmes, despite the fact that they were widely welcomed. We do not think that people were just giving us a voice play here. They were really keen to do it, but they could not get past that procurement wall to deliver within the time frame that would have been effective. There is a possibility for next year. However, even then, with the sort of time spans that you are talking about, you are talking about using up maybe a year to get delivery in the following year.

So, that is just a factual aside, but an important one with regard to operating effectively and delivering well.

The Chairperson: OK, Brian, thanks. Does Sentinus have any input into careers training for teachers or careers teachers? Is your input purely stand-alone advice in 620 schools?

Mr B Campbell: Currently, we deliver 24 fairly substantial initiatives to those 64,000 people. All of them involve teachers in some way or another. A number of them actually involve teachers being involved in training and working with people who come in to deliver programmes for us. Most of those programmes are actually delivered by our own project managers. However, increasingly, we are training up industrialists to go in and deliver programmes under our management. In several of those programmes, teachers are actually involved in the training. So, they are learning how to work with STEM, and so on.

By the way, it is particularly important to say that there is a massive deficit in the primary sector of trained teachers who can cope with STEM at that basic level. That has to have a knock-on effect on children.

It sounds as though we are throwing things at you, one after the other, and griping, but these are really major issues. One other issue is the curriculum. In the primary sector, STEM disappears into The World Around Us. I mean that: "disappears" is the right word to use. A lot of teachers are frightened of it and are reluctant to cope and to focus on STEM because there is that fear factor that I mentioned earlier. So, they do other things to deliver that part of the curriculum and give STEM voice play. There has to be far more emphasis on STEM at that level.

Mr F McCann: Thank you for the presentation. It was interesting. At the end of this inquiry, we hope to have a report that starts to change attitudes to STEM subjects. I have two questions. First, how do you measure the success of your programmes over a period of time? You touched on my second question when you discussed primary schools. A number of people have told us that unless you start to get children at primary school, you lose them by the time they come out of primary school, especially in STEM subjects. Teachers focus more on education, medicine and law rather than on directing pupils to STEM careers. Have you come across any of that when you have been in primary schools?

Mr B Campbell: Your first question was about measuring success. We have an evaluation process built in to every programme that we deliver. What you can achieve varies, and, obviously, cost factors, and so on, are involved in going through it. At the end of every year, we produce quantitative and qualitative evaluation. The Department of Education receives statistics from us that are a very detailed breakdown of all the schools, the people who take part and the adults other than teachers who help right across that spectrum. It is a very big spreadsheet that gives that quantitative analysis.

We measure the success that we have in youngsters being enthused and involved in the most basic sense by questionnaires. At post-16 level, we also track youngsters who have been through our programmes. It is not possible for us to track the 64,000, because that would take up five times our budget. We do try to do that with the post-16 youngsters to see whether they have gone into some sort of STEM-related career path. With post-16, that usually involves tracking their university degree and where they go to and the type of course that they are following. However, that also breaks down into technicians and other people who follow other career paths. We do an analysis on those people. The percentages of people who follow STEM courses at those levels are very good.

I mentioned the in-built problem because of the system, involving the way that the curriculum exists, teacher training as it stands and the skill levels of teachers. I am not denigrating teachers in any way, because a primary teacher has to be a generalist per se. In most cases, there is a real difficulty with their approach to STEM, because they think that it is difficult, and they see that they have to organise

people into groups and do teamwork, and so on. There are many brilliant teachers who do it all, but, in general, there is a problem. Sorry, what was the second part to your question on primary schools?

Mr F McCann: From what we gather, young people seem to be pushed. People from the private sector who are looking for people with skills said that young people are pointed in the direction of medicine, law or teaching rather than being given a wider selection of career options.

Mr B Campbell: One thing that we have found is that, the younger the grouping, the easier it is to influence them personally about the different areas of science, technology, engineering and maths. Parental influence is massive, and it is a problem that needs to be addressed. I mentioned one of the proposals that we had with DEL, and that was to tackle the issue of how its careers information could reach parents effectively. It is a problem, and it is the single biggest guiding influence on youngsters.

We have a number of programmes that youngsters apply to us to get onto. The Nuffield Bursary Scheme is one. That is an industrial placement scheme that takes place over four weeks in the summer. Team R&D is another. Over the past three years, we have found that the numbers applying have increased hugely. In other words, these are not traditional types of courses that medics, lawyers, and so on, want to go on. They are more focused on engineering, biotech and general STEM industrial-type placements, and the numbers have gone up massively. One of the reasons behind that is that the credit crunch has hit hard and people are starting to look at degrees that they perceive to be, for want of a better word, real degrees. Therefore, they are looking for placements in those types of industries to see what the prospects are and whether they can follow through on them and come out with that sort of qualification. The situation is improving, but it will take time for it to come through.

Mr Allister: I was interested in what you said about your parental outreach being thwarted, because some of the evidence that we have had indicates that, despite this being a multimedia age where one might think that kids and young people draw a lot down from what they get on the web, etc, the primary and main influence on a career choice is still parental. Could you tell us a bit more about what it was that you wanted to do and what it was that you were thwarted in doing?

Mr B Campbell: We put a proposal to DEL that we would run a pilot scheme that would involve 20-plus roadshows around different schools in the Province, and the target group would have been the parents of those youngsters in the school who were at the age of moving towards making decisions that would put them on a career path. You would be talking about parents of children in year 14 who are deciding whether to follow science subjects or not. We run an initiative called family days, which is a transition initiative involving youngsters who are moving from the primary to the secondary sector. We get parents and grandparents to come along with the students and go through STEM activities, mainly on a Saturday morning, although sometimes after school. When we get them to do that, we also hit them with the careers information in a very friendly sort of way. If you sit down with a parent and tell them what their youngster could earn if they were to become an ICT programmer, or what they could earn in a good engineering firm and what the statistical averages are, you can see their eyes changing and their attitude changing. However, it is about getting that message out.

If you ask a member of the general public what an engineer does, a very big percentage of them will still say that he mends cars. That sounds trite if you are an educated person and you know better, but that is what is happening. There is also a perception —

Mr Allister: Why was your project rejected?

Mr B Campbell: It was very well received, but there was a procurement wall. They thought that it would have to go through a tender process, which would have brought it well into the beginning of the next academic year, and it would have been impossible to deliver the thing in the time frame.

Mr Allister: Is it not a timeless sort of programme?

Mr B Campbell: It could be. Those things are still alive. In fact, the ICT one is very much alive. We are told that there is a very general problem in Departments with getting almost anything that needs a quick response done in a reasonable time frame. We hope to put in proposals in November for roll-out in the next financial year, which would be from April onwards. You prepare schools from April to June that you will be delivering the programme to from September through to the following April, but you need to know that you are getting the resources or that the project is a runner by the end of March, and that is after putting in proposals in November.

Mr Allister: Is the uptake of your services in schools patchy or is it fairly widespread?

Mr Bill Connor (Sentinus): In any given year, 92% or 93% of schools, particularly in the post-primary sector, would be engaged. Over the course of two years, it would be 100%. So, engagement with schools is not an issue. We are oversubscribed for just about everything that we offer schools, so they are keen to be involved. They see the service that we provide as enriching what youngsters do in curriculum time and enhancing their perceptions of STEM careers. Brian referred to the difficulties with the primary curriculum in respect of STEM being embedded in The World Around Us. A recent report found that fewer than 5% of primary teachers come from a STEM background, so that obviously has an impact on the effectiveness of teaching in those subject areas. Again, —

Mr Allister: Is that compensated for at all through career development, where they go off on courses and that sort of thing?

Mr Connor: No. There is almost no continuing professional development (CPD), particularly for primary teachers at the moment. The education and library boards' curriculum advisory and support service —

Mr Allister: There is almost no CPD per se or just not for science?

Mr Connor: There is almost zero for STEM.

Mr Allister: But there is CPD?

Mr Connor: There is a certain amount of CPD.

Mr Allister: But not for STEM?

Mr Connor: Not for STEM. The curriculum advisory and support service in the education and library boards has almost disappeared. Therefore, those people are not in a position to offer curriculum support to teachers in the primary sector any more. It is a huge issue for teachers at primary level.

Mr Allister: I must say that I agree. I have an interest in my local primary school. I think that losing the focus on science by losing it in The World Around Us has been a backward step. Did you get any positive response from the Department of Education when you raised that?

Mr Connor: Certainly, the Department of Education very much values the work that we do. As Brian says, we are limited by resource in what we can put out there. The loss of science and technology in the curriculum has had a huge impact. There is a point at which you can really influence young people and excite them about science and technology. If you do not do that by the age of 11, it becomes an issue, because some research indicates that, by the age of 12, youngsters may not have decided what they want to do but a lot of them have decided what they do not want to do, and STEM can fall into that bracket.

Ms McGahan: Thank you for your presentation. I speak as a mother of a 16-year-old who will drop the sciences to pursue other subjects. When I try to raise the issue of her doing maths and physics, there is a blockage there. I feel, as a parent, that you need that joined-up approach. I do not feel that students are getting that encouragement or that those subjects are not being made exciting for them. Can you tell me any good news stories about females who have pursued a career in the engineering sector and who are, if you like, role models?

Mr Connor: There are a few. We have a young girl who works with us as an ambassador. She went through one of our programmes while she was at school. She then went to university to study electrical engineering and is now employed by Northern Ireland Electricity. She is a great success story as well as being a great role model and ambassador for us. It tells a great story. There are others as well.

At the minute, we are running a programme with 10 schools in the Belfast area, through which undergraduate engineers engage with young people in year 10. We have 20 undergraduate engineers involved in that, 10 of whom went through our programmes and have come back to support

us because they feel that this is a message that they want to get across to young people. Many of those undergraduates are girls. So, we have lots of success stories involving girls who go on to study engineering and other STEM disciplines.

Mr B Campbell: Anecdotally, the evidence is huge. I noticed you reading the magazine. We produce that roughly three times a year. Again, it highlights the stories of people who have done different things and had different levels of success, and so on. We find that Northern Ireland produces as good, if not better, than anywhere else in the UK in the STEM arena. We run a big celebration event every year at the Odyssey, and, from that, we sent 10 projects over to the UK as part of the Big Bang project, which is UK-wide. We also sent projects over to ICEF in America, which is worldwide, and we also sent them to Europe. We have massive successes year on year. In the Big Bang competition last year, for instance, we won four of the main categories. Northern Ireland has a population of 1.5 million people — the size of Merseyside — and we are cleaning up. Those things help, but they are at that top echelon. It needs to filter down so that you get the numbers.

The main point that we keep emphasising is that we honestly believe, as an organisation, that Northern Ireland has no other option. STEM is the only answer. Obviously, there are other industries that will make up the overall economy, but if you want a driver for the economy, where else do you go, other than to a knowledge-based model? The shipyard is dead. All the big old industries have gone or are completely wilting. We have some success stories. If you look at the success stories, you see that they are all hi-tech, innovative industries, and they use the sort of people we need to produce.

Mr Buchanan: Thank you for your presentation. I found it and the work that you are involved in very interesting. You mentioned CERN. The Committee has only recently come back from a visit there, and it is something that we will be following up on. There is immense knowledge and expertise that can be gained from there for students and teachers, and so forth, but that is something that the Committee will follow up on.

At the commencement of your presentation, you gave a summary and mentioned a number of concerns you have with current careers guidance. You raise a number of issues, yet, further in the presentation, I noticed that you do not engage directly with the Northern Ireland Careers Service. I would have thought that if you wanted to get your concerns brought in and driven forward, it would have been good practice to have collaborated a bit more with the Careers Service to ensure that it had full knowledge of the concerns that you folk have regarding the current careers guidance. What is the problem or difficulty that has prevented that level of engagement? Maybe that would have benefited the current careers guidance.

Mr B Campbell: Probably the main reason behind it is that, historically, DEL is where the Careers Service lies. DE has been our predominant Department in support over the years and the one that we have worked most with. We have worked from time to time with different projects with Invest NI and with DEL. Coincidentally, one of the proposals that I mentioned to you was put to DEL — the one around parents — but alongside that, we proposed working with careers officers from DEL on the STEM agenda. There were five strands to it. That was a proposal specifically for us, working with careers officers on the STEM agenda.

In the past, on an ad hoc basis, we have been involved with careers officers on different projects. Team R&D, the research and development project, is one of them, for instance. However, there has not been a strategic partnership, which would obviously have its advantages if we could do it.

Mr Hilditch: In the week that the Assembly report into the creative industries was launched, including facts and figures in relation to job creation and the ICT sector, you mentioned some thoughts on it. I think you said that qualifications are not the only things that are being looked for. Do you want to further develop that issue?

Mr B Campbell: It is specifically around the ICT issue. Historically, we have done some work in that sector, but it has not been a major component every year for us. We have been working predominantly on the science side, the engineering side, technology and mathematics. ICT has been built into a lot of that, but it has not been tackled as a bespoke discipline. This year, we were approached by one of the Departments, asking us if we would be prepared to put a proposal around doing work on ICT across a number of strands. We did that, and that was really well received, but it hit difficulties with procurement, as I mentioned. However, it is still there, and it is still being looked at to see how we can roll it out.

There are two elements to the work that we do. One element is getting youngsters involved and immersed in the subject area. In other words, being enthused about technology or science or whatever it happens to be. The other element is developing them as people and managers and their overall contribution to firms. A lot of the stuff that we do revolves around team work. Very bright youngsters will come along, but they might not have much confidence. They work in teams with industrialists for a period of time, and, at the end of it, you can see the confidence growing.

That is the other side to the work that we do. We let young people see what the world of work is all about. There are skills that are needed other than just coming along and being able to do the specific requirements in respect of qualifications. They need to be able to interact with other people, manage, and so on. A number of the projects that we do home in on that as well as the technical interest side.

Mr Connor: In respect of the qualifications, there is a recognition that ICT at GCSE and A level does not prepare young people for engagement in, for example, the creative industries, in any profession that is going to involve programming. Indeed, employers will tell you that when youngsters come out of university, their degrees do not equip them with the appropriate skills to go into those industries either.

Mr Hilditch: Those who formulated the document had a look at the Dundee situation and the hub that was created there for the industry? Do you see anything along those lines coming to Northern Ireland at any stage?

Mr Connor: I am not familiar with the model that you are talking about, so I cannot comment on that. However, it is recognised now that the qualifications do not meet the industry needs. There are moves towards addressing that, and the Council for the Curriculum, Examinations and Assessment has introduced an A level in programming. It remains to be seen what the uptake of that will be and what the capacity to deliver that is, but that problem has been recognised. A lot more work has been done to bring kids in at a lower age group to make them interested and to give them the stimulus to want to go on to study those subjects.

Mr B Campbell: If my understanding is correct, the employers were subsidised by Invest NI — it could be DEL, mind you — to form a grouping, and there has been some support for that. They are becoming quite vociferous and proactive in trying to drive the needs of their industry. That was set up about a year ago, and it has just received funding again to expand the work that it is doing. Therefore, things are moving, certainly at the ICT end, but there is still a long way to go. There is a big need in respect of industries wanting people.

The Chairperson: Thank you very much for your time. One thing that David did not mention was that the recommendation in Scotland was to change STEM to STEAM to include the arts, but I do not think that you want to go down that line of thought today. Thank you very much for your time and for your presentation.