TECH PARTNERSHIP
skills for the digital economy

THE WOMEN IN IT

# SCORECARD

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

bcs
The Chartered Institute for IT

# 2016

The Tech Partnership is the network of employers collaborating to create the skills for the digital economy. Our ambition is to deliver the skills for a million digital jobs in the UK by 2025, by inspiring new and diverse talent into digital careers; raising the quality of digital skills training and education; and enabling employers to offer high quality digital apprenticeships.

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

In an era where we have a woman in Number 10, a woman in the German Chancellery, and came within a hair's breadth of a woman in the White House, it may seem anachronistic still to be concerned about women's progress in the workplace.

Yet the figures in this report continue to paint a startling picture: in a sector where there is a real skills gap, and where there are high value, creative and purposeful jobs to be done, only 17% of specialists are women.

This is a problem, whichever way you come at it. How can we even think of filling that skills gap, and maximising our growth potential, if we are not harnessing the talents of half the population? From a business point of view, we know that organisations that reflect their communities are more fulfilling places to work, and do better as a consequence. From a social justice point of view, we want women to be exercising their talents in well-paid and productive jobs.

So what are we to do? Some of the coverage of the gender gap in tech can seem finger-wagging – girls 'should' aspire to a career in tech, and it is somehow girls' fault if they do not do so. Increasingly, though, the focus is on the organisations that recruit: why are they failing to find a way to show girls how rewarding and interesting these careers are? How can they change and improve, to achieve better outcomes for themselves and for women?

The Tech Partnership's employer led campaign, My Tech Future, is doing its bit to show girls the bright prospects before them. Many other organisations are doing the same – there is consensus on how important this is. Making change on this scale is daunting, but we have to keep working at it. Ensuring that we have the baseline information we need, through this report, is a core part of the task.

**Karen Price OBE**
**CEO, the Tech Partnership**

Last year in my foreword to this document, I mentioned the need for optimism in relation to the numbers of women in digital roles. I know that our focus on the numbers of women taking up IT-related education, and the statistics regarding women working in technical roles, gives a great starting point by which to challenge parents, educators and employers.

I had hoped that the percentage of women working in digital and IT related roles would have grown this year but, sadly, whilst there are more women in professional roles, we have yet to see a significant impact through the work done by the numerous organisations who are trying to make a difference.

In BCSWomen we are aware of dozens of active UK-based voluntary organisations who are undertaking programmes to engage more girls and women in our profession, and there are many more activities being run by the larger companies, yet still we see limited change. It is clear that there are systemic and cultural issues to be addressed if we are to attract and retain greater numbers of women in technology roles

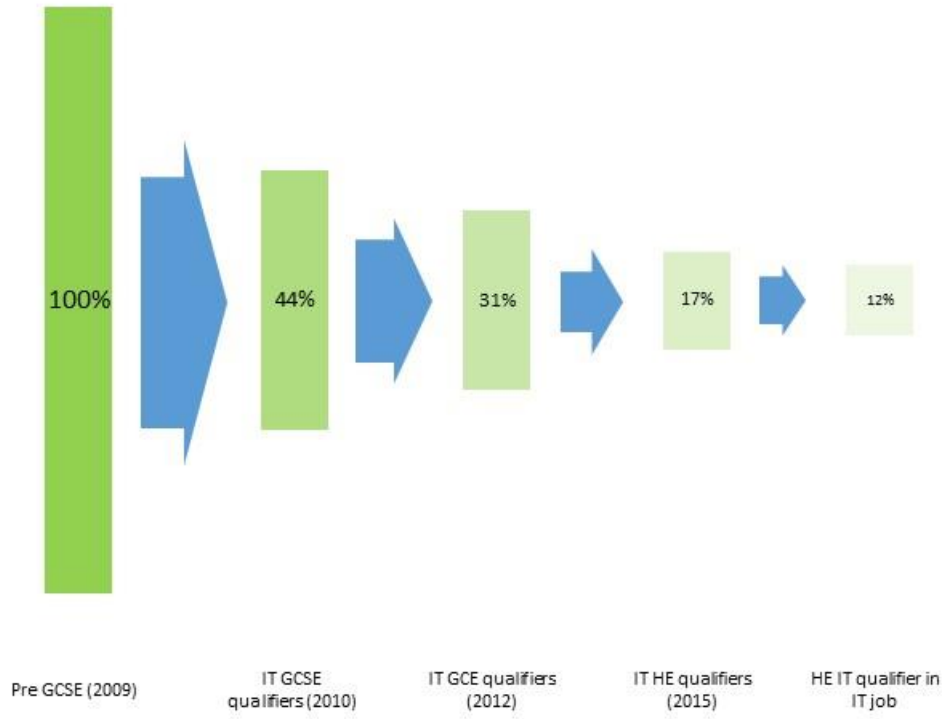
The bright spot in the detail this year is that the number of women IT Directors working in the UK has risen by 1% this year. Let us hope that these women will be the ones to help others up the steps and drive a brighter future for technical women in the UK.

**Gillian Arnold**
**Chair, BCSWomen**

# Key messages

## Overview

- Despite the existence of numerous initiatives designed to elevate the status of IT as an academic or career choice amongst girls/women in the UK, the data from government sources for 2015 indicate that little has changed since the previous year and IT still appears a relatively unattractive study or career choice for much of the UK population.
- At the same time the latest economic statistics show the IT sector is continuing to outperform other elements of the economy both with respect to wealth generation and the creation of employment opportunities, which in turn are associated with favourable levels of remuneration and benefits packages making IT a desirable career option.
- Yet, as shown below, the proportion of females studying/progressing along the path to IT employment drops at each of the key stages in their educational development:




- This report gives a detailed analysis of the levels of female representation at each of the above life stages, providing a 'definitive up-to-date evidence base of data and commentary on women in IT employment and education' to be used by individuals/organisations seeking to develop further initiatives to address the continued gender imbalance within IT in the UK.

## Primary education

- The national curricula for England, Wales, Scotland and Northern Ireland all contain a requirement for children to learn basic aspects of IT usage and, in England/Scotland, computing studies at 'primary age'.
- There appears to be no authoritative set of data upon which a detailed analysis of pupils' opinions and experiences of IT/computing at this stage of their educational development can be undertaken.
- Published information tends to be generic investigations around STEM subjects as a whole, is frequently based on small (qualitative) samples, is often not split by gender, and mostly relates to children/students from very broad age band.
- A recent study commissioned by the Tech Partnership shows that whilst girls and boys tend to have a similar level of interest in computing/IT at early stages of their academic development, for girls at least interest in IT tuition tapers off with age at the pre-GSCE stage of their educational development.

## Secondary education

- JCQ data for 2015 shows the number of IT related GCSEs taken in the UK rising for the fourth consecutive year to 147,300 exams or 2.8% of all GCSEs taken.
- The proportion of IT related GCSEs (Computing and ICT) taken by female students fell for the fourth year running to just 36% - 15 percentage points below that for GCSEs as a whole (51%).
- Of the 49 subject areas for which data are available ICT appeared 39$^{th}$ with respect to the proportion of girls taking the subject at GCSE (42%) and computing (16%) ranked 45$^{th}$.
- Girls taking IT related GCSEs continued to outperform boys - the proportion gaining either A*/A or A*-C typically around 6-7 percentage points higher than that for male students.
- At GCE ('A' level) girls accounted for only 26% of those sitting exams in IT related subjects (Computing and ICT) - down 1 percentage point on the previous year and again down for the fourth year in a row.
- Of the 36 subject areas for which data are available, ICT appeared 31$^{st}$ with respect to the proportion of girls taking the subject at GCE (36%) and computing (8%) ranked last.
- As with GCSEs exams, female students taking IT related GCEs gained better grades on average than males though in both cases attainment levels were well below the norm for GCEs as a whole.

## Apprenticeships

- Females accounted for 19% of IT apprenticeships ('Practitioner' and 'User') started in 2015 but just 10% of apprenticeships that were IT practitioner/specialist focussed.
- The proportion of IT User apprenticeship starts accounted for by females was much higher in Wales than other nations whilst Northern Ireland was associated with the most even gender balance for IT specialist apprenticeships.

## Higher Education

- Just 15% of applicants to computer science courses in 2015 were female - a lower proportion than for any other subject group and well below the figure for applicants as a whole (57%).
- By sub-discipline the proportion of female applicants ranged from 18% for courses in Information systems to just 10% in the case of Software Engineering.
- Amongst those accepting places on computer science courses only 13% were female and again, female representation was lower than for any other subject group and well below the norm for all subjects (56%).
- The proportion of students leaving HE with an IT related award (from a UK institution) who were female remained unchanged in 2015 at 17% of IT qualifiers. By comparison, women accounted for 59% of HE qualifiers as a whole.
- Of the 19 broad subject groups for which data are available, Computer Science courses were 18th with respect to the proportion of qualifiers that were female - just above Engineering & technology courses (14%).
- Less than one half of female IT qualifiers that went into employment post study were working in an IT position and amongst all leavers just 20% of those in IT positions were female.
- Amongst female IT qualifiers working in IT positions 63% stated they had taken such a role as it fitted their career plan/was exactly type of work wanted.

## Women in the workforce

- As in the previous year just 17% of IT specialists working in the UK in 2015 were women, well below the proportion recorded for the workforce as a whole (47%).
- From a list of 25 broad occupational groups, IT came out 21st with respect to the proportion of women in post and the gender balance was also found to be much higher within many other skilled professions i.e. secondary teachers (57%), doctors (47%), solicitors (44%), accountants (41%), barristers/judges (31%), police offices (29%), architects (24%) and chefs (21%).

- Amongst IT specialists, the lowest levels of female representation continue to be for IT Directors (11%), Programmers & Software Developers (12%) and 'other' IT specialists (13%).
- By locality during 2015 the IT gender balance ranged from 14% in Yorkshire & the Humber to 19% in Northern Ireland though an analysis of Census data from 2011 shows that in some small areas of the UK women are much better represented within the IT workforce - particularly in the Scottish Highlands (30%) and Copeland (27%) districts.

## Workforce skills and CPD

- Just under seven in ten (68%) female IT specialists were qualified to HE level in 2015, well above the level observed for female workers in the UK as a whole (45%).
- The incidence of job-related education/training amongst female IT specialists fell dramatically between 2014 and 2015 and on average just 22% stated that they had received such training (during the 13 weeks prior to interview).
- The incidence of education/training delivery was particularly low amongst female IT specialists working on a self-employed basis (13%), within SMEs (18%) or with an IT employer (15%).
- Just under one fifth of female IT specialists (19%) stated that they had been offered education/ training but that they had not taken up that offer.

## International comparisons

- The gender balance in IT remains a global issue and of all the leading nations for which data is available the highest recorded level of female representation amongst IT specialists in 2015 was just 26% in the case of Israel.
- The level of female representation for IT specialists in the UK remains higher than the EU (15) average and is notably higher than in either France (14%) or Germany (13%).
- Ireland continues to exhibit the highest level of female representation (25%) within the EU(15).

# 1 Introduction

Growth within the digital sector continues to outpace that exhibited by the rest of the economy - over the past five years, the number of digital enterprises operating in the UK increased by 30% - almost double the rate for business enterprises as a whole (17%)[1], employment growth within digital firms was almost triple that for all industry sectors (20% versus 7%)[2] and, as shown later in this report, the number of people working in IT related positions in the UK again increased at a rate three times that for UK workers as a whole (21% versus 7%)[3].

Outside of the digital sector itself, the adoption of digital technologies continues apace and there are now very few businesses or individuals that do not regularly implement or at least employ digital technologies in the course of their normal day-to-day activities. Latest data from the ONS e-commerce survey (2014) for example shows 96% of all businesses in the UK having access to the internet (99% for those with 50 or more staff) and 88% of the population over 15 to have been internet users (97% of those in work)[4].

Despite the inexorable creep towards 100% adoption, the relative propensity of girls/women to move from being users of digital technologies in their work/home life to shapers of a digital society by way of related study and employment has remained stubbornly low. This is despite the comparatively high level of achievement displayed by female students taking related courses at school/university and the favourable working conditions, benefits and career opportunities enjoyed by all individuals pursuing IT specialist careers (i.e. abundant employment opportunities, availability of part-time/flexible working, above average remuneration as illustrated in later sections of this report).

As a result, the academic community continues to lose out on a valuable source of intellectual capital and UK businesses, already dogged by IT related skills shortages (39% of IT recruiters in 2015)[5], are failing to engage with a significant potential source of labour and skills. This is particularly worrying at a time when post-Brexit reductions in worker mobility seem likely, and forecast demand increase for IT specialists remains well above that for workers as a whole[6].

With this as a backdrop, the latest Women in IT Scorecard has been produced, bringing together the latest annual data from public sources to generate a 'definitive up-to-date evidence base of data and commentary on women in IT employment and education'. As in previous years, it is hoped that this document will aid those seeking to promote IT as an education or career choice amongst female students or job seekers, and support the development of new initiatives/approaches to improve the gender balance within the field of IT.

1 Analysis of IDBR data accessed via the NOMIS system.

2 Datasheet: Tech specialists in the UK - The Tech Partnership, 2015.

3 Ibid.

4 Analysis of ONS Annual Population Survey (APS) data undertaken by the Tech Partnership.

5 ONS e-commerce survey (2015).

6 Datasheet: Tech specialists in the UK - The Tech Partnership, 2015.

# 2 IT and the formative years

## 1.1 Overview

Throughout their early years at school, all children aged 5 and upwards across the UK will follow a curriculum which encompasses ICT (IT user), and in the case of England/Scotland, computing skills development. In the main however, the related development requirements are cross-curricular (i.e. as opposed to being listed as a core/mainstream subject) and are not 'tested' (i.e. via formal exams) at this stage of children's academic development. As such there are few sources of information available to show either the overall level of interest/progress in IT related subjects, much less comparison statistics for male/female pupils. In the absence of such data, this section has been incorporated within this year's report to provide a brief summary/introduction at least to the respective curriculum requirements for different age groups/key stages in England, Wales, Northern Ireland and Scotland as they stand, together with some further observations relating to this data gap with respect to our knowledge of gender subject preferences at this age and potential remedial activities required.

## 1.2 The 'Early Years' (up to 5)

In their 'early years' of life (up to 5 years) boys and girls in England placed with an Ofsted-registered early years provider[7] will follow the Early Years Foundation Stage (EYFS) curriculum set out by the Department for Education (DFE). The curriculum does not identify IT as a 'prime learning area' though it does state that children should '*recognise that a range of technology is used in places such as homes and schools' and that they should be able to 'select and use technology for particular purposes*.'

In Wales the requirements for IT teaching at this stage are set out under the '*Information and Communication Technology in the Foundation Phase*' (3-7) documentation which states that '*In the Foundation Phase, ICT should be holistic and integral to all Areas of Learning. Childrens' ICT skills, knowledge and understanding should be developed through a range of experiences that involve them finding and developing information and ideas, and creating and presenting information and ideas*.'

In Northern Ireland 'Using ICT' is identified as one of three cross curricular skills (along with maths and communication) to be delivered under the primary curriculum and is recognised as having '*the potential to transform and enrich pupils' learning experiences and environments'* and the potential to '*empower pupils, develop self-esteem and promote positive attitudes to learning*.' More specifically, the associated guidance notes identify five broad concept areas for ICT to be developed amongst pupils at primary school age: Explore, Express, Exchange, Evaluate and Exhibit which in each case are allied to a range of relevant activities such as: data access/ management/ analysis, digital media content creation/ publication and security. ICT requirements are also listed as sub-elements of certain 'core' curriculum areas.

7 Schools, childminders, preschools, nurseries and school reception classes.

In Scotland 'technologies' is identified as one of eight curriculum areas under the '*Curriculum for Excellence'* and under the technologies framework there are 6 'organisers' which include 'ICT to enhance learning' and 'computing science'. Pupils aged up to primary 1 (i.e. age 6) in Scotland will receive schooling in both areas, covering topics such as exploring software, using IT to solve problems, IT and communications and basic media capture ('using ICT') along with 'developing problem-solving strategies, navigation and co-ordination skills, as they 'play and learn with electronic games, remote control or programmable toys' (computing science).

## 1.2 Key Stage 1 (age 5-7 or school years 1 & 2)

Since September 2014 primary school children in England aged 5-7 have been required to follow a range of subjects under the national curriculum which include science, mathematics and computing. More specifically, with respect to computing pupils are taught about:

- algorithms
- program creation/debugging
- logical reasoning
- utilising IT to organise, store, manipulate and retrieve digital content
- common uses of IT outside of school
- data/on-line security/privacy

In addition, students will be expected to further develop their more general ICT user skills through the application of ICT in other curriculum areas and in particular to utilise a wide range of equipment and software to find, create, develop and present information and ideas. As such ICT teaching is seen as being 'holistic and integral across the curriculum'.

In Wales, the curriculum for pupils at Key Stage 1 is again a covered by Information and Communication Technology in the Foundation Phase documentation (i.e. and in the same manner as cited previously given that the document encompasses all those aged 3-7) whilst in Northern Ireland children at Key Stage 1 are expected to build on and develop the experiences provided at the Foundation Stage with continued emphasis on personal, social and emotional development as well as an explicit emphasis on the development of skills in *Communication, Using Mathematics, Thinking Skills, Personal Capabilities and Using ICT.*

In Scotland pupils up to age 8 will continue to develop their ICT skills using software to find, organise, manage and access information, and subsequently use this information (from electronic sources) in other areas of study. They will also expand their use of digital media and begin to work on '*Computing science contexts for developing technological skills and knowledge'*.

## 1.3 Key Stage 2 (age 7-11 or Years 3, 4, 5 and 6)

At Key Stage 2 the English curriculum builds upon the knowledge/skills developed in previous years and sets out a number of more demanding requirements for pupils in this age band i.e.

- *'design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts*
- *use sequence, selection, and repetition in programs; work with variables and various forms of input and output*
- *use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs*
- *understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration*
- *use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content*
- *select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information*
- *use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact'*

In Wales at this stage the guidance for Information and Communication Technology at Key Stage 2 states that learners should be given opportunities to build on their experiences during the Foundation Phase (age 3-7). Moreover, they will be taught to consider the sort of information they require to support their other tasks and activities and how they '*might use an increasing range of ICT tools and resources to find, process and communicate relevant information from a variety of given safe and suitable sources; to develop and communicate their ideas in appropriate ways with a developing sense of purpose and audience'*.

In Northern Ireland children will continue to build upon the experiences/learning obtained at foundation stage/Key Stage 1 and to concentrate upon those learning areas identified in the previous sections.

In Scotland at this age (to 11/12) pupils will continue to develop/expand their generic ICT skills and under computing science they will use '*appropriate software … to work collaboratively to design an interesting and entertaining game which incorporates a form of control technology or interactive multimedia.'*

## 1.4 Key Stage 3 (age 11-14 or school years 7, 8 and 9)

The complexity of computational activities encompassed by the national curriculum in England continues to grow with the move from Key Stage 2 to Key Stage 3 and in this period of their education all pupils aged 11-14 in England will learn to:

- *'design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems*
- *understand several key algorithms that reflect computational thinking*
- *use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures*
- *understand simple Boolean logic and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers*
- *understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems*
- *understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits*
- *undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users*
- *create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability*
- *understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns'*

Again, in other areas of the UK, students will continue to build on existing learning, become more discerning IT users and further develop their awareness of IT security/privacy concerns.

In Wales, the guidance for Information and Communication Technology at Key Stage 3 states that, learners should be given opportunities to build on the skills, knowledge and understanding acquired at Key Stage 2 and that they develop a growing awareness of the relevance and plausibility of information and begin to identify and question bias in sources. They should be taught to become increasingly independent in their use of safe and suitable information sources, both ICT and non-ICT; to use a range of ICT skills and resources to find, analyse, communicate, present and share information, while becoming more aware of the need to check the accuracy of their work; to consider the advantages and

limitations of using ICT in their activities across a range of subjects thus becoming increasingly aware of the social, ethical, moral and economic effects of ICT in the wider society.

In Northern Ireland, the emphasis on ICT skills development also becomes more pronounced at Key Stage 3 and the Northern Ireland curriculum for this age group recognises '*The Cross-Curricular Skills of Communication, Using Mathematics, and Using Information and Communications Technology (ICT) are the bedrock skills through which young people access knowledge*'. This said, there's no explicit computing requirement (at present) nor is ICT identified as a 'core' subject area within the curriculum.

By age 14 Scottish pupils will have received a level of ICT instruction enabling them to '*explore and use the features of a variety of familiar and unfamiliar software to determine the most appropriate to solve problems or issue' and 'enhance learning by applying ICT skills in different learning contexts across the curriculum*'. Computing studies by this stage will encompass such areas as security, multimedia development, knowledge and understanding of the components of a computer, and the design and implementation of a game, animation or other application.

## 1.5 Gender and IT to Key stage 3

As stated previously, there are no specific examinations for pupils in computing/ICT during this stage of their schooling, and whilst teachers may be expected to provide commentary on individual pupils by way of some form of end of year assessments, there is no specific requirement for related progress to be explored/graded in the same way as with GCSEs/GCEs (or Highers etc. in Scotland). Hence there is no freely available data to compare male/female performance/affinity for related subjects.

Given the absence of any statutory requirement for ICT related reporting within the school system it was decided to undertake a short review of additional, secondary sources in the hope that private sector/ government sponsored research could provide a better understanding of gender differences towards IT at this age and, in particular, how these evolve with time.

The result of this exercise revealed however that whilst a substantial amount of literature exists that relates to STEM subjects as a whole (especially science/maths) there is little pertaining to IT in particular. Moreover, given that (as shown within the subsequent sections of this report) the levels of female representation associated with STEM subjects (and where appropriate related careers) are significantly higher than that recorded for IT/Computing in all cases bar engineering, the applicability of such data to IT is in any case questionable.

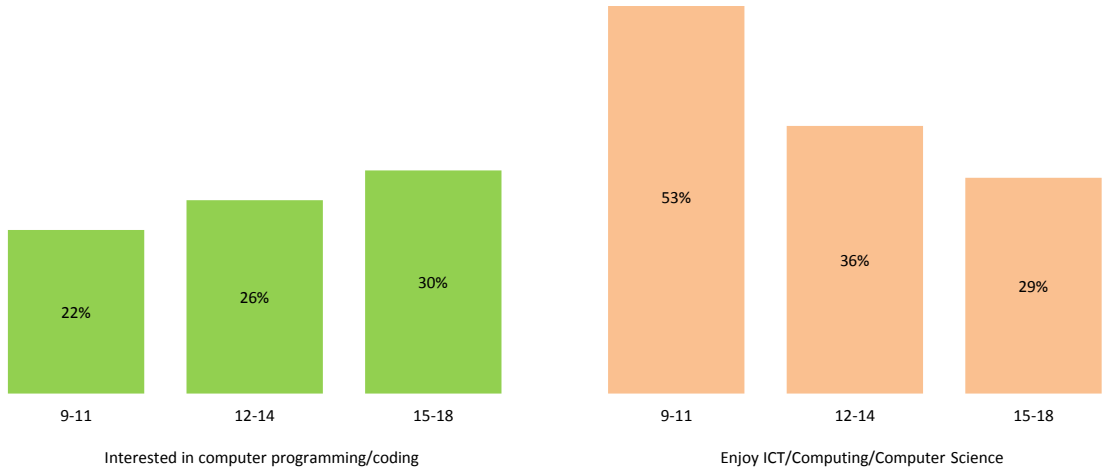
In addition, it was also observed that the majority of STEM studies are very broad in focus and have tended to incorporate responses from children of very differing age groups - typically from primary to school leaving age. Thus, observations for specific subjects/ years/ genders, if available at all, are often based upon small samples, focus groups etc.[8]

8 This is also observed within the Wellcome Trust report: Subject Choice in STEM: Factors Influencing Young People (aged 14–19) in Education (2010) which states 'Without doubt, the most significant finding was the lack of good-quality research on this topic - a situation that should be addressed'.

This said, some IT specific findings are available from a piece of market research commissioned by the Tech Partnership earlier in the year as part of a market testing exercise for related initiatives to increase interest in IT amongst girls of compulsory school age[9].

What was striking from this research is the contrast between the apparent increase in the level of interest in IT displayed by school girls as they moved through the educational system and the decline in enjoyment of IT teaching at school as illustrated in the following chart:

***Figure 1: Girls attitude towards IT and related study by age***




*Source: Encouraging female participation in tech education and careers, the Tech Partnership, September 2016*

9 My Tech Future: Girls and Technology, 2016

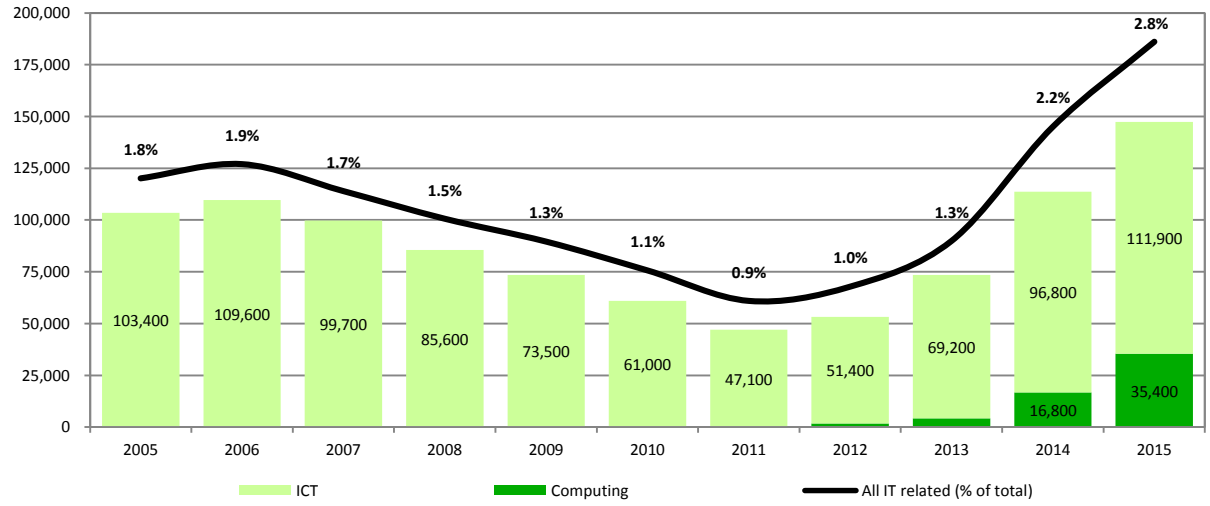
# 3 Secondary education and IT

## 3.1 Uptake of IT related courses at Key Stage 4

### 3.1.1 Overall trends in the uptake of IT & related GCSEs

In total, there were 147,300 IT related GCSEs taken by students in England, Wales and Northern Ireland during 2015[10] of which 76% (111,900) were ICT focused and 24% (35,400) were in Computing. Compared with the previous year, there was an increase of 30% in the number of IT related GCSE exams taken and, in the case of Computing courses in particular the increase was still more pronounced at 111% (compared with an increase of 16% for ICT courses).

***Figure 2: IT related GCSEs taken in England, Wales & Northern Ireland by subject area, 2005-2015***




*Source: Analysis of JCQ data undertaken by The Tech Partnership*

By comparison the overall number of GCSEs undertaken in England, Wales and Northern Ireland was seen to increase by just 1% between 2014 and 2015 hence the proportion that were IT related rose from 2.2% to 2.8% of the total.

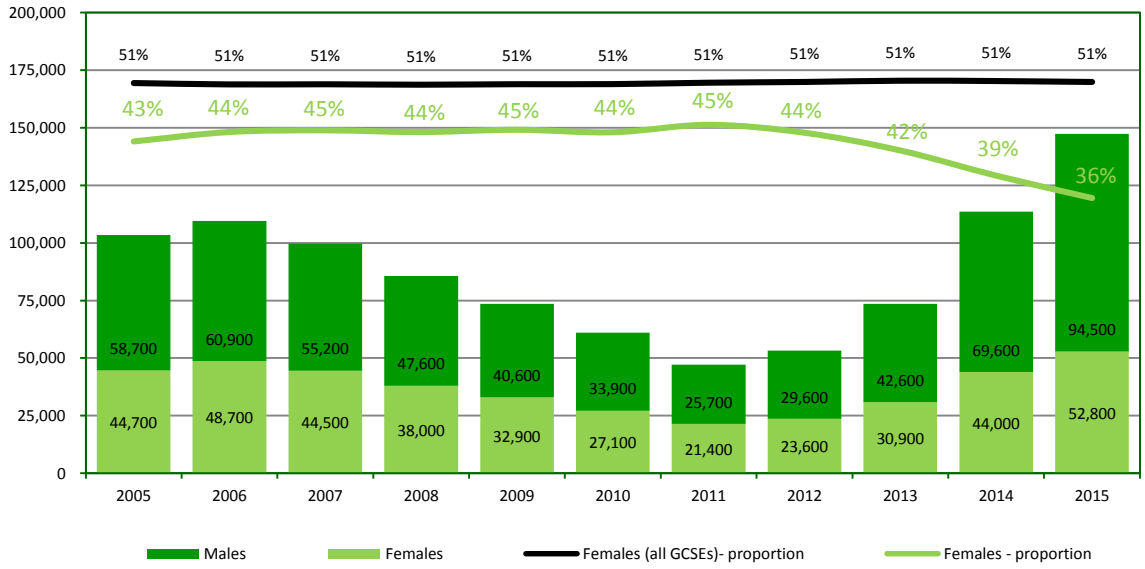
### 3.1.2 Uptake of IT & related GCSEs by gender

Though the number of IT related GCSEs taken in the UK (i.e. excluding Scotland) rose dramatically between 2014 and 2015, the increase was notably higher for male as opposed to female students (36% vs 20% respectively) and consequently, the overall level of female representation on IT related courses actually fell over the course of the year from 39% to 36%.

This was the fourth consecutive year in which female representation on IT related courses has fallen whilst throughout this period representation on GCSE courses as a whole has remained stable at 51% of the total (as has been the case throughout the last decade).

10 Data within this section relates to full-course GCSEs only and is solely for England, Wales and Northern Ireland as GCSEs are not undertaken in Scotland

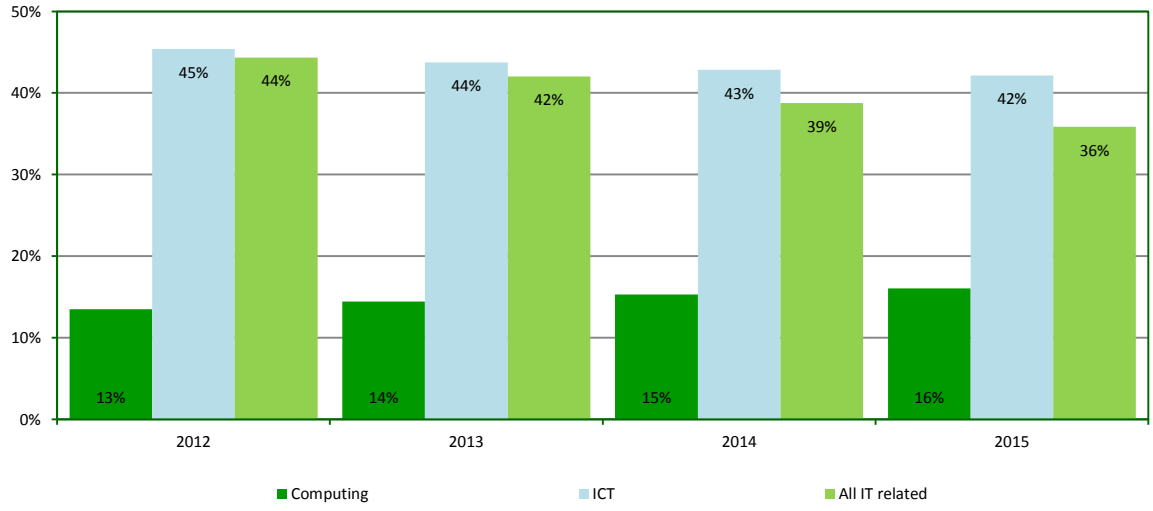
***Figure 3: IT related GCSEs taken in England, Wales & Northern Ireland by gender, 2005-2015***




*Source: Analysis of JCQ data undertaken by The Tech Partnership*

Further analysis reveals that whilst the overall level of female representation on IT related GCSEs continues to fall, for Computing GCSEs at least the situation has improved slightly during each of the past three years, with females accounting for 13% of exams taken in 2012, 14% in 2013, 15% in 2014 and 16% by 2015:

***Figure 4: Female representation on IT related GCSEs by subject area, 2012-2015[11]***



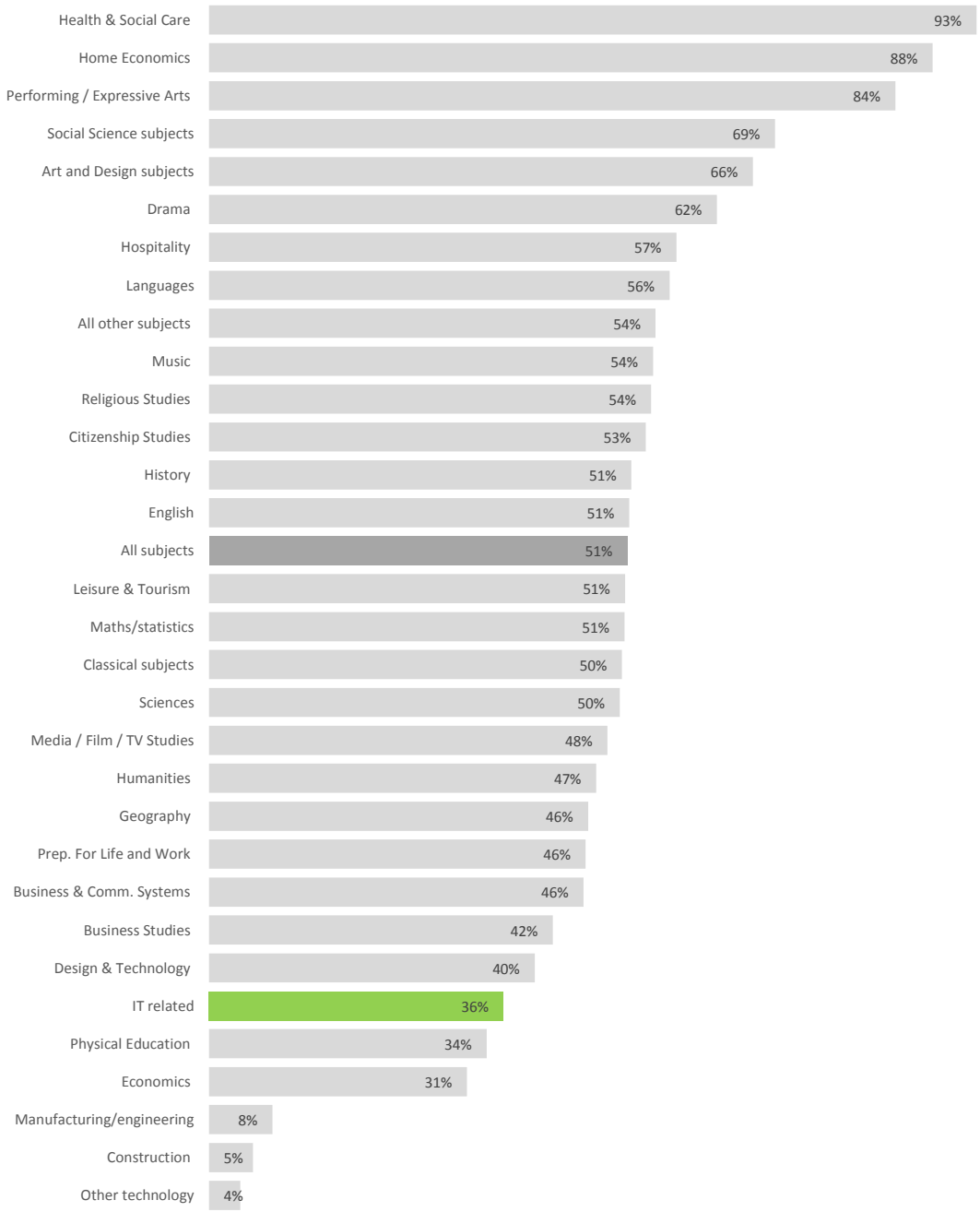

*Source: Analysis of JCQ data undertaken by The Tech Partnership*

Compared with other subjects however, Computing and ICT both rank very poorly with respect to levels of female representation and of the 49 subject areas for which GCSE attainment data is available

11 Computing GCSE attainment data available from 2012 only

ICT ranked 39th and Computing still lower at 45th with only 'other technology', construction, engineering and manufacturing associated with lower levels of female representation. Even subject areas like science and maths/stats were associated with a good male/female balance of around 50% males and 50% females whilst for GCSEs subjects focussed on the arts, humanities and social care in particular, the issue was very much the lack of male students taking such courses.

***Figure 5: Female representation by GCSE subject area (groups), 2015***

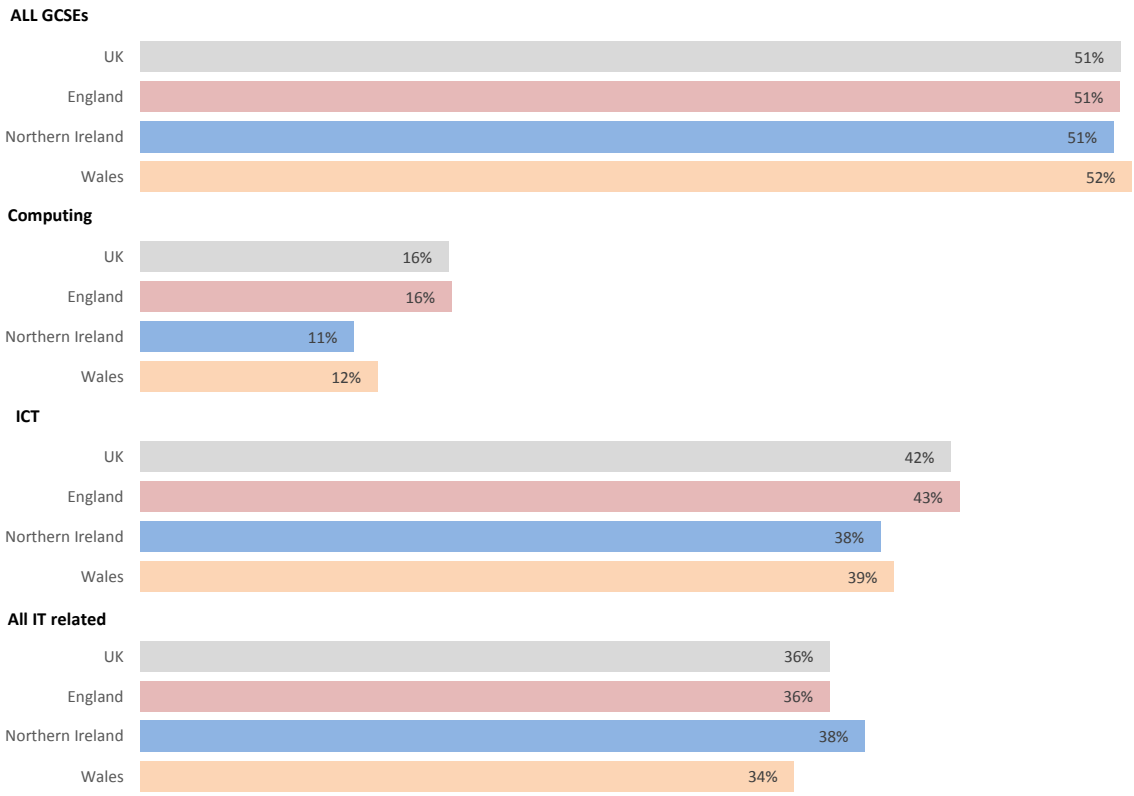



*Source: Analysis of JCQ data undertaken by the Tech Partnership*

### 3.1.3 IT related GCSEs by nation

Though the overall level of female representation on IT related courses is similar across the three nations for which data is available, there are marked differences according to the field of study - most notably the much lower proportion of Computing GCSEs taken by females in Wales and Northern Ireland (11% and 12% respectively compared with 16% in England).

***Figure 6: Female representation on IT related GCSEs, 2015***



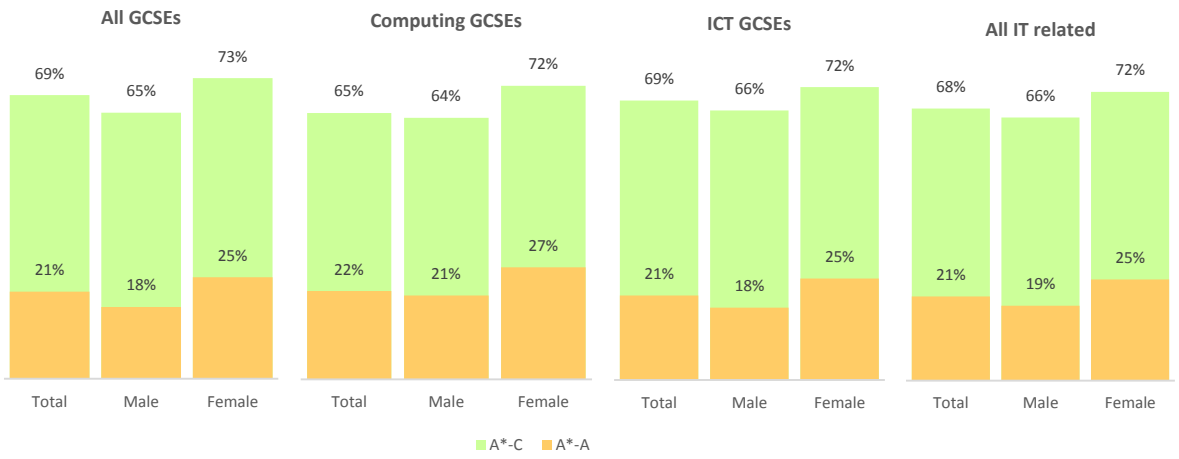

*Source: Analysis of JCQ data undertaken by The Tech Partnership*

### 3.1.4 IT related GCSE results by outcome

The levels of attainment for students taking IT related GCSEs in 2015 were, on average, much the same as those for students taking GCSEs as a whole with 21% (in each case) obtaining grades A*/A and 68% gaining a pass at A*-C grade (69% of all GCSE students).

Moreover, as with GCSEs more generally, female students taking IT related GCSEs were consistently found to have outperformed their male counterparts during 2015 irrespective of the type of GCSE course undertaken. The proportion of female students gaining either A*/A or A*-C grade was typically around 6-7 percentage points higher than that for male students.

*Figure 7: Comparative level of attainment for IT related/other GCSEs, 2015*




*Source: Analysis of JCQ data undertaken by The Tech Partnership*

### 3.1.5 IT related GCSE results by outcome and nation

There were marked differences in the level of attainments achieved by students of IT related courses across the UK - notably in the case of Northern Ireland where attainments tended to be higher than in other areas (e.g. 82% of IT related awards were graded A*-C in Northern Ireland compared with 68% of those in the UK as a whole) and in particular with respect to Computing GCSEs (92% of such awards in Northern Ireland graded A*-C compared with just 65% across the UK as a whole).

Northern Ireland was also noted for the large difference in female vs male students obtaining an A*/A grade in Computing GCSE - a full 30 percentage points in 2015 (i.e. 79% of females and 49% of males).

*Table 1: GCSE attainments at grades A*-C by subject and nation, 2015*

| | | Computing | | | ICT | | | IT related | | | All GCSEs | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Total** | Male | Female | **Total** | Male | Female | **Total** | Male | Female | **Total** | Male | Female |
| **A*-C** | UK | **65%** | 64% | 72% | **69%** | 66% | 72% | **68%** | 66% | 72% | **69%** | 65% | 73% |
| | England | **65%** | 64% | 72% | **67%** | 65% | 71% | **67%** | 64% | 71% | **69%** | 64% | 73% |
| | Northern Ireland | **92%** | 92% | 96% | **82%** | 80% | 84% | **82%** | 81% | 84% | **79%** | 75% | 82% |
| | Wales | **52%** | 53% | 44% | **79%** | 78% | 80% | **73%** | 71% | 78% | **67%** | 62% | 71% |
| **A*-A** | UK | **22%** | 21% | 27% | **21%** | 18% | 25% | **21%** | 19% | 25% | **21%** | 18% | 25% |
| | England | **22%** | 21% | 28% | **19%** | 16% | 24% | **20%** | 18% | 24% | **21%** | 17% | 25% |
| | Northern Ireland | **52%** | 49% | 79% | **34%** | 31% | 37% | **34%** | 32% | 38% | **29%** | 23% | 34% |
| | Wales | **14%** | 14% | 12% | **28%** | 24% | 34% | **25%** | 21% | 33% | **19%** | 16% | 23% |

*Source: Analysis of JCQ data undertaken by The Tech Partnership*

By contrast, Wales, though exhibiting generally lower levels of GCSE attainment (IT or otherwise) than other areas, was notable for being the only nation in which male IT students had outperformed their female counterparts - 53% achieving grades A*-C in Computing compared with just 44% of females.

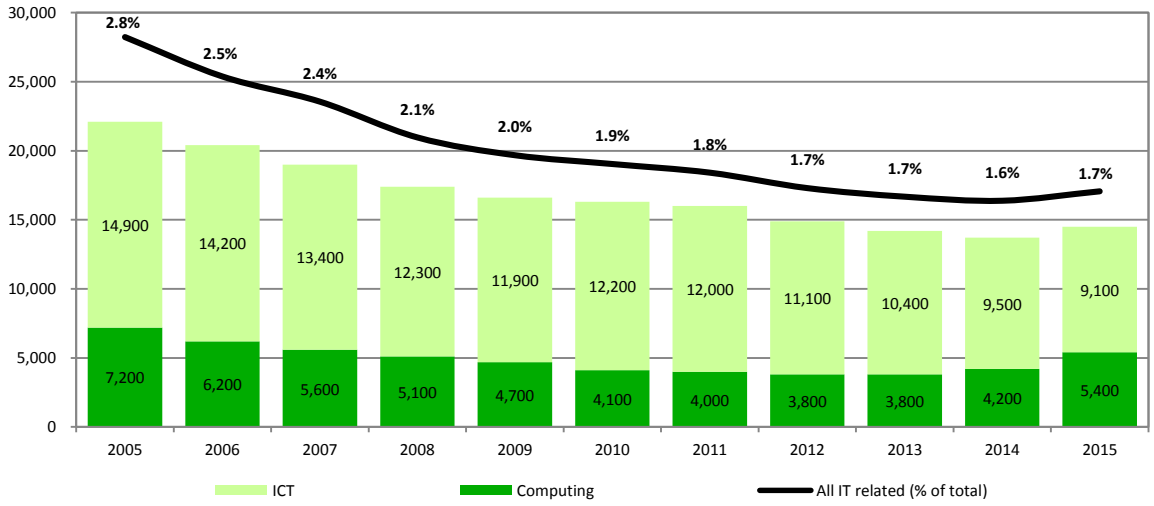
## 3.2 Uptake of IT related courses at Key Stage 5

As with GCSEs, students in the UK[12] are currently able to choose between two types of IT related GCE ('A' level) - a Computing GCE targeted at those seeking to undertake further study in the IT field and/or obtain work as an IT specialist; and an ICT GCE which is more application focussed and aimed at those wishing to use IT as a tool to aid them in further study/employment not necessarily IT focussed.

### 3.2.1 Overview of trends in uptake for IT related GCEs

A total of 14,500 IT related GCEs were taken by students across the UK (again excluding Scotland) in 2015, of which 5,400 (37%) were Computing courses and 9,100 (63%) were in ICT. The overall number of IT related GCEs taken was up by 6% on the previous year and Computing GCEs in particular were associated with an annual growth rate of 29%.

***Figure 8: IT related GSEs taken in England, Wales & Northern Ireland by subject area, 2005-2015***




*Source: Analysis of JCQ data undertaken by The Tech Partnership*

The increase in IT related GCEs taken was much greater than that recorded for GCEs as a whole and as a result, the proportion of GCEs that were IT related was seen to rise from 1.6% of the total in 2014 to 1.7% in 2015.

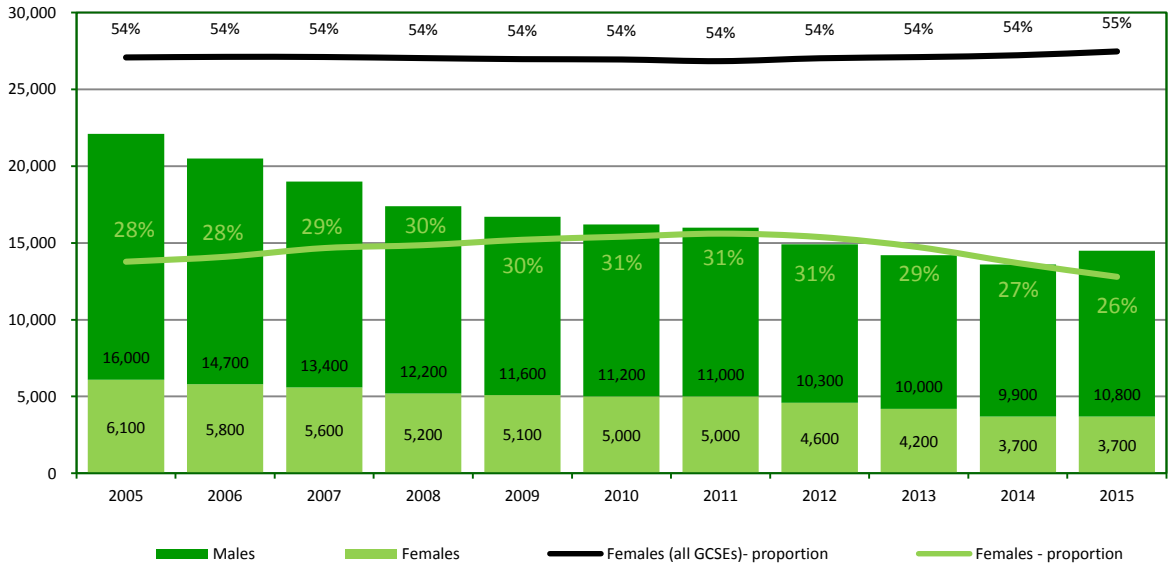
### 3.2.2 Uptake of IT related GCEs by gender

The proportion of IT related GCEs taken by female students fell by 1 percentage point over the 2014-15 period to just 26% of total. This was the fourth consecutive annual decline recorded (if un-rounded figures are employed) and female representation on such courses is now at its lowest since 2004.

By comparison, the proportion of all GCEs that were taken by female students rose by 1 percentage point between 2014 and 2015 and is now at its highest level for more than a decade.

12 Again, all data and references to the UK in this section will exclude Scotland where GCSEs are not undertaken.

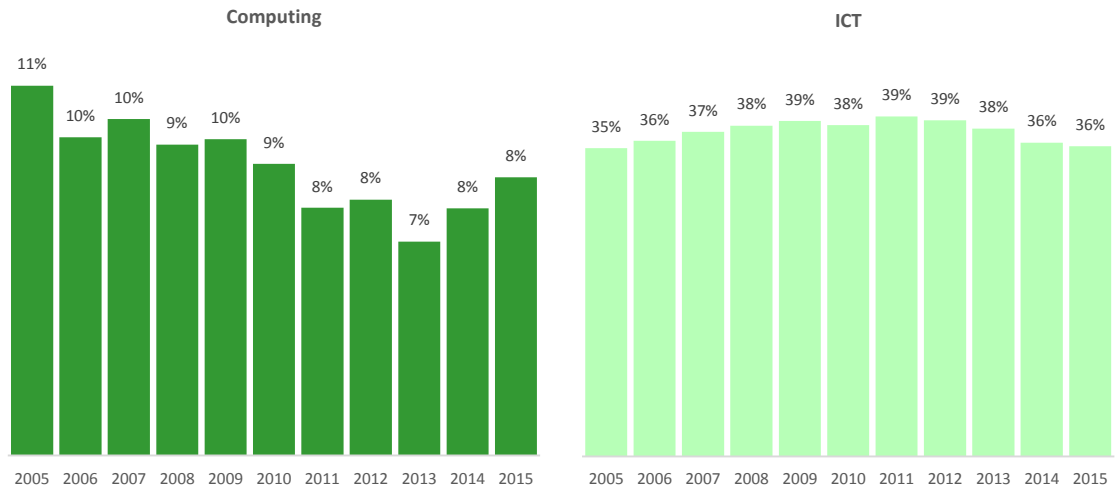
***Figure 9: IT related GCEs taken in England, Wales & Northern Ireland by gender, 2005-2015***




*Source: Analysis of JCQ data undertaken by The Tech Partnership*

Though females are already seen to be underrepresented on IT related GCE courses, the level of female representation on computing courses is still worse. Even after a small improvement recorded over the past two years, by 2015 just 8% of computing GCEs were seen to have been taken by female students. In fact, the minor improvement in the gender balance on computing courses was offset by a relative deterioration in female representation on ICT GCE courses (unrounded figures only) - giving rise to the decline illustrated in the chart above.

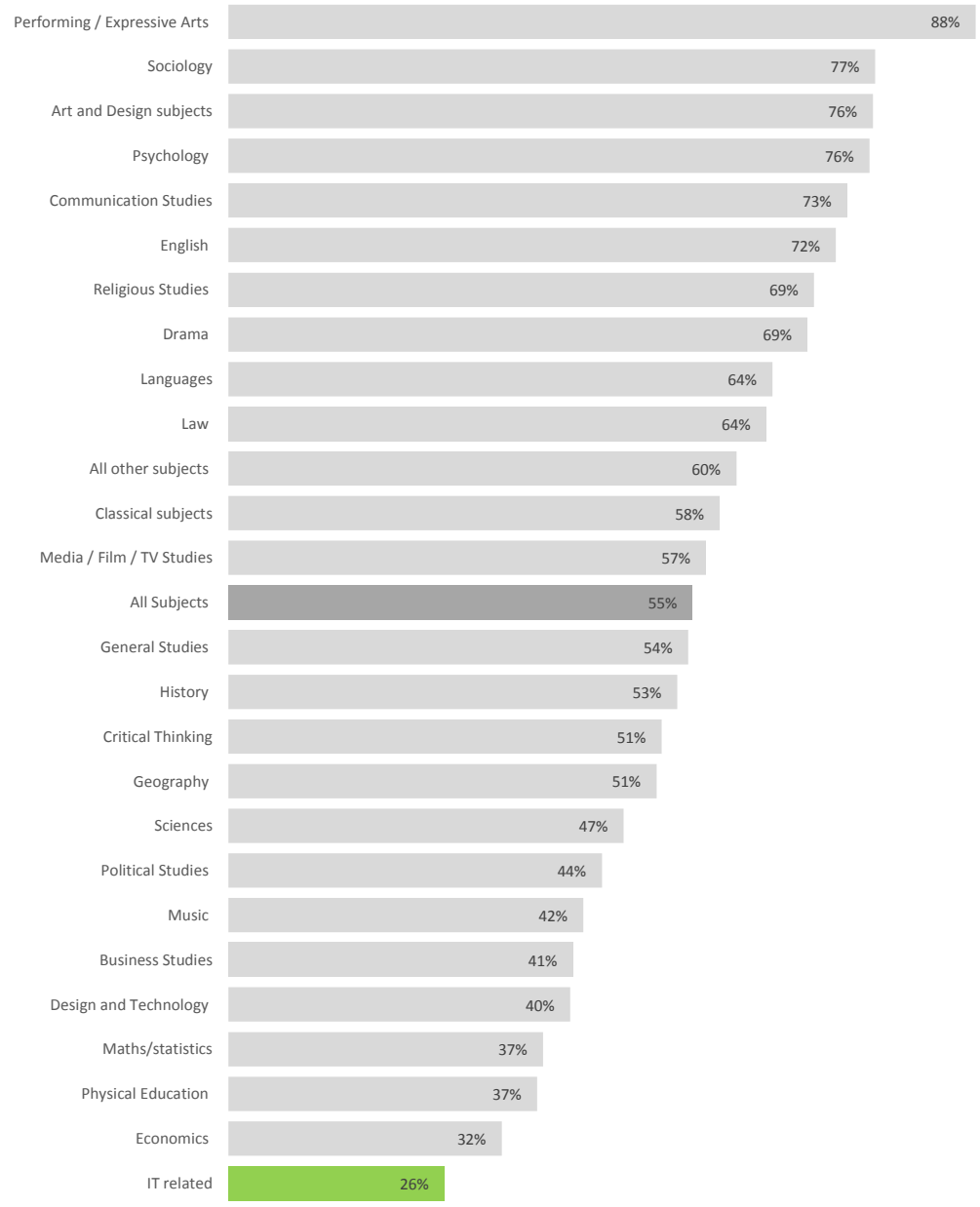
***Figure 10: Female representation on IT related GCEs by nature of course, 2005-2015***




*Source: Analysis of JCQ data undertaken by the Tech Partnership*

Even at 36%, the level of female representation for ICT GCEs in 2015 was well below the average for all subject areas: of the 36 subjects for which data is available ICT ranked 31st with respect to the proportion of female students taking exams at this level, and Computing ranked the lowest amongst all subjects. Again, when considering computing/ICT together and comparing with other groups the associated level of representation was the lowest of all those for which data are available.

***Figure 11: Female representation by GCE subject area (grouped), 2015***

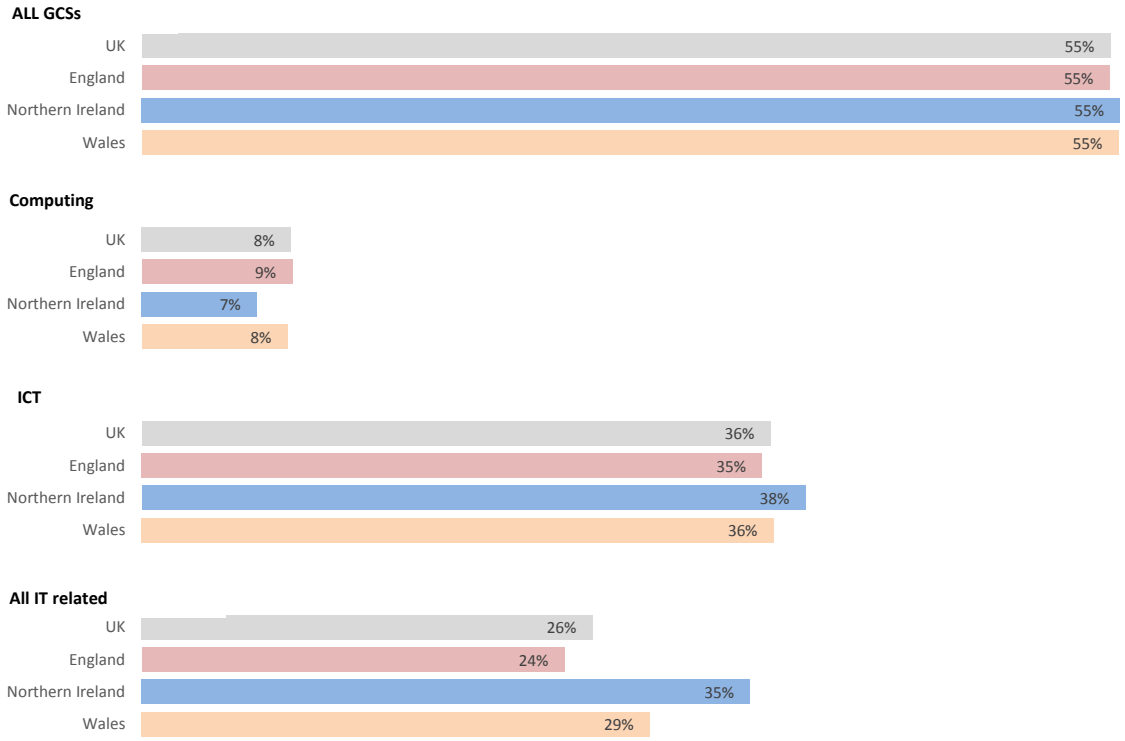



***Source: Analysis of JCQ data undertaken by The Tech Partnership***

### 3.2.3 IT related GCEs by nation

In 2015 female representation on IT related GCE courses as a whole was highest in Northern Ireland, (35%) though this was largely down to the relatively high proportion of students taking ICT courses - upon which female students tended to be better represented. By contrast, the proportion of students taking Computing GCEs in Northern Ireland was lower than in each of the other UK the nations analysed at just 7% of exams taken during the year.

***Figure 12: Female representation on IT related GCEs, 2015***




*Source: Analysis of JCQ data undertaken by The Tech Partnership*

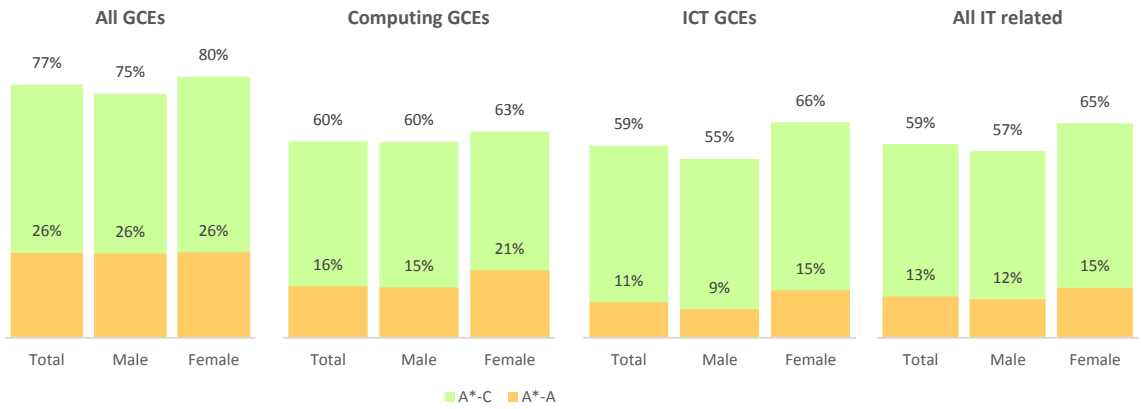
### 3.2.4 IT related GCE results by gender

The attainment levels for students taking IT related GCEs in 2015 were notably lower than those for GCE students as a whole with just 59% gaining grades at A*-C (compared with 77% for all GCE subjects) and 13% achieving A*/A grades (compared with 26% for GCE exams as a whole).

As with GCSEs exams, female students taking IT related GCEs (and GCEs as a whole) tended to achieve better grades than their male counterparts though, on average, again attainment levels were still well below the norm.

The level of attainment was higher for students (female or male) taking GCEs in Computing as opposed to ICT exams but again, by comparison with other courses, the level of outcome obtained was much lower.

*Figure 13: Comparative level of attainments for IT related/other GCEs, 2015*




*Source: Analysis of JCQ data undertaken by The Tech Partnership*

### 3.2.5 IT related GCE results by outcome and nation

Again, like GCSE students, those taking GCEs in Northern Ireland tended to obtain higher grades than in other parts of the UK in 2015 and this was even more pronounced amongst those undertaking GCEs in IT related subjects - 77% obtaining awards at grades A*C and 22% at grades A*/A in Northern Ireland compared with 59% and 13% respectively of all UK students taking such exams.

Similarly, Wales was again associated with below average levels of attainment and as with GCSE results, the proportion of students in Wales obtaining passes at grades A*-C and A*/A in IT related GCEs were well below the level recorded for the UK as a whole.

*Table 2: GCE attainments at grades A*-C and A*-A by subject, 2015*

| | | Computing | | | ICT | | | IT related | | | All GCSEs | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Total** | Male | Female | **Total** | Male | Female | **Total** | Male | Female | **Total** | Male | Female |
| **A*-C** | UK | **60%** | 60% | 63% | **59%** | 55% | 66% | **59%** | 57% | 65% | **77%** | 75% | 80% |
| | England | **60%** | 60% | 63% | **56%** | 52% | 64% | **58%** | 56% | 64% | **77%** | 74% | 80% |
| | Northern Ireland | **76%** | 75% | 91% | **78%** | 76% | 80% | **77%** | 76% | 80% | **83%** | 81% | 85% |
| | Wales | **51%** | 50% | 54% | **45%** | 40% | 54% | **47%** | 44% | 54% | **74%** | 71% | 77% |
| **A*-A** | UK | **16%** | 15% | 21% | **11%** | 9% | 15% | **13%** | 12% | 15% | **26%** | 26% | 26% |
| | England | **16%** | 16% | 21% | **9%** | 7% | 13% | **12%** | 11% | 14% | **26%** | 26% | 26% |
| | Northern Ireland | **21%** | 20% | 36% | **22%** | 20% | 25% | **22%** | 20% | 25% | **29%** | 27% | 31% |
| | Wales | **9%** | 9% | 8% | **6%** | 5% | 9% | **7%** | 6% | 9% | **23%** | 23% | 24% |

*Source: Analysis of JCQ data undertaken by The Tech Partnership*

The GCE results data for Wales were also notable in that males on GCE computing courses were found to perform better than their female equivalents (53% of males gaining an A*-C grade and 14% an A*/A compared with 44% and 12% respectively of females) - this was only the case for Computing as opposed to ICT exams taken in Wales, and Wales was the only nation in which this occurred.

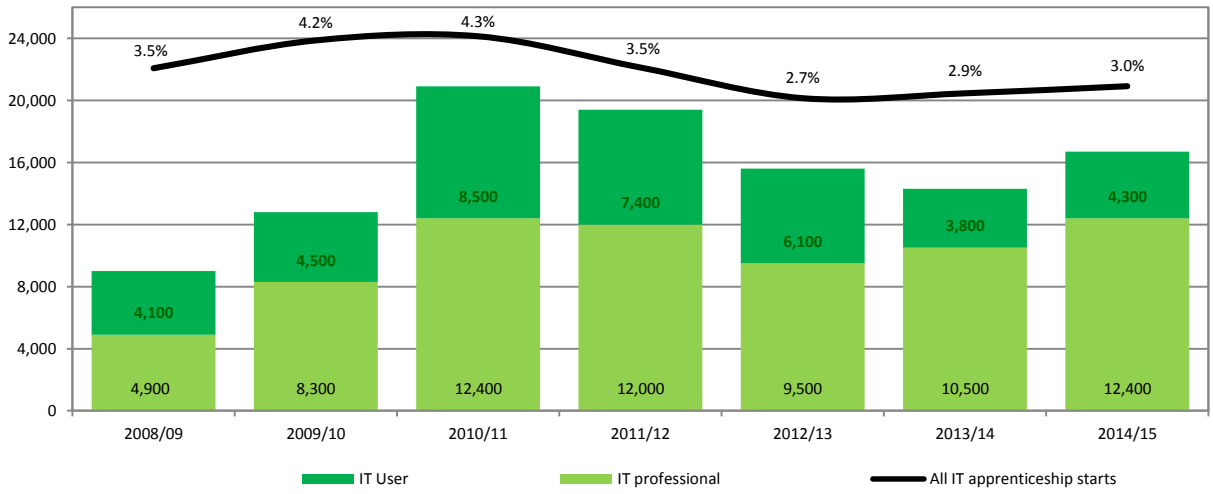
# 4 IT apprenticeships

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 and cover a range of IT specialisms i.e. Cyber Security, Data Analysis, Digital Marketing, Infrastructure, Technical Sales, Networking, Software Development,and Unified Communications.

### 4.1.1 Trends in uptake of IT and other apprenticeships

There were just under 17,000 IT apprenticeship starts across the UK in 2014/15 - a 17% increase on the number recorded during the previous year. By comparison, the overall number of apprenticeship starts rose by just 10% year on year and as a result, IT apprenticeships increased slightly as a proportion of the total from 2.9% to 3.0% over the 2013-2015 period.

***Figure 14: Trends in apprenticeship starts across the UK, 2008-15***



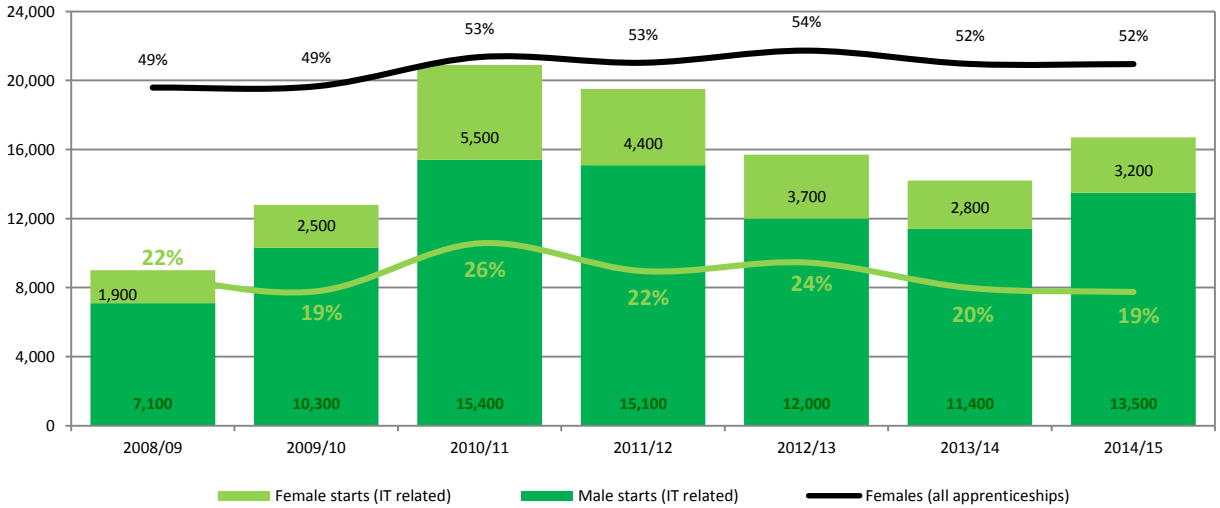

*Source: Analysis of data from DELNI, Skills Development Scotland, the Welsh Government and the SFA undertaken by The Tech Partnership*

The overall increase in IT apprenticeship starts was largely down to a rise in the number of people taking professional, as opposed to IT User type apprenticeships with associated annual increases of 18% and 13% respectively.

### 4.1.2 Apprenticeship starts by gender

Whilst women continued to account for 52% of apprenticeship starts as a whole during 2014/15, the proportion of IT apprenticeships starts made by women was seen to fall by 1 percentage point to just 19%. More specifically, this decline arose as a result of the fall in female representation on IT practitioner/specialist apprenticeships which dropped from 11% to 10% over the year (female representation on IT User apprenticeships rising instead from 45% to 46% over the period).

*Figure 15: Trends in apprenticeship starts, 2008-15*




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

### 4.1.3 Apprenticeship starts by nation

By UK nation, Wales continued to exhibit the highest level of female representation on IT user apprenticeship starts during 2014/15 (75%) whilst Northern Ireland fared best with respect to starts on IT professional programmes. As in the previous year Wales and Northern Ireland had notably higher proportions of female starters on IT apprenticeship programmes than either England or Scotland.

*Table 3: IT apprenticeship starts across the UK by gender and subject area, 2014/15*

| | IT User | | IT professional | | All IT related | | All subjects | |
|---|---|---|---|---|---|---|---|---|
| | Female (%) | Total | Female (%) | Total | Female (%) | Total | Female (%) | Total |
| England | 41% | 3,700 | 10% | 11,500 | 18% | 15,200 | 53% | 499,900 |
| Scotland | - | - | 10% | 700 | 10% | 700 | 40% | 25,200 |
| Wales | 75% | 600 | 15% | 200 | 62% | 800 | 57% | 19,600 |
| Northern Ireland | 43% | - | 27% | 100 | 28% | 100 | 40% | 5,500 |
| UK | 46% | 4,300 | 10% | 12,400 | 19% | 16,700 | 52% | 550,200 |

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

# 5 Higher education

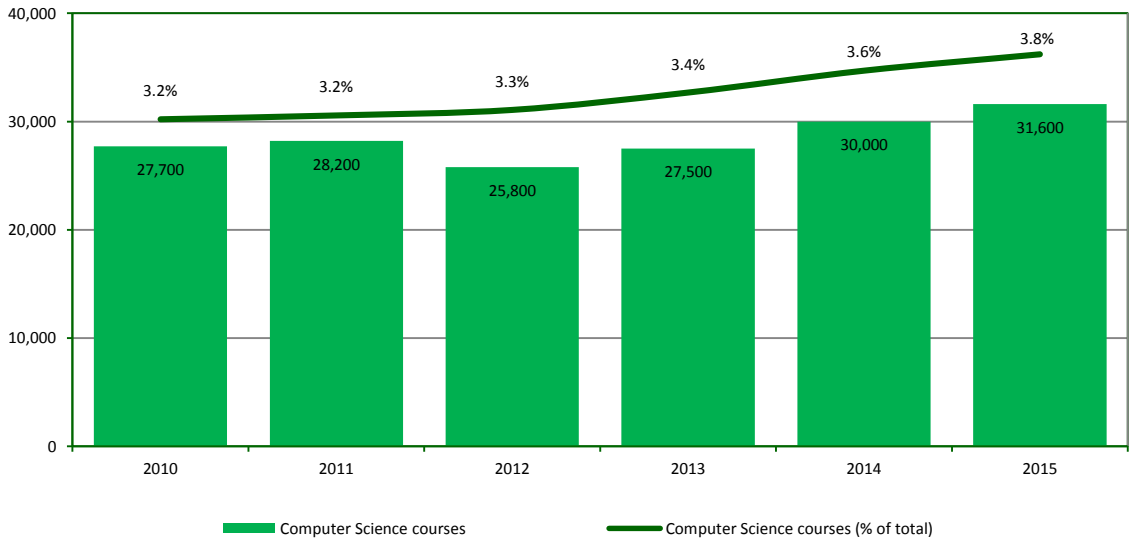
In this section, we use bespoke data from UCAS and The Higher Education Statistics Agency (HESA) to give a detailed analysis of applications, acceptances and outcomes from IT related HE courses, focussing on UK domiciled applicants/students of higher education and courses listed under JASC3 (Joint Academic Coding System) Group I - Computer Sciences (detailed in report Annex).

## 5.1 HE applications

### 5.1.1 Applicants by subject of study

The number of applicants to HE level Computer Science courses in the UK increased by 5% between 2014 and 2015 whilst HE applicant numbers as a whole increased by just 1%. As a result, the proportion of all applicants accounted for by Computer Science courses was seen to increase slightly to 3.8% of the total - the third consecutive annual increase recorded since 2012.

***Figure 16: Unique applicants to IT/other HE courses, 2010-15***




*Source: Analysis of UCAS data undertaken by The Tech Partnership*

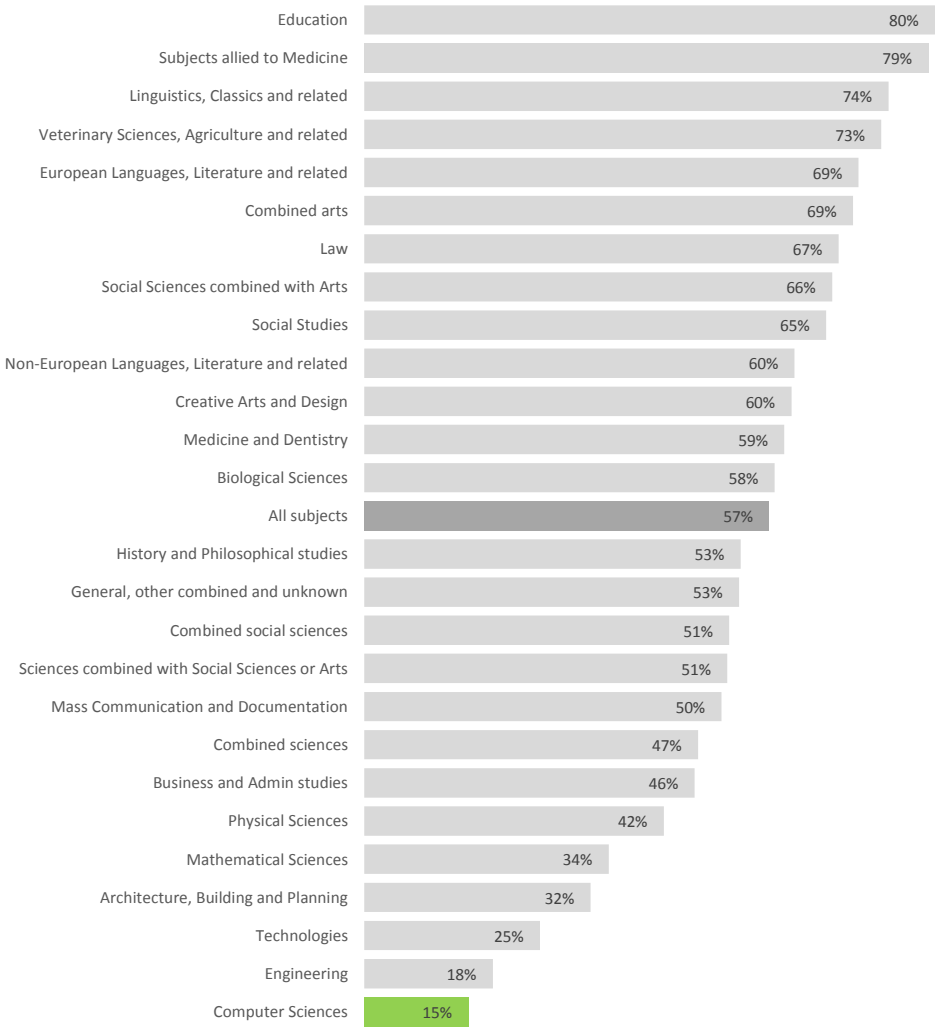
Amongst the sub-disciplines incorporated within the Computer Science subject group, increases in applicant numbers were most pronounced for 'straight' Computer Science courses (up by 1,400 or 6% year on year) followed by Games courses (up 700/15%). By contrast, the largest falls recorded were for 'combinations in Computer Sciences' (down by 400 applicants/10%) and 'Information Systems' (down by 200 applicants/4%).

### 5.1.2 Applications by gender

The rise in Computer Science applications between 2014 and 2015 was apparent for both males and females, though female applicant numbers increased at a slightly higher rate (7% compared with 5%

for males). As a result, female applicants as a percentage of the total were seen to increase from 14% to 15% over the year. This said, UCAS data shows that Computer Science was still associated with a lower proportion of female applicants than any other subject group in 2015.

***Figure 17: Unique applicants (females) to IT and other HE courses, 2015***




***Source: Analysis of UCAS data undertaken by The Tech Partnership***

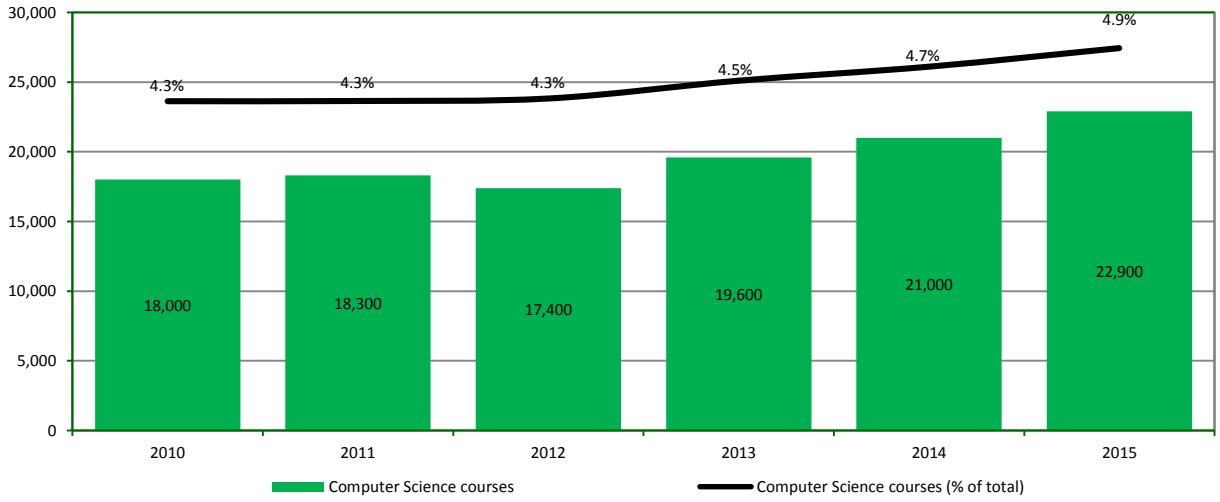
Between 2014 and 2015 there was little change in the proportion of female applicants to specific Computer Science sub-disciplines and in 2015 (for courses with 100 or more female applicants) the level of representation was as follows: Information Systems - 18%, 'other' Computer Science courses - 17%, 'straight' Computer Science - 14%, combinations in Computer Science - 14%, Games - 13% and Software Engineering - 10%.

## 5.2 HE acceptances

### 5.2.1 Acceptances by subject of study

The number of students accepting places on Computer Science courses rose by 9% between 2014 and 2015 to 22,900 students. This was the third consecutive annual increase recorded and in 2015 Computer Science courses accounted for 4.9% of all acceptances made by (UK) applicants to HE institutions across the UK.

***Figure 18: Acceptances to IT/other HE courses, 2010-15***



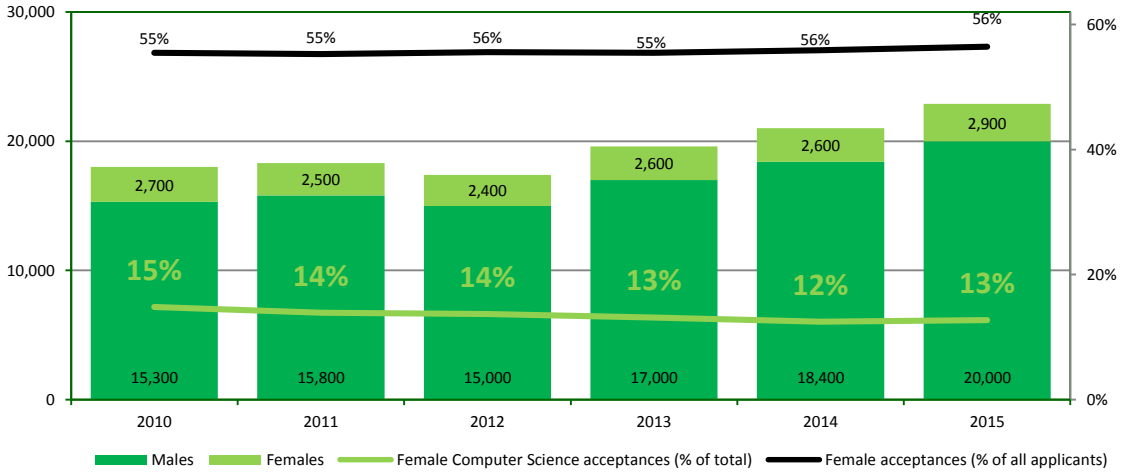

*Source: Analysis of UCAS data undertaken by The Tech Partnership*

### 5.2.2 Acceptances by gender

Growth in acceptance numbers was slightly higher for female, as opposed to male, students, and as a result the proportion of acceptances to Computer Science courses accounted for by females was seen rise slightly from 12% to 13% of the total. However, this increase had little effect on the overall (downward) trend in gender balance for Computer Science courses, as illustrated in the chart overleaf.

Moreover, like applications, the proportion of acceptances accounted for by female students was found to be lower for Computer Science than any other courses subjects at HE level.

*Figure 19: Acceptances to IT/other HE courses, by gender 2010-15*



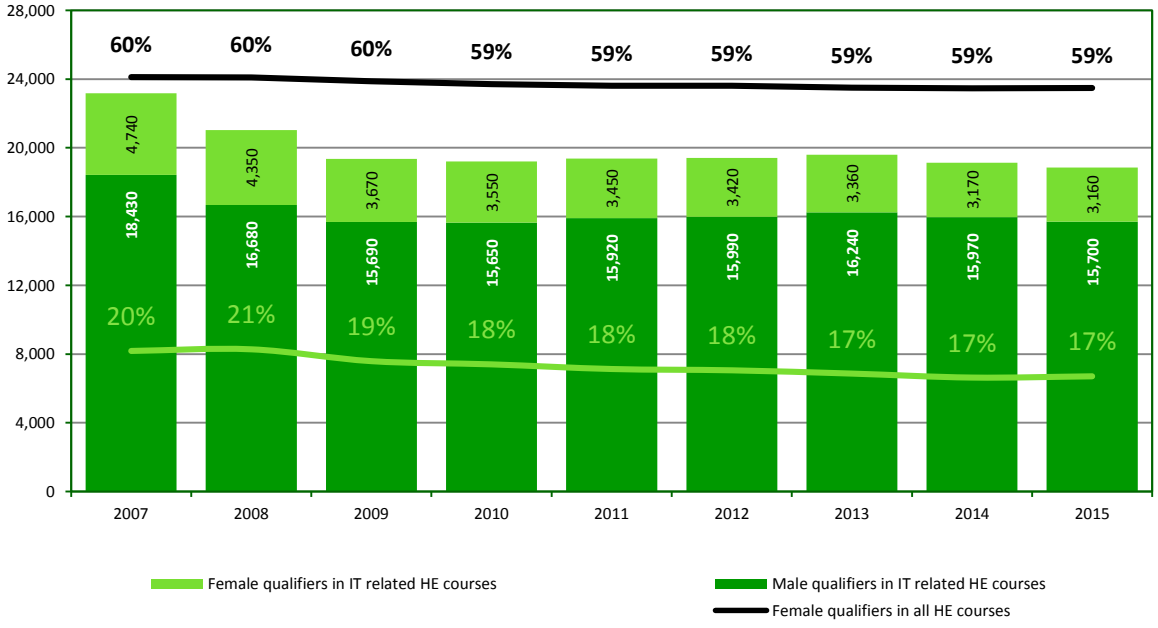

*Source: Analysis of UCAS data undertaken by The Tech Partnership*

## 5.3 HE qualifiers

### 5.3.1 Historical trends

The number of female students achieving an HE level qualification in an IT related subject from a UK institution was down slightly (0.3%) in 2015 compared with the previous year to 3,160 qualifiers in total.

*Figure 20: UK domiciled qualifiers in Computer Sciences/all HE courses by gender, 2007-2015*

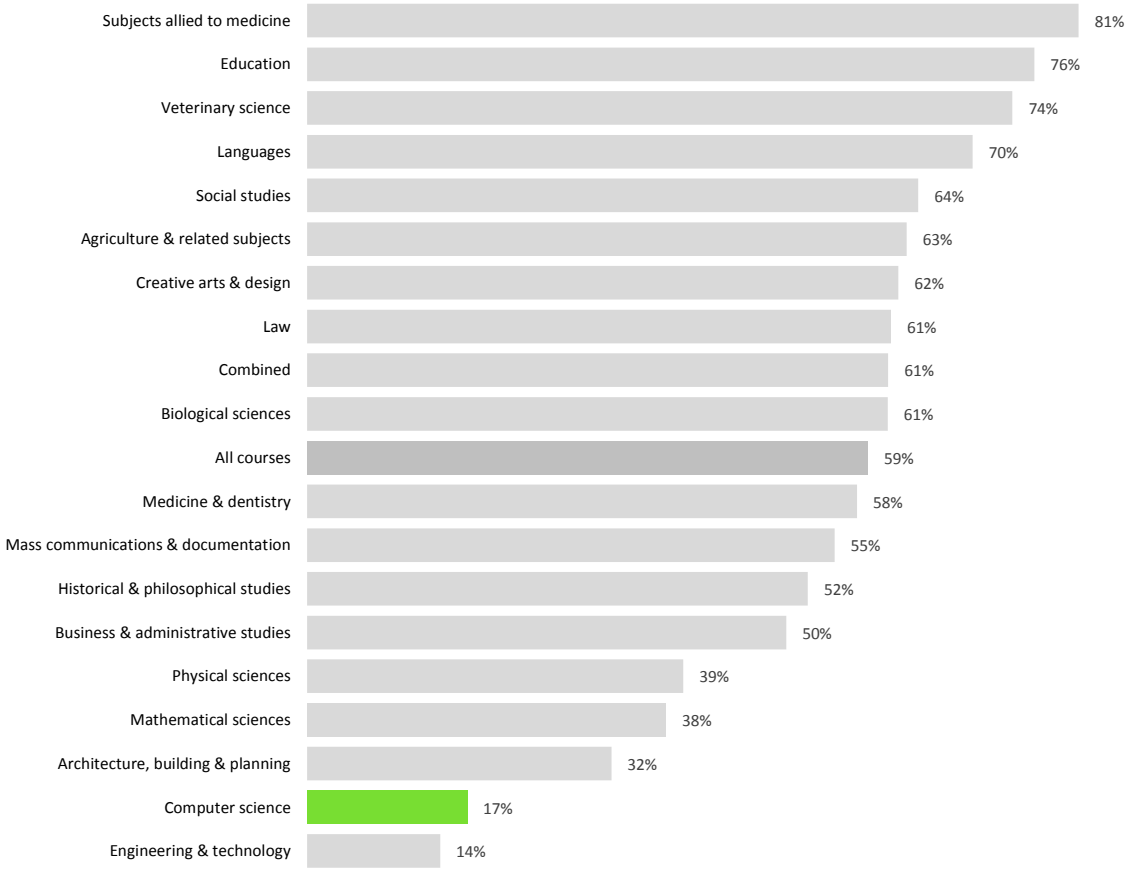



*Source: Analysis of HESA data undertaken by The Tech Partnership*

Though the decline registered was lower than that for male students (down 1.7%) and much lower than that for student qualifiers as a whole (down 6.2%) it is notable that this was the eighth consecutive year in which a fall in the number of female IT qualifiers was recorded, and that the number of females qualifying in this subject area has now fallen by a full 10% over the past 5 years.

At 17% the gender balance amongst IT qualifiers from HE was the second lowest amongst the 19 broad JASC subject area groups for which data is available and well below the all subject average of 59%.

***Figure 21: Female qualifiers by 'principal subject of study', 2015***

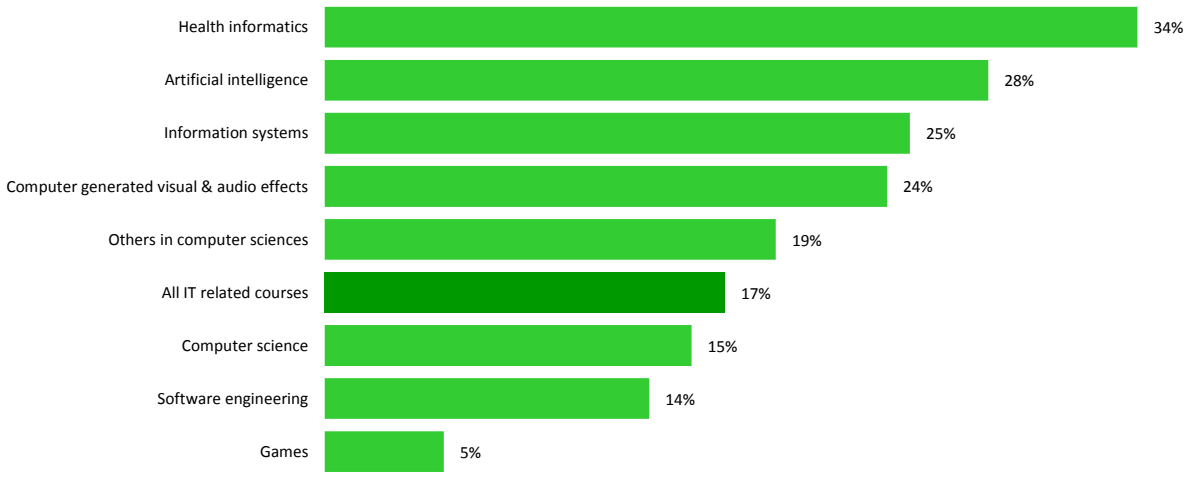



*Source: Analysis of HESA data undertaken by The Tech Partnership*

### 5.3.2 IT qualifiers by specific subject of study

Though the proportion of female qualifiers on IT courses as a whole was very low, certain aspects of Computer Science are associated with much higher levels of female representation - notably Health Informatics (34%) and Artificial Intelligence focussed courses (28%). Interestingly by contrast, games related courses were associated with the lowest proportion of female qualifiers (5%) even though almost one quarter of qualifiers on Computer generated visual and audio effects courses were women. In fact, of all the 163 'principal subject groups' for which data are available, games courses were the lowest overall with respect to the proportion of female qualifiers in 2015.

*Figure 22: UK domiciled qualifiers from HE courses by type of IT qualification, 2015*

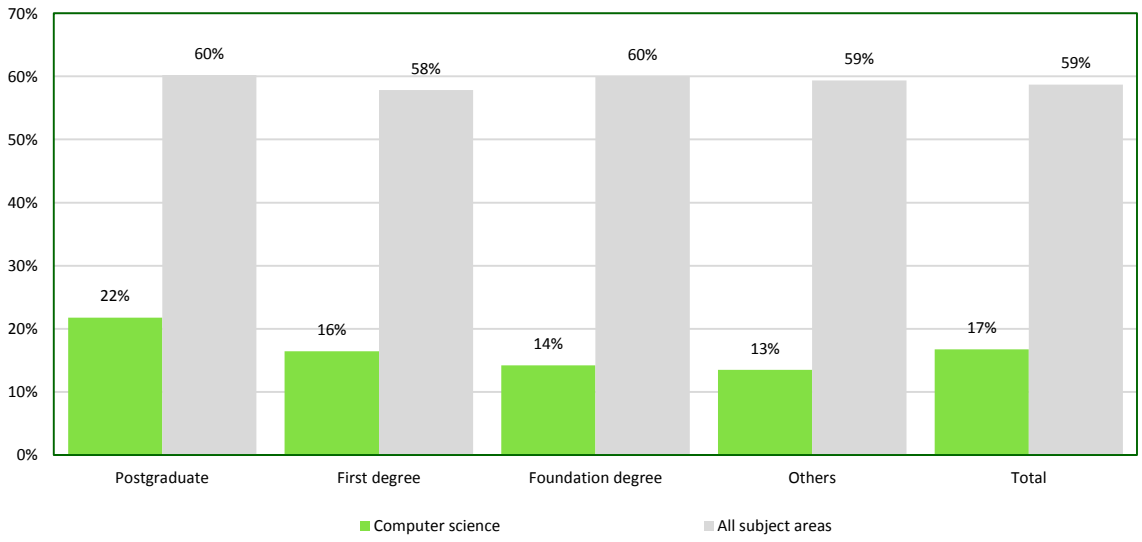



*Source: Analysis of HESA data undertaken by The Tech Partnership*

### 5.3.3 Qualifiers by level of study

Unfortunately, the proportion of female qualifiers from IT related HE courses was found to be well below average irrespective of the level of study involved and though the difference was slightly lower amongst those gaining a post as opposed to under-graduate award there was still a 38-percentage point gap between the figures for IT qualifiers and the average across all subjects.

*Figure 23: Female qualifiers from HE courses by level of qualification, 2015*



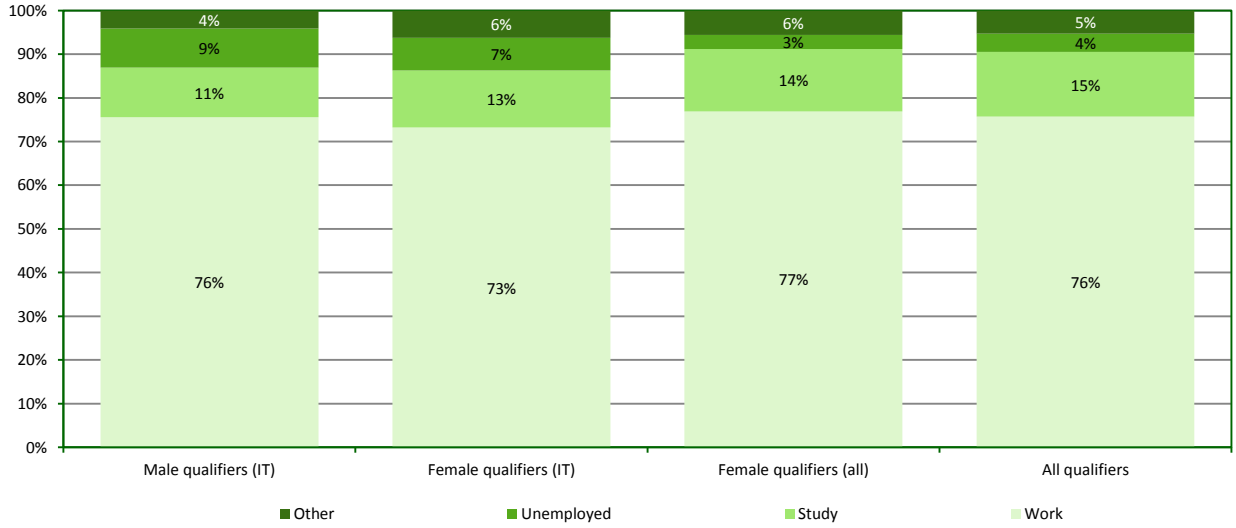

*Source: Analysis of HESA data undertaken by The Tech Partnership*

### 5.3.4 Destination of leavers

Just under three quarters (73%) of females gaining an IT related qualification at HE level in 2015 were found to be in work 6 months after completing their studies - a slightly lower proportion than that for male IT qualifiers (76%), female qualifiers in general (77%) and qualifiers as a whole (76%).

Like male IT qualifiers, females who were not in work were much more likely to be unemployed 6 months after leaving HE than those from other study areas (7% of females with an IT award compared with 3% of all female qualifiers and 4% of qualifiers in total) - the difference in each case arising from the comparatively low proportion of IT qualifiers going on to further study.

***Figure 24: Destinations of IT/other qualifiers from HE courses by gender, 2015***




*Source: Analysis of HESA data undertaken by The Tech Partnership*

Amongst female IT graduates who were in work 6 months post completion, just under one half (47%) were found to be working in an IT specialist role, and of all HE leavers working as IT specialists just 20% were female.

Aside from IT positions, the next most common roles for females with IT awards were: Sales assistants and retail cashiers (7%), Business, finance and related associate professionals (5%), Business, research and administrative professionals (5%), Teaching and educational professionals (4%), Sales, marketing and related associate professionals (3%) and Other administrative occupations (3%).

For males, a much higher proportion (63%) of IT graduates were in IT roles 6 months post completion, though for those in different types of job the common alternatives tended to be much the same as those listed above.

### 5.3.5 Rational for career choices post HE

As in previous years, 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

(63%) females leaving HE with an IT award in 2014/15 and taking up an IT role stated this to be the case (as was the case for male IT graduates). After career choice, the next most common reasons for taking an IT position were:

1. it was the best job offer received (30% of female qualifiers/29% of males),
2. to broaden/gain work experience (29% and 25%) and
3. location (28% and 27% respectively).

Interestingly, just under one half (47%) of female graduates from non-IT disciplines (and 51% of male equivalents) who had obtained work as an IT specialist also stated that they had taken up such a position as it fitted their career plan/was exactly type of work wanted.

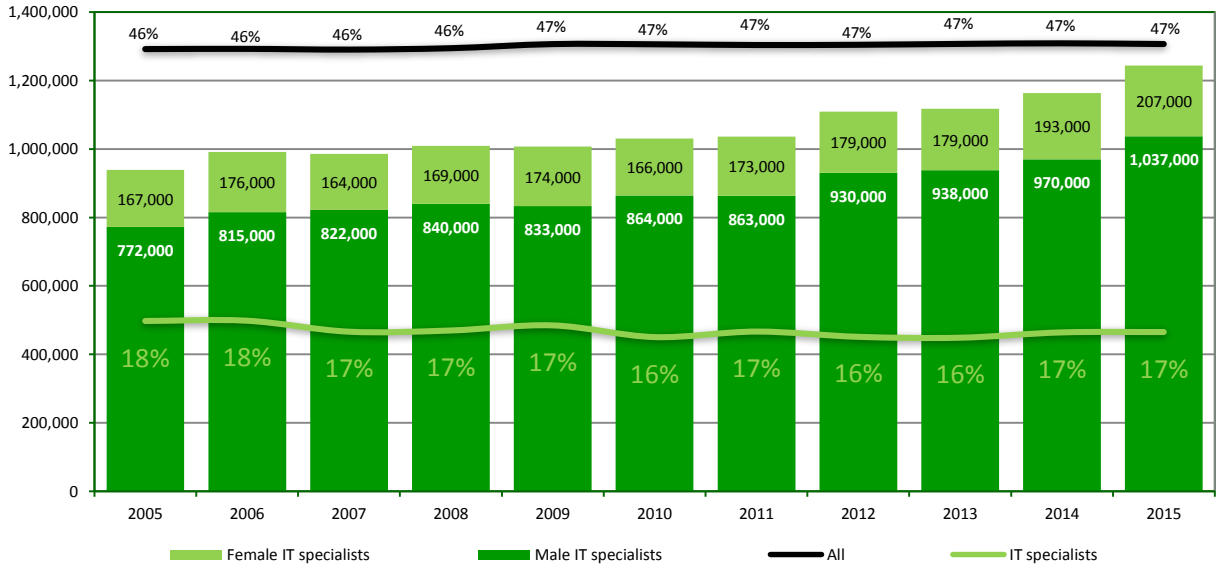
# 6 IT workers

## 6.1 IT workforce trends

There were approximately 1,243,000 IT specialists working in the UK during 2015, of which just 17% (207,000) were women - a figure well below that for the workforce as a whole (47%).

Compared with the previous year, the number of female IT specialists was up by 7% or 14,000 people and though the increase was well above that for female workers more generally (2%) it was no different to that for male IT specialists (also up 7%) - hence female representation in the IT professions remained unchanged on the previous year.

***Figure 25: IT specialists in the UK by gender, 2005-2015[13]***



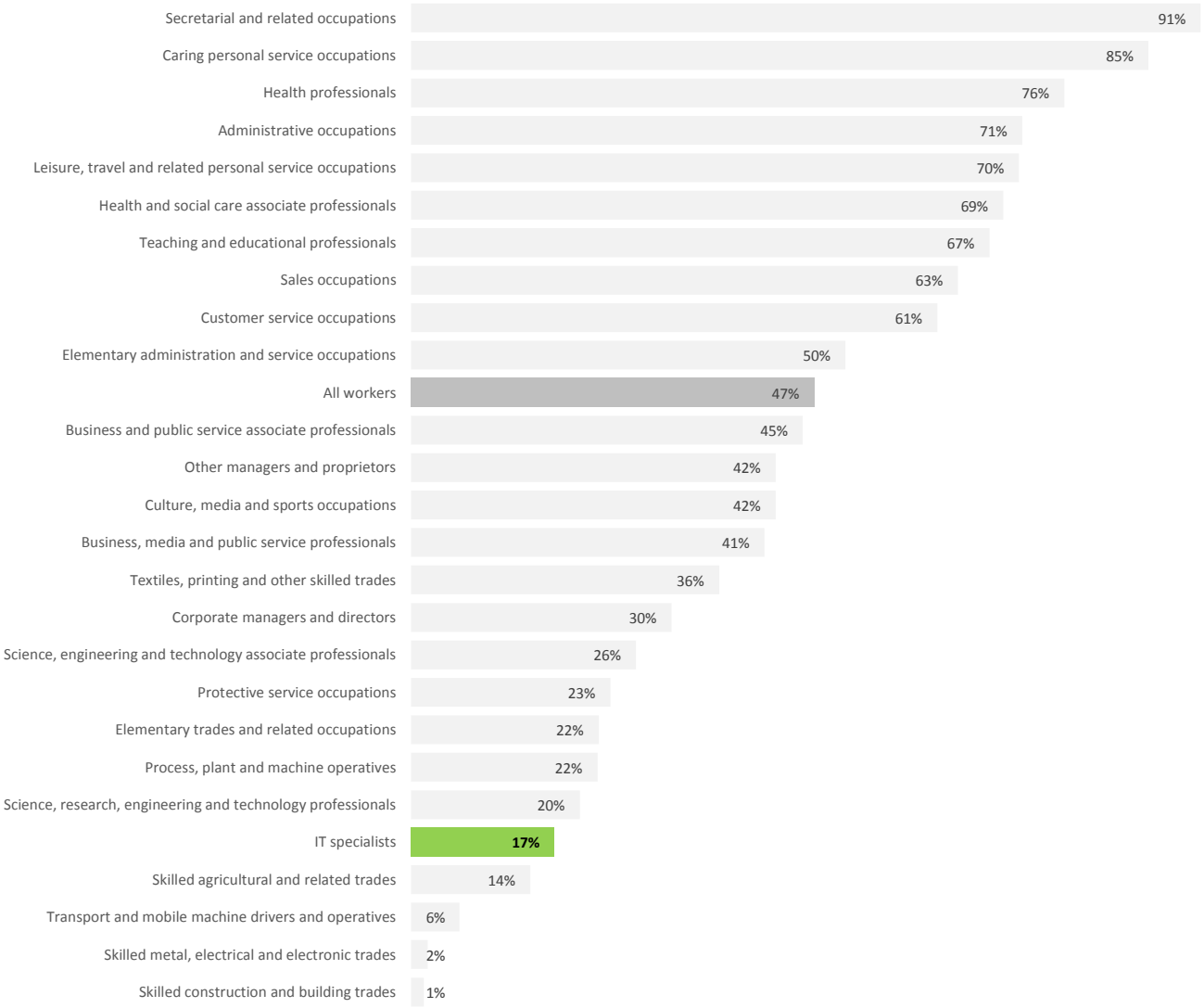

*Source: Analysis of ONS Annual Population Survey data undertaken by The Tech Partnership*

### 6.1.1 The gender balance by occupation

Even at a very broad level, the gender balance amongst IT specialists compares poorly with other occupations and a comparison between IT specialists and the 25 sub-major occupational groups set out within the ONS SOC framework puts IT as being 21st out of 25 with respect to the level of female representation within such occupations.

13 Data for 2005-2010 are based upon an earlier version of SOC (SOC2000) and have been converted to SOC2010 using SPSS syntax provided by ONS. Caution should therefore be applied to any analysis of trend data spanning the 2005-15 period.

***Figure 26: Female representation by broad occupational group, 2015***




***Source: Analysis of ONS Annual Population Survey data undertaken by The Tech Partnership***

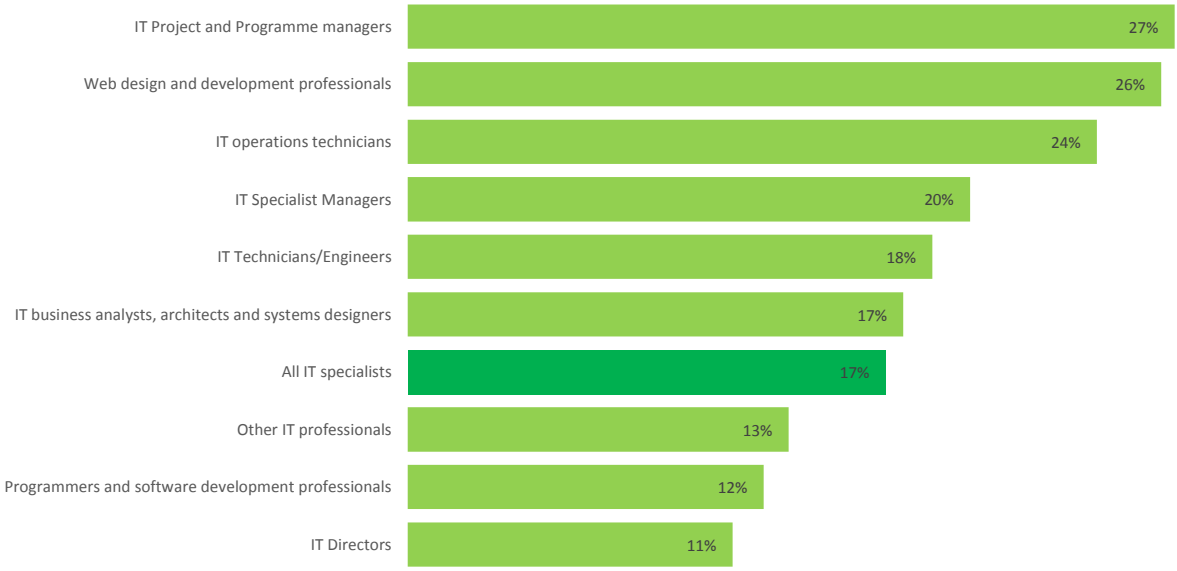
At a more granular level certain IT occupations are associated with a higher level of female representation. However, even in the case of IT Project and Programme managers (which fared the best in terms of gender equality in 2015 with 27% of positions held by women) the gender balance is still very low when compared with other occupations. In fact, of 369 most detailed occupational groups (SOC unit codes) set out under the SOC10 coding system IT Project and Programme managers were 220$^{th}$ with respect to the proportion of women in post. Moreover, at the opposite end of the spectrum IT Directors[14] (amongst which just 11% were females) was ranked 280$^{th}$.

More specifically though, female representation amongst the IT professions is found to be much lower than within with many of the more traditional (and specific) professions such as; secondary teachers

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

(57%), doctors (47%), solicitors (44%), accountants (41%), barristers/judges (31%), police officers (sergeant or below - 29%), architects (24%) and chefs (21%) for example.

***Figure 27: Female representation by IT occupations (SOC unit codes), 2015***




*Source: Analysis of ONS Annual Population Survey data undertaken by The Tech Partnership*

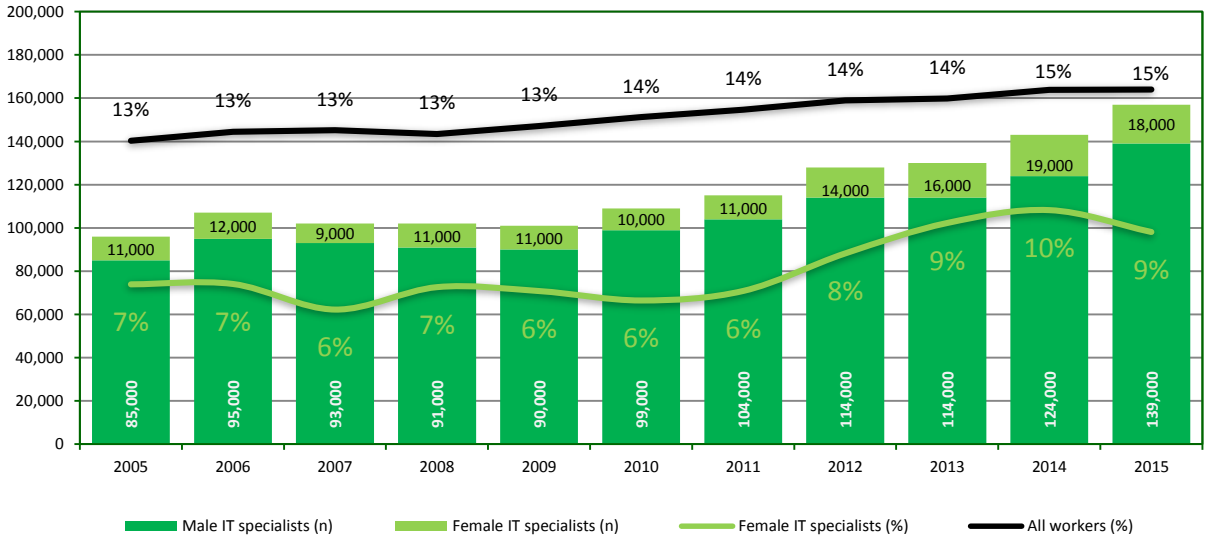
## 6.3 Employment characteristics

### 6.3.1 Contractual status

The increase in the number of female IT specialists between 2014 and 2015 was driven by a rise in employee numbers (up 9% from 173,000 to 188,000) whilst the number working on a self-employed basis (contractors) declined by 3% over the year bringing the contract total down from 19,000 to 18,000 - 9% of the total.

By comparison for males, annual increases were recorded both in the number of IT specialists working as employees and those in self-employment (12% and 6% respectively) and as a result, the proportion of IT specialists who were self-employed remained unchanged at 13%. In both cases, then, the proportion of the workforce overall who were working to contract (self-employed) remained notably below the level recorded amongst the workforce as a whole (15%).

*Figure 28: Scale/incidence of self-employment, 2005-2015*



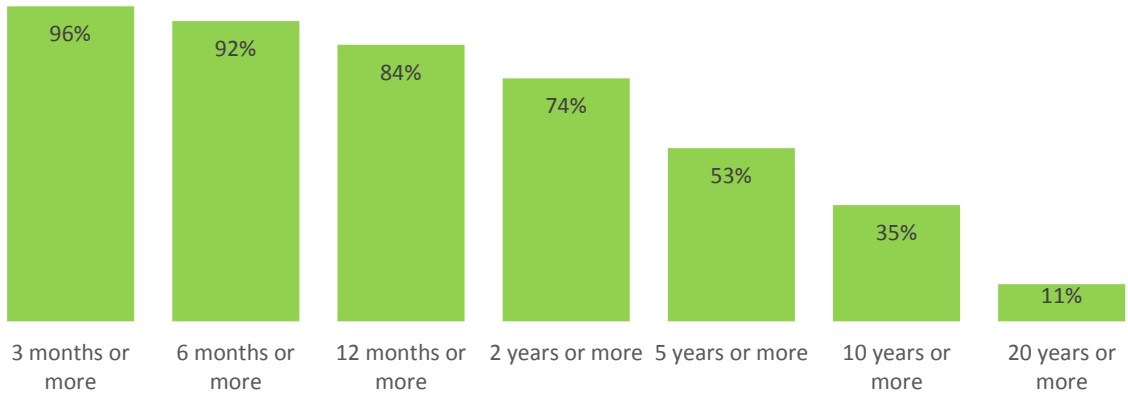

*Source: Analysis of ONS Annual Population Survey data undertaken by The Tech Partnership*

### 6.3.2 Permanency of employment and job tenure

Amongst female IT specialist working as employees, virtually all (96%) were working in permanent positions during 2015 - the same proportion as that recorded in the previous year. The incidence of permanent employment was marginally lower than amongst male IT specialists (97%) though higher than for female employees or workers as a whole (93% and 94% respectively).

As in previous years for the most part it would appear that female IT specialists (and other workers) who were not working under permanent contracts were doing so out of choice as opposed to their being unable to find a permanent position (on average over the past three years shows only 24% of female IT specialists were in non-permanent positions due to an inability to find a permanent job).

*Figure 29: Tenure of employment amongst female IT specialists, 2015*




*Source: Analysis of ONS Annual Population Survey data undertaken by The Tech Partnership*

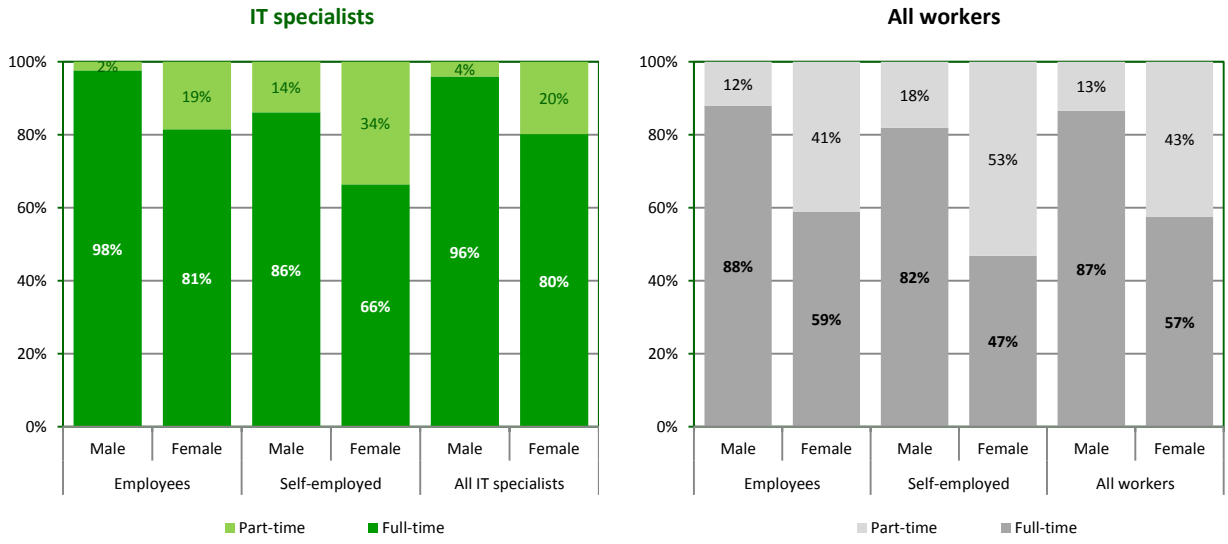
As illustrated in the previous chart around three quarters (74%) of female IT specialists had been working with the same employer for 2 or more years in 2015 - the same proportion as for male IT specialists, though a slightly higher proportion than for UK workers as a whole (72%).

### 6.3.3 Incidence of part-time working

One in five (20%) of female IT specialists were working part-time in 2015 - a much higher proportion than that recorded for male IT specialists (4%) but lower than that for female workers as a whole (43%). Part-time working was most prevalent amongst workers who were self-employed - both in the case of females and males and irrespective of whether they were working as an IT specialist or other occupation.

The propensity to work part-time did however appear to be linked to the nature of occupation held and female IT specialists working in more highly skilled positions (Directors/Managers/Professionals) were much less likely to be working part-time than those holding jobs as Technicians/Engineers (comparison figures of 18% and 28% respectively). For males by comparison the incidence of part-time working was much the same for both groups of worker (4% and 5% respectively).

***Figure 30: Incidence of full and part-time working amongst IT specialists/other employees, 2015***




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

As in previous years, female IT specialists working part-time were most likely to be doing so as they did not want a full-time job (95% of those working in such positions) and this was found to be the case both for those working as employees or in self-employment (93% and 95% respectively). Interestingly, the incidence of women in IT/other occupations stating that they were in part-time work for this reason did not appear to vary significantly with age even though it may perhaps have been expected to increase around the age at which women have traditionally taken time out of the labour market due to maternity.

### 6.3.4 Hours of work

In 2015 female IT specialists were found to be working 38 hours on average per week - 41 hours for those working full-time and 25 hours for part-timers. By comparison the average for all female workers was 6 hours less per week overall at 32 hours - in part due to the lower number of hours worked by other part- timers (20 hours per week for all females working part-time) but also due to the higher proportion part-time workers in other occupations.

***Table 4: Total usual hours of work by occupation/contractual status, 2015***

| | Employees | | | Self-employed | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | Full-time | Part-time | Total | Full-time | Part-time | Total | Full-time | Part-time | Total |
| Male IT specialists | 42 | 20 | 42 | 45 | 17 | 41 | 42 | 18 | 41 |
| Female IT specialists | 41 | 25 | 38 | 41 | 20 | 34 | 41 | 25 | 38 |
| All female workers | 40 | 20 | 32 | 43 | 16 | 29 | 41 | 20 | 32 |
| **All workers** | 42 | 20 | 37 | 46 | 17 | 38 | 43 | 19 | 37 |

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

As noted in the table above, the hours worked by male IT specialists were much the same as for females amongst those working full-time though amongst male part-timers in such roles, the average weekly hours were much lower at 18 per week.

### 6.3.5 Flexible working and other worker friendly arrangements

The incidence of flexible working amongst female IT specialists (employees) fell between 2014 and 2015 - from 34% to 32% of those working in such positions. This was still a higher proportion than recorded for male IT specialists however (28%) and almost double the proportion recorded for UK employees as a whole (26%)[15].

As in the previous year, female IT specialists were more likely to be working from home than other IT specialists/workers more generally - 9% of those working as employees and 50% of those working as contractors (self-employed). By comparison the proportion of male IT specialists working from home in 2015 were 6% for employees and just 25% for contractors - half the level recorded for women. For workers as a whole though, the levels were even lower at 2% and 17% respectively.

Both female and male IT specialists stated that on average they received 25 days paid holiday (excluding bank holidays) per year - 1 day more than their equivalents within the workforce as a whole.

### 6.3.6 Managerial and supervisory responsibilities

In 2015 just over one third (35%) of female employees in the UK working as IT specialists stated that they were in a managerial role - roughly the same proportion as for male IT specialists (36%), but well above that for female workers/all workers in the UK at that time (20% and 24% respectively).

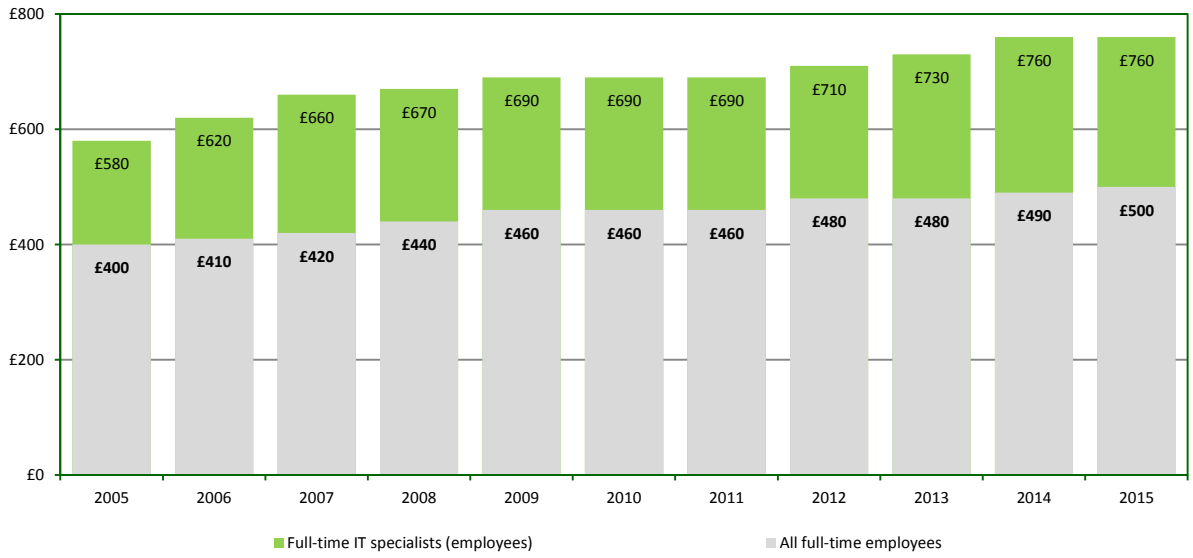
15 Figures based on the ONS Quarterly Labour Force Survey - 2nd and 4th quarters only

As perhaps would be expected, the vast majority (90%) of female IT specialists in managerial positions were also found also to hold supervisory duties and again this was also the case for male IT specialist employees and for females/males within the wider workforce (with around nine in ten having supervisory duties in all instances).

### 6.3.7 Remuneration trends

In 2015 the rounded gross weekly (median) earnings of IT specialist employees working in the UK on full-time contracts remained unchanged compared with the previous year at £760 per week whilst the overall figure for all full-time employees increased by 2% to £500 per week bringing the pay premium enjoyed by IT specialists down slightly to 53%.

***Figure31: Gross weekly pay (median) for permanent full-time employees, 2005-15***




*Source: Analysis of ONS Annual Population Survey data undertaken by The Tech Partnership*

### 6.3.8 Remuneration by occupation

The rate for male IT specialists (full-time employees) also remained unchanged at £770 per week in 2015. Amongst female IT specialists an increase of 2% was again recorded, bringing the median weekly earnings figure up to £650 per week or 85% of the male rate.

Much larger increases were observed for specific occupations - the most notable being a rise of 8% amongst female IT project & programme managers and Web developers, and a rise of 7% for female IT Directors. Meanwhile, there were falls in the weekly earnings of women working as IT Business Analysts, Architects & Systems Designers; 'other' IT professionals; and IT User Support Technicians (down 5%, 4% and 3% respectively).

*Table 5: Gross weekly pay (median) for permanent, full-time IT specialist employees, 2015*

| | Female full-time | Male full-time | Difference | |
|---|---|---|---|---|
| | | | (£) | (%) |
| **IT Directors** | £1,250 | £1,250 | £10 | 1% |
| **IT Professionals:** | **£700** | **£790** | **£90** | **13%** |
| IT specialist managers | **£760** | **£880** | £120 | 17% |
| IT Project & Programme Managers | £840 | £970 | £130 | 16% |
| IT Business Analysts, Architects & Systems Designers | £670 | £850 | £180 | 27% |
| Programmers & software development professionals | £710 | £760 | £50 | 7% |
| Web design & development professionals | £570 | £540 | -£30 | -5% |
| Other IT professionals | £640 | £750 | £110 | 17% |
| **IT Technicians:** | **£500** | **£560** | **£50** | **10%** |
| IT Operations Technicians | £520 | £550 | £30 | 6% |
| IT User Support Technicians | £490 | £560 | £70 | 14% |
| **IT Engineers** | - | **£480** | - | - |

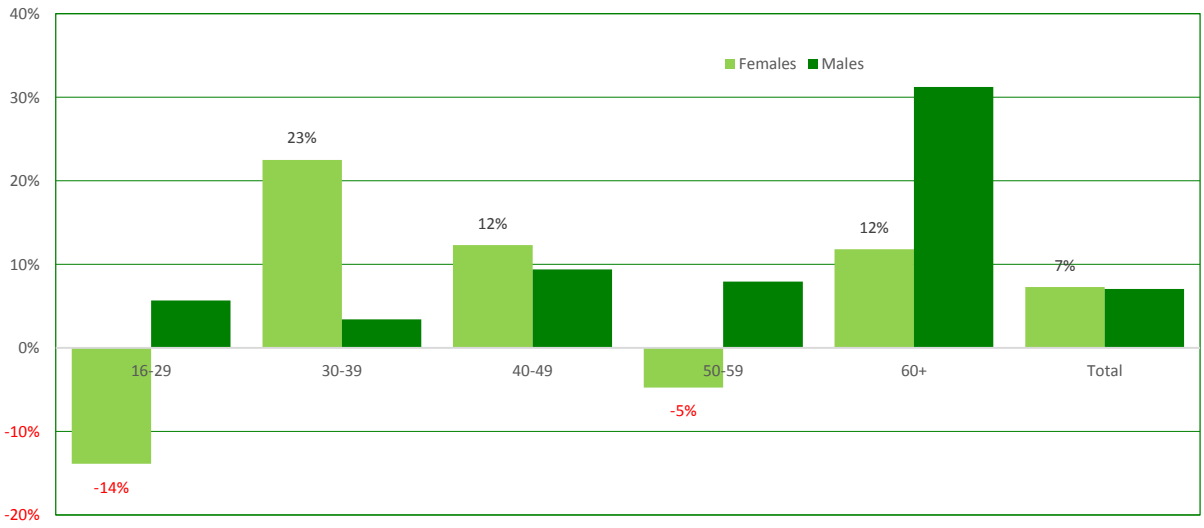
*Source: Analysis of ONS ASHE data undertaken by The Tech Partnership*

## 6.4 Individual characteristics

### 6.4.1 Age

The average age of male/female IT specialists remained unchanged in 2015 at 40 years in both cases - one year less than the average for all workers in the UK. There was however, a marked fall in the number of younger women working in such positions - those aged between 16-29 decreasing in number by 14% on the previous year in contrast to a 6% increase in the number of male IT specialists of this age.

*Figure 32: Change in number of IT specialists in the UK by gender, 2014-15*




*Source: Analysis of ONS Annual Population Survey data undertaken by The Tech Partnership*

### 6.4.2 Ethnicity

As in previous years by far the majority of female and male IT specialists working in the UK during 2015 described their ethnicity as 'white' (83% and 84% respectively) though this was slightly lower than for workers as a whole (with comparison figures of 89% and 88% for all female and all male workers).

### 6.4.3 Disabled status

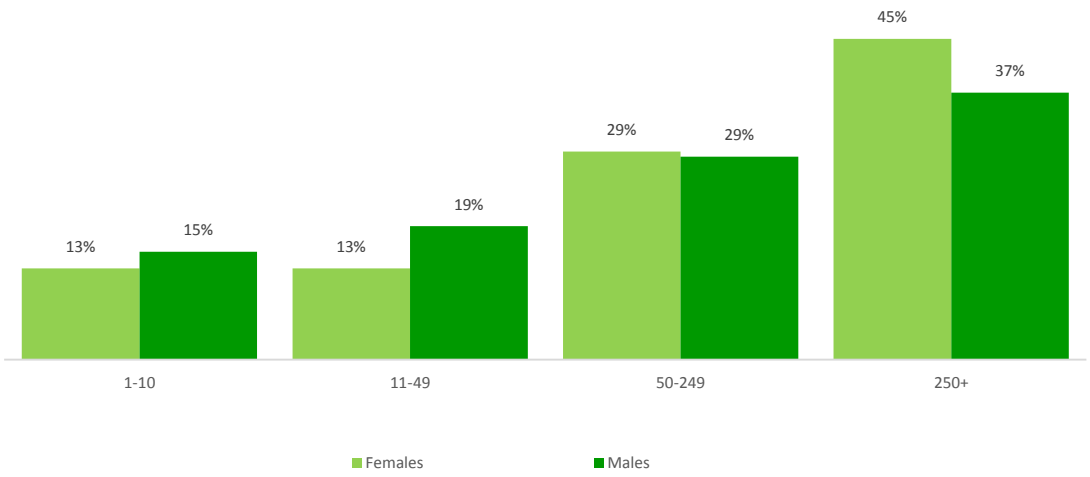
Less than one in ten female IT specialists (8%) working in the UK in 2015 had some form of 'work limiting disability' - a slightly higher proportion than that recorded amongst male IT specialists (5%) but less than the proportion for all workers (9%).

## 6.5 Employer characteristics

### 6.5.1 Size of employer

Micro/small and medium sized enterprises (MSMEs) [16] continue to account for the largest share of employment for IT specialists working in the UK and in 2015, just over one half (55%) of female employees working in such roles were doing so within firms of this size (as were 62% of male employees working in IT positions).

***Figure 33: IT specialists (employees) by size of employer, 2015***




*Source: Analysis of ONS Annual Population Survey data undertaken by The Tech Partnership*

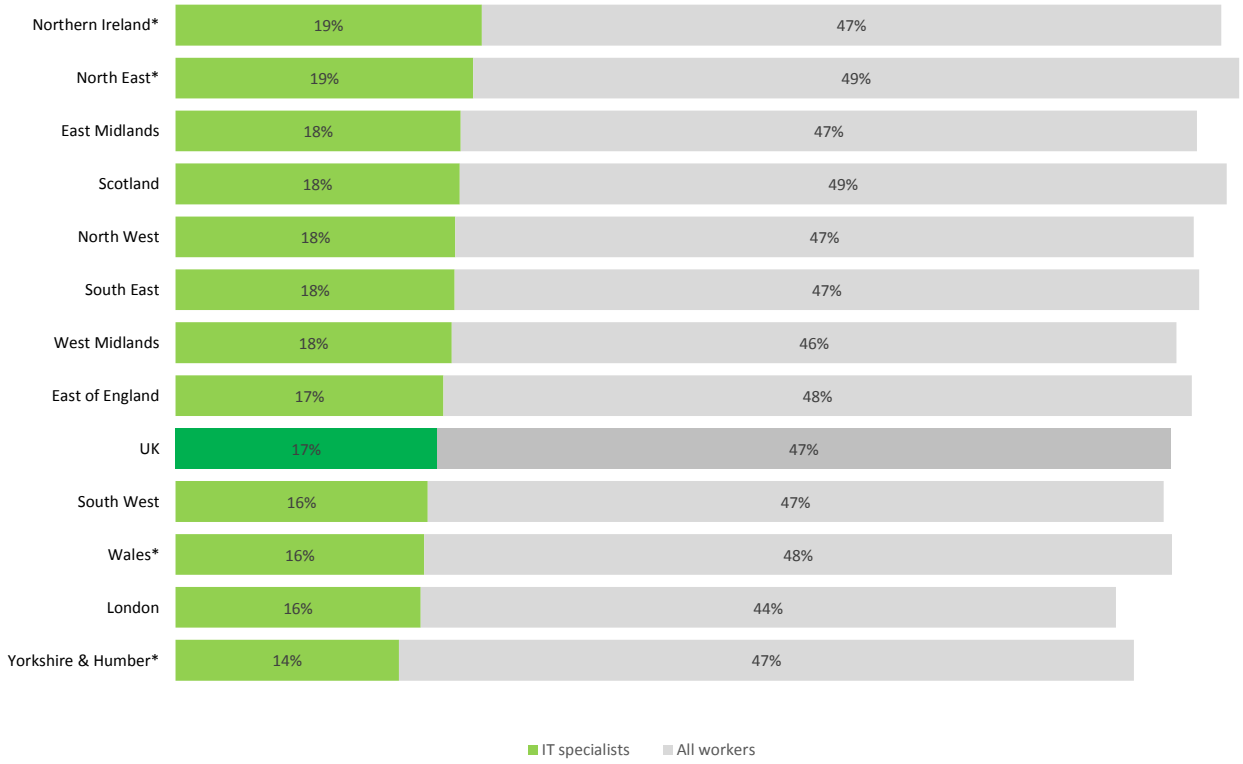
The proportion of IT specialists working in MSMEs was however, notably lower than that observed for the workforce as a whole amongst which 75% of female and 72% of male employees were found to be working in such firms.

16 Micro employers/firms are those with 1 - 10 staff, small employers/firms 11-49, medium sized businesses/firms 50-249 and large employers/firms 250 or more

### 6.5.2 Location of employment

Female IT specialists, like their male counterparts, are predominantly based in England and London / the South East of England in particular, with these two regions providing employment for 42% of those working in such roles (both females and males) during 2015. By comparison only 30% of the UK workforce as a whole were based in these areas.

***Figure 34: Female representation amongst IT specialists/all workers by nation/region, 201517***




*Source: Analysis of ONS Annual Population Survey data undertaken by The Tech Partnership*

Though a focus of IT specialist employment, neither London nor the South East were noted for particularly high levels of female representation, and at this level of disaggregation the same could be said for all nations/regions of the UK.

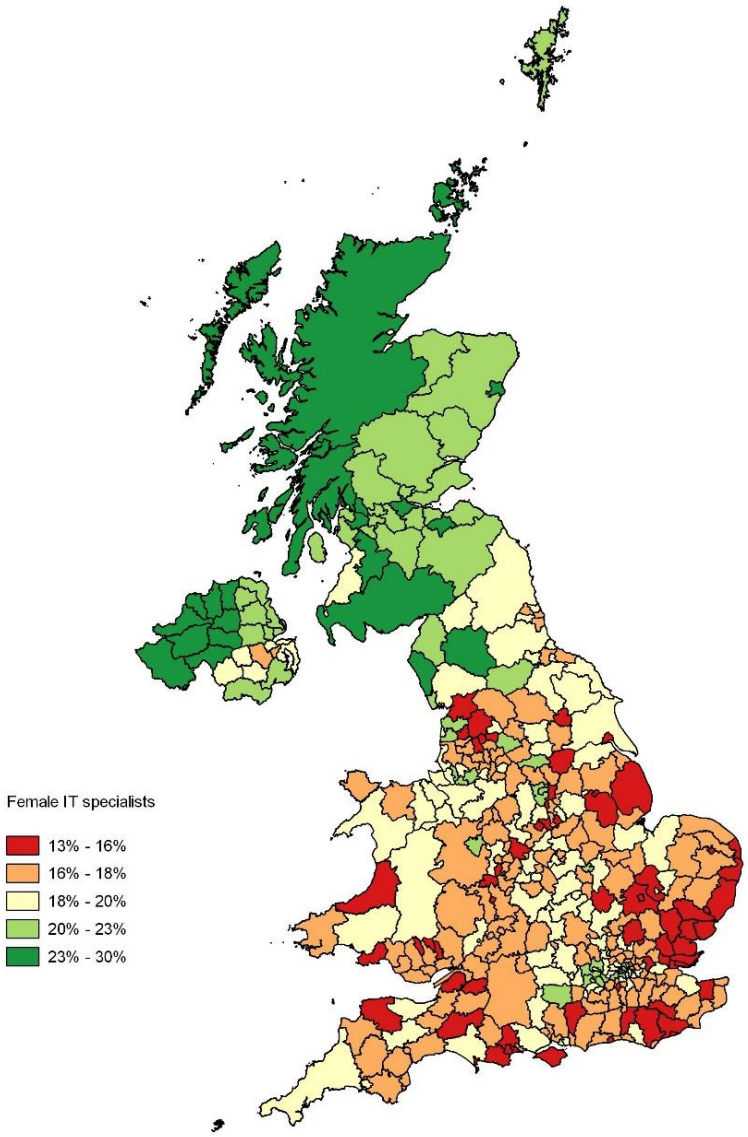
That is not to say that notable variations do not exist across the UK. An analysis of workforce data from the 2011 census[18] at district level shows the level of female representation for the IT professions ranging from just 13% in Burnley to 30% in the Scottish Highlands. At the same time, it should be noted that none of these areas was associated with a particularly high or low level of female representation for the workforce as a whole - in fact the overall proportion of female workers in both the Scottish Highlands and Burnley during 2011 was 47% - equal to the UK average

[17] Data for areas marked with an asterisk are based on a two year average for 2014-2015 to improve reliability of estimates based on small sample sizes.

[18] APS estimates at this level are generally unreliable due to the small sample sizes involved.

*Figure 35: Female IT specialists as a proportion of the total by local authority district, 2011*

| Highest | |
|---|---|
| Highlands | 30% |
| Copeland | 27% |
| West Dunbartonshire | 26% |
| Derry and Strabane | 26% |
| Orkney Islands | 26% |
| East Ayrshire | 25% |
| Fermanagh and Omagh | 25% |
| | |
| **Lowest** | |
| Tunbridge Wells | 14% |
| Blaenau Gwent | 14% |
| Blackburn with Darwen | 14% |
| East Lindsey | 14% |
| Babergh | 14% |
| Ribble Valley | 14% |
| Cambridge | 14% |
| Ipswich | 14% |
| Isle of Wight | 14% |
| Burnley | 13% |

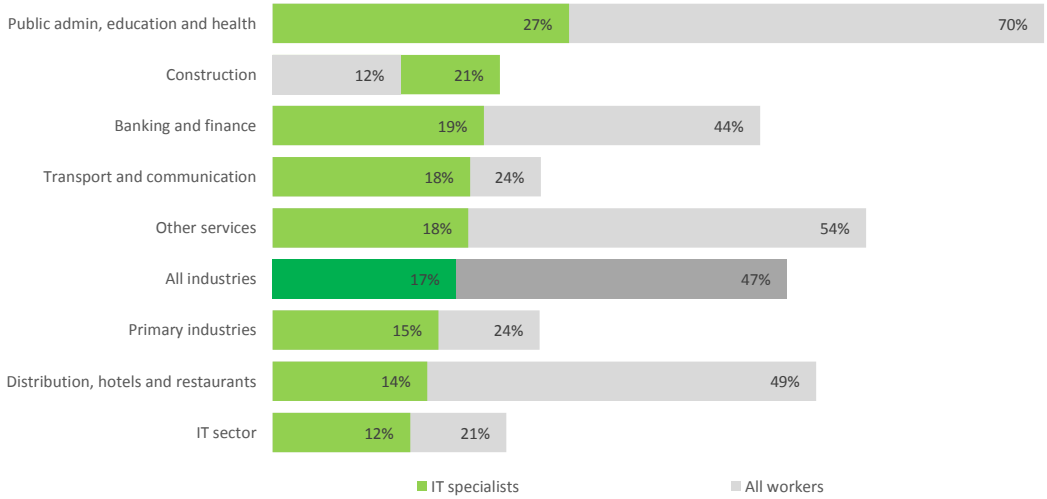



*Source: Analysis of 2011 Census data from ONS, National Records of Scotland and the Northern Ireland Statistics and Research Agency undertaken by the Tech Partnership*

### 6.5.3 Industry of employment

Understandably, the main employment sectors for female/male IT specialists in 2015 was IT, and in 2015 IT businesses provided work for just under one third of female IT specialists (32%) and almost one half (45%) of their male counterparts. Neither of these sectors was however, associated with particularly high levels of female representation either with respect to IT specialist employment, or employment as a whole - in fact at just 12% the proportion of IT specialists working in IT businesses who were female was lower than in any other broad industry grouping.

***Figure 36: Female representation amongst IT specialist/other positions by industry group, 2015***



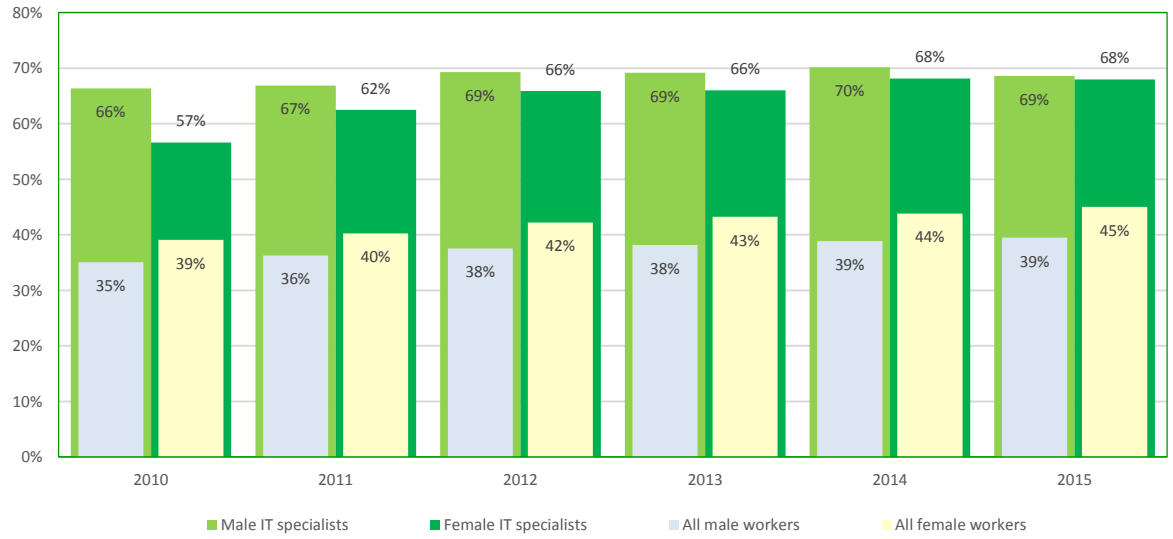

***Source: Analysis of ONS Annual Population Survey data undertaken by the Tech Partnership***

# 7 Workforce skills and CPD

## 7.1 Workforce qualification trends

In 2015, the proportions of female and male IT specialists qualified to HE level were much the same at 68% and 69% respectively, and in both cases, were well above the level observed for female/male workers as a whole (45% and 39%).

***Figure 37: Highest qualification held by IT specialists/other workers, 2010-15***




*Source: Analysis of ONS Annual Population Survey data undertaken by The Tech Partnership*

Amongst those female IT specialists who did not hold an HE level qualification, the majority had obtained an award at either A-level/equivalent or GCSE grades A*-C/equivalent (44% in each case), whilst the remainder had no qualifications or were unsure of the level held.

### 7.1.1 Prevalence of HE level qualifications explored

The likelihood that female IT specialists were in possession of an HE award was similar for those working full or part-time, though as noted in the previous Scorecard report, self-employed female IT specialists were slightly more likely to hold an HE level qualification than those working as employees (71% compared with 68%). Similarly, those working on a non-permanent basis were slightly more likely to hold an HE level qualification than those on permanent contracts (74% compared with 67%).

Comparing the level of award held by those working in different types of IT specialist positions, women working as Web Designers/Developers and Programmers/Developers appeared to be the highest qualified in 2015 on average with 81% and 80% respectively holding an HE level award. Conversely just 56% of those in Technician/Engineer jobs were seen to hold a qualification at this level.

*Table 6: Proportion of IT specialists with a higher level (HE) qualification, 2015*

| | Male | Female | Total |
|---|---|---|---|
| IT Directors | 73% | 72% | 72% |
| Specialist IT Managers | 60% | 68% | 66% |
| IT Project/Programme Managers | 72% | 76% | 75% |
| Business Analysts, Architects & System Designers | 70% | 74% | 73% |
| Programmers & Software Development Professionals | 80% | 80% | 80% |
| Web Design & Development Professionals | 81% | 62% | 67% |
| Other IT specialists | 67% | 67% | 67% |
| IT Technicians/Engineers | 56% | 50% | 51% |
| **All IT specialists** | **68%** | **67%** | **67%** |

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

By nation/region Scotland/Northern Ireland (combined) had the highest proportion of female IT specialists with an HE award (73%) followed by London/the South East of England (72%), Wales/the West of England (68%), the North of England (66%) and the Midlands/East of England (60%).

### 7.1.2 Nature of 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, 2015*

| | IT specialist | | All workers | |
|---|---|---|---|---|
| | Females | Males | Females | Males |
| With HE award | 68% | 69% | 46% | 40% |
| (of which) have degree | 84% | 85% | 76% | 78% |
| (of which) have first degree | 69% | 69% | 71% | 69% |
| (of which) have single subject | 76% | 84% | 80% | 83% |
| (of which) have IT degree | 23% | 40% | 1% | 7% |

*Source: Analysis of ONS Annual Population Survey data undertaken by The Tech Partnership*

## 7.2 Work based learning and development

### 7.2.1 Incidence of job-related education and training

The incidence of job-related education/training amongst of IT specialists (individuals stating that they had received this kind of education/training during the past 13 weeks) fell substantially between 2014 and 2015 from 26% to 23% whilst amongst the workforce as a whole, there was no change over the year (the level remaining at 26% in this case).

***Figure 38: Incidence of job-related education/training received in the past 13 weeks, 2005-15***


*Source: Analysis of ONS Annual Population Survey data undertaken by The Tech Partnership*

The fall was most pronounced amongst female as opposed to male IT specialists as the incidence of education/training for women in IT roles dropped from 27% to just 22% over the year - by comparison for male IT specialists there was a decline of just 1 percentage point from 25% to 24%.

### 7.2.2 Job-related education and training and characteristics of employment

As in previous years, female IT specialists working on a full-time basis were found to have been more likely to have received job-related education/training than those working part-time (22% versus 19% during 2015) and it was also the case for employees versus self-employed/contract workers where the difference was even more pronounced (25% and 13% respectively over the two-year period 2013/15) [19]. This was also the case though for male IT specialists and the UK workforce as a whole.

Further analysis of the incidence of education/training for female IT specialists by type of employer reveals that female IT specialists were much less likely to have received job-related education/training if working within an IT business (just 15%) or if employed within an SME (18%). Again, though these below the norm levels of education/training were also noted for males working in IT roles and for workers as a whole.

19 Two year average used due to small survey bases.

### 7.2.3 Nature of job-related education and training

Amongst those female IT specialists who had received job-related education/training during 2015[20], a similar proportion stated that they had received this education/training on-the-job as off-the-job (55% and 56% respectively). As in the previous year, just over one in ten (11%) of those who had received education/training stated that it had been undertaken via a combination of the two delivery methods. By comparison, for male IT specialists and workers more generally, the proportion receiving education/training on-the-job tended to be much higher (60% for male IT specialists and 65% for all workers).

### 7.2.4 Missed opportunities for job related education/training

As in previous years, it appears that many opportunities for individuals to undertake work related education/training opportunities were missed. In 2015, just under one fifth of female IT specialists (19%) and a similar proportion of male IT specialists (17%) stated that they had been offered education/training but that they had not taken up this offer. This was a slightly higher proportion than that recorded amongst males/females within the workforce as a whole (17% and 16% respectively).

## 7.3 BCS qualifications

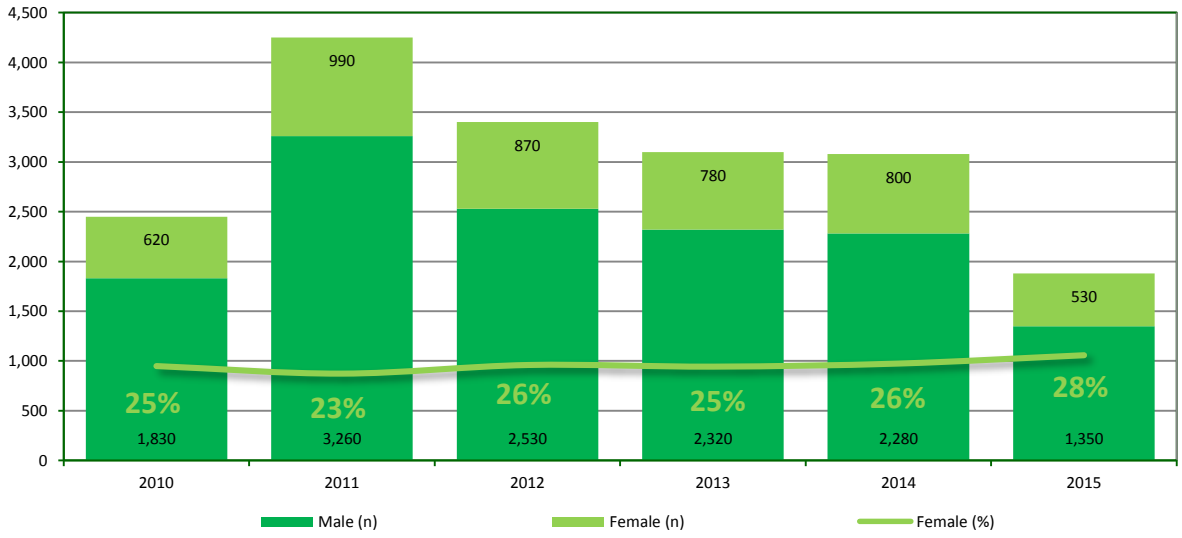
BCS offers a range of IT qualifications and certifications for those seeking to pursue/further develop a career in IT, notably, at HE level: the BCS Certificate in IT (a level 4 qualification equivalent to year one of a university honours degree), BCS Diploma in IT (a level 5 qualification equivalent 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.

### 7.3.1 BCS Higher Education Qualifications (HEQs)

There were just under 2,000 HEQ awards made by BCS in 2015, down from 3,000 in the previous year. The decline in HEQs was however, more pronounced amongst male IT specialists and as result, the proportion of HEQs gained by females working in IT roles was seen to rise from 26% to 28% of the total.

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

*Figure 39: HEQ awards by gender, 2010-15*

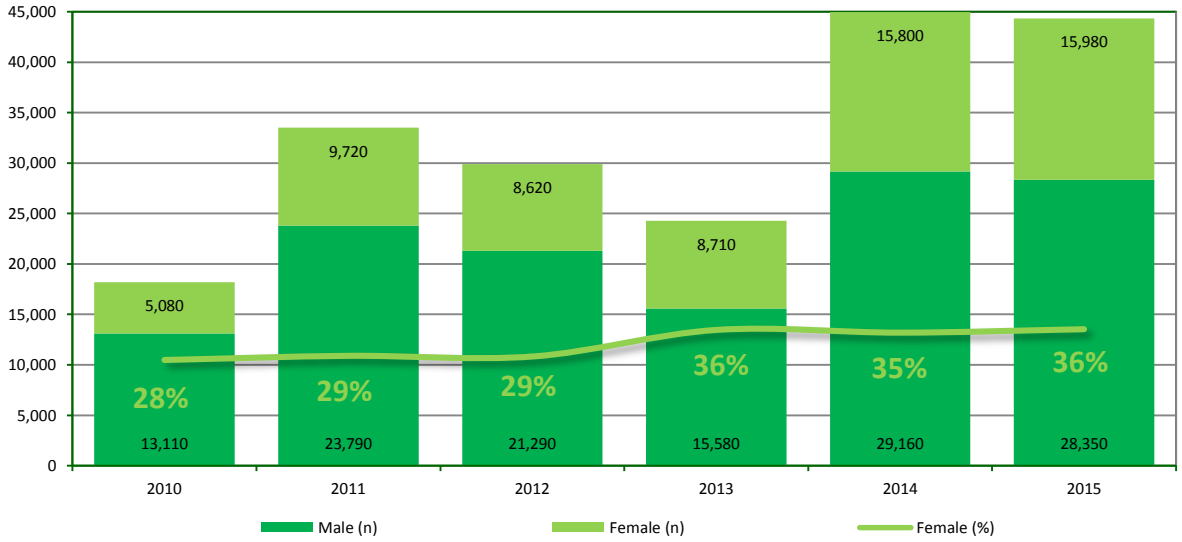



*Source: Analysis of BCS data undertaken by The Tech Partnership*

### 7.3.2 Information Systems Examinations Board (ISEB)/ BCS Professional Certifications

In 2015 the number of ISEB/Professional Certifications awarded was also down slightly on the previous year (by 1% to 45,000 awards) though compared with 2014, the number of awards to female IT specialists rose slightly and as such female representation amongst ISEB qualifiers increased from 35% to 36% of the total.

*Figure 40: ISEB awards by gender, 2010-15*




*Source: Analysis of BCS data undertaken by The Tech Partnership*

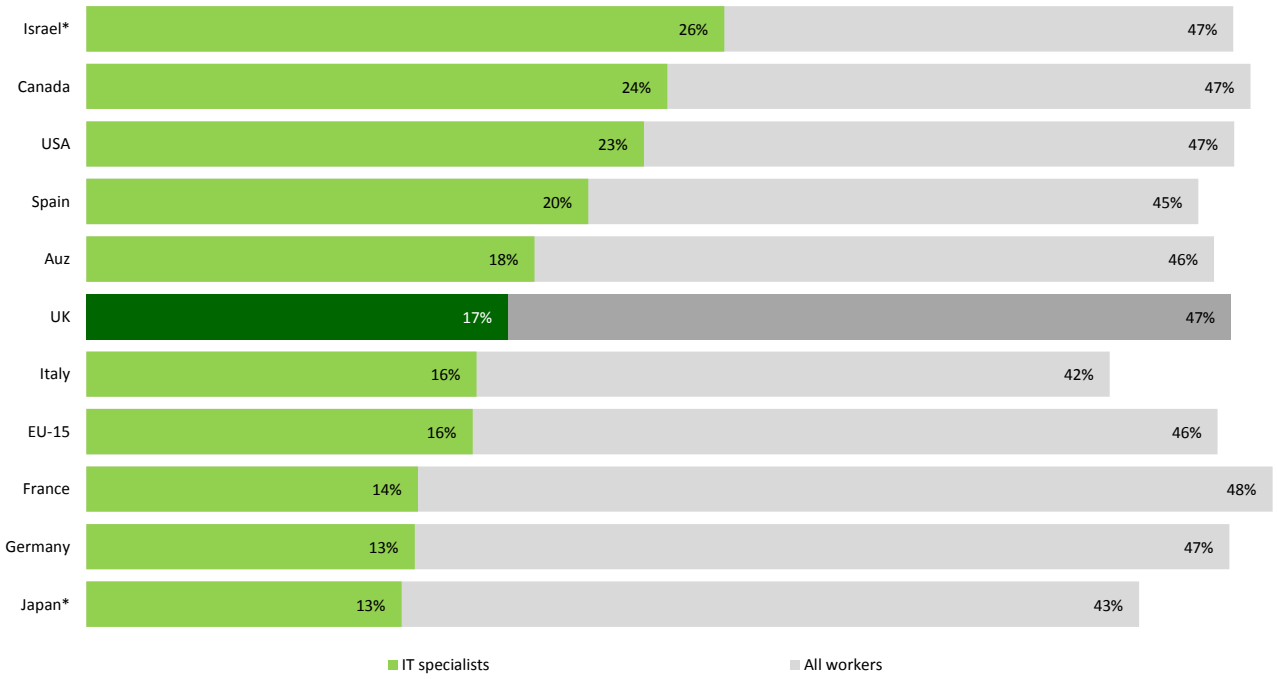
# 8 Area comparisons

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.[21]

## 8.1 Global comparisons

Though amongst most leading nations females account for around half of the workforce, when considering IT specialist positions in particular, female representation is seen to be universally low. This said the level recorded in the UK is still notably below the level recorded within Israel, Canada and the United states in particular as illustrated in the chart below.

***Figure 41: Female workforce representation within selected leading nations 2015[22]***




* Latest data for Israel and Japan relate to 2013/2012 respectively

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

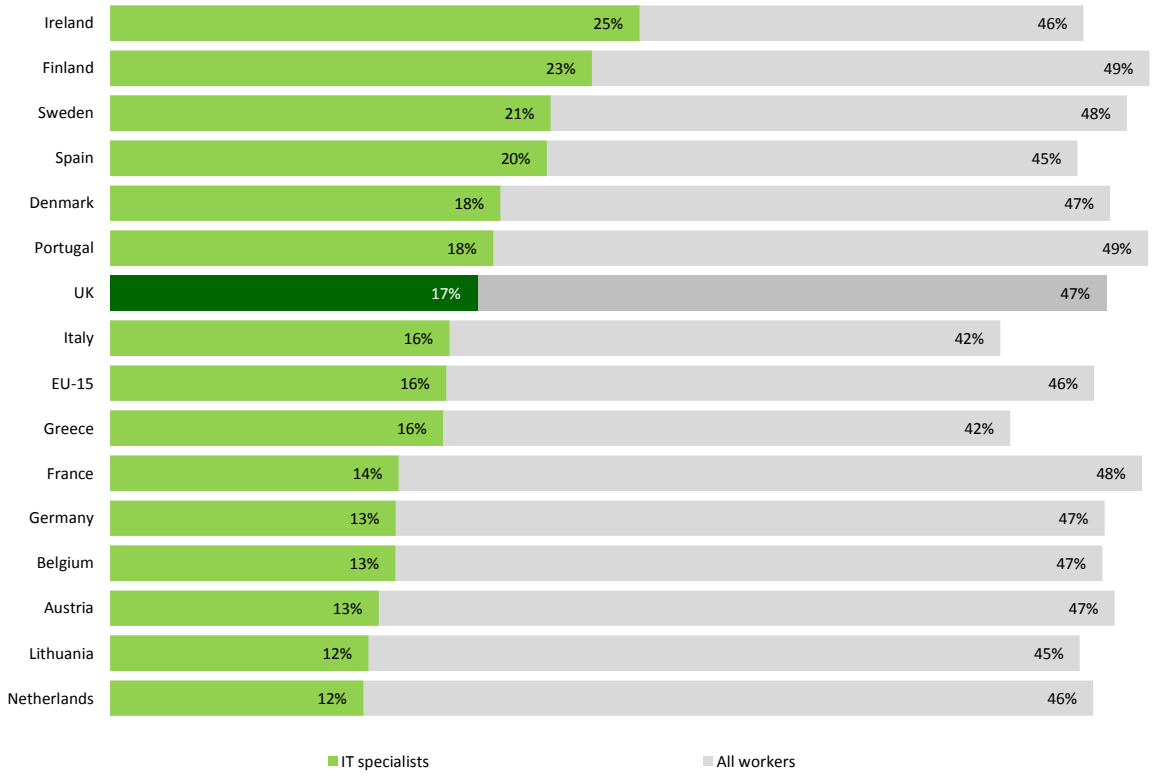
21 It should be noted that in each case differing methodologies for data collection and occupational classification are likely to exist and as such the comparisons presented should be viewed as indicative only

22 Ibid

## 8.2 The European Union

Compared with other EU nations the UK fares much better however and female representation within IT specialist positions in the UK in 2015 was higher than the EU15 average 17% and 16% respectively). Again however, a much better gender balance was observed within certain countries notably Ireland and Finland.

***Figure 42: Female representation in amongst the EU15, 2015***




*Source: Analysis of Eurostat data undertaken by The Tech Partnership*

# Data notes

## ONS Annual Population Survey (APS) and Quarterly Labour Force Survey (QLFS)

The APS is a continuous household survey, undertaken each year by the ONS. It is the largest household survey in the UK with a sample size of approximately 320,000 respondents per annum and spans a range of topics including employment and unemployment, health, housing, education, earnings, internet usage and personal well-being. The data sets consist of 12 months of survey data that are broken down on a quarterly basis. The APS and related quarterly data sets (QLFS) are used to provide 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.

## 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 2011 and 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:

APS workforce estimates - figures rounded to nearest 1,000

APS 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

* And in some cases the absence of response data.

.

**The Tech Partnership** is the network of employers collaborating to create the skills for the digital economy. Our ambition is to deliver the skills for a million digital jobs in the UK by 2025, by inspiring new and diverse talent into digital careers; raising the quality of digital skills training and education; and enabling employers to offer high quality digital apprenticeships.

**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

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