DÁIL ÉIREANN

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AN COMHCHOISTE UM POIST, FIONTAIR AGUS NUÁLAÍOCHT

JOINT COMMITTEE ON JOBS, ENTERPRISE AND INNOVATION

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Dé Máirt, 19 Feabhra 2013

Tuesday, 19 February 2013

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The Joint Committee met at 1.30 p.m.

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MEMBERS PRESENT:

Deputy Dara Calleary,	Senator Deirdre Clune,
Deputy Áine Collins,	Senator John Kelly,
Deputy Michael Conaghan,	Senator Michael Mullins,
Deputy Anthony Lawlor,	Senator Feargal Quinn.
Deputy John Lyons,	

DEPUTY DAMIEN ENGLISH IN THE CHAIR.

The joint committee met in private session until 1.55 p.m.

ICT Skills Report: Discussion

Chairman: The purpose of the meeting is to discuss the report produced by Senator Deirdre Clune entitled, A review of the ICT skills demand in Ireland, and future developments in the ICT sector. I welcome Mr. Sean O'Sullivan, managing director of Avego and founder of Open Ireland; Mr. Joe Cunningham, chairman, Ammeon; Mr. Paul Sweetman, director, ICT Ireland; and Mr. Colin Donnery, FRS Recruitment and past chairman of the National Recruitment Federation. As well as discussing the committee report, they will set out the initiatives they have taken through Open Ireland and other projects and give us a general overview of the position on ICT. We appreciate their presence.

Before we begin, I draw attention to the fact that by virtue of section 17(2)(*l*) of the Defamation Act 2009, witnesses are protected by absolute privilege in respect of their evidence to the joint committee. However, if they are directed by it to cease giving evidence on a particular matter and continue to so do, they are entitled thereafter only to qualified privilege in respect of their evidence. They are directed that only evidence connected with the subject matter of these proceedings is to be given and asked to respect the parliamentary practice to the effect that, where possible, they should not criticise or make charges against a person, persons or an entity by name or in such a way as to make him, her or it identifiable. Members are reminded of the long-standing parliamentary practice to the effect that they should not comment on, criticise or make charges against a person outside the Houses or an official either by name or in such a way as to make him or her identifiable.

I invite Mr. O'Sullivan to make his presentation.

Mr. Sean O'Sullivan: I thank the Chairman and members for inviting us to appear before them, an invitation we were very happy to accept. I praise the Joint Committee on Jobs, Enterprise and Innovation for its great work in producing the report entitled, A review of the ICT skills demand in Ireland.

Let me introduce the members of the delegation. Mr. Paul Sweetman is a director of ICT Ireland which represents 75% of the 90,000 and more tech workers employed in such companies in Ireland. Next is Mr. Joe Cunningham, chairman of the technology company Ammeon and, incidentally, the man we can either curse or praise as the creator of the text message. If anyone has ever sent a text message, he is the guy responsible. Of course, it was an Irish company that pioneered this throughout the world. Finally, there is Mr. Colin Donnery from FRS Recruitment, the former chairman of the National Recruitment Federation.

As committee members know, among the roles of government leadership is to provide oversight and direction for the Civil Service, to add perspective and priorities and to separate the forest from the trees. This leadership drives the direction in which Ireland moves. We appreciate the committee's invitation as it indicates the strength of its commitment to the technology sector and its contribution to the growth of Ireland's economy. We have an historic opportunity on our hands in the tech industry today. The committee will have a copy of the leaflet from Open Ireland outlining the vision behind the technology visa and, in addition, we have circulated in advance a white paper which forms the basis for the comments I will be making here. The paper, which was authored by Mr. Gareth Whelan, who is part of the Open Ireland team,

has been drawn from the input of hundreds in the industry, in government and in academia.

As a personal introduction, I came to Ireland about seven years ago to set up a business. I came here because of the well-deserved reputation Ireland has as a technology hotbed. I have adopted Ireland as my home and helped grow some businesses here. In fact, I have a venture capital firm, SOSventures, which has backed a number of companies. I started a couple of companies here that now employ over 100 workers in the high-tech sector alone. When I came here, I brought with me foreign direct investment which so far totals well over €10 million, to Irish businesses. Better still, the companies I have backed here attract revenues from all over the world to the tune of many millions of euro every year, which is helping to expand our economy. Every year, we support payrolls that help improve the economy and provide an income for more than 100 families, all of whom are taxpayers. These are good, high-quality jobs that provide indirect additional jobs to people throughout Ireland.

I am not unusual and there is nothing unusual about the story I am telling. There are 5,400 companies in the ICT sector that also bring investment into Ireland, generate jobs and generate a vibrant economy and inward income to the Irish high-tech sector. Yet there is a problem. Like most Irish technology companies, we have been unable to grow as fast as we would like. We have been unable to fulfil the orders we have received. We have been unable to employ as many as we could because there is a difficulty in hiring the skilled workers we need. This is not because there are no skilled workers here - there are many - but because the growth in these tech positions is too fast for colleges in Ireland to supply the workforce that can fit the needs of the jobs. These jobs are opening at a faster pace than can be filled with our native population.

As a report from IBEC last year indicated, because of the talent shortfall, the majority of companies end up facing the decision to outsource jobs to other countries or to regretfully pass on opportunities to expand their businesses inside Ireland. To bring in talent from outside the EU has, to date, been far too difficult because of structural limitations and how the Departments of Jobs, Enterprise and Innovation and Justice and Equality have applied policy and regulations to slow the hiring of critical IT workers. The situation has become so intense that companies are recruiting from other companies, driving up wages unsustainably and damaging the industry. Mr. John Mullins from Bord Gáis explained this best when he said Irish companies are cannibalising each other.

Despite the fantastic opportunity we have and the leadership Ireland has in technology, our success has put us on the cusp of a decision. Do we want the ICT industry to grow or to die? The answer to date from the Government and leadership has been resoundingly that we want it to grow. Now we need to put the policies in place to make this happen.

The plans in this committee's report highlight a number of key actions and conclusions to which I would like to respond. According to the plan, Ireland needs to double the number of graduates with key ICT skills. I agree completely, as does everyone in the industry. However, Ireland also needs to raise the bar on the quality of these graduates. We are in the creativity business, the invention business. This is not a factory worker business in which people come in and work nine-to-five on a computer screen. We need super-smart, flexible geniuses. It is hard to get these people. They are like gold dust and, when they graduate from high school, they are choosing to apply to other fields such as medicine or law rather than technology.

Another point in the report is that the demand that exists for ICT skills is not solely for very experienced software developers but spans a whole spectrum of the industry. That is very true. Competent software developers are the lifeblood of the software development industry. Too

much of the time, we think of high-level management positions only. While I accept we miss senior resources in certain areas such as product management, growth hacking and business intelligence, in addition, UX designers, Java developers and entry level positions are also in very scarce supply.

The report also mentioned that many of those who choose to study technology at third level are dropping out before the start of the second year. This is probably due to structural educational difficulties in Ireland that have been identified by this report. We have people who have not programmed before going to college and majoring in programming. It is equivalent to a person being accepted to play hurling at county level before ever having played at club level, which is preposterous.

This report signals CoderDojo as one of the creative uses of ICT in schools. It quotes Mr. James Whelton, who works closely with me at SOSventures, as saying that many teachers have little experience in web design or coding, which means that it is not taught efficiently and students have a bad experience. This needs to be recognised. We cannot operate under the fallacy that one can teach what one cannot understand. Could some secondary teachers teach coding? Of course they could. However, it is impossible for many of them to keep up with the rapidly changing pace of coding. New approaches such as CoderDojo are happening in the Irish economy, which is very exciting. The speed at which the industry moves is rapid. This report says that 150 children are learning with CoderDojo every weekend throughout Ireland. Since that was written, this has grown to more than 4,000.

The good news here is that change can happen rapidly, much faster than the incremental change we think can happen. It is sometimes easier to have a revolution than evolution. That is our challenge in Open Ireland. We are bringing to the attention of the industry and the Government that we can do more than just be competitive. We can excel. We can lead the world and become the go-to place for starting and developing high-tech businesses - the Silicon Valley of Europe. What needs to develop, we believe, is an atmosphere of openness in which the Government goes on the offensive and Ireland's national policy of recruiting and welcoming talent, including talent in engineering, puts Ireland at a distinct advantage when compared to anywhere else in the world. We need to change our mindset. We do not want to be worst country in the world at allowing in technical talent. We want to be the country that welcomes technical talent like no other. Céad míle fáilte.

The truth is the world is moving very fast beyond our little country's borders. We have a current leadership position of sorts in technology and we can and should build on this. We have advantages that few other countries have in terms of our proficiency at English, our EU membership, our culture and our workforce. However, other truths are that power tends to concentrate in a few geographic hot spots. Without enough of a critical mass and without enough people being aware of what a superstar Ireland is and could be, we will let this historic opportunity slip away from us.

Open Ireland and a group of technology companies, small and large, met the Department of Jobs, Enterprise and Innovation in the past few weeks to discuss and get feedback on the initiatives the Government is planning to unveil. I am very encouraged that the Government looks to be moving aggressively in rolling out a plan that will be in effect within one to two months. We have been informed that more than one-half of the existing rules are being scrapped and that processes are being revamped to be automated and speeded by factors. We have some specific recommendations about which we can answer the committee's questions. I thank the committee for inviting us to appear before it today.

Chairman: Do any of Mr. O'Sullivan's colleagues wish to make comments before we move on to questions? I call Senator Clune first because she wrote the report.

Senator Deirdre Clune: I thank the delegation for coming before us and giving us some feedback on the report. As Mr. O'Sullivan pointed out, the area is moving so quickly that we need to update it. The committee has agreed that we would keep all the proposals under review and constantly challenge them and make sure they are implemented or acted upon and responded to. The Ministers for Jobs, Enterprise and Innovation and Education and Skills appeared before the committee before Christmas to discuss the issue. In particular, we raised the issue of the technology visa, which the delegation has been championing and pushing for, with the Minister for Jobs, Enterprise and Innovation. His comments indicated he had moved further on with regard to introducing such an measure and he is going through the process. I agree that it is slow but it is important and something to which we are committed. As Mr. O'Sullivan noted, it is about bringing excellent skills to this country that will in turn feed out into and develop further jobs in that area. Mr. O'Sullivan outlined it very well in the submission he gave the committee.

Mr. O'Sullivan mentioned the quality of our graduates but he did not expand on it. Could he expand on it? It is something of which we are very conscious. We asked that the issue of students dropping out of third level be examined. The third-level sector is examining that. Is Mr. O'Sullivan happy with the liaison with the third-level sector? Is there enough dialogue? Our report found that there needs to be more communication.

Mr. Sean O'Sullivan: I will turn some of that to my colleagues. The quality of Irish graduates from technological universities was unparalleled in the 1980s and 1990s. They had a fantastic reputation as some of the best and brightest who chose these fields of study. That trend changed dramatically. The committee's report pointed out that Ireland is now 26th out of EU countries - I am not sure the total number of countries.

Senator Deirdre Clune: It is 27, unless Mr. O'Sullivan knows something we do not.

Mr. Sean O'Sullivan: It does change geographically.

Senator Deirdre Clune: It is 28.

Mr. Sean O'Sullivan: So it is 28. That is not a great start. If we at primary and secondary levels are not producing the quality we need to have at third level, that is a fundamental we need to address. Many people are doing things in that area. I am trying to help out in some areas such as introducing the Khan Academy to Ireland. Irish universities have an opportunity to respond to the needs of the jobs market but it is really a question of where parents and society are directing children to study.

There are a number of issues here that are too broad for me to address. We need to be selective and recognise that these most talented positions are in the top 5% of our graduates rather than at a lower cut-off level. Two or three years ago, one could get into Trinity College by being in the top third of one's high school graduating class if one was applying for engineering. That is not selective enough. The top design engineers will be much more talented than those who are slightly above the high school average. We should be looking to get really super-talented people to apply for this and we will only do so if they have the background in the mathematical skills in which we are sorely lacking. CoderDojo also helps tremendously in bringing up the level. Would Mr. Sweetman like to speak about the interface between industry and universities?

Mr. Paul Sweetman: The ICT Action Plan and Skills Programme was launched in January 2012 by the Ministers for Jobs, Enterprise and Innovation and Education and Skills. There was a series of actions within that, one of which directly addressed the situation described by Senator Clune. This was the foresight group. It is a good beginning and brings industry and academic leaders together to discuss what relationship is required to deliver courses that respond to companies' needs in the medium to long term. That is highly populated with leaders from the technology sector.

On the other side of that and reflecting what Mr. O'Sullivan said about image and careers within the sector, over the past 18 months we have seen quite a shift in the perception of the technology sector. It is now seen not just as a very strong sector for jobs but a very strong sector for a good career. We see that in CAO application rates, which have increased from between 20% to 60% in particular colleges. We are moving in the right direction with regard to creating a larger pool of graduates available to the sector and with regard to quality as well. Certainly the foresight group will be a powerful vehicle to influence change.

Deputy Dara Calleary: I welcome the delegation and thank it for all the work it has done promoting it outside these halls. It has answered many of our requests. We go to meetings everywhere to speak about this issue. The delegation seems happier now in respect of progress on the technology visa than it was previously. Does it think this will be done and dusted by Easter or by the summer?

Chairman: The action plan for jobs will be out soon. That might help him in answering.

Deputy Dara Calleary: I would not depend on that.

Mr. Sean O'Sullivan: We should wait until the action plan for jobs. It is coming out very soon.

Deputy Dara Calleary: There might be something measurable in it. So the delegation is happy it will be in the action plan for jobs but there is no delivery date.

Mr. Sean O'Sullivan: Mr. Cunningham was sitting in with the Department one day ago.

Mr. Joe Cunningham: We sensed that we would get something by the beginning of the next quarter. We have been really positive recently about the Department and how responsive it has been to green card applications. The problem we have is that it needs to be really predictable. We make offers to people around the world and have a very short window in which to catch them before they take jobs somewhere else. We are talking about the very top talent - the people who will mentor the people coming out of colleges in three years. To get those guys, we need a really predictable process and that is what this scheme we have seen presented to us by the Department in draft form will move us towards.

Deputy Dara Calleary: If any member of the delegation had a choice to be Minister for Education and Skills or Minister for Jobs, Enterprise and Innovation and was a dictator and did not have to worry about civil servants or unions, which post would he take? What would be the top three actions that would make an immediate impact on making the technology sector more attractive to graduates and parents? Perhaps Mr. Sweetman might expand on the cost to Ireland Inc. that arises from the 40% of companies that have passed on projects and business opportunities from IBEC? What did we lose in monetary terms and in terms of jobs? Perhaps Mr. O'Sullivan and Mr. Cunningham might respond as to what their dream ministry in a dictatorship would be?

Mr. Paul Sweetman: One of the issues about that statistic is that we will never see the impact of it in the sense that we do not know the jobs that have been lost. There will be no announcement of projects that have had to be passed privately by companies. It impacts in two ways. It impacts in respect of jobs gained by other jurisdictions that we would otherwise have gained. Those jobs still go somewhere. Most importantly, it concerns the reputation of Ireland. If a company passes up a project, it is less likely to be looked on favourably again when a project comes up, so certainly the impact relates to jobs and reputation. It is difficult to put a monetary figure on this. Again, however, one just does not know where the next project will lead.

Mr. Joe Cunningham: The education side is incredibly important, particularly in encouraging more children - especially girls - to do higher level maths. There is a need to provide the relevant courses in schools and get children excited about them. I am the parent of a number of primary schoolchildren and when I meet other mothers and fathers in the schoolyard, I discover that they are all excited about technology. They talk about encouraging their children to take an interest in technology and join CoderDojo while still in primary school as opposed to waiting until they go to secondary school. There is a demand on the parents side, but there are still issues on the education side in putting ICT in place in schools. I do not refer to kids sitting in front of computers and playing games but to actually becoming involved in development, programming and other interesting things which will stimulate their minds. If we could do this in the education sector, it would be great.

On the tech industry side, we need to bring on board those people who are going to develop these graduates when they emerge from colleges in three to four years time. I built businesses in the 1980s and 1990s and we brought in *emigrés* from Philips, Siemens, AT&T and other companies across the globe. We built a tremendous tech industry in the 1990s by bringing on board Irish people who had travelled abroad and obtained six, seven or eight years' experience and building businesses around them. The people concerned remained in Ireland and it is not possible to attract any others like them. As a result, we must bring in people from abroad who possess the type of top-tier skills around which we can build businesses.

Mr. Sean O'Sullivan: If given the opportunity to opt for one of the two - in his own book Mr. Cunningham cheated in this regard - I would probably choose education. We could do a number of things. For example, the Khan Academy involves self-paced instruction and inverting the classroom. These approaches can work at a secondary level and encourage the brightest minds to apply themselves in focusing on what our society truly needs. We need more of the nation-building types of individuals who can create jobs. Many people do not realise that the top talent from Irish institutions is going into law and medicine which are very noble professions but they relate to service economies. That is very limited because one is not scaling the number of jobs one is creating for society. If an engineer is creative and bright, he or she can develop a company or an industry which can create hundreds of jobs, whereas a doctor may service a couple of patients each day. Our society needs to produce people to fill these roles.

We in Ireland have a tendency to say, "Let us give something to this, that or other university and it will develop specialists in a certain area." I do not believe that is necessarily the best way to operate. I would create one MIT-like institution in Ireland which all of the very top talent would attend. Everyone who graduated would know that he or she was competing among the very best in the country. This would ensure we would not lower the skill or talent level in each of the universities.

Another action I would take would be to bring to an end the overly specialised disciplines. I invented the term "cloud computing". I do not know if members are familiar with it. Irish

institutions now offer degrees in cloud computing, which is nuts. They also offer degrees in other super-specialised areas. It is not that these are not important specialties relating to important industries. Elsewhere in the world, however, people obtain degrees in electrical engineering or computer science and they may specialise in or concentrate on a particular aspect. Here we offer esoteric degrees which will not prepare someone for his or her entire career. Rather, they will only prepare someone for the next five years and this is only if one truly believes the degree is in such a specialised area. There were no cloud computing systems ten years ago, but software was available. We must be concerned about this over-specialisation. Much of it is the result of the way the points system for the leaving certificate works. All of this would need to be adjusted.

That is my take on the matter. I do not have all the answers because I just run a business. Since the Chairman asked me to indulge my fantasy, however, I took the opportunity to do so.

Mr. Colin Donnery: My colleagues' companies have all the big solutions. In the context of recruitment, there is a worldwide war going on in attracting talent. As Mr. Cunningham stated, when a person from Russia or elsewhere applies for a job in Ireland, he or she is also probably applying for jobs in ten other countries. We have a small window of opportunity in attracting these individuals and if we do not grab them as quickly as possible, we lose them. There was a work authorisation programme in Ireland up to 2009. A former Minister, Mary Harney, got rid of the programme, which created huge difficulties at the time. We had not actually lost any IT jobs at that point, but we were losing them in other areas. The programme in question allowed us to bring people into Ireland in approximately two weeks. At present, it takes two weeks just to get someone into the country in order that he or she might attend an interview. If the person is from Azerbaijan or some other country where there is no Irish consulate, we must make an application through the Department of Foreign Affairs and Trade and via another country's consulate in getting him or her to Ireland. As a result, the interview process is delayed. In addition, the process relating to green card applications takes six to eight weeks to complete.

I accept that we have been hammering on about this matter for a long period. However, the position is becoming serious, not just for Apple and other major companies but also for small indigenous Irish companies which are really suffering. The process is having a knock-on effect on wages in this country because people who are here are receiving seven or eight offers when they seek employment elsewhere. Salaries are increasing and the smaller indigenous Irish companies that are creating great products and in which those emerging from our universities with specialist skills will seek positions are unable to compete. There is a need to expedite matters and make this an open country in order that we can attract both companies and the relevant specialists required to fill particular roles.

We have been involved in discussions with successive Ministers for the past four to five years on this matter. Let us consider an example. Pramerica Systems Ireland Limited in County Donegal has been in operation since 1999. It started out with ten staff and now has 900. It built its workforce on the back of the work authorisation programme. Top-level staff were brought in from Singapore, Russia, the United States, etc., and the company grew its teams around them. It now takes on graduates from Irish universities each year. There is no reason we cannot be winners on the worldwide stage.

Chairman: I would have presumed that Mr. O'Sullivan would have been consulted about the cloud computing course to which he referred before places on it were first offered. However, he was obviously not consulted at any stage.

Mr. Sean O'Sullivan: No.

Chairman: Was the course provided to attract students or was it to obtain funding for the institution involved?

Mr. Sean O'Sullivan: The leaving certificate system seems to create a degree of unnecessary specialisation. We need generalists who are able to be problem solvers and extremely talented across a range of areas. The job one obtains when one graduates from college will not be the same five years later. It will be slightly different. One might perhaps be managing something differently or the job may be broader in nature. One's career changes. Our careers should be broad but with specialisation, where necessary. The focus of the leaving certificate system seems to be that we should create niche degrees which will attract more highly qualified students. We should have more selective and wide open colleges for different quality candidates.

Deputy Áine Collins: I welcome Mr. O'Sullivan and the other members of the delegation. They referred to subjects. We all know maths is really important. Is science as important as used to be the case and should it be a core subject on the junior and leaving certificate syllabuses? I accept that we do not have enough graduates, that there is a high level of unemployment and that we need to try to deal with these issues together. It is important, however, that when we emerge from the current phase there will still be people with IT skills coming to Ireland, particularly as they bring with them diversity, etc. I heard Mr. O'Sullivan speak on this topic previously - it might have been in the context of Silicon Valley - and perhaps he might enlighten us further on it. In this regard, I refer particularly to the assertion that if we attract 10,000 jobs from abroad, it will lead to the creation of 100,000 jobs locally.

Mr. Sean O'Sullivan: In respect of Silicon Valley, 40% of the residents of the town of San José which is larger than Dublin were not born in the United States. In general, about half of the companies in Silicon Valley were created by founders born outside the United States. Some 75% of senior management teams also comprise people born outside the United States. When I attend board meetings in Ireland, I do not see that diversity. I do not see Indians, Russians or South Americans, for example, at senior board level. We have to ask whether we want this to be a country of origin, sending our people everywhere throughout the world, or we want this to be a destination country to which people want to come and bring their families to create lasting growth and a multicultural society of significance. We want Ireland to be a destination country and I hope we can achieve this. It is not just a case of accepting everyone who wants to immigrate but choosing to accept the highest value immigrants, as the United States, Canada and Australia are choosing to do. Ireland is not operating in a vacuum; several countries are actively recruiting high value economic immigrants. This is the policy pursued by the United States in the past which it did better than it does today. This is the opportunity available to Ireland. Do we want to be the only English-speaking people in the world with an open door for the best and brightest tech talent? That would be a unique and remarkable position to be in that would resonate throughout the world. It is a position we should be seeking to grow the economy to the point where we would not have to worry about a slow growth rate; we would be trying to restrain the growth rate and there would be full employment. We can take advantage of what we already have ever since Mr. Seán Lemass and Mr. T. K. Whitaker set the policy of opening up Ireland. If we continue on that path, we have a bright future. We need to aggressively seize and capture this opportunity. If this happens, we will be known around the world for it.

Deputy Áine Collins: Are the science subjects important?

Mr. Joe Cunningham: Maths and science are incredibly important. As Mr. O'Sullivan

said, we are looking for thinkers, people we can mould and who have a broad set of skills. In the case of medicine, one does not begin with studying to become a dermatologist or an orthopaedic surgeon; rather, one spends six years in general medicine and then proceeds to specialisation. It is no different in industry with regard to engineering or computer science. We can mould people with a broad initial education.

Deputy John Lyons: This delegation is a breath of fresh air. It is great to be across the table from people who are exceptionally proactive and productive and offering ways out of our current situation. I hope the Action Plan for Jobs or the follow-on from that strategy will offer solutions to the problems highlighted by the delegation. I also hope the committee can be an advocate and that the delegation will offer us further sound and practical advice in the future.

I have a question more out of curiosity about girls and their attitude to maths. Are fewer girls studying higher level maths or is there another reason?

Mr. Joe Cunningham: Higher level maths does not seem to be offered in a sufficient number of all-girls' schools, in particular. The performance of girls in the STEM subjects exceeds that of boys, particularly in all-girls' schools, which is ironic. They are not offered higher level maths, even though they are probably the best at it. This is a serious loss to the workforce because they account for 50% of the potential workforce.

Chairman: Is Mr. Cunningham saying we do not offer them the chance to study higher level maths or that they do not choose to study it?

Mr. Joe Cunningham: It is a combination of both. There is more of a drive by parents who want their children to have a future in the technology sector. I suggest it is very difficult to find higher level physics courses in all-girls' schools. Higher level maths may be offered, but the students may not receive enough encouragement to study it. If there are not enough students willing to study it, the school will not provide a class that year. Parents are beginning to push for these subjects and we need schools to be incentivised. The policy of offering extra bonus points for maths has been very successful, as shown in the CAO applications. We need to continue this policy.

Chairman: Is it sufficient to encourage the take-up of higher level maths or is there a need to encourage the study of applied mathematics?

Mr. Joe Cunningham: Some combination of maths, physics and applied maths is very important. Chemistry and biology are also important and I do not discount them. It is a case of allowing second-level students to participate in a process where they learn to think in order that they will go to university with their minds open to thinking for themselves. They can then progress from college into the industry where that thinking will be used. The great thing about maths and physics is not so much the specific knowledge one learns but rather the fact that one must solve problems, think about systems and the way things work. That is what we want in our industries. Software and programming, knowing Java, for example, are fundamental, but it is also vital to understand a complicated system, whether it be text messaging, how a gas system works, for example, and applying this knowledge to software. We need to have people who can think about problems in a lateral fashion and apply software methods to solve them.

Mr. Sean O' Sullivan: As I have a seven year-old daughter, I second Mr. Cunningham's comments. There is an expression, "Women hold up half the sky". Unfortunately, when it comes to programming positions, there may be one out of ten who is actually in the field. Sup-

posedly 25% of women are working in technical areas, but this includes medicine and other fields which are not the software and high tech areas. We would really like to see greater participation by women. It is noticeable in some design areas in which several women are heading up companies, but we would like to see more. Women are not carrying half the burden in technology jobs, which is not because they are not good at it. The challenge for society is to encourage more women to work in an area which can develop their creativity.

Mr. Colin Donnery: I have four children involved in CoderDojo, two of whom are girls. Our CoderDojo group is in Birr and the girls are outperforming the boys in many cases. They are not just taking part in programming with Scratch or HTML, they are taking part in chess, rocket launching and robotics. I applaud the CoderDojo people who have done a phenomenal job.

Senator Deirdre Clune: Our report addresses the issue of female participation. During the dot.com era the level of female participation was not at 50%, but many more were involved. The uptake is not as good now. There are many theories, one being the tech area is perceived as being too macho, or that boys are more familiar with computer games and PlayStation which are very much male-oriented. This may have turned off many girls from moving into the tech area. I agree with the point that honours maths is available in girls' schools but physics and applied maths are not available. This is due to lack of demand and it becomes self-fulfilling.

Mr. Joe Cunningham: If those subjects are not offered, girls are not incentivised to study them. The irony is that the software industry is very family-friendly. Girls may not want to follow a career in some industries but ours is very family-friendly. We work long hours, but we are flexible within them.

Senator Feargal Quinn: I am fascinated by Mr. O'Sullivan's point on over-specialisation. I thought we were moving in the other direction. I understood our education system was too broad, yet Mr. O'Sullivan argues that a general or broad educational base is needed. Mr. Cunningham has explained it very well that a medical student does not decide to be a dermatologist first but rather must study to be a doctor for five or six years before engaging in specialisation. Will Mr. O'Sullivan please go back over this? He said people should be prepared to think and solve problems rather than specialise. I was aware of somebody who had studied technology in university and applied for a job but was told he or she was not suitable because he or she should have specialised in gaming or whatever. I thought that was the problem, but clearly it is not.

Mr. Sean O'Sullivan: It probably depends on the employer. We are doing work that requires brilliant minds, creative minds and creative problem solving. Most of the software industry is like that, in fact. Perhaps Mr. Sweetman could speak on this question also. Sometimes there is a tendency among recruiters to say a person needs to have a certain skill such as JavaScript, or they need to have HTML5 or whatever. However, most of the time those skills can be learned in a matter of two or three months, enough to be good at it. I knew 19 computer programming languages by the time I was 19 years of age. If one is good enough at something it is not difficult to pick up a different set of similar skills. Employers such as those I mentioned might as well be saying "I would like to hire a mechanic who uses only wrenches." That does not work; one must have the ability to use blowtorches, wrenches and other tools. As an industry we do not need totally hyper-focused people; we need problem solvers. It is a contrast. I do not know if my colleague can explain it better.

Mr. Joe Cunningham: I think that is spot-on. Also, we can be over-critical. Our concern is about courses that are very narrow. By training I am an electronic engineer. Ninety-nine

percent of what I learned in college - specific technical things - I have never deployed in industry, but 100% of the reasoning I learned was applicable to what I did. I did very little software at college but went straight into a software job. That is what we are looking for in a growing economy. Employers are willing to train people - that is what we do. We mould people into what we want them to be.

Chairman: There were a couple of questions. Mr. Cunningham said employers are willing to train people. How engaged are employers across the board for all the different levels? The witnesses are specifically talking about the high-level end, but there are many other jobs along the way. I know employers want to do it, but are they doing it or are they restricted? Is there anything we can do as a committee to ensure there is more engagement with employers in training people and in course development? Even though we have had many of the third level institutes appear before the committee, I get the impression that there is still a breakdown in course development and in targeting the right people. Is there an issue with the public and private sectors working together in terms of colleges and courses? Is there a need to focus more fusion there? Is the organisation not involved enough, or does Mr. Sweetman consider it is beginning to happen, as he may see it more clearly? If not, we may need to give a bit of a push as well.

In regard to career guidance, does the industry or the organisation itself engage with the Institute of Guidance Counsellors? Is the issue being pushed enough at school level? Nearly every day when we knock on doors or engage with people, parents ask along which route they should direct their children. Where is their future? Where are their jobs? Parents want more direction and more help. I do not know how we can do it, but they need to hear from the organisation. The questions we are asked every time we go to somebody's house are "What do we get our children to do? What is their future? What courses and what subjects should they pursue?". We are asked that all the time. Parents want to do the right thing and are interested but the message does not appear to be getting through. Perhaps the issue is career guidance. I do not know at what stage it goes wrong.

Mr. Colin Donnery: I will answer with regard to career guidance. What we are seeing is that people are not really engaged. We have started talking to children in schools and so on, and I am involved a little at local level. It is about getting people to do what they love when they are 15, 16, 17 or 19 years of age. One of the problems in Ireland over the years has been changing fashions - if construction is the fashion today, people go into the construction sector. The same applies to law and medicine. Funnily enough, IT was fashionable back in 1998 and 1999, but then there was the dot-com bust, and nobody did IT for three years. Now there is a three- to four-year gap during which not enough people pursued IT degrees. It is a case of getting people to do what they love doing, or to do a general degree in an area in which they are interested and then specialise in year four or when they start working with an employer. There is much specialisation earlier on, which does not help, as many students drop out in first and second year. They may be interested in the general subject they are studying but not the specialisations.

Mr. Paul Sweetman: Perhaps I can add a couple of points. I thank the Chairman for the offer to help. That is something on which the committee could be strong. The great advantage is that much has already been done. There are a number of programmes and initiatives out there and we need to focus on picking the ones that are working effectively. On the issue of engagement with the industry, universities and institutes of technology, I can point the committee to strong examples of programmes that receive Government support. To cut a long story short, I would encourage more support for these programmes. The two examples are the following. A very powerful conversion programme, a master's in applied software technology, is being de-

veloped by Ericsson in conjunction with the ICT Ireland Skillnet, through Skillnets Ltd. funding, which is under the auspices of the Government. In the first cohort, Ericsson has been able to take 50 people off the live register, put them through an intensive master's programme and guarantee them jobs as strong software developers within Ericsson. That first programme was very successful, and now there is a cohort of 100 people. There is no reason this programme cannot be replicated across many of the other large employer-based ICT companies. The attractive aspect of the programme is that on successful completion the graduates are guaranteed a job, but also, these are anchor jobs, which secure the footprint of Ericsson in Ireland. That can be replicated. The way the programme was developed was that individuals from Ericsson worked directly on what they wanted to see within the programme. It turned out that a level 9 master's degree was what was required. That went out to tender, and Athlone IT is delivering the programme. Fundamental to that was the Government programme through Skillnets Ltd.

To show that we are not talking just about high-level skills, VMware and a group of companies in Ballincollig, Cork, pooled together through another Skillnets programme - the Irish Software Association Skillnet - when seeking to fill entry-level positions. It was looking for two aspects in terms of entry into the programme: a person's attitude, and his or her ability to use a computer in a very basic sense. Out of that it got many programming specialists, some within its cloud computing services - about 100 people. That was a specific programme developed with local educational institutions and also directly with companies. In terms of assistance, I would certainly recommend that programmes such as Skillnets be encouraged to continue and that funding be supported. Another development is the 760 conversion programmes that were recently launched by the Government. They are very strong because they are working with industry and academic institutions in trying to develop as best they can what the industry needs and trying to align this with work placement.

What is important about Skillnets is not just that there is funding but that the programmes being developed are often the first of their kind. They are industry-led and have not existed before. For example, a project management diploma being taught by DIT, which was developed through a Skillnet, is actually the first of its kind in Europe. Not only does that bode well for those going through the course; it also gives Ireland a strong reputation for tackling the needs that are important to companies.

With regard to career guidance, there have been some very strong initiatives, and continued support for them would be good. Through industry groups such as IBEC we host career guidance conferences once a year and go through the key topics and the key career options for students. We try to arm career guidance counsellors with the information they will need and tailor it to the requirements of students and parents.

There are some very strong programmes, including Smart Futures, which is run through Discover Science and Engineering. That is trying to capture all the initiatives in order to encourage students to look more at opportunities. It was piloted with the information and communications technology sector but we are now taking in the medical devices and pharmaceutical sectors as well, including science, technology, engineering and maths, and focusing on careers available from there. It is a very strong programme and it could play some part in continuing the shift we observed last year, with more students going for third level courses that are technology-related.

There is a champions programme that heavily involves Engineers Ireland. Recent graduates from engineering programmes in particular speak to fourth level students, detailing their work as an engineer and the strong opportunities that they see. They advocate consideration of such a career. It is important work as that is the point at which students begin to make critical deci-

sions that could open or eliminate the possibilities for getting involved in the technical sector. We have very strong building blocks and we are beyond the foundations in quite a few of those programmes. It is important to get momentum behind such action.

We are also talking about the visas issue and that is one of the last big plays where we can gain a significant advantage. If we get it over the line it will both solve the problem in the short term and give us a very strong footing internationally, giving companies confidence that whatever the issue will be in five or ten years - it may not be a matter of skills - Ireland will work flexibly and nimbly in its work. The ramifications are very important and it is critical to see if we can do something about it.

Chairman: Does Mr. O'Sullivan have any additional comments?

Mr. Sean O'Sullivan: No.

Chairman: If there are no other comments we will leave it at that. We will engage with the Minister and with the efforts of the witnesses and everybody else, we might see some action with the action plan for jobs. This version will continue the efforts of last year. There are many issues on which we can engage with the witnesses on a more regular basis and we will focus on this area as a committee. We will engage with the witnesses again during the year if that is okay. I thank them for coming today. We will be meeting the Minister next week to discuss the action plan for jobs.

The joint committee adjourned at 2.55 p.m. until 2.15 p.m. on Tuesday, 26 February 2013.