TECH PARTNERSHIP
skills for the digital economy

THE WOMEN IN IT

SCORECARD

A definitive up-to-date evidence base for data and commentary on women in IT employment and education

bcs
The Chartered Institute for IT

2015

The Tech Partnership is a growing network of employers, collaborating to create the skills for the the digital economy. It acts for the good of the sector by inspiring young people about technology, accelerating the flow of talented people of all backgrounds into technology careers, and helping companies to develop the technology skills they need for the future.

For further information please visit www.thetechpartnership.com

Our mission as BCS, The Chartered Institute for IT, is to enable the information society. We promote wider social and economic progress through the advancement of information technology science and practice.

We bring together industry, academics, practitioners and government to share knowledge, promote new thinking, influence the development of computing education, shape public policy and inform the public.

For further information please visit www.bcs.org

Contents

Forewords

The employers of the Tech Partnership have committed to delivering the skills for a million new digital jobs over the next decade. If that seems ambitious, it is actually simply necessary – the ever-growing tech specialist workforce needs more new talent than ever before. Meeting that goal will mean overcoming many challenges, and the biggest remains the stark and persistent gender imbalance.

The headline number in this report – that just 17% of tech specialists working in the UK are women – demonstrates the size of the challenge. It is a challenge that employers are motivated to address. If they cannot find a way to attract more young women into careers in tech, then the whole economy will continue to be constrained by lack of digital expertise. But as this report demonstrates, the challenges are not just about attracting more applicants: the roots of the problem run deep.

Much more has to be done to redress the gender split in schools. We know that girls who study tech subjects at GCSE and A-Level outperform boys. But last year just 314 girls sat the Computing A-Level – 8% of all entrants. To make real progress, we must better understand the reasons for this lack of uptake and work together to address them.

We do already have some ideas – we know that focused, engaging programmes make a real difference to young women's attitudes to technology. The industry-backed TechFuture Girls clubs are transformative for girls at the key 10 – 14 age, and the Tech Industry Gold degrees, which are again defined by industry, deliver much higher than average levels of female participation.

This report is a very helpful step along the road to gender balance in the tech workforce. It places the problems in the spotlight, and allows us to ask the important questions. Thanks are due to those who have contributed to it, and now it is for the rest of us to make sure that those questions do not remain unanswered.

Karen Price OBE
CEO, The Tech Partnership

Last year I said in my introduction to this report that we have plenty to do on the gender imbalance problem in the IT profession. And whilst we wouldn't expect the numbers to have changed hugely (and they haven't) there is still reason for optimism. At the moment this is largely in the realm of publicising the issue more widely, but it is a good start nonetheless.

BCS ran another campaign on the subject during June of this year, with the express purpose of showing the diverse role models we have amongst women already in the industry and computer science. The IT skills gap is a much discussed phenomenon, so engaging females, whether at school, university, early career or as returners is vital.

BCS's campaign this year shows the enthusiasm that women already having successful careers in IT can bring as role models. During June over twenty were showcased – already in careers ranging from chief technology officers (Christine Scott at Pearson Professional), to AI expert bioinformatics lecturers (Amanda Clare, Aberystwyth University) and taking in professors of computer science, service managers, software developers, managing directors, scientists and lots more.

One issue still largely unaffected by recent changes is the gender pay gap. Again, as I said last year, it is time that the leaders of our industry got real about the impact of the gender pay gap on the retention of women in tech.

As in 2014 this research shows that the potential in the female IT workforce is huge. When we start addressing these issues the technology profession can prove to all that we are forward thinking and fair to all of our workers. And the industry will also start to get the breadth of input from all sections of society that will keep it vibrant and forward-looking.

Gillian Arnold
Chair, BCSWomen

Key messages

Women in the workforce

- There were 1.18m IT specialists working in the UK in 2014, of which only 17% were women. This compares with a figure of 47% for the workforce as a whole.
- Female representation in the IT professions has changed little in the past ten years despite significant growth in the number of women working in IT roles (up 19% between 2004 and 2014).
- Just under 20,000 female IT specialists were self-employed in 2014 – proportionately much less than either male IT specialists (13%) or UK workers as a whole (15%).
- Female representation within IT occupations ranges from one third (33%) of employees working as Web Design & Development Professionals to less than one in ten (10%) working as IT Directors. Amongst those employed as Programmers & Software Developers (the largest group of IT specialists) again only around one in ten (13%) were women.
- Just under six in ten (59%) of all females employed as IT specialists in 2014 were working within small and medium sized enterprises (SMEs).
- Female representation in the IT professions was low in all UK regions/devolved nations during 2014 and ranged from 15% of IT specialists employed (or self-employed) in the East of England and the South East to 20% of those working in Wales.
- Around one third (34%) of female IT specialists were working in IT businesses in 2014 compared with almost one half (45%) of males working in such roles and of all IT specialists working in IT firms only 13% were women.
- On average, around one in twenty (6%) female IT specialists were looking for a new or additional job during 2014 and over the 2011-2014 period at least, the most common means of finding employment as an IT specialist, was by replying to an advert and using recruitment agencies.

Higher Education

- Like their male counterparts, female IT specialists are relatively well qualified with 70% holding an HE level qualification in 2014 compared with 42% of the workforce as a whole.
- Amongst those educated to undergraduate level, the proportion of females with such an award in an IT discipline was less than half that recorded amongst male IT specialists.
- Though applications and acceptances for HE courses in Computer Science have risen in recent years (both in volume terms and as a proportion of all application), growth has been driven primarily by increases in the number of male applicants.
- Between 2010 and 2012 the proportion of applications to HE Computer Science courses made by females declined from 16% to 14% whilst the proportion of acceptances fell from 15% to 12% over the period.

- In 2013, just under 3,400 females gained an HE level qualification in an IT related subject (from a UK institution) accounting for one in five (17%) IT qualifiers at this level. By comparison, overall, women accounted for six in ten (59%) qualifiers from HE institutions at that time.
- The proportion of IT graduates (all HE awards) that are women was down 1 percentage point on the previous year and appears to be following a downward trend over the longer term though this is driven primarily by a fall in the number of female students gaining 'other HE' level qualifications as opposed to a fall in the number gaining a first or post-graduate degree.
- Two thirds (67%) of female IT graduates were in employment 6 months after leaving their HE studies – much the same proportion as for males taking IT courses at this level. At 39% however, the likelihood of female IT graduates (in work) holding an IT position was however much lower than for males (59%).
- Six in ten female IT graduates starting work as IT specialists (61%) stated they had taken such a role as it fitted their career plan/was exactly type of work wanted.

Secondary education

- In total, around 13,700 students sat an IT related GCE (A level) during 2014 of which around one third (31%) took a computing course and two thirds (69%) an ICT GCE.
- The number of students sitting ICT GCEs was down 9% on the previous year whilst an increase of 11% was observed in the number taking Computing courses at this level.
- Overall approximately 27% of students taking IT related GCEs in 2014 were female though female representation varied substantially by course from 36% for ICT GCEs to just 8% of those taking Computing courses at this level.
- Female students taking ICT or Computing GCEs were found to have performed better than males with a higher proportion achieving A/A8 or A-C grades in 2014.
- Of the 123,600 students taking IT & related GCSEs in 2014, just under four in ten (39%) were female. This was 5 percentage points down on the previous year and 11 down on the figure recorded in 2011 when females accounted for half of all those sitting IT related GCSEs.
- By comparison just over one half (51%) of all GCSEs taken in 2014 were taken by female students.
- As with GCEs, females taking IT related GCSEs were seen to have performed better on average than males.

Vocational and professional qualifications

- The incidence of job-related education/training amongst IT specialists is lower than that for other workers and has been in decline for much of the past decade. Moreover, female IT specialists in work are even less likely to have received job-related education/training than their male counterparts.
- For both female and male IT specialists the incidence of job-related education/training was much lower for those working in a self-employed capacity.
- Since their inception just under one in three Higher Education Qualifications and Certificates (HEQs) issued by BCS were to women.

Earnings

- With gross weekly earnings of £650 per week, female IT specialists[1] were found to be earning only 84% of the rate for males working in such positions during 2014 (£770 per week).
- The difference in female and male pay rates appears to be greatest amongst 'professional' level IT positions.

International comparisons

- Female representation in IT occupations appears to be slightly higher in the UK than the EU(15) average (18% versus 16% using Eurostat data) though lessons may still be learnt from Greece and Ireland where it appears that around one quarter of IT specialists are women.
- Comparison with other leading global economies shows that in Canada and the USA again around one quarter of IT specialists are women though in Japan only around one in ten IT specialists are female.

1 Median figure for full-time employees on permanent contracts

1 The importance of IT

IT is truly the cornerstone of both society and commerce – enabling and enhancing the lives of nigh on every individual and organisation across the globe - in the UK currently nearly nine in every ten people are recent Internet users[2] whilst even as far back as 2006 more than nine in ten businesses were already found to have invested in IT&T hardware such as PCs, workstations, terminals etc.[3]

Given the degree to which IT impacts upon the daily activities of individuals and organisations in the UK it is perhaps unsurprising to see that IT, or Tech (when considered along with telecoms) has developed into one of the main industry sectors of the economy generating £91bn or 6% of all Gross Value Added (GVA) in 2013 and providing employment to over 1.7 million people (i.e. 6% of the workforce).[4]

Looking into to the future however, the importance of the Tech industry is expected to increase still further – Tech is anticipated to be one of the fastest growing elements of the UK economy over the next ten years characterised by GVA growth 33% above the UK average[5], employment growth 50% above the average and, more specifically - growth in the number of (IT) specialist staff at a level three times that of the UK workforce as a whole[6].

To realise this potential, tech industry employers and employers of tech specialists from other sectors will each require ready access to a source of suitably skilled applicants for both new and replacement positions. Yet the tech labour market is already under strain, with latest estimates showing two fifths of recruiters (42%) experiencing difficulty filling tech specialist positions[7] and half of firms already employing tech specialists with gaps in their skills portfolio[8]. Moreover, with 170,000 adverts for tech specialists already arising each quarter and an anticipated 130,000 new recruits for tech roles needed each year throughout the next decade, it seems clear that employers must expand their source of intake and gain access to a larger recruitment pool if the often mentioned 'skills crisis' is to be avoided.

Fortunately there already exists a major source of untapped talent that could, potentially be seen as the solution to demand-supply imbalances in the tech sector – women. Though accounting for around half the UK population, half the student numbers and half the UK workforce females are still something of a rarity within the tech arena and this is despite demonstrating relatively good performance in related subjects at compulsory/post compulsory education when compared to males undertaking such courses.

It is not the purpose of this report to answer the question: why are women so poorly represented within the IT/Tech sector or even how to 'put this right', it does however seek to provide a detailed analysis of secondary employment and education data which, we hope can be used as to stimulate debate and hence promote action that will help improve the gender balance within the sector over coming years.

2 ONS Statistical bulletin: Internet Users, 2015 (May 2015) which shows 86% using the internet in the past 3 months

3 ONS E-commerce Survey

4 The Tech Partnership Employer Insights: skills report 2015

5 Experian, 2015 (unpublished)

6 Experian, e-skills UK, 2014

7 The Tech Partnership Employer Insights: skills report 2015

8 Ibid

2 Women in the workforce

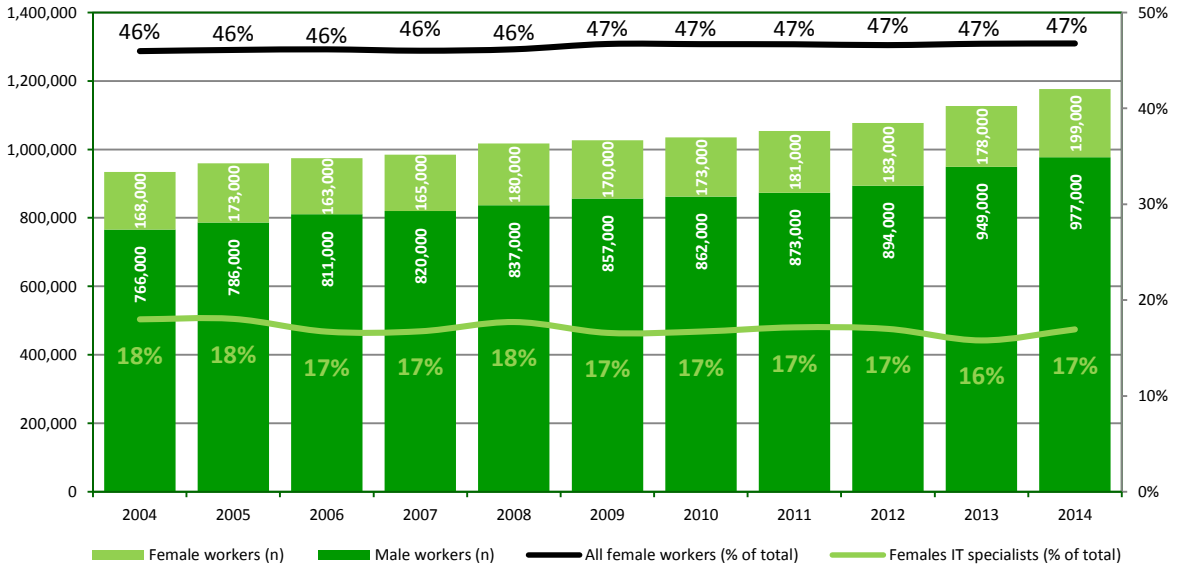
Latest estimates from the Office for National Statistics (ONS) quarterly Labour Force Survey (LFS) show that in 2014, there approximately 31 million people working in the UK of which around half (47%) were women. But is the level of female representation also apparent within the IT professions and what differences, if any, exist in the employment patterns of men and women working in such roles in the UK?

This section provides a detailed analysis of the IT specialist workforce as defined by a series of codes taken from the ONS Standard Occupational Classification (SOC2010) system (see report annex for details) highlighting key characteristics, trends and gender differences where apparent. Figures presented are predominantly annual estimates (based upon averages taken over four successive quarters) though in certain cases results spanning two or more years are shown in order to meet ONS publication guidelines and improve the reliability of the data presented.

2.1 Workforce trends and IT specialists

There were 1.18m IT specialists working in the UK during 2014, of which just 17% (199,000) were women. The share of IT specialist positions held by women was up slightly on the previous year (1 percentage point), though as illustrated in the chart below there has been little real change over the past decade during which time female representation within the IT professions has consistently remained well below that recorded associated with the UK workforce as a whole (i.e. 46-47%).

Figure 1: IT specialists in the UK by gender, 2004-2014[9]



Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

9 Data for the period 2004-2010 are derived from original LFS estimates based upon an earlier version of SOC (SOC2000) which have been converted to SOC2010 using SPSS syntax provided by ONS

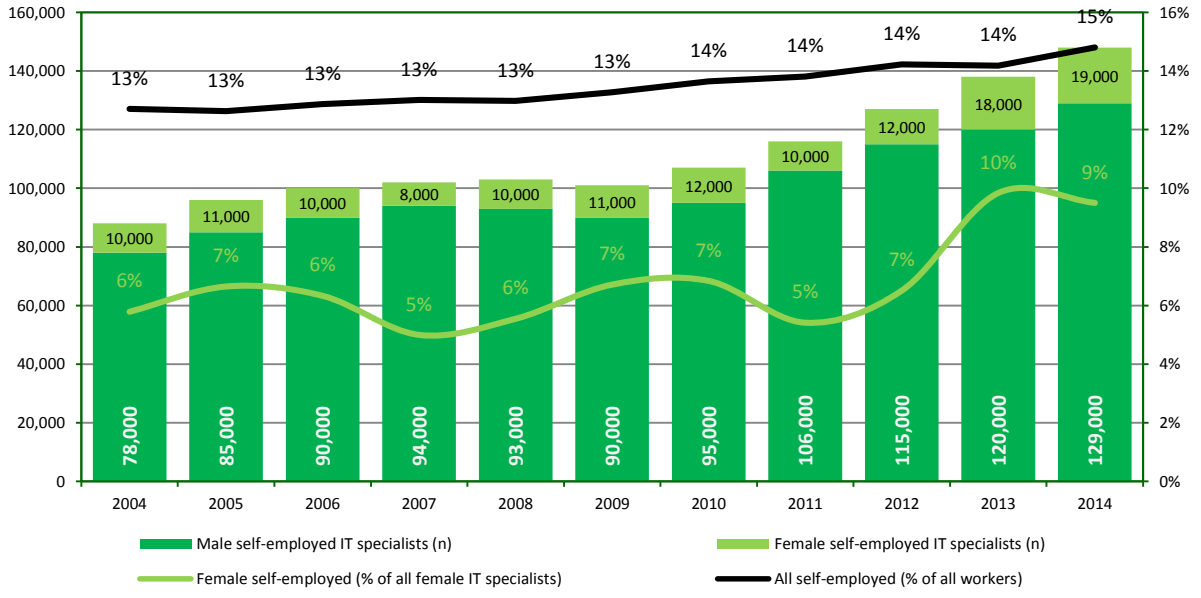
This is not to say that the number of women working in IT roles has not changed by a significant margin – in fact, between 2004 and 2014 the number of female IT specialists working in the UK rose by 19% (31,000 people) i.e. a rate almost double that recorded for female workers as a whole over this period (10%) and nearly two and a half times the rate for all UK workers (8%). At the same time however, a still higher rate of growth in the number of males working in IT positions (28%) means the relative shares of IT professional employment have remained almost unchanged.

2.2 Employment characteristics

2.2.1 Contractual status

Just under one in ten (9%) female IT specialists were working as contractors (self-employed) in 2014 -a relatively low figure compared with males working in such roles (13%) and with UK workers as a whole (15%). Over the past ten years however, the number of female IT specialists working in a self-employed capacity has increased dramatically even by comparison with male IT specialist or workers more generally (with comparison figures of 95%, 65% and 68% respectively for female IT specialists, male IT specialists and all workers).

Figure 2: Scale/incidence of self-employment, 2004-2014



Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

2.2.2 Permanency of employment

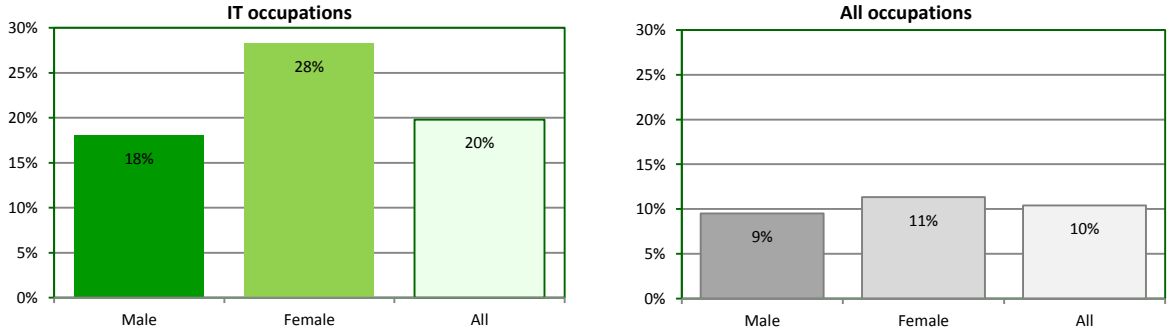
As in previous years, the vast majority (94%) of women employed as IT specialists (i.e. employees) in 2014 were working under a permanent contract and for the most part this appeared to be their preferred mode of employment as amongst the 6% in temporary positions less than four in ten (37%) stated that this was due to them being unable to find a permanent position.

For male employees working as IT specialists the proportion working in temporary positions was lower at 4% whilst for the UK workforce as a whole it is estimated that 7% were working in non-permanent positions.

2.2.3 Flexible working and other arrangements

The incidence of flexible working appears to be much higher amongst employees working as IT specialists than for other workers (20% of IT specialist employees compared with 10% of employees as whole) and this holds true for both women and men employed in such roles. In fact more than one quarter (28%) of all women working as IT specialists in the UK during 2014 were found to have been working flexitime[10].

Figure 3: Incidence of flexitime working amongst IT specialists/other employees, 2014[11]



Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

Female IT specialists are also more likely to be able to work from home than either their male counterparts or indeed than women in employment as a whole (with comparison figures of 12%, 8% for 2014). The incidence of home working was still higher for those working on a self-employed basis and in this case female IT specialists were found to be more than twice as likely to work from home than male IT specialists or female workers more generally (i.e. with comparison figures of 40% for female IT specialists, 23% for male IT specialists and 28% for female workers as a whole).

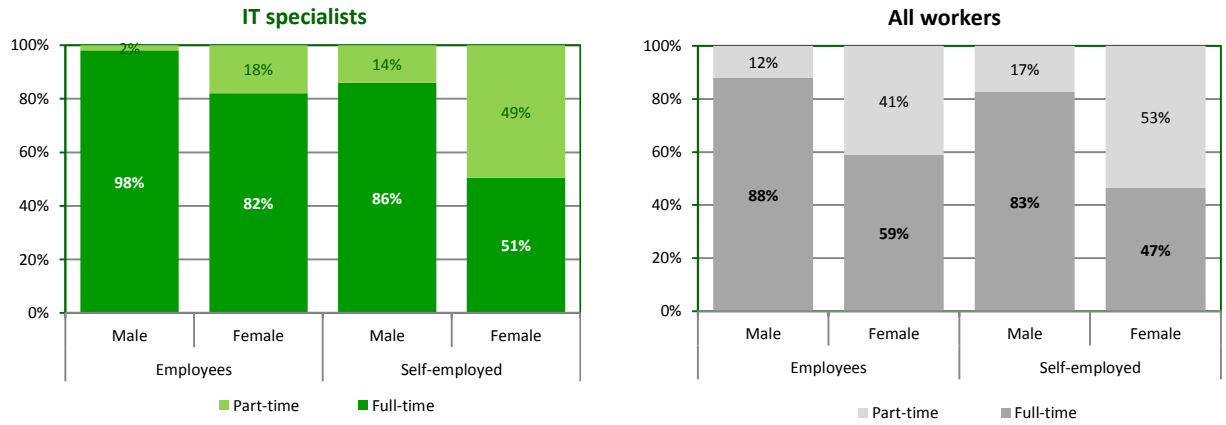
2.2.4 Incidence of part-time working

Female IT specialists were much more likely to be working on a part-time basis than their male counterparts in 2014 (with comparison figures of 18% and just 2% respectively) and this observation was also apparent for women in the workforce as a whole albeit in this case the proportion working part-time was much greater for both men and women as shown overleaf.

10 Figures based on Labour Force Survey data from the 2nd and 4th quarters only of 2014

11 Ibid

Figure 4: Incidence of full and part-time working amongst IT specialists/other employees, 2014



Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

In most cases, the reason for women taking a part-time as opposed to full-time work was that they did not want a full-time job, and this was particularly evident amongst those working as IT specialists where 93% of part-time employees and 83% of self-employed part-time workers stated this to be the case (91% for both groups combined). By comparison male part-timers and women working in other occupations were much less likely to have been working in this fashion by way of choice whether they were self-employed or working as employees.

Table 1: Part-time workers not wanting a full-time job by occupation/contractual status, 2014

		Employees	Self-employed	Total
Male	IT specialists	63%	61%	62%
	All	38%	70%	47%
Female	IT specialists	93%	83%	91%
	All	74%	85%	75%
Total	**IT specialists**	**83%**	**69%**	**77%**
	All	**66%**	**79%**	**68%**

Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

2.2.5 Hours of work

The average working week for female IT specialists during 2014 was 40 hours for those working full-time and 22 hours for part-timers. By comparison, male IT specialists were found to be working slightly longer if working full-time (43 hours) and slightly less if working part-time (19 hours). Similarly, when comparing the hours worked by female IT specialists with those worked by women as a whole, female IT specialists were again found to be working fewer hours on average when in full-time work and more hours if working part-time. In all cases, the typical number of hours worked remained virtually unchanged on the previous year, irrespective of the nature of occupation undertaken.

Table 2: Total usual hours of work by occupation/contractual status, 2014

	Employees			Self-employed			Total		
	Full-time	Part-time	Total	Full-time	Part-time	Total	Full-time	Part-time	Total
Male IT specialists	42	21	42	45	17	42	43	19	42
Female IT specialists	40	23	37	40	17	29	40	22	36
All female workers	40	20	32	43	16	29	41	19	32
All workers	**42**	**20**	**36**	**46**	**17**	**38**	**43**	**19**	**37**

Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

2.2.6 Nature of occupation

The level of female workforce representation varies significantly according to the type of IT specialist position held and an analysis of employee data for 2014 shows the proportion of employment accounted for by women ranged from one third (33%) of Web Design & Development Professionals to less than one in ten (10%) IT Directors.[12]

Table 3: IT specialist employees by occupation and gender, 2014

	Employees		Females (%)	Share of IT specialists	
	Total (n)	Females (n)		Females	Males
IT Managers/Directors	236,000	40,000	17%	22%	23%
IT Directors	60,000	6,000	10%	3%	6%
Specialist IT Managers	176,000	34,000	19%	19%	17%
IT Professionals[13]	**572,000**	**95,000**	**17%**	**53%**	**56%**
IT Project & Programme Managers	65,000	17,000	27%	10%	6%
Business Analysts, Architects & System Designers	103,000	15,000	15%	8%	10%
Programmers & Software Developers	233,000	31,000	13%	17%	24%
Web Design & Development Professionals	45,000	15,000	33%	8%	4%
Other IT Professionals	125,000	17,000	14%	9%	13%
IT Technicians/Engineers	**217,000**	**45,000**	**21%**	**25%**	**20%**
IT Operations Technicians	94,000	26,000	28%	14%	8%
IT User Support Technicians & Engineers	123,000	19,000	16%	11%	12%
All IT specialists	**1,025,000**	**180,000**	**18%**	**100%**	**100%**
All employees	**24,814,000**	**12,616,000**	**49%**		

Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

12 This group also incorporates a relatively small number of Telecoms Directors - further details are presented within the notes section of this report

13 'Professionals' under the SOC2010 system would normally include Specialist IT Managers however for presentation/analytical purposes they are often linked to IT Directors within this report to form the broad Group IT Managers/Directors

As in previous years, it was also noted that in 2014 a larger proportion of female IT specialists were working within 'lower level' occupations (i.e. as Technicians/Engineers) than was the case for males working in IT roles (with comparison figure of 25% and 20% respectively). In both cases however, the proportion at this level was much lower than that associated with non-IT roles where 52% of male employees and 35% of females were found to be working at an equivalent level.

2.2.7 Managerial and supervisory responsibilities

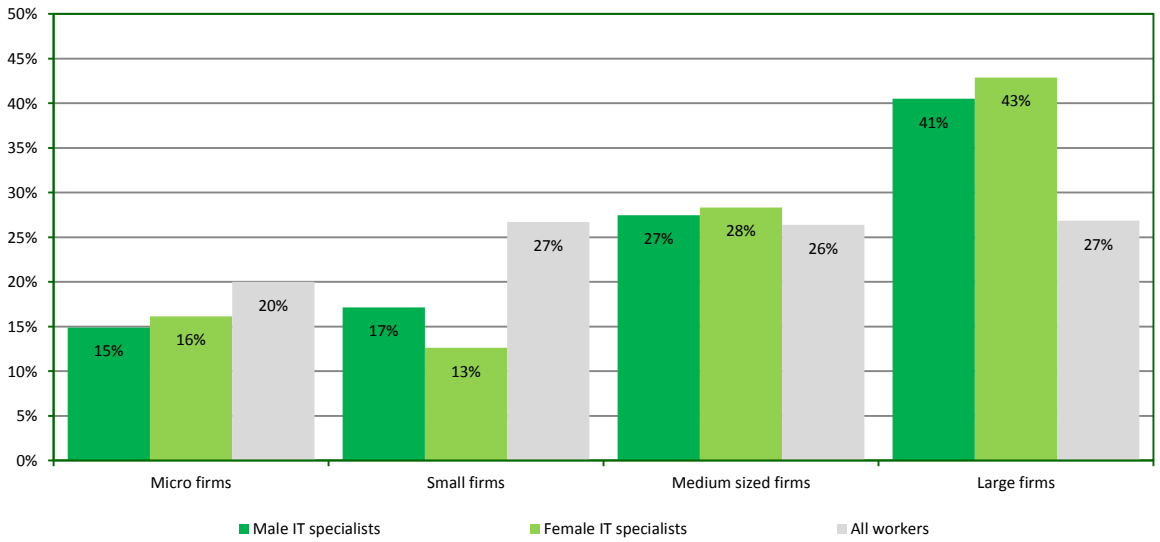
Though not necessarily working in positions classed as being at Managerial/Director level, many IT specialists working in the UK in 2014 were still thought to hold responsibility for managerial tasks. More specifically, amongst female IT specialists, just under four in ten (38%) employees in IT roles stated that they held supervisory responsibilities and one third (33%) were carrying out managerial tasks. This compares with figures of 37% and 45% respectively for male IT specialist employees.

2.3 Employer characteristics

2.3.1 Size of employer

More than half of IT specialists working as employees in 2014 were working in micro/small and medium sized enterprises (SMEs) and this observation holds true for both females and males employed in such roles (i.e. 59% and 56% respectively).

Figure 5: Distribution of IT/other employees by gender and employer size, 2014[14]



Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

14 Micro employers/firms are defined in this case as having between 1 and 10 staff, small employers/firms having 11-49, medium sized businesses/firms 50-249 and large employers/firms having 250 or more

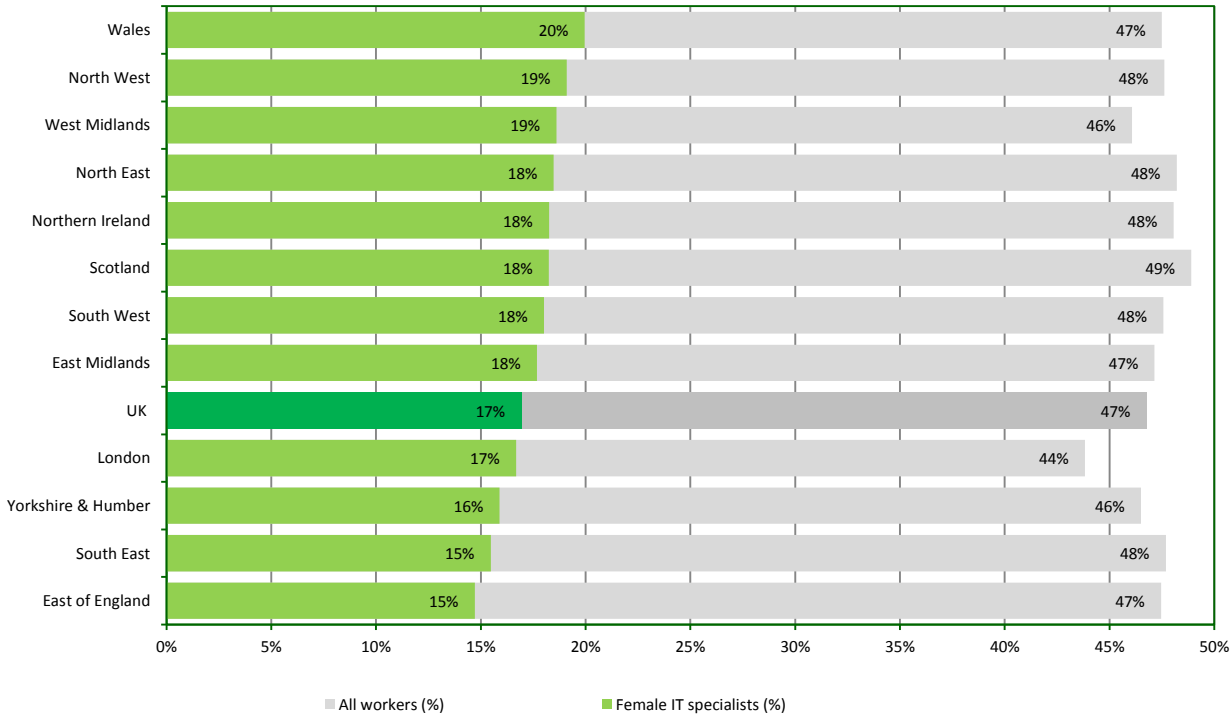
For female IT specialists at least, the importance of the SME sector (micro/small and medium sized employers) was even more evident when considering those working in part-time positions and in this case almost two thirds (63%) were found to be working for employers of this size (i.e. 1-249 employees) during 2014. By contrast the proportion of male IT specialists working in SMEs was the same for both full and part-time employees.

2.3.2 Location of employer

Looking across the UK, the proportion of women working as IT specialists appears highest in Wales where 20% of all those working in such occupations in 2014[15] were female. Moreover, Wales was noted as being an area in which the difference between female representation in IT occupations and that within the workforce as a whole was *relatively* low i.e. 28 percentage points compared with 30 for the UK.

The shortfall in female participation rates was still lower within the West Midlands and London (where a difference of 27 percentage points was observed in each case) though London was also associated with the lowest level of female representation within the workforce as a whole - just 44% of those working in the capital in 2014 being women (compared with 47% across the UK as a whole).

Figure 6: Proportion of IT specialists that are women, by region/nation of employment



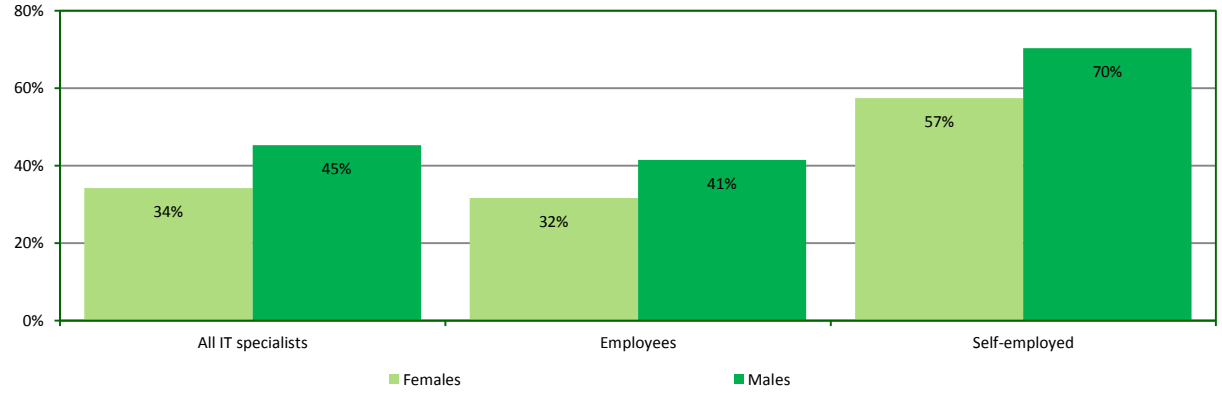
Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

15 To improve reliability, figures for Wales, Northern Ireland and the North East of England presented within this section are based upon three year averages (2012-2014)

2.3.3 Industry of employment

In 2014, approximately one third (34%) of all female IT specialists were working in IT businesses – a much lower proportion than that recorded amongst male IT specialists (45%) at that time. As would perhaps be expected, the proportion of female IT specialists working on a self-employed basis in the IT sector was much higher (57%), though again below the level observed amongst their male counterparts (70%).

Figure 7: Proportion of IT specialists working in the IT industries



Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

As illustrated in the table below, female representation in IT occupations was actually lower within the IT industries during 2014 than in any other parts of the economy including manufacturing and the primary industries (extractive, energy and agro-industries). In fact, at 21% the proportion of IT specialist posts held by women within the primary industries was amongst the highest in 2014 along with distribution, hotels & restaurants (22%), other services (27%) and public services (28%).

Table 4: Female/other employees by occupation and industry, 2014

	Female IT specialists		All female workers		Industry workforce
	(n)	(% of specialists in industry)	(n)	(% of workers in industry)	
IT sector	68,000	13%	170,000	22%	781,000
Primary industries	9,000	21%	476,000	15%	3,099,000
Manufacturing	10,000	14%	743,000	26%	2,885,000
Distribution, hotels & restaurants	10,000	22%	2,785,000	50%	5,570,000
Transport & communication	17,000	18%	506,000	26%	1,914,000
Banking & finance	34,000	15%	2,231,000	46%	4,881,000
Public sector	44,000	28%	6,402,000	72%	8,936,000
Other services	6,000	27%	940,000	55%	1,713,000
All workers	**131,000**	**20%**	**14,200,000**	**49%**	**29,133,000**

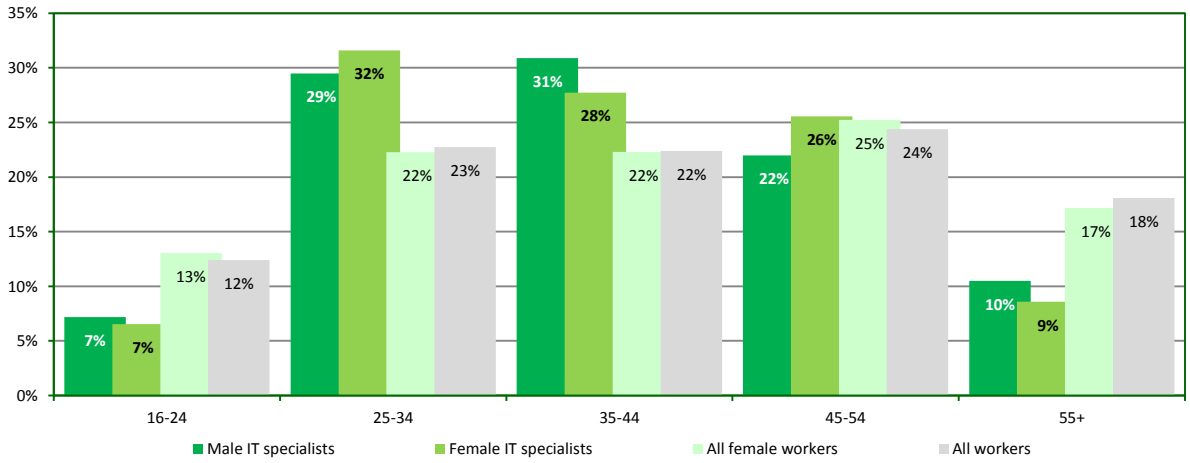
Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

2.4 Workforce characteristics

2.4.1 Age

Female IT specialists working in the UK during 2014 were 40 years old on average – the same age as males working in such roles and one year younger than the average for UK workers as a whole (for which the average was 41 years). Though the differences were not large, the average age for female IT specialists (and males) was found to vary according to a number of factors, not least, contractual status (the average for self-employed IT specialists was generally higher at 43 for women and 42 for men); hours worked (the average again higher amongst part-timers i.e. 47 and 43 for females and males respectively) and job role (in this case it was observed that those in higher level roles tended to be older than other IT specialists).

Figure 8: Age distribution for IT specialists/other workers by gender, 2014



Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

Another key observation about the age of IT specialists (female and male) is that when compared with other workers the proportion aged 16-24 is notably lower (i.e. 7% of male/female IT specialists compared with 13% of female workers and 12% of all workers as a whole). IT specialists then account for a relatively large proportion of those aged 24-44 and a lower proportion again of older workers aged 55 and above.

2.4.2 Ethnicity

Just under one in five female IT specialists (18%) were from 'non-white' ethnic groups in 2014, a slightly higher proportion than that for male IT specialists (15%) and for all workers in the UK at that time (11%).

2.4.3 Disabled status

Just over one in ten female IT specialists (12%) working in the UK during 2014 stated that they had a 'work limiting disability' and/or a disability as described by the Disability Discrimination Act (DDA). By

comparison the figure for male IT specialists was found to be slightly lower (9%) whilst amongst UK workers as a whole a marginally higher level was recorded (13%)[16].

2.5 Workflows

2.5.1 Job seeking activity

On average, around one in twenty (6%) female IT specialists were looking for a new or additional job during 2014 – the same proportion as with male IT specialists and slightly less than the figure for workers as a whole (7%). Of those looking for work, the majority in all cases (around nine in ten) were looking for a new as opposed to additional job.

2.5.2 Means of job acquisition

The most common means of finding employment as an IT specialist (or employment in other roles) for both men and women over the period 2011-2014[17] was by replying to an advert, followed by use of a recruitment agency. The proportion of female IT specialist employees (and other female employees) finding work in this manner was however, notably higher than that for male employees at 23% versus 17% in each instance.

Table 5: Means of job acquisition for IT specialists and other employees, 2011-14[18]

		Reply to advertisement	Private employment agency/business	Hearing from someone who worked there	Direct application	Other
Male	IT specialists	17%	14%	13%	10%	47%
	All	17%	8%	20%	13%	42%
Female	IT specialists	23%	11%	10%	10%	46%
	All	23%	6%	17%	14%	39%
Total	**IT specialists**	**18%**	**13%**	**12%**	**10%**	**47%**
	All	**20%**	**7%**	**19%**	**14%**	**41%**

Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

2.6 Workforce skills

2.6.1 Highest qualification held

IT specialists are much more highly qualified than other UK workers and this is true for both males and females working in such roles. In 2014, seven in ten female/male IT specialists (71% and 70%

16 Figures based on ONS Labour Force Survey data collected in the first, second and fourth quarters of 2014 only

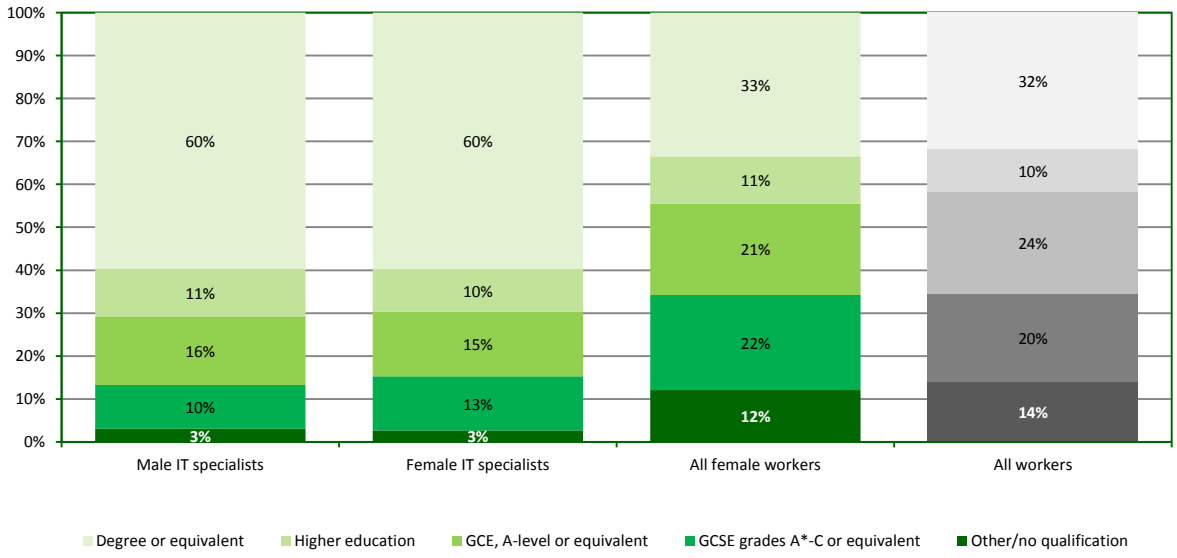
17 A four year average was taken due to the small number of responses to this question

18 A four year average was taken due to the small number of responses to this question

respectively) were thought to hold some form of higher level qualification compared with just over four in ten female workers/UK workers as a whole (comparison figures of 44% and 42%).

Also of note was the fact that female IT specialists working in a self-employed capacity tended to be slightly better qualified than those working as employees (the proportions with higher qualification being 74% and 69% respectively) - again this was also true for males working in IT specialist positions.

Figure 9: Highest qualification held by IT specialists/other workers, 2014



Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

By role, female IT specialists working in 'professional' level positions are found to be the most highly qualified with 76% holding a higher level qualification compared with 73% of those working as IT Directors/Managers and 51% of IT Technicians/Engineers. Again, this closely matches the picture for male IT specialists at that time.

Table 6: Proportion of IT specialists with a higher level qualification, 2014

	Male	Female	Total
IT Managers/Directors	**70%**	**73%**	**71%**
IT&T Directors	72%	82%	73%
Specialist IT&T Managers	69%	72%	70%
IT professionals	**78%**	**76%**	**77%**
IT&T Project & Programme Managers	77%	81%	78%
Business Analysts, Architects & System Designers	78%	69%	77%
Programmers & Software Development Professionals	81%	75%	80%
Web Design & Development Professionals	77%	83%	79%
IT&T Professionals NEC	72%	70%	72%

Table 6: Proportion of IT specialists with a higher level qualification, 2014(continued)

	Male	Female	Total
IT Technicians/Engineers	**50%**	**51%**	**50%**
IT Operations Technicians	51%	46%	50%
IT User Support Technicians/IT Engineers	49%	58%	51%
All IT specialists	**71%**	**70%**	**71%**

Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

2.6.2 HE qualifications

Degrees (as opposed to degree equivalents) were most often cited as being the highest qualification held by female IT specialists (and others) with an HE award and amongst those with a degree; the majority were found to have a first, as opposed to higher degree. Furthermore, first degrees (when identified as being the highest qualification held) tended to be in single, as opposed to combined subjects.

Table 7: Nature of HE award held by IT specialists/others, 2014

	Female IT specialists	Male IT specialists	All females	All workers
With HE award	70%	71%	44%	42%
(of which) have degree	86%	84%	75%	76%
(of which) have first degree	67%	70%	72%	71%
(of which) have single subject	77%	82%	80%	81%
(of which) have IT degree	20%	44%	1%	5%

Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

As illustrated in the table above, the pattern of HE attainment amongst female/male IT specialists (and other workers) is broadly similar, however when considering those with single subject undergraduate degrees (i.e. whose highest qualification is of this nature) it is apparent that male IT specialists are twice as likely to hold this kind of award as females working in this type of role (i.e. with comparison figures of 44% and 20% respectively).

3 Higher education (HE)

Figures from the Universities and Colleges Admissions Service (UCAS) show there to have been just over 200 (203) UK higher education establishments offering HE level courses in IT during 2014 i.e. one in six (60%) HE institutions in total. Over the past year, the number of HE institutions offering IT courses at this level has increased by 5% and compared with five years ago the number has risen by 18% [19] - but how is this growth reflected in the student numbers?

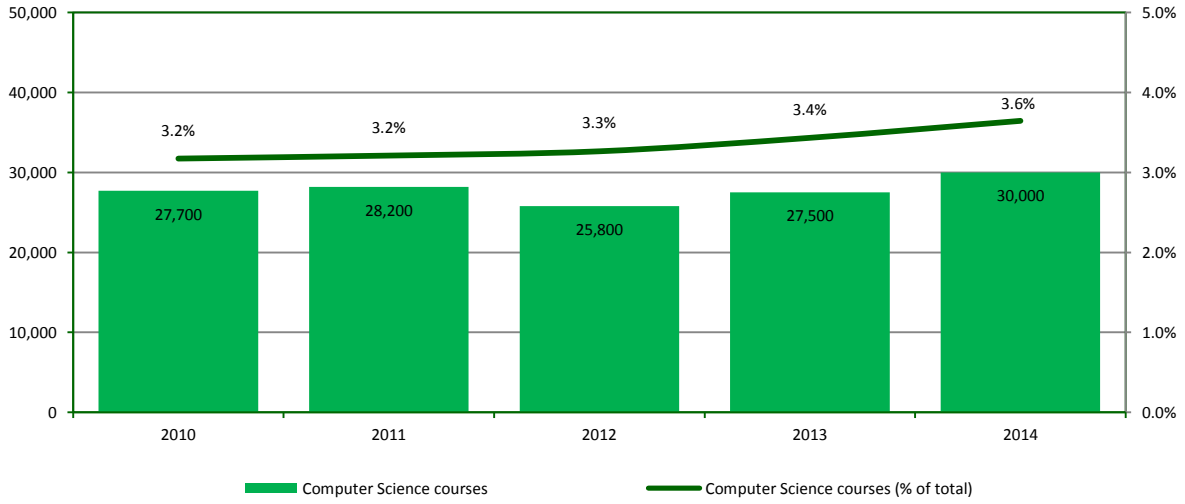
In this section we use bespoke data from UCAS and The Higher Education Statistics Agency (HESA) to give a detailed analysis of applications/acceptances and outcomes from IT related HE courses, focussing in particular on UK domiciled applicants/students of higher education and courses listed under JASC (Joint Academic Coding System) 3 Group I - Computer Sciences (detailed in report Annex).

3.1 HE applications

3.1.1 Applicants by subject of study

Bespoke data provided by UCAS shows how following a decline over the 2011-12 period, the number of applications to HE level Computer Science courses in the UK rose during each successive year to a high of 30,000 applicants in 2014 at which point applicants to Computer Science courses accounted for3.6% of all applicants to HE courses at that time.

Figure 9: Unique applicants to IT/other HE courses, 2010-14



Source: Analysis of UCAS data undertaken by The Tech Partnership

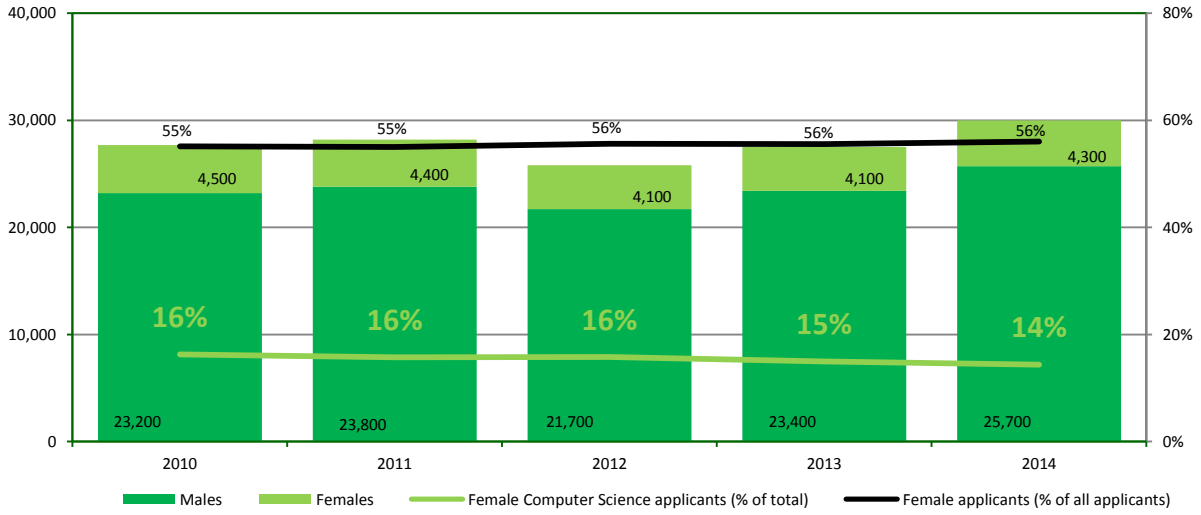
Growth (during the past year at least) was most pronounced for Games related courses (where applicant numbers were up by 79%) followed by Computer generated visual & audio effect (74%) and Artificial Intelligence (32%). Over the longer term however Software Engineering was associated with the highest growth rate i.e. 22% between 2010 and 2014.

19 Based on the number of HE institutions that have accepted students for HE level courses listed under JASC (Joint Academic Coding System)3 Group I - Computer Sciences

3.1.2 Applications by gender

Whilst the total number of applicants to Computer Science courses at HE institutions has increased over the past four years, this growth has been driven by a rise in the number of male applicants, and as a result, the proportion of applicants that were female has declined from 16% in 2010 to 14% in 2012. By comparison, the proportion of applicants as a whole that were female was seen to increase slightly over the period from 55% to 56%.

Figure 10: Unique applicants to IT/other HE courses by gender, 2010-14



Source: Analysis of UCAS data undertaken by The Tech Partnership

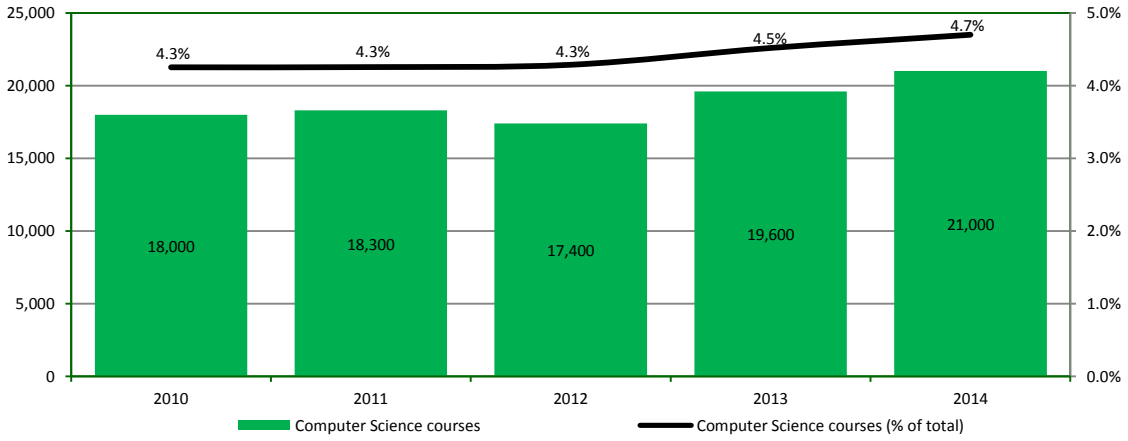
By course, the proportion of applicants that were female varied between 10-20% for each sub-category of Computer Science with just one exception – Health informatics for which females accounted for one third (33%) of the total. This said, it should be noted that there were less than 20 applicants for such courses in 2014 and each of the two preceding years.

3.1 HE acceptances

3.2.1 Acceptances by subject of study

As with applicant numbers, the number of acceptances for Computer Science courses by HE institutions has also followed an upward trend over the past four years and in 2014, 4.7% of all acceptances were in this discipline – up from 4.3% in 2010. Again, like applicant numbers, the highest rates of growth in acceptances over the short term were associated with Games and Computer generated visual & audio effects courses, whilst Software Engineering and Artificial Intelligence showed the greatest (proportionate) increases over the longer term.

Figure 9: Acceptances to IT/other HE courses, 2010-14



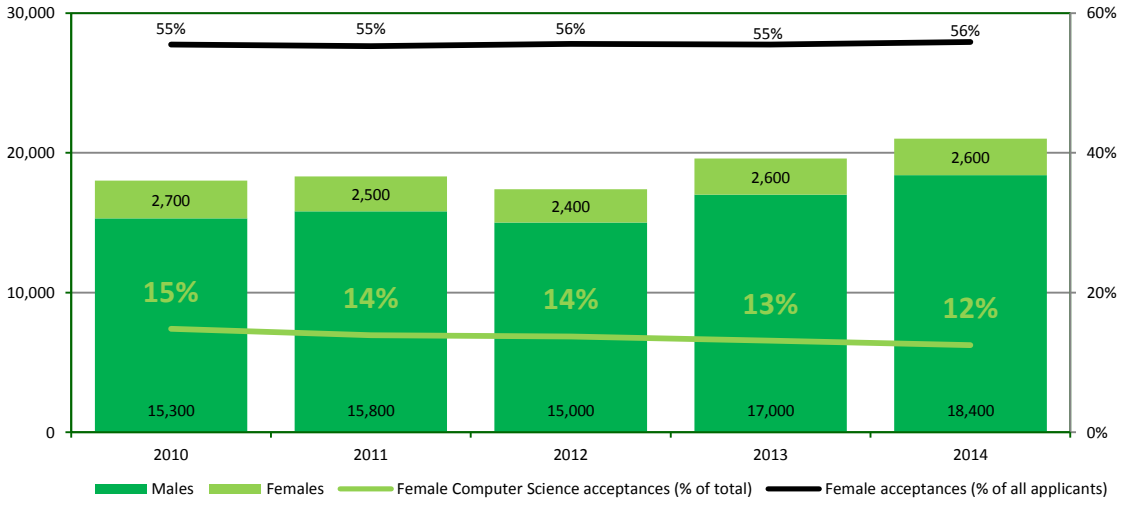
Source: Analysis of UCAS data undertaken by The Tech Partnership

3.2.2 Acceptances by gender

Though the number of students accepted for HE level Computer Science courses has increased in recent years, this has been driven primarily by a rise in the number of males accepted for such courses (up 8% between 2013 and 2014 and 20% between 2010 and 2014). By comparison, female acceptances rose only slightly (2%) between 2013 and 2014 whilst declining by 2% over the 2010-2014 period.

As a result, the proportion of acceptances for Computer Science courses accounted for by females is seen to have fallen from 15% to just 12% between 2010 and 2014.

Figure 9: Acceptances to IT/other HE courses, by gender 2010-14



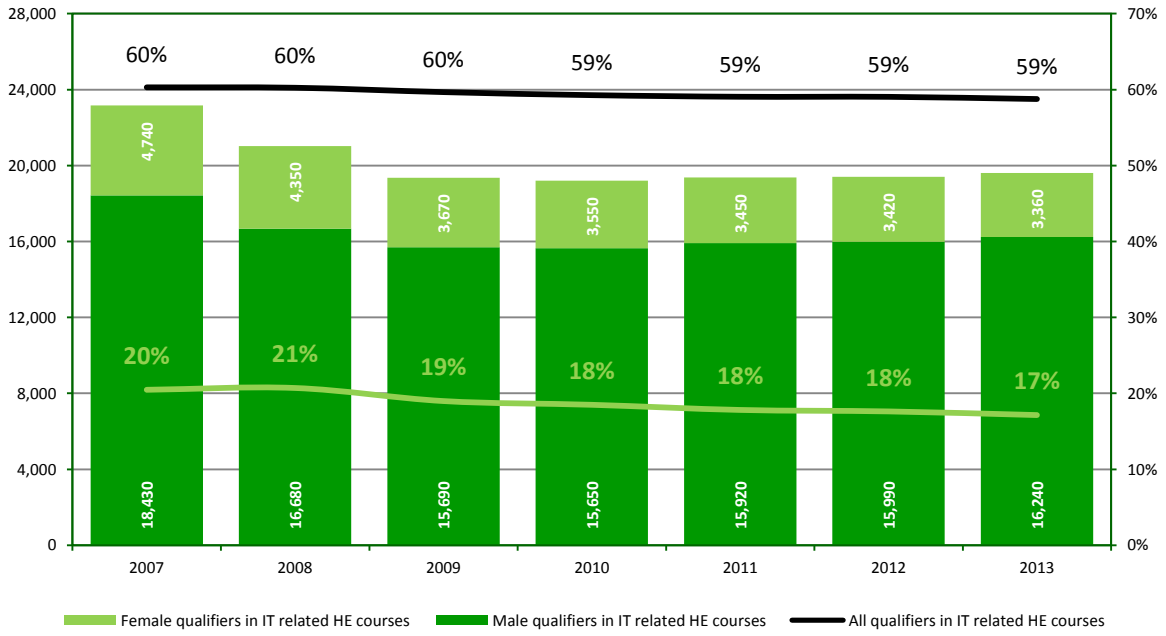
Source: Analysis of UCAS data undertaken by The Tech Partnership

3.3 Higher Education qualifiers in IT related subjects

3.3.1 Historical trends

Analysis of data from HESA shows that in 2013, just under 3,400 females achieved an HE level qualification in an IT related subject from a UK institution - a slight decrease (2%) on the number recorded in the previous year. By contrast, the number of male qualifiers in IT related subjects at this level was seen to have increased slightly (up 2%) and as result, the proportion of IT related awards at this level received by female students fell from 18% to 17% over the 2012-13 period.

Figure 16: UK domiciled qualifiers in Computer Sciences/IT related HE courses by gender, 2007-2013



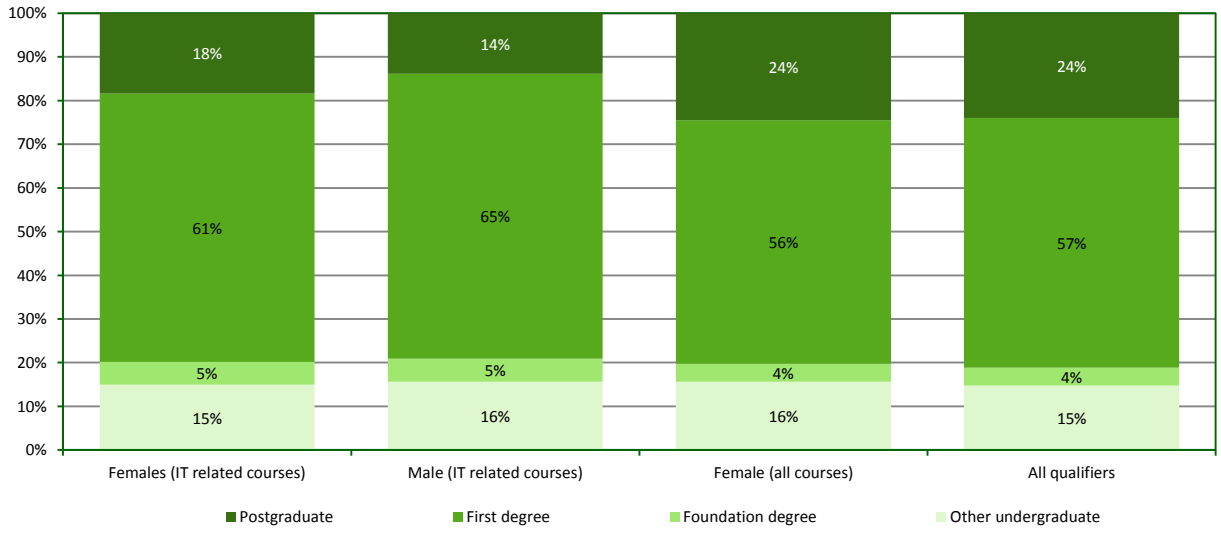
Source: Analysis of HESA data undertaken by The Tech Partnership

3.3.1 Qualifiers by level of study

The fall in the number of females achieving IT related awards at HE level was driven primarily by a decline in the number taking 'other HE qualifications' i.e. as opposed to higher, first or foundation degrees - with the number achieving qualifications of this nature falling by 20% over the year. The number of male students achieving this type of award was also seen to have fallen though in this case the decline was smaller in scale (i.e. a fall of 10%).

For both females and males, the number of students achieving a first degree in an IT related discipline was up by 5% on the previous year and first degrees accounted for around six in ten IT qualifiers in 2013 – a similar though slightly higher proportion than amongst HE qualifiers as a whole.

Figure 17: UK domiciled qualifiers from HE courses by level of qualification, 2013



Source: Analysis of HESA data undertaken by The Tech Partnership

3.3.2 Destination of leavers

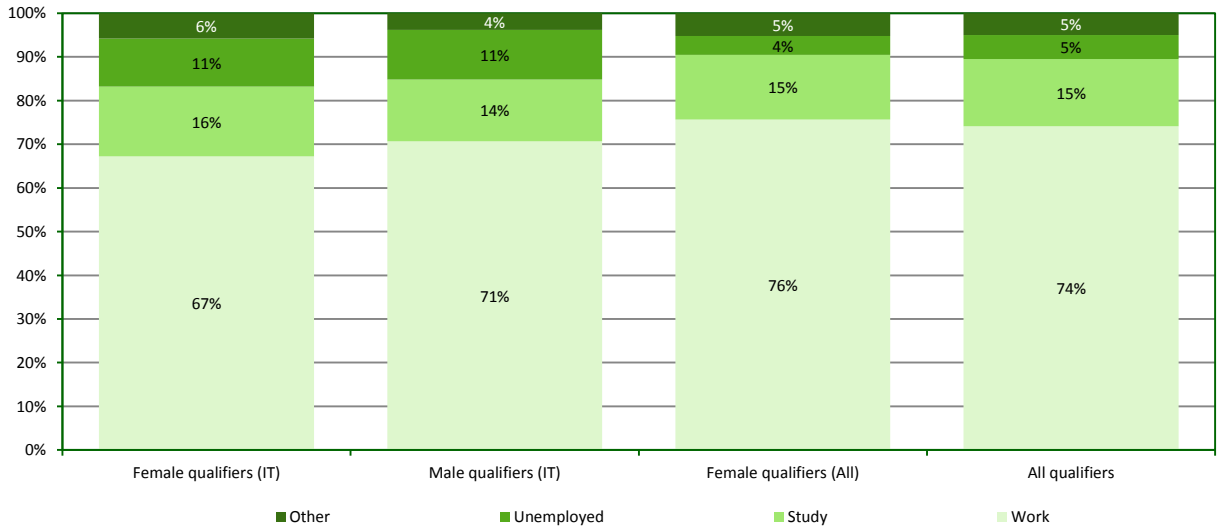
Results from HESA's Destination of Leavers from Higher Education (DELHE) survey[20] show that, like HE graduates from other disciplines, the majority (70%) of those leaving HE with an IT related award in 2013 had moved into employment - primarily working on a full-time basis (58% of IT graduates) and within an IT role (56%).Of those that were not in work, most were found to be undertaking further study (15% of IT graduates) though a sizeable proportion of IT graduates (11%) were unemployed at the time of survey – a figure well in excess of that recorded for HE leavers as a whole (5%).

A comparison of the figures for female/male IT leavers reveals a broadly similar pattern overall albeit with a slightly lower proportion of females in work (i.e. 67% versus 71%) and a slightly higher proportion continuing with their studies (16% versus 14%).

A much more notable difference was seen however in the nature of work being undertaken by females from IT courses with just 38% of those in work holding IT positions compared with 59% of males.

20 Undertaken 6 months post-graduation

Figure 17: Destinations of IT/other qualifiers from HE courses by gender, 2013



Source: Analysis of HESA data undertaken by The Tech Partnership

3.3.3 Career choices for IT graduates

The most common reason given by female IT graduates for starting work as an IT specialist was that it fitted their career plan/was exactly type of work wanted and just over six in ten (61%) of females leaving HE with an IT award in 2012/13 and taking up an IT role stated this to be the case (as was the case for male IT graduates). By contrast, amongst those that had graduated in a different subject area prior to securing work as an IT specialist, the figure was much lower at around one third (33%) of HE leavers working in this field.

4 Secondary education

As illustrated in the earlier section, the majority of IT specialists are educated to degree level and will often hold an IT related degree. The number of students taking IT degrees will, in turn, is likely to be influenced by the numbers taking IT/ICT at A level (GCE), and prior to this at GCSE level. This section provides an analysis of IT/ICT uptake amongst male/female students at this level and hence an indicator of future flows into IT occupations from academia using figures provided by the Joint Council for Qualifications (JCQ).

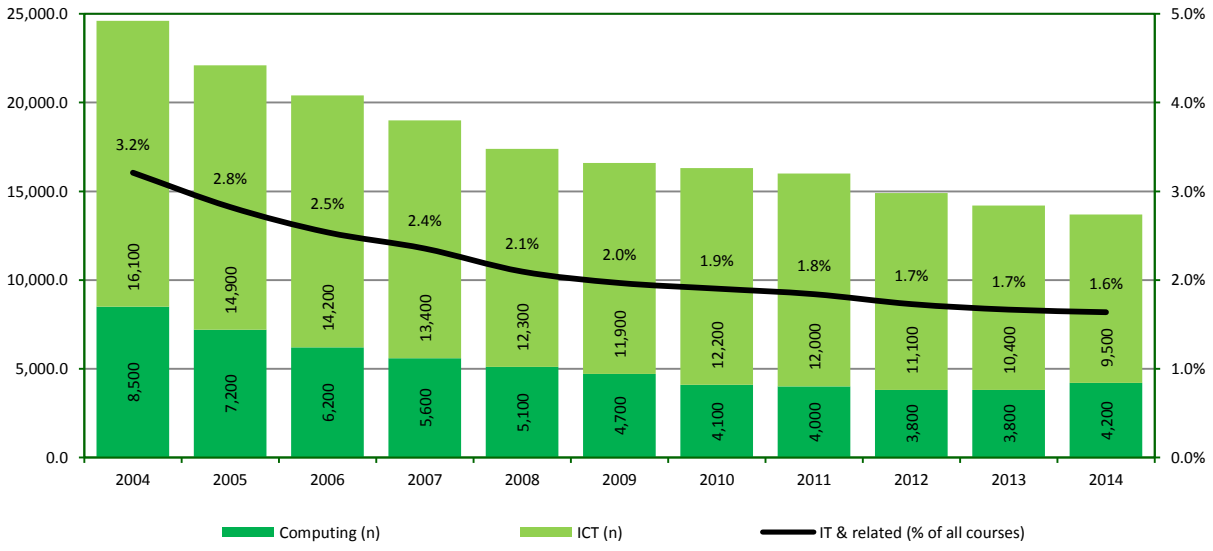
4.1 Uptake of IT and related A levels (GCEs)

Students in the UK are currently able to choose between two types of IT related GCE; a Computing GCE which can be thought of as a 'pure' computing award and targeted at those seeking to undertake further study in the IT field and/or obtain work as IT specialist, and, an ICT GCE which is more application focussed and aimed at those wishing to have a broad understanding/capacity to use IT as a tool to aid them in further study/employment that is not necessarily IT focussed.

4.1.1 Trends in uptake for IT related GCEs

In total, around of 13,700 students sat an IT related GCE during 2014 of which around one third (31%) took a computing course and two thirds (69%) an ICT GCE[21]. As with GCE student numbers as a whole, the number taking IT related GCEs was down slightly on the level recorded in 2013 though at 4% the fall for IT related courses was double that for GCEs more generally (2%). As a result, IT related courses now account for just 1.6% of all GCEs undertaken in the UK – half the proportion registered in 2004.

Figure 20: Students taking IT related GCEs, 2004-2014



Source: Analysis of JCQ data undertaken by The Tech Partnership

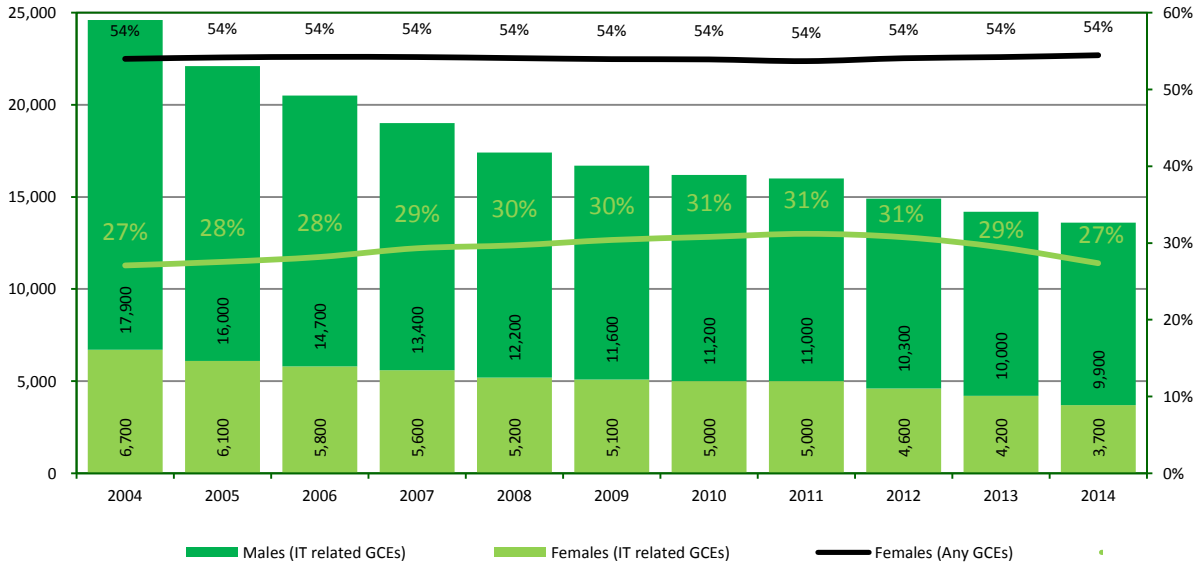
21 Some degree of double counting may exist where GCEs have been taken in Computing and ICT

On a more positive note, the number of students taking computing GCEs was seen to increase over the 2013-14 period, rising by 11% (or 400 students in total) compared with a fall of 9% for ICT GCEs.

4.1.2 Uptake of IT related GCEs by gender

In 2014, just over one quarter (27%) of students taking IT related GCEs in 2014 were female compared with more than half (54%) of those taking GCEs as a whole. The level of female representation on IT related GCE courses was down on the previous year (29% in 2013) and has now fallen for three successive years in a row (if un-rounded figures are employed). By contrast, the overall proportion of females taking GCEs in the UK actually increased marginally over each of the past two years (again looking at un-rounded data) and has remained at a rounded figure of 54% throughout the past decade.

Figure 21: Students taking IT related GCEs by gender, 2004-2014



Source: Analysis of JCQ data undertaken by The Tech Partnership

This reduction in the proportion of females taking IT related courses overall is due to the declining popularity of ICT courses which tend to attract a much higher proportion of female students (36% in 2014) than do Computing GCE courses (8%).

4.1.3 IT related GCEs by nation

At first glance, the level of female representation on IT related GCE courses would appear to be much worse in England than in either Wales or Northern Ireland - with comparison figures of 25%, 31% and 38% respectively). Analysis by type of course however shows that this is largely down to the fact that computing courses account for a much higher proportion of IT related GCSEs in England (35% versus 7% in Northern Ireland and 21% in Wales) and that female representation on such courses is universally much lower than for ICT GCEs as noted previously. In fact, for computing GCEs, Northern Ireland was noted as being the area in which the proportion of female students was the lowest at just 6% of the total.

Table 8: Proportion of IT related GCEs taken by females within different UK nations, 2004-14

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Computing	**UK**	**12%**	**11%**	**10%**	**10%**	**9%**	**10%**	**9%**	**8%**	**8%**	**7%**	**8%**
	England	10%	9%	8%	8%	8%	8%	8%	7%	7%	6%	8%
	Northern Ireland	24%	25%	15%	16%	19%	14%	7%	9%	8%	6%	6%
	Wales	21%	22%	20%	23%	20%	22%	21%	14%	13%	12%	9%
ICT	**UK**	**35%**	**35%**	**36%**	**37%**	**38%**	**39%**	**38%**	**39%**	**39%**	**38%**	**36%**
	England	34%	35%	35%	36%	36%	37%	36%	37%	37%	36%	35%
	Northern Ireland	41%	44%	45%	44%	47%	44%	43%	45%	42%	40%	40%
	Wales	39%	35%	41%	39%	44%	46%	47%	45%	44%	45%	38%
All IT related	**UK**	**27%**	**28%**	**28%**	**29%**	**30%**	**30%**	**31%**	**31%**	**31%**	**29%**	**27%**
	England	27%	27%	27%	28%	28%	28%	28%	29%	28%	27%	25%
	Northern Ireland	35%	39%	40%	41%	44%	42%	42%	43%	41%	38%	38%
	Wales	27%	27%	29%	32%	36%	39%	42%	39%	38%	38%	31%
All Subjects	**UK**	**54%**	**54%**	**54%**	**54%**	**54%**	**54%**	**54%**	**54%**	**54%**	**54%**	**54%**
	England	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
	Northern Ireland	57%	57%	57%	57%	57%	56%	56%	54%	55%	54%	54%
	Wales	56%	56%	56%	55%	56%	55%	55%	55%	56%	55%	55%

Source: Analysis of JCQ data undertaken by The Tech Partnership

4.1.4 IT related GCEs results by gender

The proportion of female students achieving grades A/A* grades and grades A-C for IT related GCEs was higher than amongst their male counterparts and this was particularly apparent amongst those taking ICT GCEs where a difference of 6 percentage points was recorded in the proportions obtaining A/A* grades (i.e. 15% of female students compared with just 9% of males).

Table 9: Proportion of students achieving GCEs at A*/A and A-C level, 2014

	Female			Male			Total		
	A/A*	A-C	Other	A/A*	A-C	Other	A/A*	A-C	Other
Computing	19%	65%	35%	16%	61%	39%	16%	61%	39%
ICT	15%	67%	33%	9%	57%	43%	11%	61%	39%
All IT related	16%	67%	33%	12%	59%	41%	13%	61%	39%
All subjects	**26%**	**79%**	**21%**	**26%**	**74%**	**26%**	**26%**	**77%**	**23%**

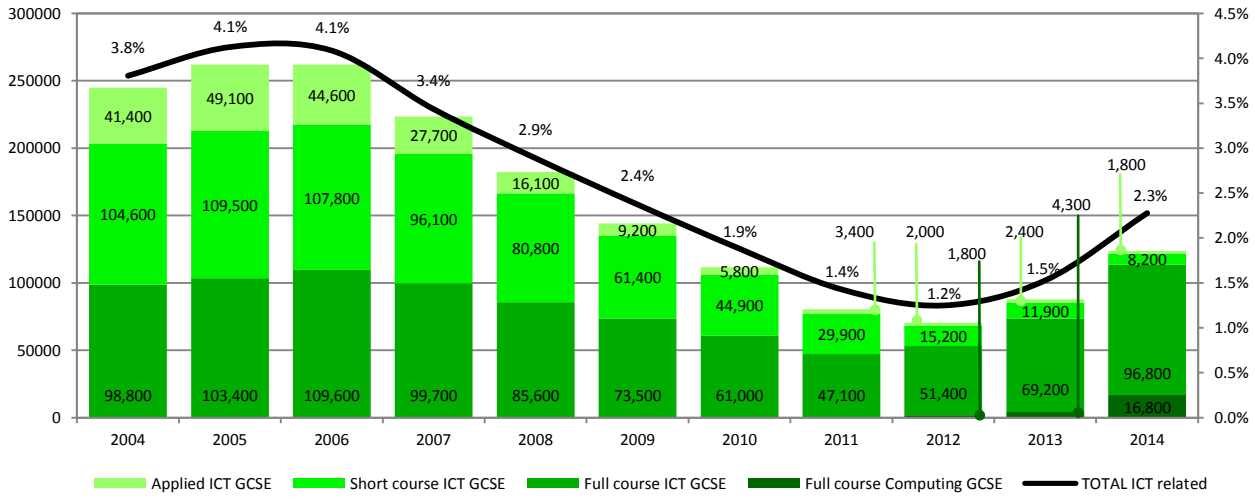
Source: Analysis of JCQ data undertaken by The Tech Partnership

4.2 Uptake of IT related GCSEs

4.2.1 Trends in IT & related GCSE uptake

In total, around 123,600 students took IT & related GCSEs during 2014[22] and of these 78% took full course ICT GCSEs, 14% took full-course computing GCSEs, 7% took short-course ICT GCSEs and 1% took an applied ICT GCSE. Compared with the previous year, the number of students taking IT & related GCSEs increased dramatically (up by 41%) and this change was in stark contrast to an overall decline in the number of students sitting GCSEs as a whole (down by 6% between 2013 and 2014).

Figure 18: Uptake of IT related GCSEs in England, Wales & Northern Ireland by course, 2004-2014



Source: Analysis of JCQ data undertaken by The Tech Partnership

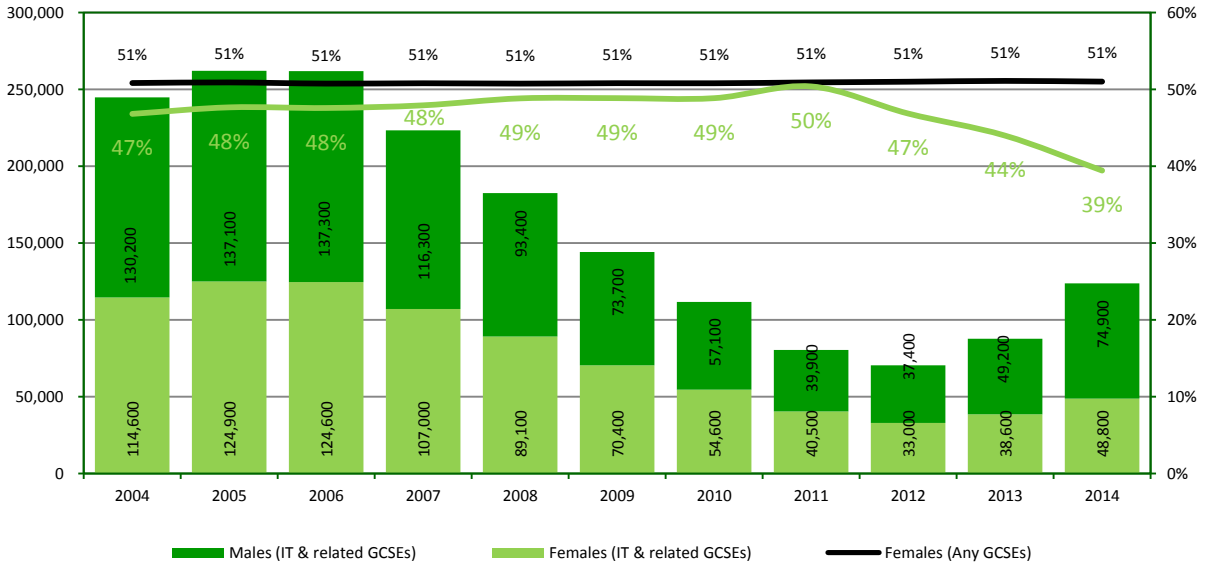
As illustrated in the chart above, this was the second annual increase in the number of students taking ICT related GCSEs in the UK and the total number of entries for such exams now stands at its highest level since 2009 (when 144,000 entries were recorded) and accounts for 2.3% of all GCSEs undertaken. Even so, the number taking IT & related GCSEs is only a little more than half (51%) of that observed ten years ago and less than half (47%) of the peak level recorded in 2005.

4.2.2 Uptake of IT & related GCSEs by gender

Though the overall number of students taking IT related GCSEs has increased in the past two years, the level of growth has been much more pronounced amongst male, as opposed to female students. More specifically, over the growth period between 2012 and 2014 whilst the number of females sitting IT related GCSEs rose by 48% to 48,800, the number of males taking this kind of course increased by more than double this rate (i.e. 100%) to 74,900 students in total. As a result the proportion of IT related GCSEs undertaken by female students actually fell over the 2012-14 period from 47% to 39% of the total (compared with a comparison figure of 51% for all GCSEs courses in 2014 and previous years).

22 Ibid

Figure 19: Students taking IT related GCSEs in the UK by gender, 2004-2014



Source: Analysis of JCQ data undertaken by The Tech Partnership

Female representation on IT related GCSE courses does vary according to the nature of study however, and for short courses at least the number of females taking them was equal to that for males during the year. This said, the proportion of females was down significantly on the level recorded in 2013 when they accounted for 57% of all those taking IT related GCSEs of this nature.

Table 10: Proportion of IT related/other GCSEs taken by females, 2004-14

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Full course	IT related	42%	43%	44%	45%	44%	45%	44%	45%	44%	42%	39%
	All	51%	51%	51%	51%	51%	51%	51%	51%	51%	51%	51%
Short course	IT related	53%	54%	54%	53%	55%	54%	55%	59%	56%	57%	50%
	All	51%	52%	51%	51%	51%	51%	51%	51%	51%	50%	49%
Applied	IT related	43%	42%	41%	41%	42%	45%	45%	44%	41%	38%	34%
	All	51%	52%	53%	56%	58%	60%	60%	56%	57%	56%	54%
Total	**IT related**	**47%**	**48%**	**48%**	**48%**	**49%**	**49%**	**49%**	**50%**	**47%**	**44%**	**39%**
	All	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**

Source: Analysis of JCQ data undertaken by The Tech Partnership

Short courses are also notable in that the proportion of females studying for IT related GCSEs in this way during 2014 was actually higher than the overall proportion of females taking (any) short courses at this level (i.e. 50% vs. 49%). Moreover this has been the case in each of the past ten years.

By contrast or all other modes of study, the proportion of females taking IT related GCSEs was lower than the comparison figure for all GCSE students – the difference ranging from 1 percentage point in the case of short courses as noted above to 20 percentage points in the case of applied IT related GCSEs.

4.2.3 IT related GCSEs by nation

For the most part, there appears to have been little difference in the proportion of female students taking IT related GCSEs within the different constituent nations of the UK during 2014 though when considering applied GCSE, the proportion seen in Northern Ireland was found to be significantly higher than that recorded in either England or Wales (with comparison figures of 63%, 30% and 48% respectively). This has not always been the case however and prior to 2008 the proportion recorded in Northern Ireland fluctuated around the 40% mark as was the case for England and Wales.

Table 11: Proportion of IT related/other GCSEs taken by females across the UK, 2004-14

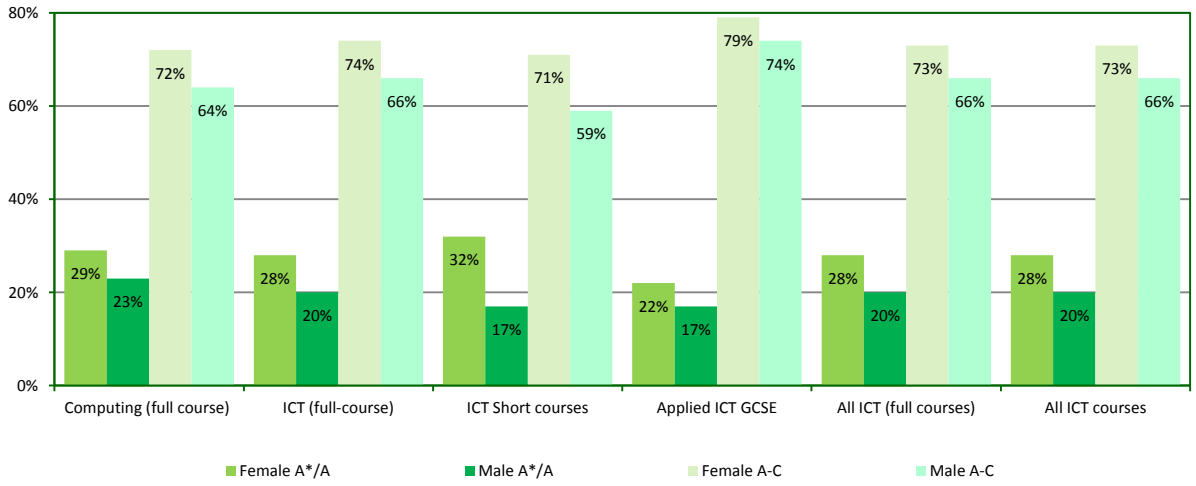
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Full course IT related GCSEs	England	42%	43%	45%	45%	45%	45%	44%	46%	45%	42%	39%
	Northern Ireland	38%	40%	41%	41%	42%	44%	43%	44%	42%	41%	41%
	Wales	43%	44%	44%	45%	44%	45%	46%	45%	41%	40%	39%
Short course IT related GCSEs	England	67%	55%	58%	47%	47%	46%	54%	53%	50%	55%	45%
	Northern Ireland	67%	55%	58%	47%	47%	46%	54%	53%	50%	55%	45%
	Wales	52%	52%	50%	51%	53%	53%	53%	52%	44%	48%	45%
Applied IT related GCSEs	England	43%	43%	41%	41%	42%	45%	45%	43%	37%	36%	30%
	Northern Ireland	41%	39%	45%	43%	51%	68%	68%	62%	69%	71%	63%
	Wales	38%	37%	35%	33%	39%	42%	37%	44%	49%	45%	48%
All IT related GCSEs	England	47%	48%	52%	48%	49%	49%	49%	52%	48%	46%	43%
	Northern Ireland	42%	42%	44%	42%	43%	45%	45%	45%	43%	44%	42%
	Wales	45%	45%	45%	46%	47%	47%	48%	47%	42%	43%	42%
All GCSEs	**England**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**
	Northern Ireland	**52%**	**51%**	**52%**	**52%**	**51%**	**51%**	**52%**	**51%**	**50%**	**51%**	**51%**
	Wales	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**	**51%**

Source: Analysis of JCQ data undertaken by The Tech Partnership

4.2.4 IT related GCSE results by gender

In 2014 female students taking IT related GCSEs continued to outperform their male counterparts irrespective of the type of course undertaken. The difference in the achievement was most pronounced amongst those undertaking IT & related short courses for which the proportion of females obtaining A/A*grades was almost double that recoded for males (comparison figures of 32% and 17% respectively) and the proportion achieving grades at grades A-C also much higher (figures of 71% versus 59% in this case) .

Figure 19: Proportion of students achieving GCSEs at A/A and A-C level, 2014*



Source: Analysis of JCQ data undertaken by The Tech Partnership

When comparing the level of achievement of females undertaking GCSEs in IT related subjects with that of female GCSE students as a whole, the proportion obtaining grades A-C was seen to be the same in both cases (73%) though females undertaking IT & related GCSEs were slightly more likely to have been awarded an A/A* (with comparison figures of 28% and 25% respectively).

Table 12: GCSE attainment for IT related/other GCSEs, 2014

		Female			Male			Total		
		A*/A	A-C	Others	A*/A	A-C	Others	A*/A	A-C	Others
Full-courses	IT related	28%	74%	27%	20%	66%	34%	23%	70%	31%
	All subjects	25%	73%	27%	18%	64%	36%	21%	69%	31%
Short-courses	IT related	32%	71%	29%	17%	59%	42%	25%	65%	35%
	All subjects	24%	65%	35%	13%	48%	52%	18%	56%	44%
Applied-courses	IT related	22%	79%	21%	17%	74%	27%	19%	75%	25%
	All subjects	22%	75%	25%	15%	68%	32%	19%	72%	28%
All courses	**IT related**	**28%**	**73%**	**27%**	**20%**	**66%**	**34%**	**23%**	**69%**	**31%**
	All subjects	**25%**	**73%**	**27%**	**17%**	**64%**	**36%**	**21%**	**68%**	**32%**

Source: Analysis of JCQ data undertaken by The Tech Partnership

5 Vocational and professional qualifications

Though almost one half (46%) of the workforce in 2014 stated that they held a qualification 'related to work' (45% of females and 41% of female IT specialists), there is relatively little detailed/regularly updated information on vocational development available from public/other sources.

In this section, data from the ONS Labour Force Survey (LFS) is used to provide an overview of the incidence of job-related education/training received by female IT specialists/others in work, whilst take up figures for BCS qualifications provide an indicator of female representation on IT specific development programmes. In addition, data on apprenticeships starts and completions for each of the devolved nations[23] shows how (primarily) new male/female entrants to the workforce are using this vocational route as a means of initiating a career in IT.

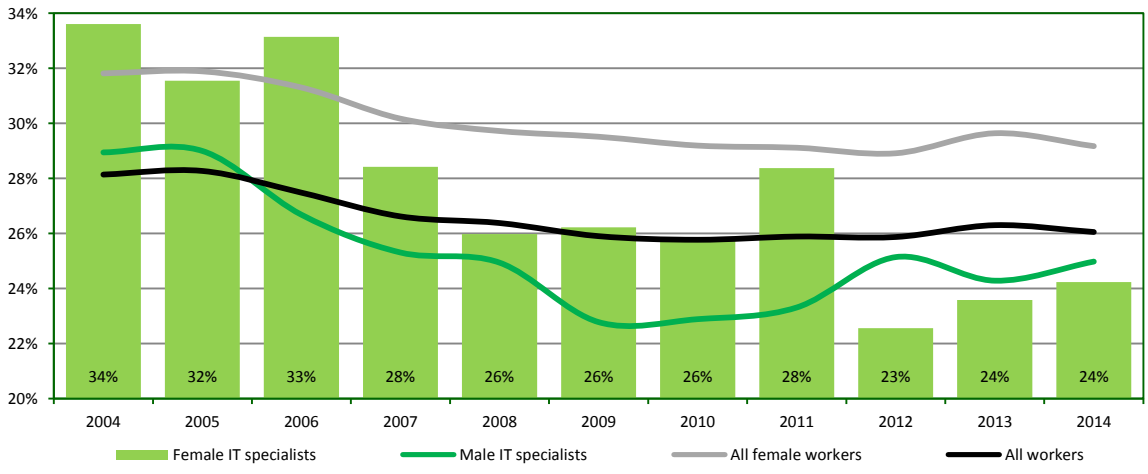
5.1 Work based learning and development

5.1.1 Incidence of job-related education and training

Though already a highly qualified group of people, IT specialists work in a field characterised by rapid and often dramatic change. As such continued professional development is essential if individuals are to keep up with new developments and hence retain a marketable skillset in such a dynamic employment sector. Despite this observation however, latest figures show the proportion of both female and male IT specialists receiving job-related education in 2014 to have been lower than the overall average for all UK workers (i.e. with comparison figures of 24%, 25% and 26% respectively).

The below average incidence of education/training activity amongst IT specialists (and female IT specialists in particular) has existed for much of the past ten years and, as illustrated below, it would appear that situation has worsened over time as whilst education/training activity has fallen for all workers, the decline has been more pronounced for IT specialists and female IT specialists in particular.

Figure 9: Incidence of job-related education/training received in the past 13 weeks, 2004-14



Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

23 Skills Funding Agency (SFA), Skills Development Scotland (SDS), the Department for Employment and Learning Norther Ireland (DELNI)

5.1.2 Job-related education and training and characteristics of employment

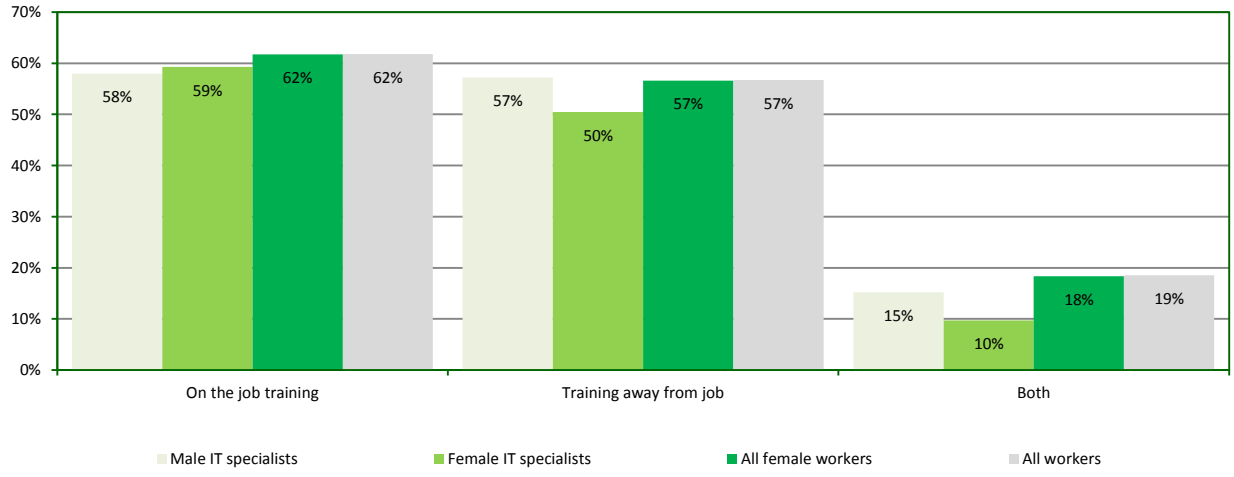
Female IT specialists working as employees (and male/other employees) appear much more likely to be receiving job-related education/training than those working on a self-employed basis as are those working full- as opposed to part-time. Over the 2011-14 period[24] whilst 26% of female IT specialists stated that they had received education/training in the previous 13 weeks, the equivalent figure for those in self-employment was just 17% whilst for full versus part-time workers figures of 26% and 21% respectively were recorded.

The incidence of education/training being received was also found to be lower amongst female IT specialists (and other female workers) working in the IT industries (21%) though this did not appear to be the case for males working in IT or other roles.

5.1.3 Nature of job-related education and training

Like other workers, female IT specialists undertaking job-related education/training are more likely to do so via 'on' as opposed to 'off' the job (59% versus 50% respectively), though around one in ten (10%) of those that have received education/training[25] will have done so via a combination of the two.

Figure 9: Nature of job-related education/training received in the past 4 weeks, 2011-14



Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

5.1.4 Missed opportunities for job related education/training

Amongst female IT specialists that had not undertaken education/training in the previous 13 weeks just over one quarter (26%) stated that it had at least been offered to them by their employer(i.e. amongst those working as employees). By comparison the figure for male IT specialists was lower at 23%, as was the figure for females in the workforce as a whole (22%).

24 Figures of 26% and 17% respectively for the 2011-2014 period (four year average employed due to small base)

25 For those that have received education/training during the past 4 weeks – figures based on four year average 2011-2014

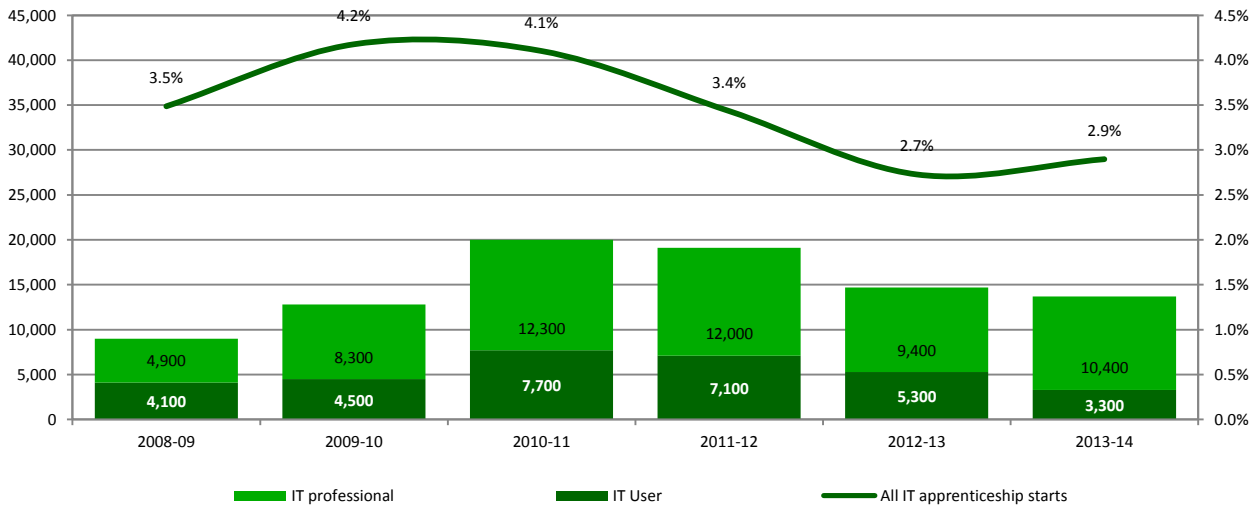
5.2 Apprenticeships

A range of apprenticeship programmes are now available for young people (and others) interested in undertaking a recognised vocational qualification in IT whilst progressing their careers as IT specialists. More specifically, apprenticeships are available at intermediate, advanced and higher levels. These are broadly comparable with level 2 (NVQ and BTEC first certificate), level 3 (NVQ, BTEC national and OND) and level 4 (NVQ, BTEC HNC/HND) qualifications and have been designed specifically for those seeking a career working as digital business specialist, technician or software developer/network engineer.

5.2.1 Trends in uptake of IT and other apprenticeships

In total, just over 14,000 people started an IT apprenticeship in the UK during 2013/14 representing 3.0% of all apprenticeships started during this period. The vast majority of apprenticeship starts (74%) during the year were for IT professional apprenticeships and starts on this type of programme were seen to have increased by 10% over the previous year even as the overall number of apprenticeship starts fell by 13%.

Figure 22: Trends in apprenticeship starts for England, Scotland and Northern Ireland[26], 2008-14



Source: Analysis of data from DELNI, Skills Development Scotland and the SFA undertaken by The Tech Partnership

As a result of this increase, IT apprenticeship starts increased from 2.8 to 3.0% of all starts over the 20012/13 – 2013/14 period, though this follows a period of relative decline over the previous two years from a peak of over 4% in 2009/10 and 2010/11. The change in the number of IT apprenticeship starts/proportion of all starts is illustrated in the chart below though data in this case relates to England, Scotland and Northern Ireland only (Wales has been omitted due to the absence of comparable statistics prior to 2012/13 but the relatively small number of starts in Wales means that this will have little effect on the totals shown).

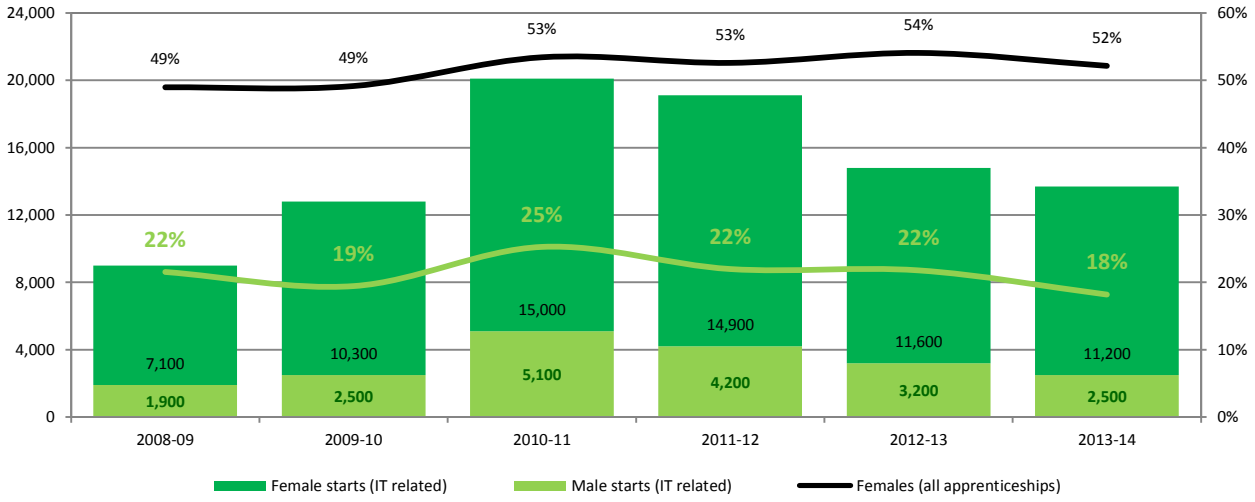
26 Comparison data for Wales was unavailable at time of publication

5.2.2 Apprenticeship starts by gender

Latest statistics show that females accounted for just over one half (52%) of all apprenticeships starts in the UK during 2013/14, though when considering IT related apprenticeships the proportion was much lower at just one fifth (20%) and for IT professional apprenticeships in particular only around one in ten starters (11%) were female.

As illustrated in the chart below, the proportion of IT apprenticeship starts accounted for by females in the UK (excluding Wales) has fluctuated around the 20% mark for much of the past six years peaking at 25% in 2010/11. This change has however been driven mainly by variations in the number taking IT user apprenticeships – the proportion taking professional programmes remaining static throughout the majority of this period (i.e. 11% in all years bar 2009-9 in which a figure of 9% was recorded).

Figure 23: Trends in apprenticeship starts for England, Scotland and Northern Ireland[27], 2008-14



Source: Analysis of data from DELNI, Skills Development Scotland and the SFA undertaken by The Tech Partnership

5.2.3 Apprenticeship starts by nation

By region, Wales was noted for a very high level of female representation on IT user apprenticeships during 2013/14 (69%) whilst looking at IT professional apprenticeships Northern Ireland stands out for having a particularly low proportion of female starters during the year.

Considering all apprenticeship programmes together, Wales again, together with England appeared to have a notably higher proportion of female starters than either Scotland or Northern Ireland.

27 Ibid

Table 13: IT apprenticeship starts across the UK by gender and subject, 2013/14

	IT User		IT&T professional		All IT related		All subjects	
	Female (%)	Total	Female (%)	Total	Female (%)	Total	Female (%)	Total
England	41%	3,240	11%	9,820	18%	13,060	53%	440,400
Northern Ireland	45%	40	6%	30	28%	70	42%	5,410
Scotland	-	-	14%	520	14%	520	41%	25,280
Wales	69%	510	15%	130	58%	640	57%	640
UK	**45%**	**3,790**	**11%**	**10,500**	**20%**	**14,290**	**52%**	**471,730**

Source: Analysis of data from DELNI, Skills Development Scotland, The Welsh Government and the SFA undertaken by The Tech Partnership

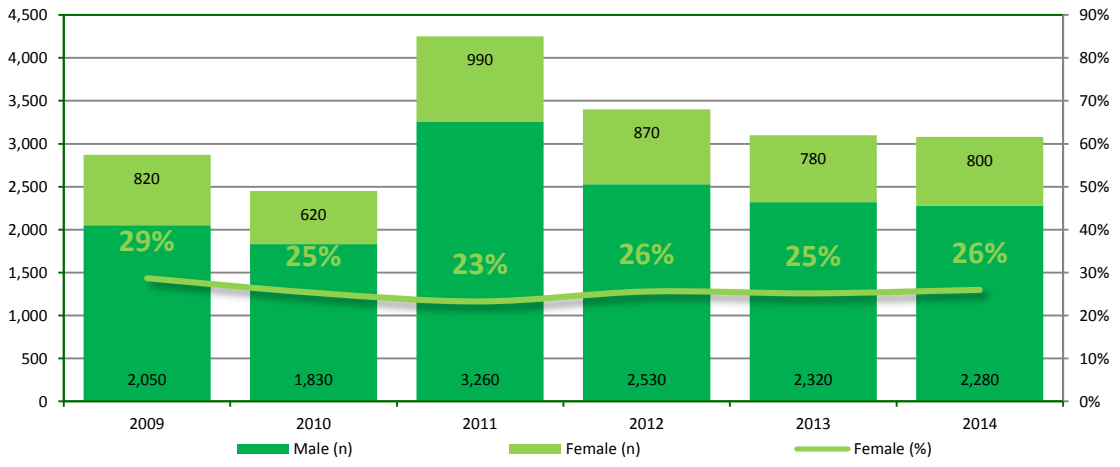
5.3 BCS qualifications

BCS offer a range of IT qualifications and certifications for those seeking to pursue/further develop a career in IT, notably, at HE level: the BCS Certificate in IT (a level 4 qualification equivalent to year one of a university honours degree), BCS Diploma in IT (a level 5 qualification equivalent to year two of a university honours degree) and BCS Professional Graduate Diploma in IT (PGD) which is a level 6 qualification equivalent to a university honours degree). In addition, BCS offers professional certifications for those in specific areas of the industry.

5.3.1 BCS Higher Education Qualifications (HEQs)

Over the past five years, the proportion of HEQ awards made to women has fluctuated around the 25% mark though at 26% the level recorded in 2014 was three percentage points down on the level recorded in 2009 and one percentage point down on the overall level for all HEQ awards made by BCS (27%).

Figure 24: HEQ awards by gender, 2009-14

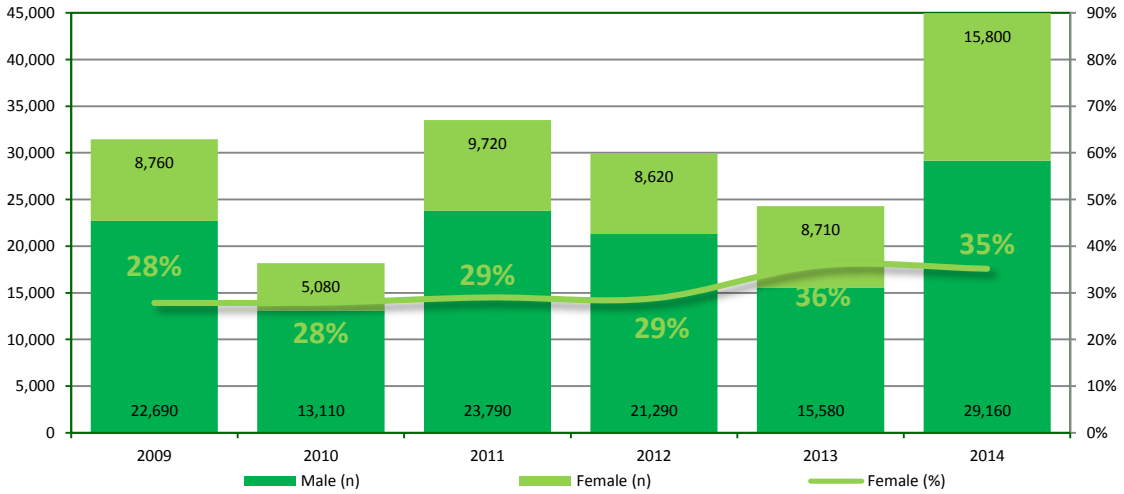


Source: Analysis of BCS data undertaken by The Tech Partnership

5.3.2 BCS Higher Education Qualifications (HEQs)

At just over one third of certifications (35%), the proportion of BCS certifications accounted for by women was much higher than that associated with HEQ awards in 2014 though considering all certifications made by BCS, the proportion made to females was quite similar at 28%.

Figure 25: ISEB awards by gender, 2009-14



Source: Analysis of BCS data undertaken by The Tech Partnership

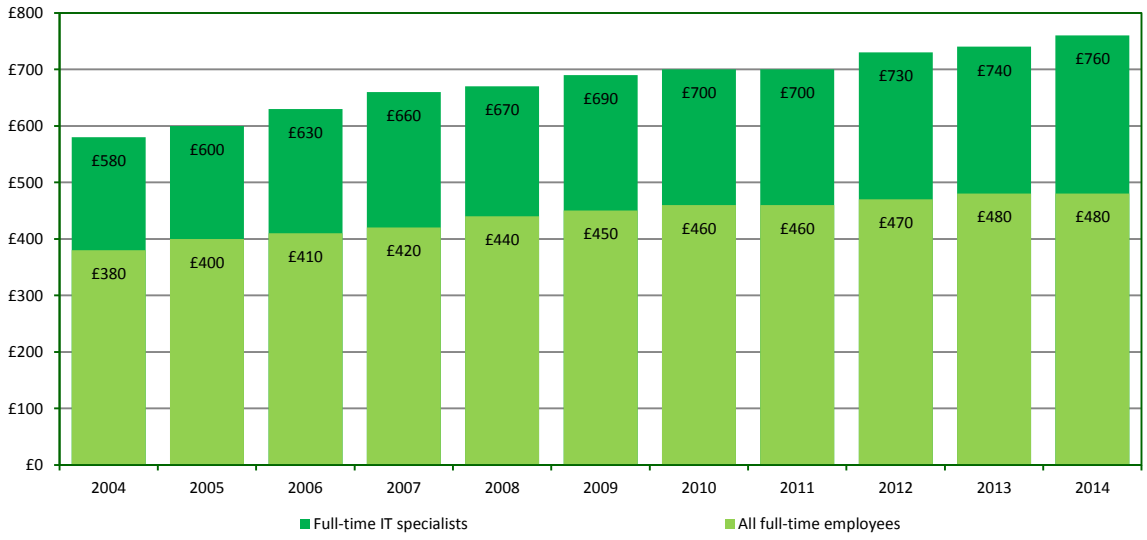
6 Earnings

6.1 Earnings

6.1.1 Remuneration trends for IT specialists and other employees

The gross weekly (median) earnings of IT specialist employees working in the UK on full-time permanent contracts was seen to rise by 2.3% between 2013 and 2014 to £760 per week. Over the same period a much more muted increase was observed in the overall median rate for full-time permanent employees (0.3%) and as such the pay premium enjoyed by IT specialists increased slightly from 55% to 58% over the period.

Figure 3: Gross weekly pay (median) for permanent full-time employees, 2004-14

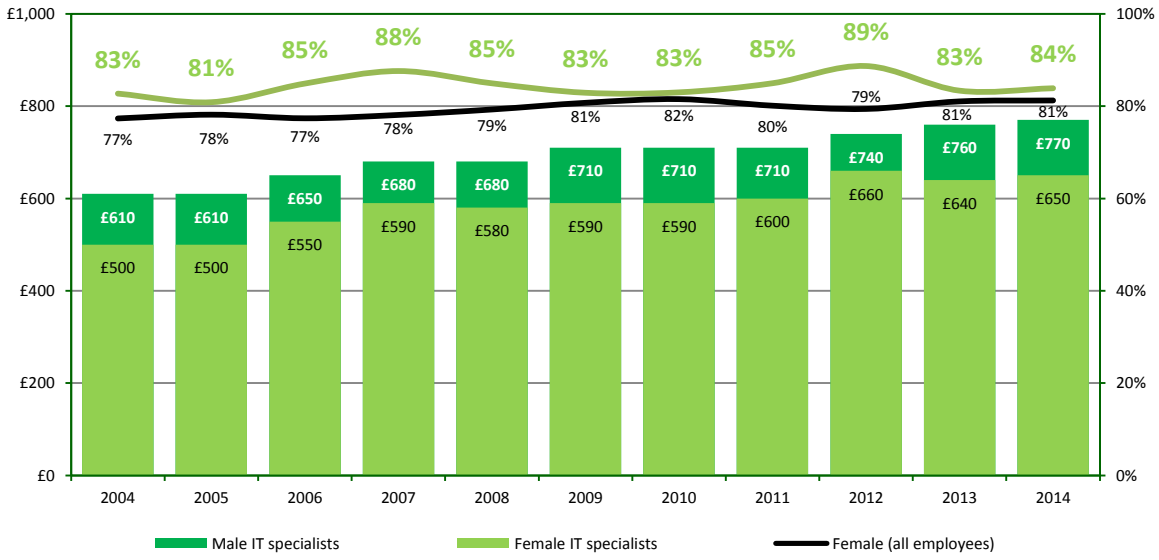


Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

6.1.2 Remuneration by gender

Annual increases were recorded in the earnings of both male and female IT specialists between 2013 and 2014 (working as full-time employees on permanent contracts) pushing the gross weekly rates up to £650 and £770 per week respectively. Accordingly the earnings received by (full-time permanent) female IT specialist employees in the UK are now estimated to be around 84% of the level associated with their male counterparts – up slightly on the previous year (83%) but in line with the general trend over the past decade.

Figure 4: Gross weekly pay (median) by gender for permanent, full-time employees, 2004-14



Source: Analysis of ONS Labour Force Survey data undertaken by The Tech Partnership

6.1.3 Remuneration by occupation

The gross weekly earnings for female IT specialists (working as full-time employees on permanent contracts) were lower than that recorded for males in equivalent positions during 2014 irrespective of the type of IT role held – the differential ranging from just 2% in the case of IT Directors – to 22% amongst IT specialist Managers

Table 14: Gross weekly pay (median) for permanent, full-time IT specialist employees, 2014

	Female full-time	Male full-time	Difference	
			(£)	(%)
IT Directors	£1,200	£1,230	£30	2%
IT professionals:	**£700**	**£790**	**£90**	**13%**
IT specialist managers	£720	£880	£160	22%
IT Project & Programme Managers	£780	£930	£150	20%
IT Business Analysts, Architects & Systems Designers	£700	£810	£110	17%
Programmers & software development professionals	£690	£770	£80	10%
Web design & development professionals	£510	£550	£40	7%
Other IT professionals	£670	£740	£70	11%
IT Technicians:	**£510**	**£540**	**£30**	**6%**
IT Operations Technicians	£510	£540	£30	7%
IT User Support Technicians	£500	£540	£40	7%
IT engineers	-	**£480**	-	-

Source: Analysis of ONS ASHE data undertaken by The Tech Partnership

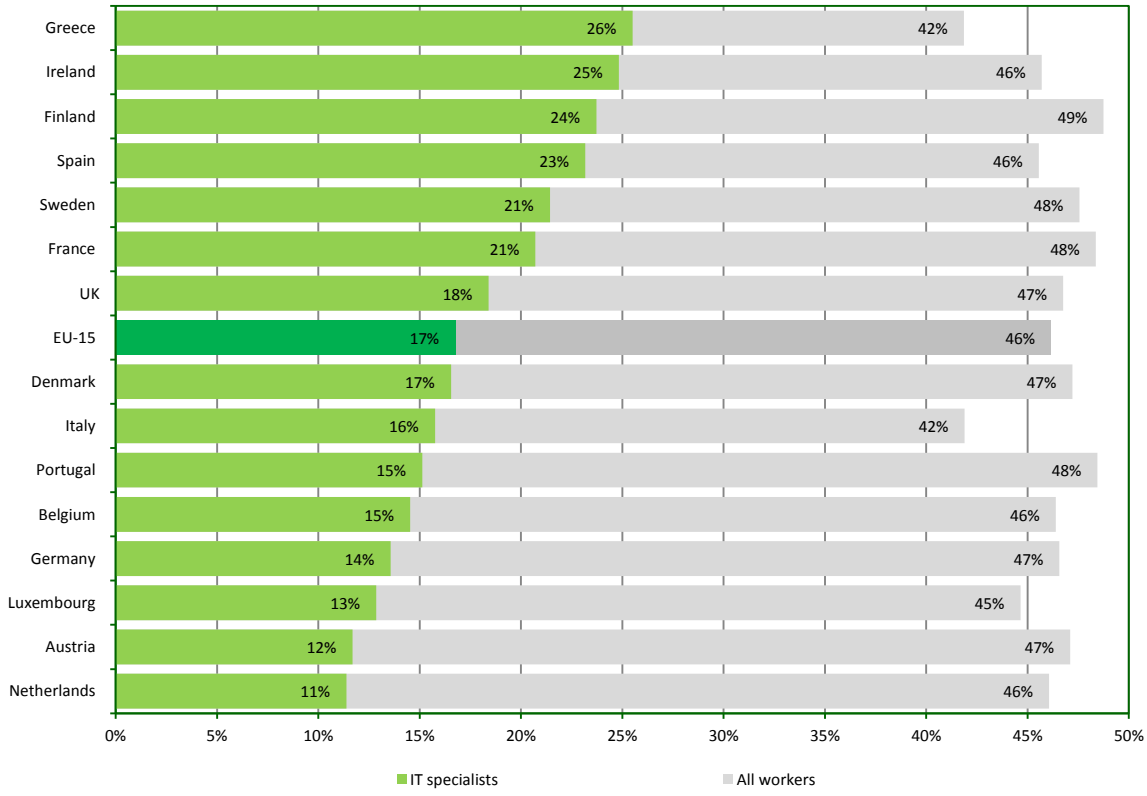
7 International comparisons

The issue of low levels of representation for females in IT professions is not one restricted to the UK alone. This section utilises data from Eurostat to understand the scale of the problem facing other EU nations together with bespoke figures from the National Statistical Agencies (NSAs) of other selected countries to give a global perspective.[28]

7.1 The European Union

Low representation of females in IT occupations remains a common problem for all EU nations and in 2014 women accounted for just 16% of IT specialists working in the EU15 despite accounting for 46% of the workforce as a whole. At 18%, representation in the UK was above the average for this group of countries though well below the levels recorded in Greece and Ireland where women accounted for at least one quarter of IT specialists at that time (25% and 26% respectively).

Figure 5: Female representation in amongst the EU15, 2014[29]



Source: Analysis of Eurostat data undertaken by The Tech Partnership

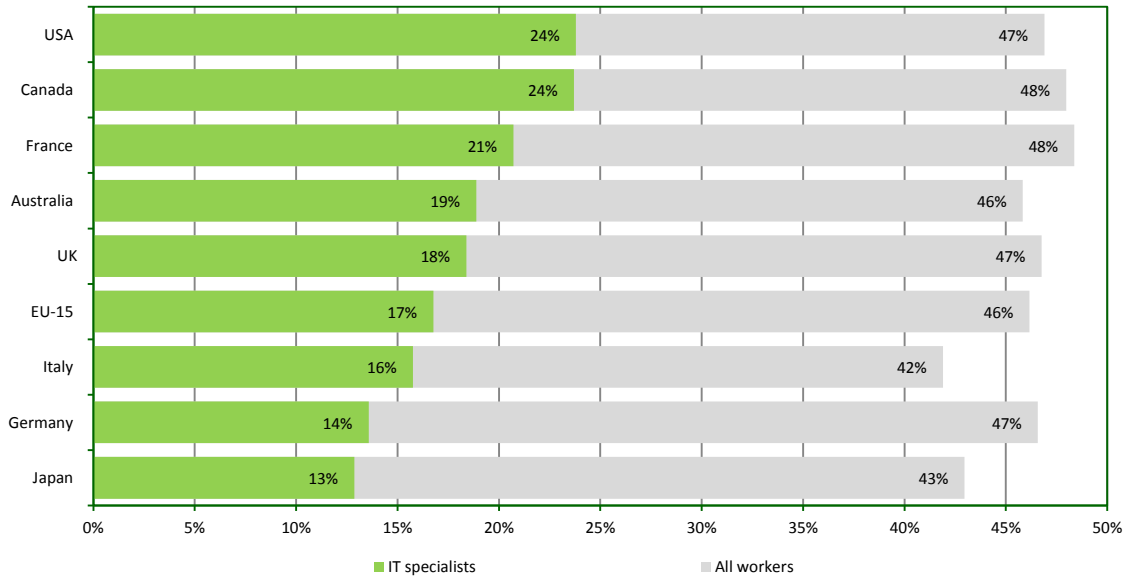
28 It should be noted that in each case differing methodologies for data collection and occupational classification are likely to exist and as such the comparisons presented should be viewed as indicative only

29 For France, 2013 data has been employed due to inconsistences in the data series/classification systems used

7.2 Global comparisons

Though the level of female representation within IT specialist positions appears high in the UK when compared to many other EU members, a comparison with other leading nations shows the UK situation appears to be relatively poor by comparison with the USA and Canada for example where, in 2014 almost one quarter of IT specialists were women.

Figure 24: Female workforce representation within leading nations 2014[30]



Source: Analysis of Eurostat/relevant NSA data undertaken by The Tech Partnership

30 Ibid

Data notes

ONS Labour Force Survey (LFS)

The LFS is a 'survey of the employment circumstances of the UK population' carried out by the UK's Office for National Statistics (ONS). It is 'the largest household survey in the UK and provides the official measures of employment and unemployment' together with a wide variety of employment, health, and socio-economic data on those based within/residing in the UK. The yearly LFS estimates presented in this report are, in the main, derived figures based upon four quarter averages for the period though in some cases 3 year/12 quarter averages have been employed in order to improve the reliability of estimates based upon small numbers of survey responses.

IT specialists and the Standard Occupational Classification (SOC) system

The Standard Occupational Classification (SOC) system has been developed by ONS to provide a common methodology for the classification of occupations in the UK based upon associated skill levels and skill content.

SOC has a hierarchical structure and in the latest version - SOC2010 - it contains 9 high level/single-digit codes (major groups), 25 more detailed/two-digit codes (sub-major groups), 90 three-digit codes (minor groups) and finally 369 four-digit (unit) codes – ten of which relate specifically to IT/related (IT specialist) occupations i.e.

1136	Information technology and telecommunications directors*
2133	IT specialist managers
2134	IT project and programme managers
2135	IT business analysts, architects and systems designers
2136	Programmers and software development professionals
2137	Web design and development professionals
2139	Information technology & telecommunications professionals not elsewhere classified (n.e.c)*
3131	IT operations technicians
3132	IT user support technicians
5245	IT engineers

* Given that estimates for IT and Telecoms cannot be further disaggregated, the relatively small proportion of workers in Telecoms roles and the commonality of skills often apparent for those working in IT and Telecoms positions of this nature, these codes are have are fully incorporated within the definition of 'IT specialist' as employed within this report.

SOC2010 was introduced in 2011 as a replacement/update to the previous version of the SOC classification system (SOC2000) and as such to enable historical comparisons/trend analysis to be undertaken, all data presented within this report for the preceding years have been converted from SOC2000 to SOC2010 using a software programme provided by ONS.

Joint Academic Coding System (JACS) Version 3.0

'The Joint Academic Coding System (JACS) is owned and maintained by the Universities and Colleges Admissions Service (UCAS) and the Higher Education Statistics Agency (HESA) and is used for subject coding of provision across higher education in the UK'. 'JACS is used to code the subjects of both higher education courses and the individual modules within them across the full range of higher education provision.' Since the introduction of JACS in 2002 there have been two updates to the coding system which were implemented in 2007/8 (JACS2) and 2012/13 (JACS3) respectively. At the highest level, the current version (JACS3) identifies 20 'subject areas' and under this, 149 'principal subjects', which are subsequent split out into 1570 four digit course code. A summary of the top level structure and related IT codes is presented below:

JACS3 Subject Areas

A	Medicine and Dentistry
B	Subjects Allied to Medicine
C	Biological Sciences
D	Veterinary Sciences, Agriculture and related subjects
F	Physical Sciences
G	Mathematical Sciences
H	Engineering
I	Computer Sciences
J	Technologies
K	Architecture, Building and Planning
L	Social Studies
M	Law
N	Business and Administrative Studies
P	Mass Communication and Documentation
Q	Linguistics, Classics and related subjects
R	European Languages, Literature and related subjects
T	Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects
V	Historical and Philosophical Studies
W	Creative Arts and Design
X	Education

JACS Subject Area I Computer Science – principal subjects

I1	Computer Science
I2	Information Systems
I3	Software Engineering
I4	Artificial Intelligence
I5	Health Informatics
I6	Games
I7	Computer generated visual & audio effects
I9	Others in Computer Sciences

Rounding

Totals presented within the tables/text of this report may not add up to the sum of the sub categories shown due to rounding of the data. The following rounding conventions have been employed within this report:

LFS workforce estimates - figures rounded to nearest 1,000

LFS earnings estimates - figures rounded to nearest £10

UCAS data -figures rounded to nearest 100

HESA qualifiers/destinations data – figures rounded to nearest 10

JCQ data – figures rounded to nearest 100

Apprenticeship statistics – figures rounded to nearest 100

BCS qualifications data – figures rounded to nearest 10

Eurostat/overseas NSA data – figures rounded to nearest 1,000

The Tech Partnership is a growing network of employers, collaborating to create the skills for the digital economy. It acts for the good of the sector by inspiring young people about technology, accelerating the flow of talented people of all backgrounds into technology careers, and helping companies to develop the technology skills they need for the future.

BCS is The Chartered Institute for IT. Its mission is to enable the information society and to promote wider social and economic progress through the advancement of information technology science and practice. We bring together industry, academics, practitioners and government to share knowledge, promote new thinking, influence the development of computing education, shape public policy and inform the public.

For further information please contact:

The Tech Partnership
1 Castle Lane
London
SW1E 6DR

+44 207 963 8920
info@thetechpartnership.com
www.thetechpartnership.com

BCS First Floor, Block D
North Star House
North Star Avenue
Swindon
SN2 1FA

+44 1793 417417
editor@bcs.org
www.bcs.org