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Department for
**Employment
and Learning**
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ICT

Action Plan

JUNE 2012

INTRODUCTION

The Northern Ireland Economic Strategy sets out how Northern Ireland plans to grow and prosper by both rebuilding and rebalancing the local economy over the short, medium and longer term to 2030.

The Skills Strategy for Northern Ireland, 'Success through Skills – Transforming Futures', launched in May 2011, aims to support the vision of the Economic Strategy and support the Executive's number one priority by facilitating a better educated and more highly skilled workforce that meets the needs of the economy. This ICT Action Plan forms part of the Government's delivery of the Economic Strategy.

A highly and appropriately skilled workforce has a crucial role to play in a modern, knowledge intensive, export driven economy. Skills and employability support the exploitation of other key drivers of economic success. They help economies make the most of new opportunities in high value-added activities, they encourage greater investment (including inward investment) and innovation, they help firms compete successfully in export markets and, ultimately, they support economic growth and enhanced productivity.

To achieve the workforce Northern Ireland requires to prosper it is clear that a change is required in the way in which we all view and invest in our skills. This is where we all must play our part – Government, employers, education and training providers and individuals alike.

This willingness to work with companies to ensure they have a highly skilled and well utilised workforce, in support of growing a prosperous and vibrant local economy that can transform our society, sets the backdrop for the formation of the ICT Working Group.

The previous ICT Future Skills Action Group has been very successful in bringing us to where we are now and the e-skills UK Employer Board is doing excellent work in further developing and enhancing the 'Bring IT On' campaign. Employers remain concerned, however, about skills shortages and the impact they are having on their ability to grow the sector. To address these concerns, the Minister for Employment and Learning convened an ICT Working Group to identify the skills challenges faced by the sector and to put in place an Action Plan setting out how these issues will be addressed by business, Government and education and training providers in the short, medium and longer term.

The membership of the group consists of:

Dr. Stephen Farry MLA	Minister for Employment and Learning
David Mawhinney	Chair of e-Skills Employer Board Managing Director EquinitiICS
Iain O’Kane	Managing Director Xperience
Liam Jordan	Managing Director ICONI Software
John Healy	Director – Head of Technology Citi Group
Prof. Tom Millar	Dean of Engineering and Physical Sciences Queen’s University Belfast
Prof. Richard Millar	Dean of Computing and Engineering University of Ulster
John Quinn	Chair of Colleges’ Economic Engagement Working Group
Christopher Morrow	Policy Executive Northern Ireland Chamber of Commerce
Nigel Smyth	Director CBI Northern Ireland
Graeme Hutchinson	Director of Economic Policy Department of Enterprise, Trade and Investment
Adrian Arbuthnot	Head of Curriculum, Qualifications and Standards Division Department of Education
Niall Casey	Director of Business Improvement Invest NI
Tracey Walsh	Client Manager International – ICT Invest NI

THE NORTHERN IRELAND ICT INDUSTRY

Information and Communications Technology (ICT) is the driving force of a globally competitive economy, underpinning innovation, competitiveness and long term prosperity. The sector is extremely important to the Northern Ireland economy and research¹ estimates that the sector has approximately 16,500 jobs, contributing 3.6% of total Northern Ireland Gross Value Added (GVA)². Within the ICT sector, GVA per job is £57,000 and wages are one third above the private sector average.

Over the past decade, the computing sector, and particularly software development, has shown strong growth. Its share of overall ICT employment has more than doubled and now represents over half of all ICT employment. The key areas of software development growth have been in financial services (capital markets technologies), customer relationship management, general software, mobile communications, internet and e-commerce.

The sector has experienced indigenous growth and continues to show expansion through attracting foreign direct investment (FDI). The indigenous companies and those who have located here both recognise the need to quantify and qualify the number and types of future jobs that the sector as a whole can create. Several of the larger new investors have stated that they could attract more work from within their global business groups if there were the quantity and quality of staff available to them in Northern Ireland. The e-skills UK Employer Board, with Invest NI, has agreed to develop a five year 'shared vision' for the ICT sector. The Department for Employment and Learning will engage in this process, in order to ensure a closer relationship between, and understanding of, the skills demands of the sector and the skills provision available from the further education colleges and universities.

With the rate of change and growth within the sector, it is not surprising that a mismatch between the skills of the workforce and the skills needed by the sector to facilitate its growth has developed. Yet the shortage of appropriately skilled people available to work in the sector has the potential to limit the sector's contribution to economic growth and, therefore, must be addressed as a matter of urgency.

¹ 'Research Study on High Level Skill Needs in Northern Ireland ICT Sector', Oxford Economics (2009)

² GVA is the difference between the value of goods and services produced and the cost of raw materials and other inputs which are used up in production.

There has been a number of reports that consider the skills shortages and gaps within the ICT sector that have informed Government interventions over the past number of years. Initiatives through the ICT Future Skills Action Group have been welcomed by the sector and have achieved demonstrable results. Despite this work, a range of issues have been raised by employers and other stakeholders who report that:

- skills shortages are prevalent within the software development, infrastructure management and applications management sub sectors;
- there is a shortage of people available to enter the sector with relevant skills, including both technical software language skills and management skills (due primarily to the rapid growth experienced in the sector);
- despite the skills shortages reported by software companies, there is evidence of a high number of suitably qualified individuals choosing other occupations, rather than working in software development;
- they are experiencing a shortage of experienced ICT professionals, i.e. those with several years experience in the sector, and consequently there are too few who can lead and manage projects with minimal supervision;
- there is a mismatch between the skills of graduates leaving colleges and universities and the skills needs of the software industry;
- there are concerns about the provision of Computer Science in secondary level schools. These concerns relate to the fact that the most popular ICT related subject being taught at A level is that in Information Technology and whilst this is a good qualification for ICT users, it is not an appropriate qualification to meet industry needs; and
- there is a 'spectrum of need' in relation to entry level qualifications with the larger companies seeking honours degree level entrants, whereas SMEs, particularly in the Information Systems arena, are content to consider a lower level of education attainment for entry level posts where these are supplemented by 'vendor' qualifications such as Cisco, Microsoft Gold and Citrix. These SME employers also expressed an openness to look for alternative sources of suitably educated young recruits, such as from flexible further education provision, including Foundation Degrees, apprenticeships and ICT Career Academies.

These issues will be examined under three themes: skills provision, sector attractiveness and co-ordination and communication.

THEME 1: SKILLS PROVISION

Challenge: Understanding the demand for ICT Professionals

Understanding the demand for ICT professionals is vital, if we are to ensure that there is a pipeline in place to deliver an appropriate number of quality skilled people to work in the industry. In order to provide this understanding of demand in the ICT sector, four main sources of research have been used. They are: Oxford Economics' 'Research Study on High-Level Skill Needs in the Northern Ireland ICT Sector'; e-skills UK's 'Snapshot Report' 2012; the Employer Board ICT Skills Action Network's 'ICT Skills Action Plan Report' produced by the sector and Invest NI; and the 'Preparing for a Lower Corporation Tax Environment' report by Oxford Economics for the Department for Employment and Learning. Each of these pieces of research assesses the current situation and future potential of the sector from a different perspective but collectively they provide a direction of travel of increased need in terms of numbers of people required for the sector and of specific skills needs. As reflected in the Economic Strategy for Northern Ireland, an agreed and articulated industry and Government 'shared vision' for the ICT sector in Northern Ireland, covering the next five years, will be important to ensure that these opportunities are maximised.

Oxford Economics - 'Research Study on High-Level Skill Needs in the Northern Ireland ICT Sector'

In 2009 the Department for Employment and Learning, supported by the ICT Future Skills Action Group, commissioned Oxford Economics, in association with FGS McClure Watters, to conduct research into the higher level skills needs of the Northern Ireland ICT sector. This research involved a detailed analysis of supply and demand and the production of an appropriate forecasting model to inform longer term policy making, in relation to higher level skills for the ICT sector.

The research indicated that in 2008 the Northern Ireland ICT sector comprised 16,500 jobs, including 1,500 self-employed individuals. The ICT sector's share of total employment was equivalent to 1.9% or just less than 1 in 50 total jobs in Northern Ireland. The Northern Ireland ICT sector was seen as a relatively under-developed sector in size terms compared with many regions in Great Britain and the Republic of Ireland and as 'fledgling', given the presence of few large ICT companies.

The report developed three scenarios, from a baseline outlook to aspirational outlooks, to analyse the short, medium and long-term recruitment and skills requirements of the ICT sector in Northern Ireland. A **baseline scenario** indicated that the long-term annual net requirement from education and in-migration would be equivalent to 300 persons, and half of those recruited would require high-level skills. A **Leitch upper scenario**, focussed on closing the private sector productivity gap, predicted an expansion demand over the period 2010-2020 of 3.4% per annum which equates to an annual net requirement of 600 with over half of those recruited requiring high level skills. A **MATRIX upper scenario**, based on projections by the MATRIX ICT Horizon Panel, predicted employment growth over the period 2012-2020 of 5%, requiring 1,000 net new jobs per annum and again more than half of these individuals would require high level skills.

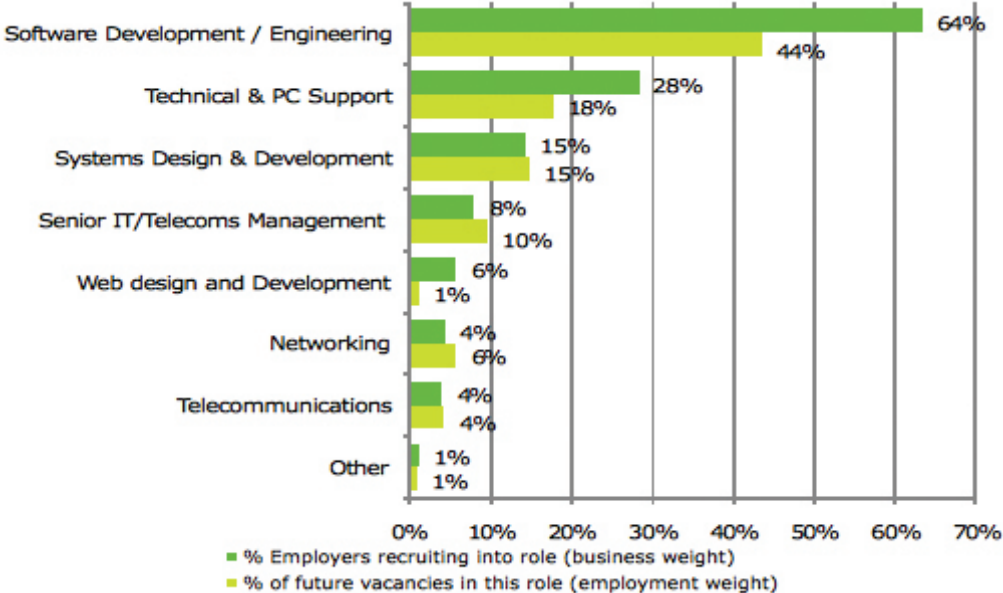
The study found that if Northern Ireland is to achieve the type of knowledge economy originally envisaged in the MATRIX report, then an increase in the quantity and quality of those with high level ICT skills would be essential. The report also identified a number of policy issues to be addressed in order to achieve the growth required. These included developing a closer alignment of the secondary level Information Technology curriculum with the university curriculum to meet industry needs and ensure a smooth transition from school to tertiary education; universities considering raising the entry requirements for ICT courses, assessing the feasibility of introducing a top-tier course in this discipline and considering incentives for higher level ICT study, such as bursaries and scholarships; and that career attractiveness campaigns such as ‘Bring IT On’ should continue and be expanded.

e-skills UK - ‘Snapshot Report’

The ‘Snapshot Report’ for Northern Ireland is produced by e-skills UK as part of their work for the Department for Employment and Learning. Its purpose is to ascertain the current staffing levels of IT and Telecoms companies in Northern Ireland and to assess the likely recruitment demands of the sector over the next year. From the ‘Snapshot Report’ e-skills UK reports that as of December 2011 there are 12,090 employee jobs in the core ICT sector in Northern Ireland with almost 8,600 of these jobs in the category of computer programming, consultancy and related activities. The combined total of 12,090 is an increase of almost 5% since December 2010.

Figure 1 highlights the anticipated future recruitment for various occupational roles within the sector over the next six months. It is clear that the future recruitment outlook is encouraging with a growing number of companies expecting to recruit ICT professionals over the next six months. It is estimated that almost 64% of businesses expect to recruit into software development/engineering roles, and these roles are estimated to make up 44% of all future recruitment.

Figure 1



e-skills UK has predicted that there could be an additional 2,300 new jobs each year in the ICT sector in Northern Ireland up to 2019. This figure is supported by the work taken forward in the demand side workshops and could also be significantly bolstered by Invest NI’s prediction of 500 new jobs each year in the ICT sector, as a result of the FDI pipeline.

To date the sector has made approximately 2,090 appointments per year, with these jobs being filled by 300 individuals joining from education (16%); and 1,540 positions being met by people joining the sector from occupations other than IT or Telecommunications. It is estimated that there could be around 250 positions that will be filled by people moving from one IT and Telecoms professional job to another (i.e. 'churn' or movement within the IT and Telecommunications professional workforce). The level of 'churn' in any sector is not only a factor of demand and supply, but also the level of confidence that 'job-changers' have in the economy as a whole. In a buoyant labour market, and where demand exceeds supply, churn levels can be expected to be higher. However, in a labour market where there is low confidence and fear of redundancy (last in: first out), 'churn' levels will be lower. Throughout the recession, the ICT sector has been 'recession neutral' (especially when compared with other sectors) and accordingly, 'churn' in Northern Ireland was estimated by e-skills UK in 2011 to be around 5%.

Employer Board ICT Skills Action Network - 'ICT Skills Action Plan Report'

Through the Collaborative Network Programme, Invest NI, members of the e-skills UK Employer Board and other ICT businesses have been engaged in an exercise which attempts to articulate and predict the potential of the ICT sector in Northern Ireland to grow over the next five years. This is very much an aspirational view of the industry's potential that includes estimates of likely expansion numbers from indigenous company growth, existing FDI company expansion, the FDI pipeline numbers and a measure of the numbers of jobs that (multi-national) companies could create through their internal bidding for projects. David Mawhinney, Managing Director of Equiniti ICS Ltd and Chair of e-skills UK Employer Board, described this scenario as "the aspiration of what could be achieved were we able to remove all the inhibitors to growth."

Given the aspirational nature of this exercise it is not surprising that the estimate of the potential numbers required by the sector is larger than other forecasts. The aspirational scenario predicts that the number of jobs in the ICT sector could double over the next five years from a base of 28,000 (16,500 IT Professionals and 12,000 other IT workers) to 53,000 overall. The exercise also estimated the number of people likely to enter the industry from education and training over the same period, in order to quantify the potential gap in supply. These indicate that 25,303 IT positions could be created over the next five years with 13,029 individuals being available to the sector over the same period through education and training. These figures indicate a shortfall of 12,274 people during this timescale. The report also estimates the level of labour 'churn' at around 9.5% per annum and comments that this is high and represents a risk that could inhibit growth.

Oxford Economics - 'Preparing for a Lower Corporation Tax Environment' Report

Oxford Economics was commissioned by the Department for Employment and Learning to assess the likely impact on the skills needs of the economy should the Northern Ireland Executive be given the legislative power to reduce Corporation Tax in Northern Ireland. This report, which was published on 20 June 2012, indicates that the number of jobs created by 2030 in the Northern Ireland economy could increase by 57,000 in their baseline scenario and by 115,000 in the 12.5% Corporation Tax scenario. Under the 12.5% Corporation Tax scenario, it is estimated that the number of jobs in the software and IT sector will almost double from its current size, providing an additional 10,000 software and IT jobs by 2030, on top of the baseline. The report also notes that almost 90% of the additional jobs created in software and IT will come from new FDI, or expansion of existing firms. Looking specifically at demand for high level skills, compared with the baseline scenario, the low tax scenario net requirement subject share is highest for Computer Science, in comparison with other subject areas.

Summary of four main research sources

Accepting that the numbers of new jobs that will be created and that the timelines for the four reports are different, there is a consistent message from all four reports that the need for experienced and new graduate talent in ICT will increase in the future. In order to respond to this need and the additional jobs created, more will be required of the education and training systems to supply skilled individuals, in order to maximise the economic opportunities of the future.

This is not a new message from the ICT sector and Government and the industry have worked together in the past to address the skills mismatch and short term issues. It should also be noted that the forecasted and aspirational numbers of new jobs created are dependent on the continued growth of the global economy into the medium and long term. Extraneous events such as the collapse of confidence in global financial services markets, as witnessed in 2008-2009 led to redundancies and head count freezes in many multi-national companies and such major economic events could again have a very negative impact on economic growth.

This must not, however, detract from the need for collective action with Government, industry and education working together to support the ICT sector and to achieve the aspiration of establishing Northern Ireland as a centre of ICT excellence.

Actions:

- The e-skills UK Employer Board will continue to use existing labour market information and annually updated forecasting reports to identify specific skills gaps faced by each sub sector (software development, infrastructure management and applications management) and likely future skills gaps. Consideration may need to be given to making this review process more regular.
- The e-skills UK Employer Board will seek support from Invest NI's Collaborative Network Programme to continue work with the demand side to better understand the range of skills demands in the sector.

Challenge: Understanding the annual supply of appropriately qualified people

It is predicted that between 2011/12 and 2014/15 there will be just under 2,400 graduates from Computer Science courses at the universities in Northern Ireland. This predicted output is set out overleaf by year and subject area, for both the University of Ulster and Queen's University.

Table 1

Predicted Completions on University of Ulster Computer Science courses 2011/12 – 2014/15.				
Subject	2011/12	2012/13	2013/14	2014/15
Computer Science	242	288	334	348
Multimedia Computing Science	94	65	36	54
Information Systems	15	12	10	7
Software Engineering	19	6	10	12
Artificial Intelligence	1	2	1	
Total	371	373	391	421

Table 2

Predicted Completions on Queens University Computer Science courses 2011/12 – 2014/15.				
Subject	2011/12	2012/13	2013/14	2014/15
MEng Computer Games Development	4	11	13	11
MEng Computer Science	5	17	28	26
BEng/BSc Computer Science	50	56	66	102
BSc Computing and Information Technology	69	60	57	64
Business Information Technology	47	52	52	42
Total	175	196	216	245

It is therefore predicted that there will be a yearly output of some 550 – 600 Computer Science graduates from the Northern Ireland universities each year over the next four years.

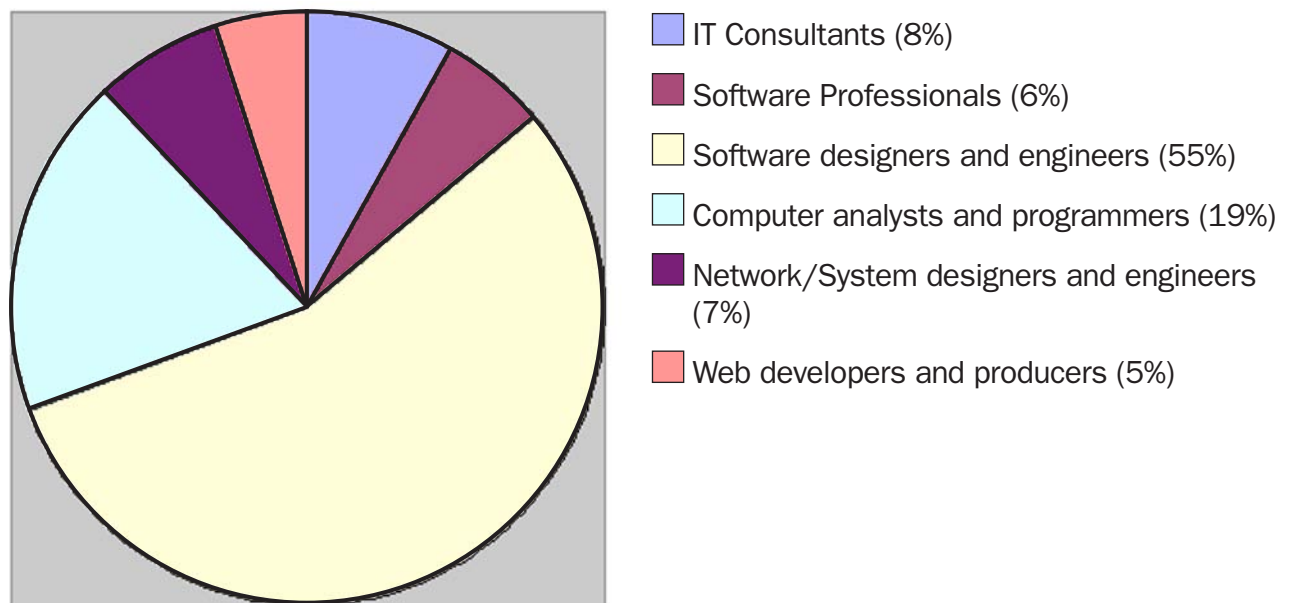
In 2012/13, Queen’s University and the University of Ulster will also launch postgraduate MSc courses aimed at non-IT graduates that will bolster the annual output of Computer Science graduates from our universities. These courses will offer 90 non-IT graduates the opportunity to gain ICT qualifications.

Another important factor to consider is where these graduates will end up working. In 2009/10 there were 590 graduates from Computer Science courses at Northern Ireland’s universities. Figures from the 2009/10 ‘Destination of Leavers from Higher Education’ survey indicate that 76% of those graduates who were surveyed were in work within six months of graduating and that 40% of those who were in work were employed as ICT professionals.

Figure 2 below indicates the specific job roles secured by those 2009/10 Computer Science graduates who were working as ICT professionals within six months of graduation.

Figure 2

2009/10 Computer Science Graduates from Northern Ireland universities who work as ICT Professionals



The further education colleges are the main providers of Foundation Degrees and can also offer the IT Professional Course. The latter is a one year conversion course for non-ICT graduates and is accredited at Level 5 on the Qualifications and Credit Framework. The colleges have gained a reputation of being able to deliver teaching and skills provision in a very flexible way and focused on the needs of industry e.g. the Software Testers Academy.

There are a significant number of students enrolled on Higher Level Computing and Computing-related courses throughout the six further education colleges in Northern Ireland. The table overleaf gives details of projected outputs from the further education sector between 2012 and 2015.

Table 3**Projected completions from further education Computer Science courses 2011/12 – 2014/15**

Course	2011/12	2012/13	2013/14	2014/15	Total
Foundation Degree in Computing	34	51	67	67	219
Foundation Degree in Computing and Network Systems	14	37	30	30	111
Foundation Degree in Computing and Software Development	53	57	61	66	237
Foundation Degree in Media Production	9	9	9	9	36
Foundation Degree in Multimedia	31	32	18	18	99
Foundation Degree In Software Engineering	18	27	35	35	115
Foundation Degree in Web Technology	4	4	4	4	16
Foundation Degree Interactive Multimedia	15	22	18	20	75
Sub-total	178	239	242	249	908
HNC Administration and Information Technology	13	10	0	0	23
HNC Interactive Media	0	10	24	24	58
HNC Computing and Systems Development	66	80	147	162	455
HND Administration and Information Technology	8	20	0	0	28
HND Computing	20	0	0	0	20
HND Computing (software Development)	18	0	0	0	18
HND Computing and Systems Development (Software Development stream)	20	22	30	30	102
HND Computing and Systems Development (Systems Support stream)	10	10	15	15	50
HND Computing and Systems Development (general PT option)	18	36	45	50	149
HND Computing and Systems Development	52	100	115	125	392
HND Creative Media Production (Computer Games Design)	0	0	18	18	36
HND Interactive Media	14	34	51	56	155
HND Multimedia	15	0	0	0	15
Sub-total	254	322	445	480	1501
Software Testing Academy	20	20	tbc	tbc	40
Total	452	581	687	729	2449

Actions:

- Universities and colleges will continue to provide figures regarding predicted outflow from their courses to develop a clear understanding of the provision from our institutions in order to inform actions.
- The e-skills UK Employer Board, with the proposed support of their Collaborative Network facilitator, will continue to monitor the dynamics between the sector's demand for graduates and the numbers supplied through the education and training systems.

Challenge: Encouraging the take up of Computer Studies A level

The A level in Information Technology is regarded as a good curriculum for teaching the use of information technology by individuals, but it is not regarded as a good qualification for preparation for courses in software engineering. The A level in Computer Science is regarded as a much more appropriate curriculum by the ICT sector, as it develops the fundamentals of creating computer coding.

Although a Computer Studies A level curriculum is available to schools, at present, only a limited number of schools in Northern Ireland offer their pupils this option. Enrolments continue to decrease, while Information Technology A level enrolments have increased substantially (Figure 3).

In light of this, the Council for the Curriculum, Examinations and Assessment (CCEA) has recently developed an A level in Software and Systems Development. This is an applied course which requires the demonstration of knowledge, understanding and skills relevant to the ICT sector and is assessed through the demonstration of appropriate practical skills and supported by written and oral presentation.

The course has been developed in conjunction with Invest NI, employers and universities, to ensure it suitably prepares students for further and higher education in Computer Science related courses and meets the needs of the industry in Northern Ireland.

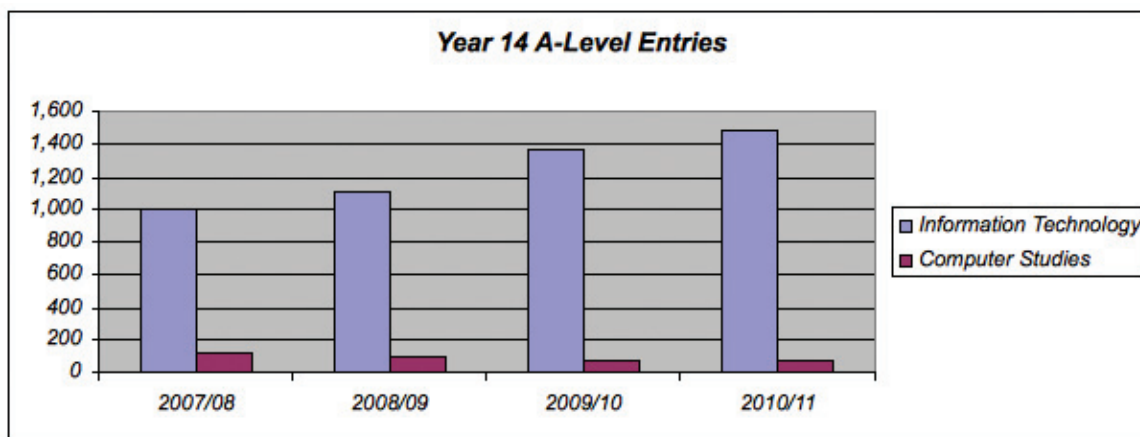
Support and training will be provided to teachers to prepare them for the rollout of the course at the start of the 2013/14 academic year with the first students completing the course in summer 2015.

The Group also believes that more needs to be done to encourage young people to choose to study relevant subjects such as Computer Science and Mathematics at A level. There are a number of ways in which this could be addressed but it is critical that Careers school teachers and Careers Advisers have access to up-to-date labour market information, to highlight the career opportunities and benefits associated with the ICT sector. Adapting the university enrolment criteria is another way which could potentially encourage the uptake of Computer Science and Mathematics at A level.

Actions:

- The Department of Education, via CCEA, will continue to examine the current provision and range of school computing/ICT qualifications to ensure it meets the needs of ICT courses in universities.
- The Department for Employment and Learning and e-skills UK will ensure Careers teachers in schools and Careers Advisers have access to up to date labour market information to highlight the career opportunities and benefits associated with the ICT Sector to school children and their influencers.
- The Department of Education will develop and introduce new awareness programmes aimed at encouraging more pupils to choose to study Computer Science.
- Universities will consider the weighting they give to certain A level courses (such as Computer Studies and Mathematics) through their entry/intake process.

Figure 3: A level take up for Information Technology and Computer Studies



Computer studies figure is made up of AQA and OCR Boards; none were registered with CCEA in for example 2010/11.

Challenge: Incentivising the take up of relevant courses at college and university

Northern Ireland's universities and further education colleges offer a wide range of ICT related courses. Some of these, however, are more relevant to current and likely future employment opportunities within the sector than others. More needs to be done to identify the courses which provide the skills in demand from employers and incentivise their take up.

Actions:

- Universities will consider the use of university or employer bursaries/scholarships to encourage more people to study Computer Science and Mathematics.
- Universities will offer postgraduate MSc courses aimed at non-IT graduates, to meet the demands of the sector.
- Industry will support the introduction of a new A level qualification in Software and Systems Development, through actions such as provision of 'guru' lecturers and through assisting with the continued professional development of teachers, who will deliver the new qualification.
- Further education colleges will offer conversion courses for non-IT graduates.

Challenge: Addressing attrition rates in college and university

Over the past number of years, much work has been taken forward to address attrition rates from Computer Science and ICT courses in colleges and universities.

Recent examples at Queen's University include the introduction of a common first year for all new entrants to Computer Science and ICT courses, that allows students to choose the areas in which they wish to specialise, after completion of their first year of study. The course design to teach Computer Programming has also been altered, to afford students a more gradual learning curve that is less intense and demanding.

Other initiatives include peer mentoring and staff mentoring for students in the university and strict attendance monitoring at lectures and practical classes.

These steps have contributed to a reduction in drop out rates of 17% in 2006/07 to 9% in 2011/12.

While this is a significant decrease in the rate of attrition from Computer Science courses, further work must be done to ensure students continue to complete ICT/Computer Science courses.

Action:

- Universities and further education colleges will ensure a significant reduction of the high attrition rate from ICT and Computer Science courses.

Challenge: Addressing critical skills shortages

While much is being done to put in place a steady supply of appropriately skilled people available to enter the industry, there will be inevitable peaks and troughs in demand. For this reason, it is important that quick, action focused interventions can be put in place to address these issues.

A recent example is South Eastern Regional College's delivery of the Software Testers Academy. This 14 week training programme incorporated a six week work placement designed by the ICT employers with the Department for Employment and Learning and Invest NI. In March 2012, 19 participants graduated from this pilot programme and are now employed in the ICT sector in the participating companies.

The success of such a programme relies on the support of the private sector to offer real employment opportunities and a second cohort of this programme has been announced to meet industry demand.

Government will facilitate further discussions with industry, in order to assess the need for more flexible short term training programmes of this type.

Actions:

- The Department for Employment and Learning and Invest NI will continue with the development of existing and pilot provision in software testing.
- Invest NI will develop a Capital Markets Technology Programme.

- The Department for Employment and Learning, Invest NI and ICT employers will develop the Academy approach, as used with Software Testers, to address known skills shortages in the software languages, such as Java, C, C+, C#, in applications skills such as Enterprise Application, Applications management and in infrastructure skills such as Unix/Linux, Microsoft and VMWare.
- The IT Professional course, which has been developed by the Department for Employment and Learning and the further education sector, will be validated by the industry, to align the curriculum more closely with the needs of employers.
- Based on the agreed identified skills gaps the e-skills UK Employer Board will identify the existing relevant provision which meets the agreed skills needs and ways in which uptake can be increased. Support will be sought from Invest NI's Collaborative Network Programme to appoint a facilitator to assist with this work.

Challenge: Explore alternative routes into the ICT sector

Given the projected figures regarding job creation in the ICT sector, there is a need to explore alternative pathways of recruiting talent into the ICT sector, in order to ensure we maximise opportunities.

One example of this is the establishment of a Public/Private ICT Apprenticeship Pilot by the Department of Finance and Personnel and a number of local ICT companies.

This pilot will establish a model to recruit and train apprentices for the ICT sector. The pilot will initially focus on Level 2 and 3 apprentices working within infrastructure and software development, but will also explore the feasibility of using the Higher Level apprenticeship, currently in development, to recruit and train software developers.

The success of this pilot relies largely on the support of the private sector to offer real employment opportunities. While the pilot is currently in the initial stages, there has been an excellent level of cooperation between the companies and Government and we are confident this pilot will establish a workable model, to recruit and train apprentices to work within the ICT sector.

Many, mainly larger, companies currently provide bursaries, scholarships, internships, apprenticeships and/or placements to students and report positive outcomes from engaging with these schemes. The Employer Board ICT Skills Action Network 'ICT Skills Action Plan Report' indicates that some 90% of placement students secure full time employment in the companies in which they were placed. This figure demonstrates the benefit, both to the companies and individuals, of running such programmes.

despite the obvious benefits, however, smaller companies generally cannot afford to offer such schemes. There is value, therefore, in exploring the possibility of offering support to SMEs to enable them to benefit from bursaries, scholarships, internships, apprenticeships and/or placements.

Actions:

- The Department of Finance and Personnel and ICT employers will develop a best practice model to recruit and train apprentices for work within the ICT sector.
- The Department for Employment and Learning will explore the possibility of establishing an assistance programme for SMEs to encourage and support them in offering bursaries, scholarships, internships, apprenticeships and/or placements to students on approved courses.

THEME 2: SECTOR ATTRACTIVENESS

Raising the profile of the ICT sector remains a major challenge for the industry. It is important that young people, the unemployed and those currently in employment are aware of the opportunities for employment and career progression in the ICT sector.

Challenge: Encouraging more people to choose the relevant subjects required to work in the sector

To help address this issue, the 'Bring IT On' campaign was initiated in 2008. It was targeted at 14 – 19 year olds and designed to raise awareness of the opportunities available in the ICT sector, with a view to encouraging young people to consider a career in the industry.

In 2011/12, the 'Bring IT On' campaign resulted in over 1,200 students attending open days at the University of Ulster and Queen's University. A further 4,564 students engaged in individual school programmes, with 76% of those students indicating they would be more likely to consider a career in IT as a result of the school engagement.

The campaign has corresponded with a rise in enrolments to relevant Computer Studies courses at university. It is important, however, that this success is built upon and that the 'Bring IT On' campaign continues to be an effective platform to communicate key messages to the relevant audiences, including younger children and their influencers, in particular teachers and parents. The work also needs to be translated into more people studying relevant ICT subjects at Northern Ireland's further education colleges and universities.

The careers education, information, advice and guidance given by Careers Advisers is also an important influencer of young peoples' subject choices. It is, therefore, important that the labour market information they have is up-to-date and relevant.

It is also important that interest and competence in computers and computing is encouraged outside of the sphere of formal education. A number of recent initiatives aimed at encouraging school children to engage with these areas include the Raspberry Pi - a credit card sized computer aimed at encouraging children to learn basic programming skills - and the launch of Belfast Metropolitan College's CoderDojo - a youth coding club movement aimed at sparking an interest in coding among 10-16 year olds. These informal mechanisms of encouraging children to engage with computing can play an important role in raising the attractiveness of the sector.

Actions:

- Taking into account the previous evaluation of 'Bring IT On', the Department for Employment and Learning, Invest NI and the e-skills UK Employer Board will consider the effectiveness of the communication of key messages to the target audience(s) and their impact. The existing audience will be expanded to include younger children and their influencers.
- The Department for Employment and Learning, Invest NI and the e-skills UK Employer Board will develop a PR campaign to highlight positive aspects of the sector, including its recent performance. This will complement the 'Bring IT On' campaign.
- e-skills UK Employer Board will commence the roll out of the revised 'Bring IT On' campaign.
- e-skills UK Employer Board and the Department for Employment and Learning will implement further direct and indirect campaign activities, in conjunction with the STEM Ambassadors Programme, and upgrade the 'Bring IT On' website.
- e-skills UK Employer Board and Department for Employment and Learning will provide information, including the 'Bring IT On' web-based material and up-to-date Fact Sheets. This information, including data relating to current and future job opportunities, will be made available to Careers Advisers and Careers teachers in schools.
- e-skills UK will develop a strategy for work with school principals, Careers teachers, subject teachers and parents, to raise the profile of the sector and the career opportunities available.

Challenge: Encouraging those people with the relevant qualifications to work in the sector

A large proportion (68%) of suitably qualified individuals in ICT chose not to work in the ICT sector. Table 4 shows the first destinations of ICT graduates from the universities.

Table 4: First Destinations of IT Graduates from universities

First Destinations of IT Graduates from Northern Ireland Universities		
	Average % (2002/03-2005/06)	
	NI	UK
ICT	32	27
Retail & distribution	14	13
Non-ICT Manufacturing	9	7
Non-IT business services	9	11
Education	8	8
Public administration and defence	7	7
Financial services	7	10
Other personal services	5	4
Health and social work	4	4
Hotels and restaurants	2	3
Construction	2	1
Non-ICT transport and communications	1	3
Mining and quarrying	0	0
Agriculture, forestry & fishing	0	0
Utilities	0	1

It is likely that some entrants to ICT firms are recorded in other industries e.g. Financial Services, outside the e-skills UK ICT footprint, although the individuals are actually performing ICT roles in these sectors.

There is a need to understand the motivating factors which determine why individuals chose not to go into the ICT sector directly from higher education, in order to develop interventions with the industry that would result in the ICT sector being a destination of first choice.

Actions:

- The Department for Employment and Learning will, through an attitude survey, investigate the reasons for the high leakage of people from relevant ICT and computer courses. This will build on information already available in the 'Destination of Leavers from Higher Education' survey.
- The e-skills UK Employer Board, Invest NI and the Department for Employment and Learning will examine appropriate mechanisms to 'attract back' experienced individuals and recently qualified individuals from the Northern Ireland diaspora and 'attract in' suitably qualified individuals from the European Economic Area (EEA), who wish to work in the Northern Ireland ICT Sector. The latter will be done through the EURES European job mobility portal.
- e-skills UK Employer Board, the Department for Employment and Learning and Invest NI will accelerate the knowledge and experience of key leaders, to help address the issue of a shortage of experienced software engineers with management and leadership skills.

Challenge: Addressing the gender imbalance within the ICT sector

The gender imbalance remains a significant and worsening issue for the IT sector throughout the UK. Since 2001, the proportion of females in the IT industry has fallen by four percentage points to just 21%. There are now nearly four males to every female working in the IT industry³.

This imbalance in participation between males and females is having a detrimental effect on the ICT sector, as it severely limits the pool of potential recruits to the industry. Also, females consistently outperform their male counterparts in ICT related qualifications at secondary level and the supposition is, therefore, that if females were more inclined to participate in ICT careers, then the pool of talent available to ICT employers might improve noticeably.

Work is already being taken forward to address this gender imbalance in Northern Ireland. Developed by e-skills UK with funding from ICT service provider Northgate Managed Services, Computer Clubs 4 Girls (CC4G) aims to address the skills and gender gap impacting on the ICT sector. The initiative enhances ICT skills through a series of carefully-graded challenges, themed around their interests, such as fashion, music, sport and celebrity. Research shows that 92% of those participating in the CC4G said they would consider studying ICT at GCSE, A level or degree level.

Action:

- e-skills UK to continue to deliver Computer Clubs 4 Girls.

³ e-skills UK, 'Women in IT Scorecard', March 2009.

THEME 3: COORDINATION AND COMMUNICATION

Challenge: Ensuring that there is a coordinated approach to addressing skills shortages within the ICT sector

The need to increase the supply of people into the ICT sector sits within the wider Government policy of encouraging more people to study and seek employment in science, technology, engineering and mathematics (STEM) related areas.

The Department for Employment and Learning, together with the Department of Education, the Department of Culture, Arts and Leisure, the Department of Agriculture and Rural Development, the Department of Health, Social Services and Public Safety and the Department of Enterprise, Trade and Investment, published the STEM Strategy, known as 'Success through STEM' in March 2011.

It is important that there is a high level of coordination between the ICT Working Group and the STEM Business sub group as central to both the groups is the need for better engagement between employers and education. Increased coordination and cooperation between the two groups will help to ensure that the training providers are aware of the particular skills challenges within the sector and ensure that employers can work with those providers to understand how their interventions can help to address their skills issues.

This Action Plan will set out how this work can be taken forward in a coordinated manner.

Actions:

- e-skills UK Employer Board will work with the STEM Business Group, to ensure synergy between the actions of the respective groups.
- e-skills UK Employer Board and Invest NI will establish an industry led ICT Collaborative Network, to gain a better understanding between industry and education science and technology capabilities.
- Each Group will develop measures, through which more employers will offer meaningful placements. Consideration will be given to the work already being undertaken by the STEM Business sub group in this area.
- Business members of the ICT Working Group will examine existing best practice (such as the Digital Media and ICT Vendor Alliance Program and Digital Hub) to consider if there are lessons that can be learned.
- e-skills will communicate the availability of alternative provision to encourage individuals into the ICT sector, such as ICT Apprenticeships, Foundation Degrees and Higher National Diplomas (HNDs).
- e-skills UK Employer Board will ensure key messages regarding the sector are incorporated in the STEM Business sub group's communication plan.

ANNEX A LIST OF ACTIONS

	Challenge	Action	Deliverables	Lead Responsibility
VISION				
1	To develop a shared vision for the ICT sector in line with the NI Economic Strategy and Programme for Government	e-skills UK Employer Board, DETI, Invest NI and DEL will work together to set out a long term vision for the sector for the next five years.	Production of a five year vision for the ICT Sector articulating the likely future demand for jobs, the job types and the relevant skills needs.	e-skills UK, Invest NI, DEL and DETI
THEME 1 - SKILLS PROVISION (RELEVANCE, QUALITY ETC)				
Short term (by 31 December 2012)				
2	Understand the demand for ICT professionals	The e-skills UK Employer Board will continue to use existing labour market information and annually updated forecasting reports to identify specific skills gaps faced by each sub-sector (software development, infrastructure management and applications management) and likely future skills gaps. Consideration may need to be given to making this review process more regular.	Agreement on the specific skills gaps faced by each sub sector. This will include information on the level of experience necessary, the qualification subject and level and numbers required to fill the shortage.	e-skills UK Employer Board
3		The e-skills UK Employer Board will seek support from Invest NI's Collaborative Network Programme to continue work with the demand side to better understand the range of skills demands in the sector	A more detailed specification of the skills demands of employers in each of the sub sectors	e-skills UK Employer Board, Invest NI and DEL
4	Understand the annual supply of appropriately qualified people relevant to employer need.	Universities and colleges will continue to provide figures regarding predicted outflow from their courses to develop a clear understanding of the provision from our institutions in order to inform actions.	A clear understanding of the numbers of people who can potentially work within the sector.	QUB/UU/further education colleges

	Challenge	Action	Deliverables	Lead Responsibility
5		The e-skills UK Employer Board, with the proposed support of their Collaborative Network facilitator, will continue to monitor the dynamics between the sector's demand for graduates and the numbers supplied through the education and training systems.	A clear understanding of the numbers of graduates who can potentially work in the sector and the requirements of industry.	e-skills UK Employer Board
6	Address critical skills shortages	The Department for Employment and Learning and Invest NI will continue with the development of existing and pilot provision in software testing.	Nineteen participants graduated from the Software Testers Academy in March 2012. A second cohort has been announced.	DEL and Invest NI
7		Invest NI will develop a Capital Markets Technology Programme.	Launch the Capital Markets Academy to deliver up to 30 places	Invest NI
8		The Department for Employment and Learning, Invest NI and ICT employers will develop the Academy approach, as used with Software Testers, to address known skills shortages in the software languages, such as Java, C, C+, C#, in applications skills such as Enterprise Application, Applications management and in infrastructure skills such as Unix/Linux, Microsoft and VMware.	Industry to determine the number of places that should be made available and the specific software language skills required.	Employers, DEL and Invest NI
9		The IT Professional course, which has been developed by the Department for Employment and Learning and the further education sector, will be validated by the industry, to align the curriculum more closely with the needs of employers.	A refined curriculum for the IT Professional course which ensures that it continues to reflect the current skills needs of local ICT employers.	DEL, further education colleges and e-skills UK Employer Board

	Challenge	Action	Deliverables	Lead Responsibility
10		Based on the agreed identified skills gaps the e-skills UK Employer Board will identify the existing relevant provision which meets the agreed skills needs and ways in which uptake can be increased. Support will be sought from Invest NI's Collaborative Network Programme to appoint a facilitator to assist with this work.	Agreement on the existing provision which meets the skills gaps identified by each sub sector. Ongoing facilitation will be required to monitor and respond to changing needs.	e-skills UK Employer Board
Medium term (30 June 2013)				
11	Encourage the take up for Computer Studies A-Level	The Department of Education, via CCEA, will continue to examine the current provision and range of school computing/ICT qualifications to ensure it meets the needs of ICT courses in universities.	Better alignment of the school computing/ICT qualifications to meet the needs of universities.	DE
12		Ensure Careers teachers in schools and Careers Advisers have access to up to date labour market information to highlight the career opportunities and benefits associated with the ICT Sector to school children and their influencers.	More school students choosing to study Computer Science and Mathematics at A level.	DEL and e-skills UK
13		The Department of Education will develop and introduce new awareness programmes aimed at encouraging more pupils to choose to study Computer Science.	An increase in the number of students enrolling in Computer Science related subjects.	DE
14		Universities will consider the weighting they give to certain A level courses (such as Computer Studies and Mathematics) through their entry/intake process.	More people entering relevant university courses with appropriate courses at A level.	QUB /UU

	Challenge	Action	Deliverables	Lead Responsibility
15	Incentivise the take up of relevant courses at college and university	Universities will consider the use of bursaries/scholarships to encourage more people to study Computer Science and Mathematics.	More people entering relevant university courses with appropriate courses at A level.	QUB/UU
16		Universities will offer postgraduate MSc courses aimed at non-IT graduates, to meet the demands of the sector.	Appropriate Post Graduate MSc courses at UU and QUB aimed at non-IT graduates in 2012 to deliver approximately 90 qualifications.	QUB/UU
17		Industry will support the introduction of a new A level qualification in Software and Systems Development through actions such as provision of 'guru' lecturers and through assisting with the continued professional development of teachers, who will deliver the new qualification.	Increased number of teachers capable of delivering the the A level qualification in Software and Systems Development.	e-skills UK Employer Board
18		Further education colleges will offer conversion courses for non-IT graduates.	Appropriate conversion courses for non-IT graduates delivered by further education sector.	Further education colleges
19	Address attrition rates in college and university	Universities and further education colleges will ensure a significant reduction of the high attrition rate from ICT and Computer Science courses.	Continue to implement measures to reduce attrition and monitor progress.	QUB/UU/further education colleges
20	Explore alternative routes into the ICT Sector	The Department of Finance and Personnel and ICT employers, will develop a best practice model to recruit and train apprentices for work within the ICT sector.	Government and companies to work together through the the Public/Private ICT Apprenticeship Pilot to develop a best practice model for recruiting and training ICT apprentices to work in the sector	DFP and employers
21		The Department for Employment and Learning will explore the possibility of establishing an assistance programme for SMEs to encourage and support them in offering bursaries, scholarships, internships, apprenticeships and/or placements to students on approved courses.	Increased number of SMEs offering bursaries, scholarships, internships, apprenticeships and/or placements to students on approved courses	DEL

Challenge	Action	Deliverables	Lead Responsibility
THEME 2 SECTOR ATTRACTIVENESS			
Short term (by 31 December 2012)			
22	Encourage more people to choose the relevant subjects required to work in the sector	Taking into account the previous evaluation of 'Bring IT On', the Department for Employment and Learning, Invest NI and the e-skills UK Employer Board will consider the effectiveness of the communication of key messages to the target audience(s) and their impact. The existing audience will be expanded to include younger children and their influencers.	A reviewed 'Bring IT On' campaign for 2012/13.
23		The Department for Employment and Learning, Invest NI and the e-skills UK Employer Board will develop a PR campaign to highlight positive aspects of the sector including its recent performance. This will complement the 'Bring IT On' campaign.	An agreed PR strategy for 2012/2013.
Medium term (30 June 2013)			
24	Encourage more people to choose the relevant	e-skills UK Employer Board will commence the roll out of the revised 'Bring IT On' campaign.	Increased interest and applications to computer/ICT courses (numbers to be defined).
25	subjects required to work in the sector	e-skills UK Employer Board and the Department for Employment and Learning will implement further direct and indirect campaign activities, in conjunction with the STEM Ambassadors Programme, and upgrade the 'Bring IT On' website.	An agreed programme of activities to be taken forward in 2012/2013.

	Challenge	Action	Deliverables	Lead Responsibility
26		<p>e-skills UK Employer Board and Department for Employment and Learning will provide information, including the 'Bring IT On' web-based material and up to date Fact Sheets. This information, including data relating to current and future job opportunities, will be made available to Careers Advisers and Careers teachers in schools.</p>	<p>Careers Advisers are confident in using the material provided. Improved advice for young people.</p>	<p>e-skills UK Employer Board and DEL</p>
27		<p>e-skills UK will develop a strategy for work with school principals, Careers teachers, subject teachers and parents to raise the profile of the sector and the career opportunities available.</p>	<p>School careers teachers and parents are readily using information and know the opportunities in the ICT industry.</p>	<p>e-skills UK</p>
28	<p>Encourage those people with the relevant qualifications to work in the sector</p>	<p>The Department for Employment and Learning will, through an attitude survey, investigate the reasons for the high leakage of people from relevant ICT and computer courses. This will build on information already available in the 'Destination of Leavers from Higher Education' survey.</p>	<p>A better understanding of the reasons people choose not to work in the industry so that remedial action to reverse the trend will be identified.</p>	<p>DEL</p>

	Challenge	Action	Deliverables	Lead Responsibility
29		The e-skills UK Employer Board, Invest NI and the Department for Employment and Learning will examine appropriate mechanisms to 'attract back' experienced individuals and recently qualified individuals from the Northern Ireland diaspora and 'attract in' suitably qualified individuals from the European Economic Area (EEA), who wish to work in the Northern Ireland ICT Sector. The latter will be done through the EURES European job mobility portal.	Employers more engaged with existing 'Attract' initiatives.	e-skills UK Employer Board, Invest NI and DEL
30		e-skills UK Employer Board, the Department for Employment and Learning and Invest NI will accelerate the knowledge and experience of key leaders to help address the issue of a shortage of experienced software engineers with management and leadership skills.	Increase in the technical and management and leadership skills of key leaders in the sector.	e-skills UK Employer Board, DEL and Invest NI
31	Addressing the gender imbalance within the ICT sector	e-skills UK to continue to deliver Computer Clubs 4 Girls	Increased number of girls choosing to study computer science courses at post-primary level.	e-skills UK

Challenge	Action	Deliverables	Lead Responsibility
THEME 3 – COORDINATION AND COMMUNICATION			
Short term (by 31 December 2012)			
32	Ensure that there is a coordinated approach to addressing skills shortages within the ICT sector	e-skills UK Employer Board will work with the STEM Business Group to ensure synergy between the actions of the respective groups.	Areas of collaboration agreed.
			e-skills UK Employer Board and STEM Business Group
Short term (by 31 December 2012)			
33	Ensure that there is a coordinated approach to addressing skills shortages within the ICT sector	e-skills UK Employer Board and Invest NI will establish an industry led ICT Collaborative Network to gain a better understanding between industry and education science and technology capabilities	Global market opportunities are identified by exploiting the science and technology capabilities in NI.
			e-skills UK Employer Board and Invest NI through the Collaborative Networks Programme
34		Each Group will develop measures through which more employers will offer meaningful placements. Consideration will be given to the work already being undertaken by the STEM Business sub group in this area.	Increase relevant work placements in scholarships and bursaries in ICT industry.
			e-skills UK Employer Board and DEL
35		Business members of the ICT Working Group will examine existing best practice (such as the Digital Media and ICT Vendor Alliance Program and Digital Hub) to consider if there are lessons that can be learned.	Agreed actions identified and added into the Action Plan where appropriate.
			Business members of the ICT Working Group

	Challenge	Action	Deliverables	Lead Responsibility
36		e-skills UK will communicate the availability of alternative provision to encourage individuals into the ICT sector - such as ICT Apprenticeships, Foundation Degrees and Higher National Diplomas (HNDs).	More information available through the careers service and 'Bring IT On' website highlighting pathways.	e-skills UK
37		e-skills UK Employer Board will ensure key messages regarding the sector are incorporated in the STEM Business sub group's communication plan.	Coordinated approach on STEM.	e-skills UK Employer Board

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THE DEPARTMENT:

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