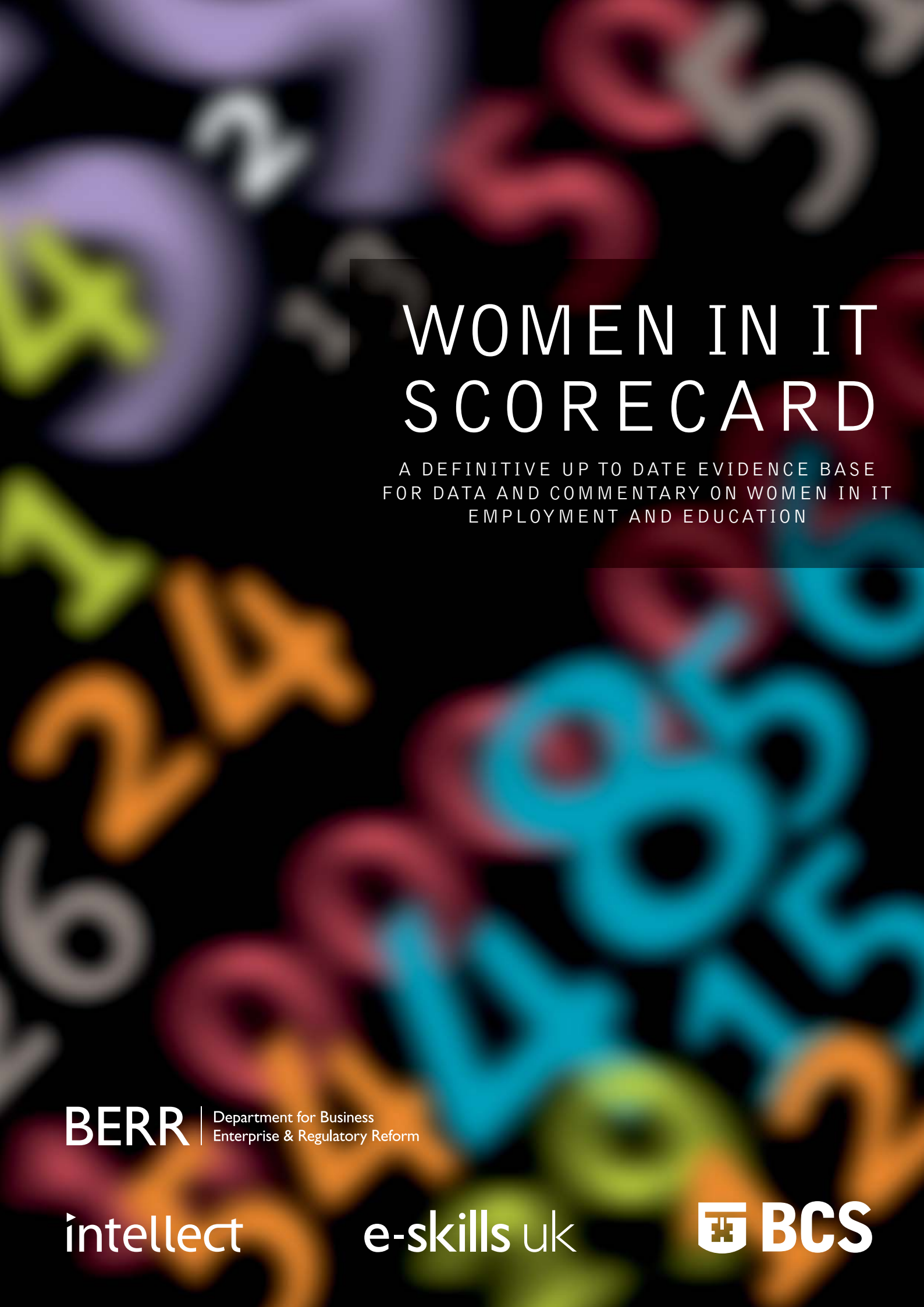

WOMEN IN IT SCORECARD

A DEFINITIVE UP TO DATE EVIDENCE BASE FOR DATA AND COMMENTARY ON WOMEN IN IT EMPLOYMENT AND EDUCATION

BERR | Department for Business Enterprise & Regulatory Reform

intellect

e-skills uk

BCS

Females consistently achieve higher grades than their male equivalents in IT related subjects

The gender divide stems in part from the ICT education system with negative experiences of GCSE ICT affecting future subject choices

CONTENTS

1. BACKGROUND

BCS, e-skills UK and Intellect, with support from BERR, have worked in partnership to produce a 'Women in IT scorecard.' The report starts with an analysis of the low female representation levels in the IT workforce and then follows this issue back to the apparent reluctance of females to take Computer Science / IT related subjects at Higher and Secondary Education levels.

The purpose of this document is to provide a robust evidence base for the facts behind the trends, to demonstrate differences in the participation rates between the genders and to present an analysis of these trends and the current situation to inform policy debate and future action by the partners and their communities.

2. INTRODUCTION

IT & Telecoms is central to the UK economy and a key source of competitiveness for all sectors; opening up new markets, increasing performance and driving productivity. The UK's IT industry alone produces an annual GVA of £30.6 billion, 3% of the total UK economy[1] with the continued adoption and exploitation of ICT having the capacity to generate an additional £35 billion of GVA to the UK economy over the next five to seven years.[2]

In the UK 1.2 million people are employed in the IT workforce[3] (597,000 in the IT industry itself and 650,000 IT professionals working in other industries).[4] These are the people upon which the 22 million employees who use IT in their daily work rely upon for the creation, implementation and operation of systems, services and communications, forming the backbone of companies across the UK.

IT is not just an important industry in its own right; it underpins and enables the growth of the wider knowledge economy and sectors such as financial services and the creative industries depend on the IT workforce for their continued competitiveness. Whilst employment in IT professional occupations has more than doubled since the early 1990s, the representation of females within IT occupations has steadily declined. This stems from low female representation levels in IT related subjects in both Secondary and Higher Education.

This document provides details of participation rates and trends by gender from Secondary Education through into the IT workforce. International comparisons by gender in ICT occupations and the ICT industry as well as an evaluation across other STEM[5] subjects are made, investigating whether the low representation levels of females is a problem limited just to the IT workforce in the UK or is an issue that needs to be addressed throughout STEM subjects and across the globe.

[1] 2004 data based on IT SIC 72: Source: Office for National Statistics (ONS) United Kingdom Input-Output Analyses 2006 edition.

[2] 'Technology Counts: IT & Telecoms Insights 2008' e-skills UK.

[3] **Key terms of reference**

- **The IT workforce:** This encompasses people working in the IT industry as well as IT professionals working in other industries.
- **The IT Industry:** This only includes those who work within the IT industry.
- **IT professionals:** This specifically refers to people employed in IT occupations.

[4] ONS LFS 2008.

[5] STEM refers to Science, Technology, Engineering, and Mathematics.

3. KEY MESSAGES

3.1 The problem

The gender divide starts early in the ICT education system. Low female participation rates exist at GCSE level, the gap increases at A-level, is even more pronounced in Higher Education and continues into the IT professional workforce. The lack of females taking IT related qualifications directly impacts upon the proportion of females that are employed today as IT professionals. Interestingly although females taking IT related qualifications in Secondary Education are low in number, they consistently outperform their male counterparts and the supposition is therefore that if females were more inclined to participate in IT careers then the pool of talent available to IT employers might improve noticeably.

Female participation rates at A-Level and in Higher Education across the majority of STEM subjects fall short of averages seen across all subjects. Notable exceptions are biological sciences and chemistry; the latter has only recently seen parity in numbers.

Given that the trend in the under representation of females throughout ICT education and careers has been predominately downwards for some years, it suggests that this situation is likely to worsen further - unless there are some significant and meaningful interventions. The gender imbalance throughout ICT education must be rectified if the UK is to meet both the current demand and the continuing future growth of the IT professional workforce over the next decade. e-skills UK's recent employment forecasts work, in partnership with Experian, identified that there is a need for an average of around 141,000 new entrants a year into IT & Telecoms professional job roles through to 2012, with a minimum of around 27,000 (19%) needing to be filled by people joining from education. [6]

3.2 The representation of females – the workforce

- Males outnumber females in the IT industry by nearly 4:1.
- Females account for around one in every five IT professionals.
- Less than 10% of females have achieved chartered status of CITP.[7]
- Just 23% of the IT workforce is female. Across the UK's working population this figure almost doubles to 45%.

3.3 Higher education

- In Computer Science / IT related subjects females account for just 15 % of both applicants and acceptances in 2008.

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[6] 'Technology Counts: IT & Telecoms Insights 2008' e-skills UK.

[7] Chartered IT Professional.

- Whilst the number of qualifiers across all subjects has risen year on year, the number of female and male qualifiers from Computer Science / IT related subjects is declining. This is as a result of the earlier decline in applicants / acceptances for such courses and is expected to continue to decline for some time.
- Just 20% of Computer Science / IT related degree qualifiers and 37% of qualifiers from STEM subjects are female.

3.4 Secondary education

- Since 2001, numbers taking ICT GCSEs have fallen by 26%.
- Since 2003, there has been a 50% decline in overall numbers taking Computing A-Levels and a 32% decline in ICT A-Levels.
- Females account for just 9% of those taking Computing A-Levels, with this proportion having steadily fallen over the last five years.
- 62% of ICT A-Levels taken are by males.
- Although fewer in number, females outperform males in IT related subjects at both GCSE and A-Level.

3.5 Qualifications and earnings

- Compared to all other occupations, the IT professional workforce and those working in the IT industry are highly qualified with males more likely than their female equivalents to hold levels 4 or 5 qualifications, the reverse of that seen across all other occupations / industries in the UK.
- Each year (2001-2008) and across all age groups, female IT professionals have consistently earned less than male IT professionals.
- In 2008 female IT professionals earned 13% less than their male equivalents.
- It pays dividends for IT professionals and in particular for female IT professionals to hold as higher a qualification as possible.

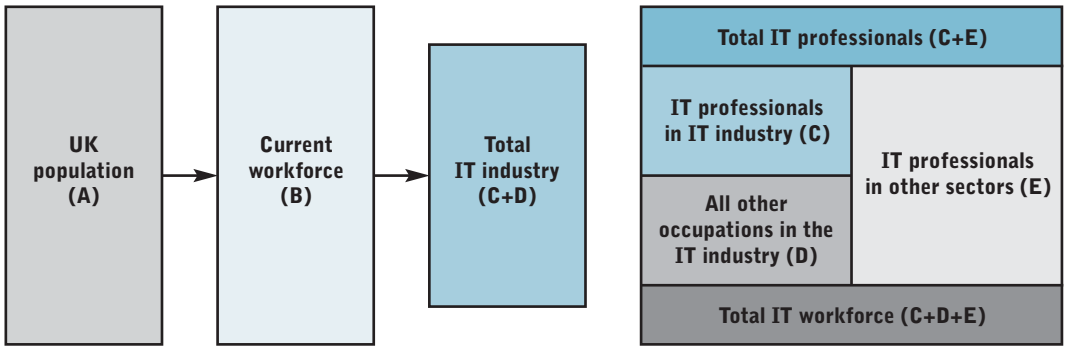
3.6 International comparisons

- Gender imbalance in both the ICT industry and in ICT occupations occurs in many other countries.
    - Female representation levels in the ICT industry are greatest in Italy and Ireland (30%), with the UK being noticeably lower (21%).

4. THE REPRESENTATION OF FEMALES IN THE IT WORKFORCE

The diagram below shows the inter-relationships between industry and professionals.

The IT workforce – high level segmentation

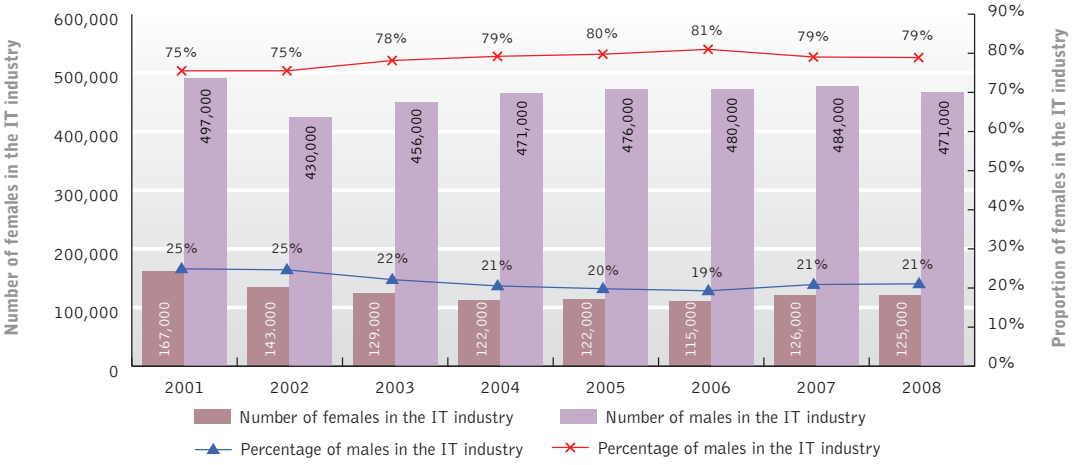


Source: e-skills UK.

4.1 The IT industry[8]

Gender imbalance remains a significant and worsening issue for the IT sector. Since 2001 the proportion of females in the IT industry has fallen by four percentage points to just 21%. There are now nearly four males to every female working in the IT industry. This represents a fall of 26,000 males and a fall of 42,000 females between 2001 and 2008.

Figure 1: The representation of females in the IT industry



Source: e-skills UK analysis of ONS LFS 2001- 2008.

[8] **The IT industry:** This only includes those who work within the IT industry.

Males out number females in the IT industry by nearly 4:1

Female IT professionals are more heavily represented in occupations such as database assistants and clerks and IT user support

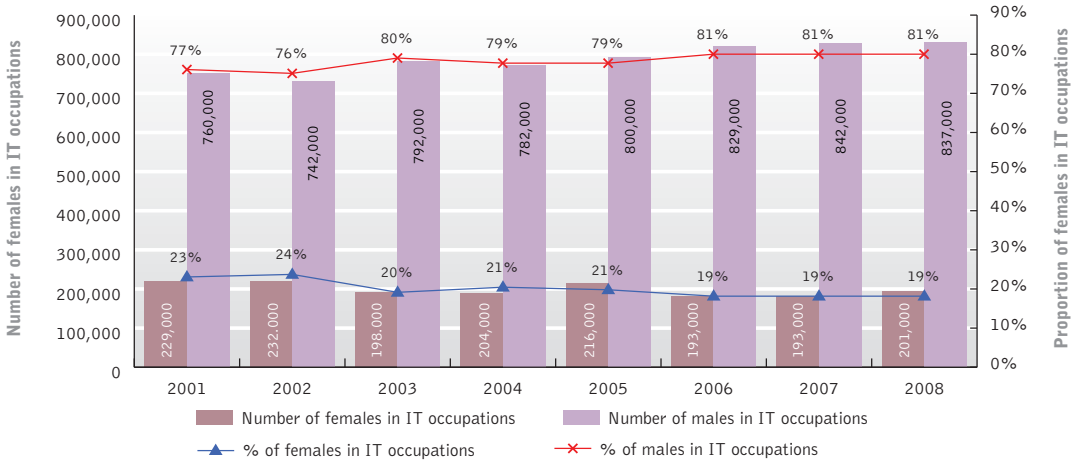
As seniority increases, female representation levels in academic staff involved in teaching and research work in Computer Science / IT related subjects decreases

Across SET occupations there are four males to every one female

4.2 IT Professional occupations [9]

As with the IT industry, females account for around one in every five IT professionals, a fall of four percentage points since 2001. The number of females in the IT professional workforce has fallen by 12% since 2001, representing a loss of 28,000. In contrast over the same time period, the number of male IT professionals has increased by 10% or 77,000.

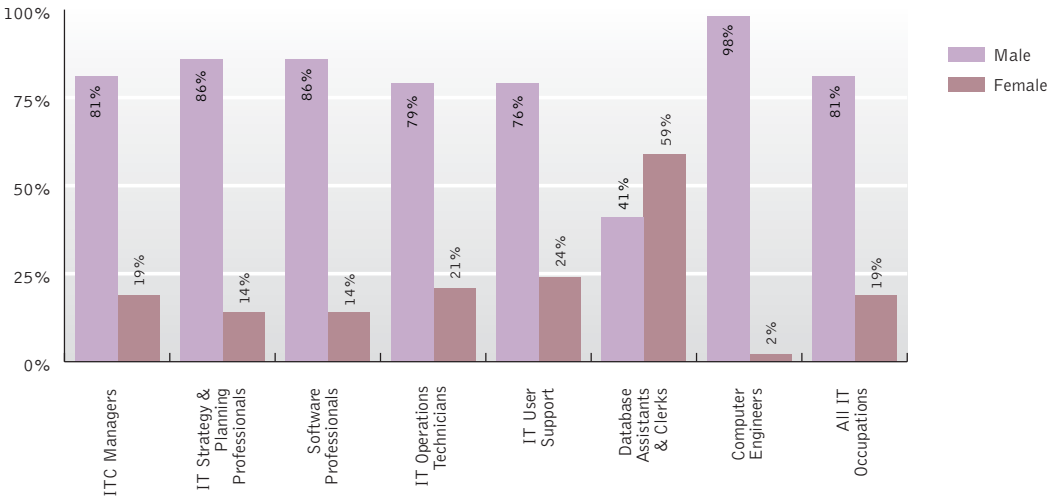
Figure 2: The representation of females in IT occupations



Source: e-skills UK analysis of ONS LFS 2001-2008.

Analysing IT occupations in more detail, it is clear females are more heavily represented in the lower skilled, less well paid occupations. Females account for just 19% of ICT Managers and 14% of IT Strategy and Planning Professionals, but comprise nearly three fifths of Database Assistants / Clerks. This occupation, the only IT occupation where females outnumber males, is the joint least well paid at £375 per week and well the below the national average (£425) – see figure 23 later.

Figure 3: The representation of females in individual IT occupations



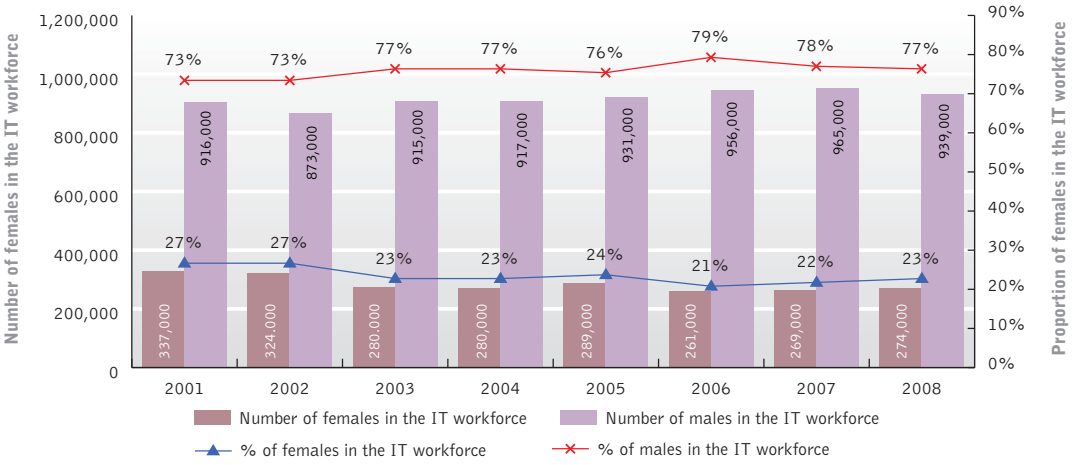
Source: e-skills UK analysis of ONS LFS Q2.2008.

[9] **IT professionals:** This specifically refers to people employed in IT occupations.

4.3 IT workforce[10]

Across the UK, females account for 45% of the working population. In the IT workforce this proportion is almost halved to just 23%, which has declined from 27% in 2001. Since 2001 the number of males in the IT workforce has increased by 3%, or a gain of 23,000 males, while the number of females has declined by 19%. This represents a loss of 63,000.

Figure 4: The representation of females in the IT workforce



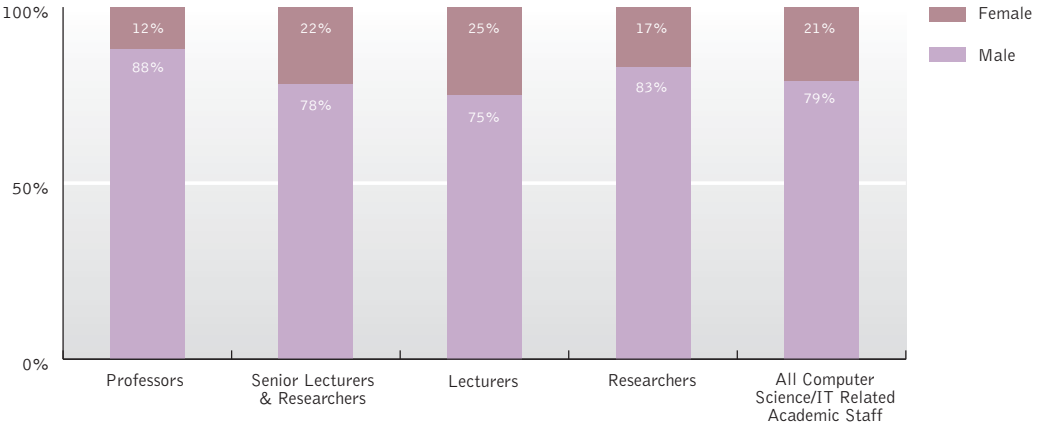
Source: e-skills UK analysis of ONS LFS 2001-2008.

4.4 Academic staff involved in teaching and research work in Computer Science / IT related subjects in Higher Education

The representation of female academic staff involved in teaching and research work in Computer Science / IT related subjects decreases as seniority increases. Just 12% of professors compared to 22 % of senior lecturers and researchers and 25% of lecturers are female.

Across all academic staff teaching Computer Science / IT related subjects in Higher Education institutions just 21% are female.

Figure 5: Academic staff involved in teaching and research work in computer science / IT related subjects in higher education by gender



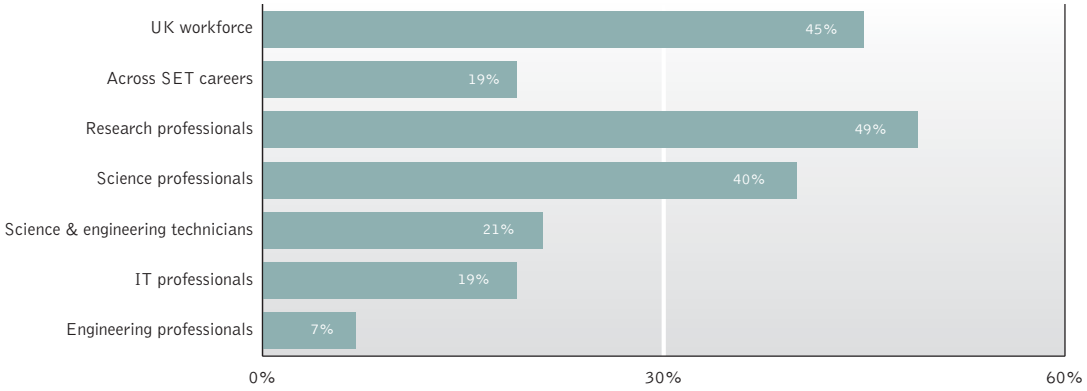
Source: e-skills UK analysis of HESA Lecturer 2007 data.

[10] **The IT workforce:** This encompasses people working in the IT industry as well as IT professionals working in other industries.

4.5 SET careers[11]

Females account for, on average, 19% of people in SET (science, engineering and technology) careers. Substantial disparities do however exist, dependant upon occupation. For example nearly half of research professionals are female compared to just 7% of engineering professionals.

Figure 6: The proportion of females in SET careers



Source: e-skills UK analysis of ONS LFS Q2.2008.

Table 1: The number of females in SET careers

	Male	Female	Total
IT professionals	837,000	201,000	1,039,000
Science professionals	83,000	55,000	138,000
Engineering professionals	448,000	35,000	483,000
Research professionals	39,000	37,000	76,000
Science & engineering technicians	179,000	49,000	228,000
Total	1,588,000	376,000	1,964,000

Source: e-skills UK analysis of ONS LFS Q2.2008.

[11] **SET** refers to science, engineering and technology

5. HIGHER EDUCATION

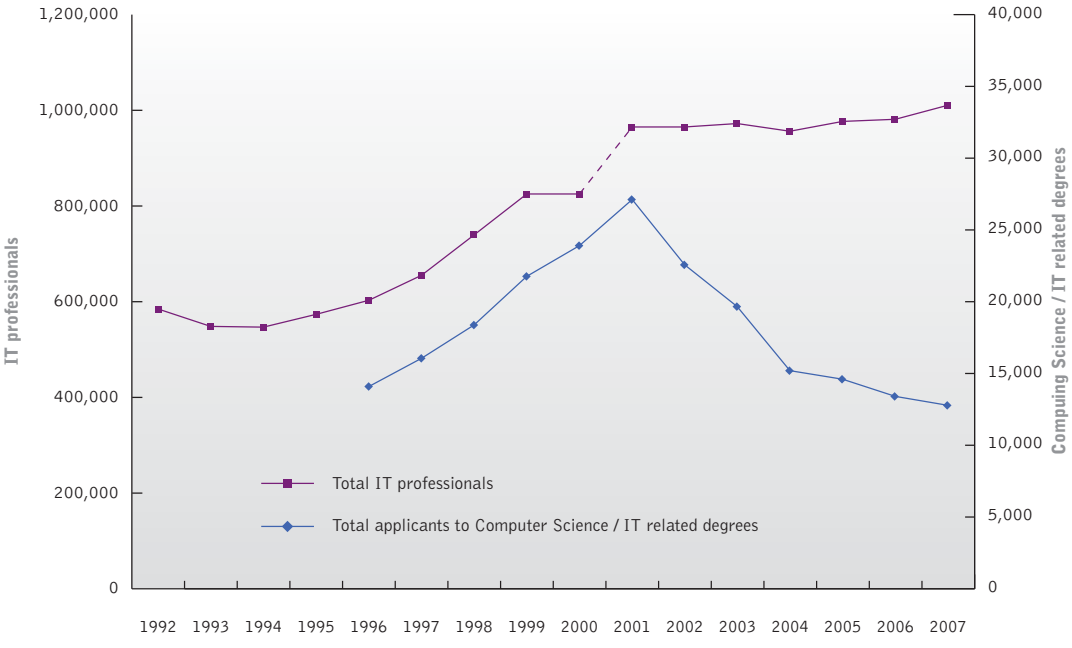
5.1 Applicants[12] to Computer Science / IT related degree courses

A key issue affecting IT & Telecoms undergraduate provision is the massive drop off of applicants to Computer Science / IT related courses. Influenced by a number of factors, the number of applicants to such courses has declined from 31,000 in 2001 to 15,000 in 2007. Within that, UK domiciled applicants (85% of the total in 2007) have dropped from 27,000 in 2001 to 13,000 in 2007- a 52% reduction in the six year period. By contrast, the total number of applicants to all degree courses has increased year on year, and by 15% over the same six year period.

Comparing female representation levels of applicants to Computer Science / IT related degrees between UK and non UK domiciled students, there is a slightly higher proportion from non UK domiciled students: 17% vs 14%.

Figure 7 shows the profile of UK applicants to Computer Science / IT related degree courses 1996-2007, contrasted with the continual growth in the number of people in IT professional occupations.

Figure 7: IT professionals in the UK workforce / UK applicants to Computer Science / IT related degrees



Source: e-skills UK analysis of ONS LFS and UCAS[13] data. Post 2000 LFS data uses SOC 2000.

[12] UCAS applicants are those who apply to full-time, undergraduate Higher Education courses offered by universities or colleges in membership of the UCAS scheme.

[13] UCAS data analysis is based on subject line G4,5,6,7.

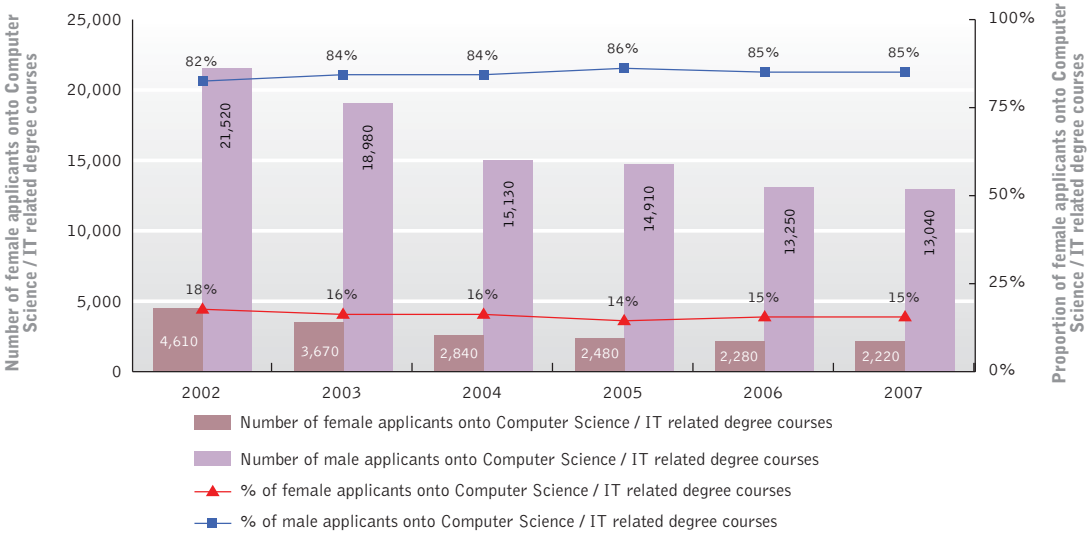
5.2 Representation in Higher Education

5.2.1 Applicants and acceptances on degree programmes

Across all subjects in Higher Education females account for 46% of applicants and 55% of acceptances.[14] By stark contrast, in Computer Science / IT related subjects, females make up just 15% of both applicants and acceptances in 2007.

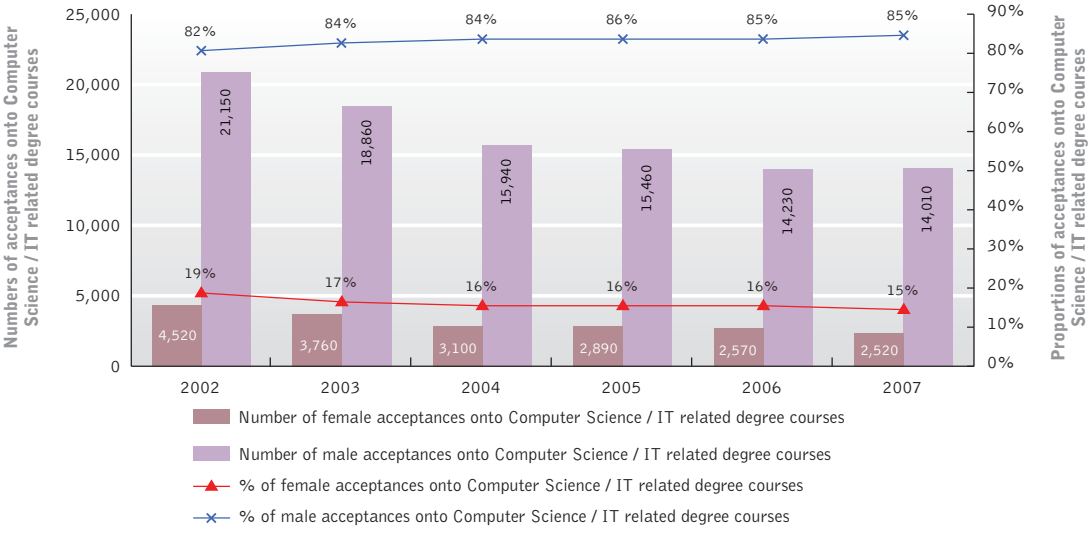
The proportion of applicants and acceptances that females account for on Computer Science / IT related courses has fallen by three and four percentage points respectively in the last five years.

Figure 8: Higher Education applicants for Computer Science / IT related degrees by gender



Source: e-skills UK analysis of UCAS Applicants 2002-2007.

Figure 9: Acceptances in Computer Science / IT related degrees by gender



Source: e-skills UK analysis of UCAS Acceptances 2002-2007.

[14] Source UCAS Applicants and Acceptances 2007.

Whilst the IT professional workforce continues to grow, the number of UK applicants to Computer Science / IT related degrees is continuing to decline

Both applicants and acceptances onto Computer Science / IT related courses are dominated by males

Just 13% of applicants and 12% of acceptances for engineering subjects in Higher Education are female

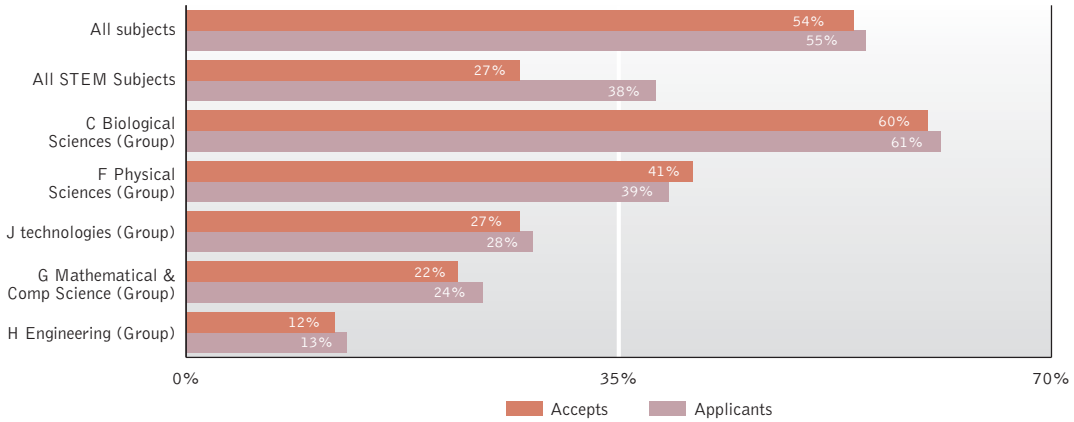
Whilst the number of qualifiers across all subjects has risen year on year, since 2004 the number of qualifiers from Computer Science / IT related degrees has declined

5.2.2 Applicants and acceptances across STEM subjects

Across STEM subjects, females account for on average just 38% of applicants and 27% of acceptance, with these proportions dropping to as low as 13% and 12% respectively for engineering.

As is the case with A-Levels (see figure 17), the biological sciences group is the only STEM subject group where female participation rates are not lower than the average seen across all subjects.

Figure 10: Proportion of female applicants and accepts in / onto STEM subjects in Higher education



Source: e-skills UK analysis of UCAS Applicants and Acceptances 2007.

Table 2: Number of female applicants and accepts in / onto STEM subjects in Higher Education

	Applications			Accepts		
	Male	Female	Total	Male	Female	Total
C Biological sciences (Group)	75,120	118,540	193,660	13,170	20,150	33,320
F Physical sciences (Group)	52,550	34,040	86,590	9,390	6,420	15,810
G Mathematical & comp science (Group)	93,970	29,560	123,530	19,163	5,460	24,620
H Engineering (Group)	102,570	14,750	117,330	19,180	2,740	21,910
J Technologies (Group)	8,480	3,290	11,770	2,130	790	2,910
Total	332,690	200,180	532,870	63,030	35,550	98,580

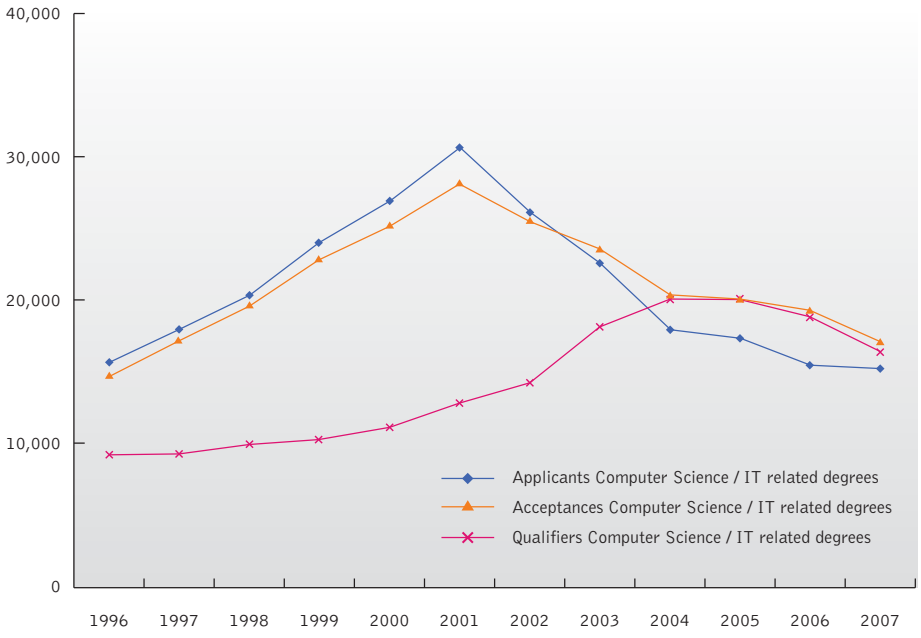
Source: e-skills UK analysis of UCAS Applicants and Acceptances 2007.

5.3 Degree qualifiers in Computer Science / IT subjects[15]

Qualifiers data provides an estimation of the potential pool of graduates in each discipline that could enter the labour market. The number of qualifiers across all subjects has risen year on year, increasing in number by 25% since 2001. However, since 2004 the number of qualifiers in Computer Science / IT related subjects is declining. It takes between three and four years to complete such a degree; the decrease in the number of applicants and acceptances for Computer Science / IT related courses is consequently beginning to filter through and affect the number of qualifiers in these subjects.

Figure 11 shows the trend in applicants and acceptances numbers for Computer Science / IT related degrees and the number of qualifiers. It can be seen that the peak for applicants and subsequent acceptances was in 2001 and the peak for qualifiers was in 2005. From the graph it can be deduced that the fall in applicants / acceptances affects the number of qualifiers three to four years later and that the number of qualifiers in future years might be expected to decline further.

Figure 11: IT related subjects – applicants, acceptances and qualifiers



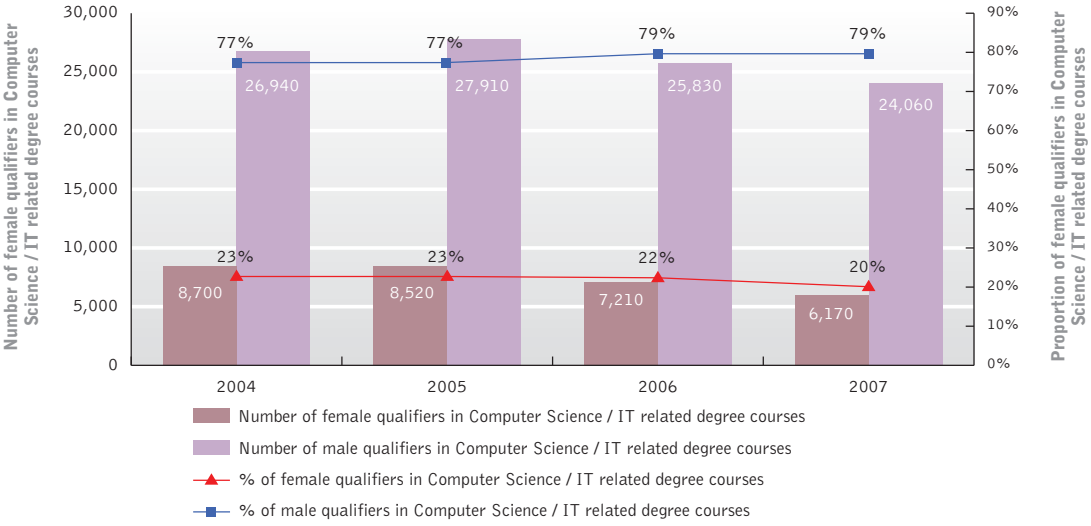
Source: e-skills UK analysis of UCAS and HESA data

Figure 12 shows that females account for 20% of qualifiers from Computer Science / IT related courses. Since 2004 the gap between the genders has widened by three percentage points. The number of female qualifiers has fallen by 29% over this time period, 18 percentage points more than the fall in number of male qualifiers from Computer Science / IT related degree courses.

The story is much the same in qualifiers from Computer Science / IT related post graduate degrees where females account for just 22% and males 88%.

[15] This refers to first degree qualifiers only.

Figure 12: Qualifiers in Computer Science / IT related degrees by gender



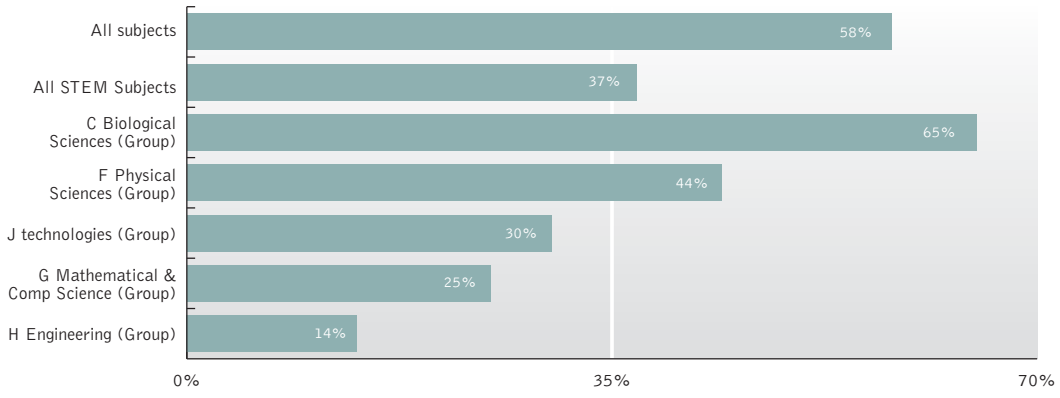
Source: e-skills UK analysis of HESA Qualifiers 2004-2007.

5.4 Degree qualifiers in STEM subjects

Low female representation levels in STEM subjects (excluding the biological sciences group) at A-Level (Figure 17) and in Higher Education (Figure 10) has filtered through and affected the proportion of female qualifiers from STEM subjects.

Across STEM subjects, just 37% are female, 19 percentage points lower than the proportion of qualifiers females account for across all subjects (numbers provided in Table 3).

Figure 13: Proportion of female qualifiers from STEM subjects in Higher Education



Source: e-skills UK analysis of HESA 2007.

Table 3: Number of female qualifiers from STEM subjects in Higher Education

	Male	Female	Total
H Engineering (Group)	28,820	4,810	33,630
G Mathematical & Comp Science (Group)	29,510	9,600	39,110
J Technologies (Group)	3,250	1,420	4,670
F Physical Sciences (Group)	11,790	9,310	21,100
C Biological Sciences (Group)	14,860	27,320	42,180
All STEM Subjects	88,230	52,460	140,690
All Subjects	268,470	371,480	639,950

Source: e-skills UK analysis of HESA 2007.

The fall in applicants for and acceptances onto Computer Science / IT related courses is beginning to filter through and affect the number of qualifiers in such subjects

37% of qualifiers from STEM subjects are female

Since 2002 numbers taking ICT GCSEs across the UK have fallen by more than a quarter

6. SECONDARY EDUCATION

Gender differences are evident in the representation and attainment at both GCSE and A-Level. This section presents data for both.

6.1 Proportions taking ICT GCSE

The gap between the genders in terms of those taking ICT GCSEs in the UK[16] has narrowed by six percentage points since 2002. In 2008 56% were male and 44% female.

Table 4: Proportion of those taking ICT GCSE by nation and gender

		2002	2003	2004	2005	2006	2007	2008
All of UK[17]	Male	59%	60%	58%	57%	55%	55%	56%
	Female	41%	40%	42%	43%	44%	45%	44%
England Only	Male	59%	60%	58%	57%	55%	55%	55%
	Female	41%	40%	42%	43%	45%	45%	45%
Wales Only	Male	58%	56%	57%	56%	56%	55%	56%
	Female	42%	44%	43%	44%	44%	45%	44%
N. Ireland Only	Male	66%	62%	62%	60%	59%	59%	58%
	Female	34%	38%	38%	40%	41%	41%	42%

Source: e-skills UK analysis of Joint Council for Qualifications results 2002-2008.

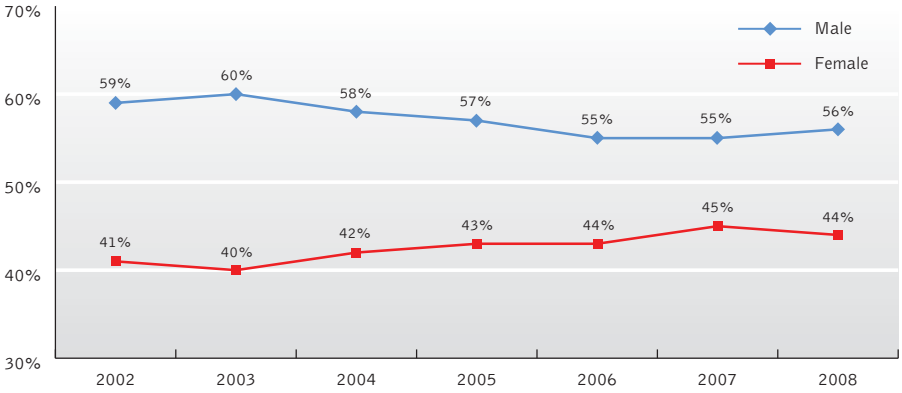
As highlighted above the gender divide in terms of those taking ICT GCSEs in the UK has narrowed since 2002. However it is important to recognise that the total number of ICT GCSEs taken has declined over the same time period from 116,030 in 2002 to 85,600 in 2008, a decline of 26% overall (numbers provided in Table 5).

In the UK, ICT GCSEs now represent just 1.5% of all GCSEs taken with England seeing the biggest fall in numbers of nearly a third, whereas Northern Ireland has experienced a net growth of 69% since 2002.

[16] References to the UK in this section excludes Scotland as it does not have the same educational system or qualifications and is not directly comparable.

[17] Excluding Scotland – see above.

Figure 14: Proportions taking GCSE (full course) ICT in the UK: Gender analysis



Source: e-skills UK analysis of Joint Council for Qualifications results 2002-2008.

Figures may not add up due to rounding.

Table 5: Numbers taking GCSE (full course) ICT by gender

		2002	2003	2004	2005	2006	2007	2008
All of UK	Male	68,830	54,940	57,480	58,710	60,890	55,150	47,560
	Female	47,200	37,110	41,350	44,690	48,710	44,510	38,040
	Total	116,030	92,050	98,830	103,400	109,600	99,660	85,600
England Only	Male	59,400	45,580	47,740	49,120	51,140	45,410	37,830
	Female	40,900	30,270	34,400	37,540	41,310	36,990	30,560
	Total	100,300	75,850	82,140	86,660	92,450	82,400	68,390
Wales Only	Male	6,650	6,370	6,540	6,250	6,300	6,000	5,580
	Female	4,840	5,030	5,010	4,870	5,000	4,880	4,440
	Total	11,490	11,400	11,550	11,120	11,300	10,880	10,020
N. Ireland Only	Male	2,790	2,990	3,200	3,350	3,460	3,740	4,150
	Female	1,460	1,820	1,940	2,270	2,410	2,640	3,040
	Total	4,250	4,810	5,140	5,620	5,870	6,380	7,190

Source: e-skills UK analysis of Joint Council for Qualifications results 2002-2008.

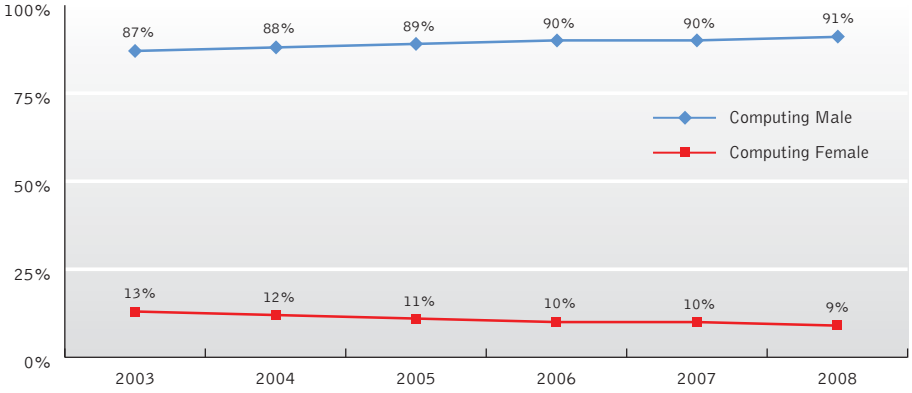
6.2 Proportions taking ICT A-Level and Computing A-Level

Males account for 91% of those taking Computing A-Levels[18] and females just nine percentage points with this gap having widened by eight percentage points since 2003. The gender gap is not as great for ICT A- Levels with 62% of males participating and 38% females. This gap has also narrowed by eight percentage points.

The only nation that has reduced the gap between the genders in terms of those who are taking Computing A-Levels is Wales, all other nations (including the UK as a whole) having seen the gap widen.

Since 2003, the proportion of males and females taking an A-Level in ICT has remained relatively constant in England and the UK as a whole; both Wales and Northern Ireland have seen this gap narrow.

Figure 15: Proportions of those taking A-Level Computing by gender



Source: e-skills UK analysis of Joint Council for Qualifications results 2003-2008.

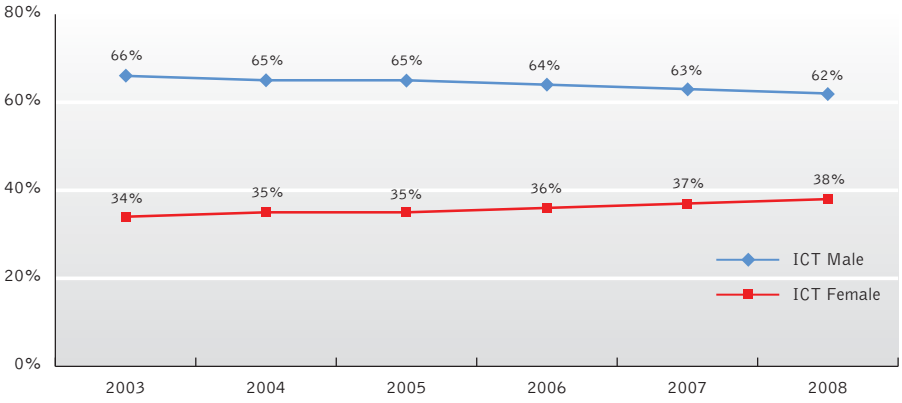
[18] There is a distinction between Computing A-Level which is more specialised and more closely related to Computer Science at HE Level (although not necessarily seen as an entry route by HEIs) and ICT A-Level which tends to be broader and more application based.

Table 6: Proportions taking ICT and Computing A-Levels by nation and gender

			2003	2004	2005	2006	2007	2008
All of UK	ICT	Male	66%	65%	65%	64%	63%	62%
		Female	34%	35%	35%	36%	37%	38%
	Computing	Male	87%	88%	89%	90%	90%	91%
		Female	13%	12%	11%	10%	10%	9%
England Only	ICT	Male	66%	66%	65%	65%	64%	64%
		Female	34%	34%	35%	35%	36%	36%
	Computing	Male	89%	90%	91%	92%	92%	92%
		Female	11%	10%	9%	8%	8%	8%
Wales Only	ICT	Male	69%	61%	65%	59%	61%	56%
		Female	31%	39%	35%	41%	39%	44%
	Computing	Male	82%	79%	78%	80%	77%	80%
		Female	18%	21%	22%	20%	23%	20%
N. Ireland Only	ICT	Male	61%	59%	56%	55%	56%	53%
		Female	39%	41%	44%	45%	44%	47%
	Computing	Male	79%	76%	75%	85%	84%	81%
		Female	21%	24%	25%	15%	16%	19%

Source: e-skills UK analysis of Joint Council for Qualifications results 2003-2008.

Figure 16: Proportions of those taking ICT A-Levels by gender



Source: e-skills UK analysis of Joint Council for Qualifications results 2003-2008.

In terms of total numbers taking Computing and ICT A-Levels, it is a similar story of decline as for GCSE numbers; since 2003, there has been a 50% decline in overall numbers taking Computing A-Level and a 32% decline in ICT A-Levels.

This means that in 2008, just 480 females took Computing A-Level and only 4,670 females took ICT A-Level.

Table 7: Numbers taking Computing and ICT A-Levels by gender

			2003	2004	2005	2006	2007	2008
All of UK	ICT	Male	11,860	10,480	9,610	9,050	8,370	7,610
		Female	6,170	5,630	5,280	5,160	4,990	4,670
		Total	18,030	16,110	14,890	14,210	13,360	12,275
	Computing	Male	8,860	7,460	6,430	5,630	5,040	4,590
		Female	1,290	1,030	820	600	580	480
		Total	10,150	8,490	7,250	6,230	5,620	5,070
England Only	ICT	Male	11,000	9,710	8,630	8,060	7,120	6,350
		Female	5,700	5,100	4,600	4,400	4,080	3,630
		Total	16,700	14,810	13,230	12,460	11,200	9,980
	Computing	Male	7,560	6,340	5,450	4,730	4,330	3,980
		Female	980	720	530	390	380	330
		Total	8,540	7,060	5,980	5,120	4,710	4,310
Wales Only	ICT	Male	410	340	360	380	590	700
		Female	190	220	200	260	380	550
		Total	600	560	560	640	970	1,250
	Computing	Male	870	790	710	710	560	510
		Female	200	210	200	180	170	130
		Total	1070	1,000	910	890	730	640
N. Ireland Only	ICT	Male	450	430	620	620	660	560
		Female	290	310	480	500	530	490
		Total	740	740	1,100	1,120	1,190	1,050
	Computing	Male	420	330	270	190	150	110
		Female	120	110	90	30	30	30
		Total	540	440	360	220	180	140

Source: e-skills UK analysis of Joint Council for Qualifications results 2003-2008

Less than 10% of those taking computing A-Level are female – this proportion has steadily fallen over the last five years

Numbers of all students taking Computing A-Level have declined by 50% and ICT A-Levels 32% since 2003

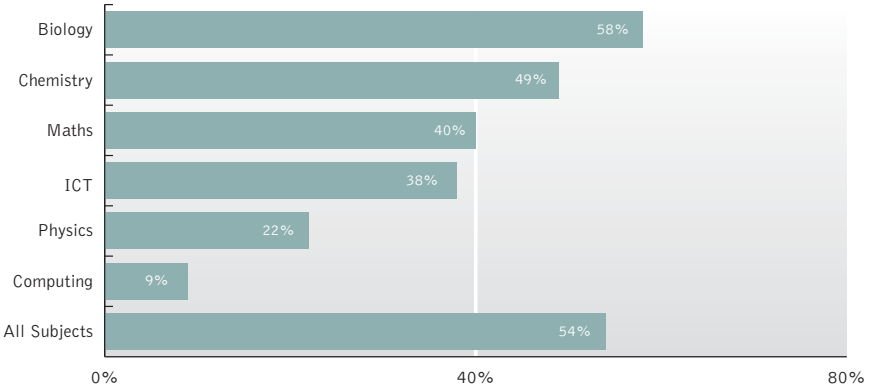
A gender imbalance is prevalent across the majority of A-Level STEM subjects

A higher proportion of females achieve higher grades in IT related subjects at GCSE and A-Level

6.2.1 A-Levels across STEM subjects

With the exception of biology and chemistry, a gender imbalance is prevalent in those taking A-Levels across the majority of STEM subjects with female participation rates, particularly in physics and computing, well below the average for across all A-Level subjects (54%).

Figure 17: Proportion of female A-Level students by STEM subject



Source: e-skills UK analysis of Joint Council for Qualifications results 2008.

Table 8: The number of female A-Level students by STEM subject

	Male	Female	Total
Computing	4,590	480	5,070
ICT	7,610	4,670	12,280
Maths	38,720	25,870	64,590
Biology	23,460	32,550	56,010
Chemistry	21,370	20,310	41,680
Physics	21,940	6,160	28,100
All Subjects	380,100	447,640	827,740

Source: e-skills UK analysis of Joint Council for Qualifications results 2008.

6.3 Gender differences by attainment

Although males account for the large majority of those taking IT related GCSEs and A-Levels, the females who do take such qualifications, in terms of attainment, outperform their male counterparts.

6.3.1 ICT GCSE

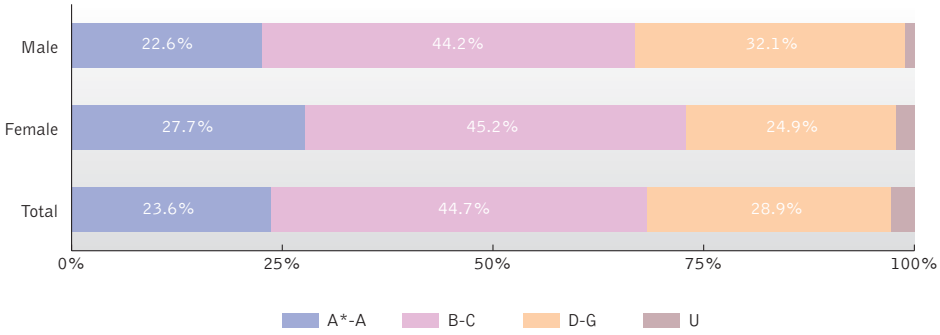
Females consistently outperform males at the higher grades, C and above. 73% of females compared to 67% of males who took GCSE (full course) ICT were awarded A*-C grades with 28% of females as opposed to 23% of males being awarded either an A* or A grade.

Table 9: Number and percentage of GCSE (full course) ICT at each grade by gender

		% at each grade								
	Number Sat	A*	A	B	C	D	E	F	G	U
Male	47,560	8	14.6	18.5	25.7	15.2	8.2	5.4	3.3	3.3
Female	38,040	8.7	19	20.9	24.3	12.6	6.4	3.8	2.1	2
Total	85,600	7.1	16.5	19.6	25.1	14	7.5	4.6	2.8	2.8

Source: e-skills UK analysis of Joint Council for Qualifications results 2008.

Figure 18: Percentage of GCSE (full course) ICT in each grade band by gender



Source: e-skills UK analysis of Joint Council for Qualifications results 2008.

6.3.2 ICT A-Level and Computing A-Level

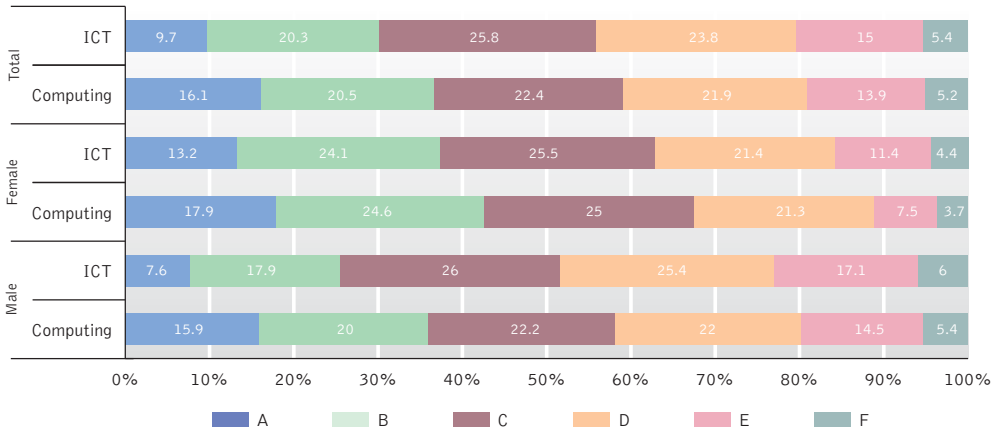
The story is much the same at A-Level with females, although less in number, continuing to outperform their male counterparts. 18% of females taking Computing A-Levels compared to 16% of males and 13% of females taking an ICT A-Level compared to 8% of males were awarded an A grade.

Table 10: Number and percentage of ICT A-Levels and Computing in each grade band by gender

	Subject	Number sat	% Achieving A grade	% Achieving grades A - C	% Achieving grades A - E
Male	Computing	4,590	15.9	58.1	94.6
	ICT	7,610	7.6	51.5	94
Female	Computing	480	17.9	67.5	96.3
	ICT	4,670	13.2	62.8	95.6
Total	Computing	5,070	16.1	59	94.8
	ICT	12,280	9.7	55.8	94.6

Source: e-skills UK analysis of Joint Council for Qualifications results 2008.

Figure 19: Percentage of ICT A-Levels and Computing in each grade band by gender



Source: e-skills UK analysis of Joint Council for Qualifications results 2008.

7. PROFESSIONAL QUALIFICATIONS

7.1 Level of qualification held by industry

Table 11 shows the level of formal qualifications achieved by employees in the IT industry compared to all other industries.

60% of those working in the IT industry hold a qualification at level 4[19] or higher, compared to 33% for employees across all other industries. At the other end of the scale, just 3% of people working in the IT industry are not qualified to level 2, compared to 12% across all other industries.

Analysing this data by gender it's clear that when compared to females within the IT industry, a larger proportion of males hold higher qualifications (63% of males compared with 44% of females hold level 4 or 5 qualifications) and a lower proportion hold lower qualifications (just 2% of males compared with 7% of females are not qualified to level 2). The reverse is seen across all other industries in the UK.

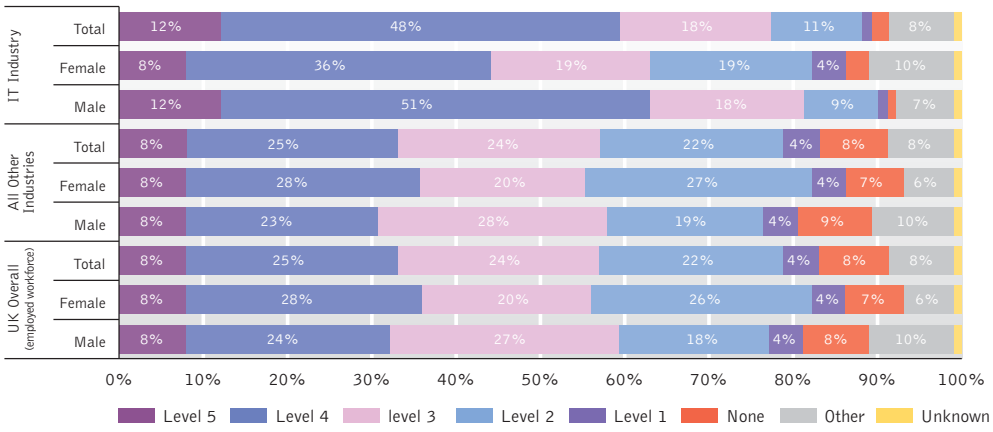
Table 11: Level of qualification held by people working in the IT industry by gender

	IT industry			All other industries			UK overall (employed workforce)		
Level	Male	Female	Total	Male	Female	Total	Male	Female	Total
5	12%	8%	12%	8%	8%	8%	8%	8%	8%
4	51%	36%	48%	23%	28%	25%	24%	28%	25%
3	18%	19%	18%	28%	20%	24%	27%	20%	24%
2	9%	19%	11%	19%	27%	22%	18%	26%	22%
1	1%	4%	1%	4%	4%	4%	4%	4%	4%
None	1%	3%	2%	9%	7%	8%	8%	7%	8%
Other	7%	10%	8%	10%	6%	8%	10%	6%	8%
Unknown	1%	1%	1%	1%	1%	1%	1%	1%	1%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: e-skills UK analysis of ONS LFS Q2.2008.

[19] Qualification equivalence of levels: 5 = postgraduate; 4 = graduate (first degree); 3 = GCE A-Level / Scottish higher; 2 = GCSE / Scottish Standard Grade.

Figure 20: Level of qualification held by people working in the IT industry by gender



Source: e-skills UK analysis of ONS LFS Q2.2008

7.2 Level of qualification held by occupation

When compared to other occupations, IT professionals are nearly twice as likely to hold a qualification at level 4 or higher and a much lower proportion, just 2% compared with 12% across all other occupations in the UK are not qualified to level 2.

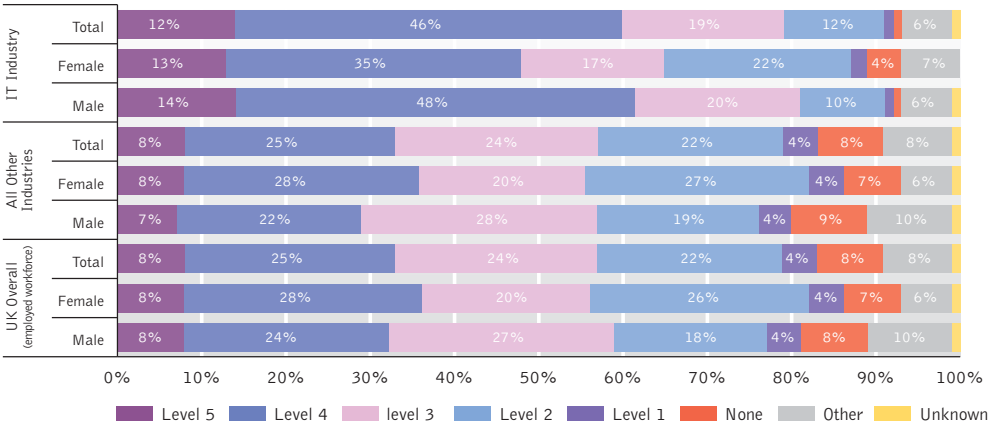
As seen across the IT industry, IT professionals that are male are more likely than female IT professionals to hold level 4 or 5 qualifications (62% of males compared with 48% of females) whilst a lower proportion of IT professionals that are male (compared with females IT professionals) are not qualified to level 2. Again, this is the reverse to the pattern seen across all other occupations in the UK.

Table 12: Level of qualification held by people working in IT occupations by gender

	IT occupations			All other occupations			UK overall (employed workforce)		
Level	Male	Female	Total	Male	Female	Total	Male	Female	Total
5	14%	13%	14%	7%	8%	8%	8%	8%	8%
4	48%	35%	46%	22%	28%	25%	24%	28%	25%
3	20%	17%	19%	28%	20%	24%	27%	20%	24%
2	10%	22%	12%	19%	27%	22%	18%	26%	22%
1	1%	2%	1%	4%	4%	4%	4%	4%	4%
None	1%	4%	1%	9%	7%	8%	8%	7%	8%
Other	6%	7%	6%	10%	6%	8%	10%	6%	8%
Unknown	1%	0%	1%	1%	1%	1%	1%	1%	1%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: e-skills UK analysis of ONS LFS Q2.2008.

Figure 21: Level of qualification held by people working in IT occupations by gender



Source: e-skills UK analysis of ONS LFS Q2.2008

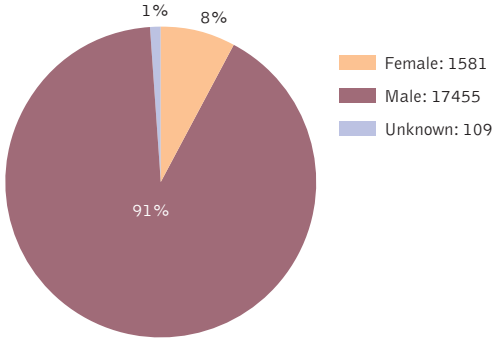
7.3 The BCS professional examination

The BCS professional examinations are recognised qualifications for a career in computing and information technology.

The three levels of examination, Certificate, Diploma and Professional Graduate Diploma, and associated projects have been developed in consultation with employers to meet the demands and evolving needs of the IT community. At their highest level, the examinations are examined to the academic level of a UK University honours degree and acknowledge practical experience and academic ability.

All three levels of the BCS Professional Examinations are accredited by the Qualifications and Curriculum Authority (QCA) for England, Wales and Northern Ireland which recognises and regulates awarding bodies (such as BCS) and their qualifications to ensure that high quality standards are maintained. The qualifications are listed on OpenQUALS, the QCA's online database of accredited qualifications.

Representation levels of females achieving chartered status



BCS Level 4 Certificate in IT 100/6181/2

BCS Level 5 Diploma in IT 100/6190/3

BCS Level 6 Professional Graduate Diploma in IT 100/6191/5

The ultimate BCS professional qualification is to achieve chartered status, CITP. In 2008 8% of chartered IT professionals were female.

8. EARNINGS

Gender differences are evident in the earnings of men and women and are monitored by both the Annual Survey of Hourly Earnings (ASHE) and the Labour Force Survey (LFS).

8.1 The annual survey of hourly earnings

The results of the 2008 Annual Survey of Hours and Earnings compiled by the Office for National Statistics (ASHE)[20] show that median weekly pay for full-time employees in the UK across all occupations grew by 4.6% in the year to April 2008 to reach £479. Median earnings of full-time male employees was £521 per week in April 2008; for women the median was £412.

According to ASHE the stronger growth in full-time men's hourly earnings excluding overtime compared with women's has meant that the gender pay gap has for the working population overall increased to 12.8%, up from 12.5% in 2007. On the basis of mean full-time hourly earnings excluding overtime, the gender pay gap has increased, from 17.0% in 2007 to 17.1% in 2008.

8.2 The Labour Force Survey (June 2008)

8.2.1 Pay by IT occupations

In Q2.2008 Gross weekly earnings[21] for IT professionals working fulltime are, on average £645 per week, which is 34% more than the UK average of £425 for all occupations in all sectors. Across all IT occupations females receive £85 per week less than their male counterparts.

Figure 22: Gross weekly pay of full-time IT professionals by occupation and gender

Source: e-skills UK analysis of ONS LFS Q2.2008.

Notes: Female Computer engineer's figures have been omitted due to low sample sizes.

[20] Source: Annual Survey of Hours and Earnings (ASHE) www.statistics.gov.uk

[21] All earnings are calculated using the median and refer to IT professionals in full time employment.

Females outperform males in IT related A-levels

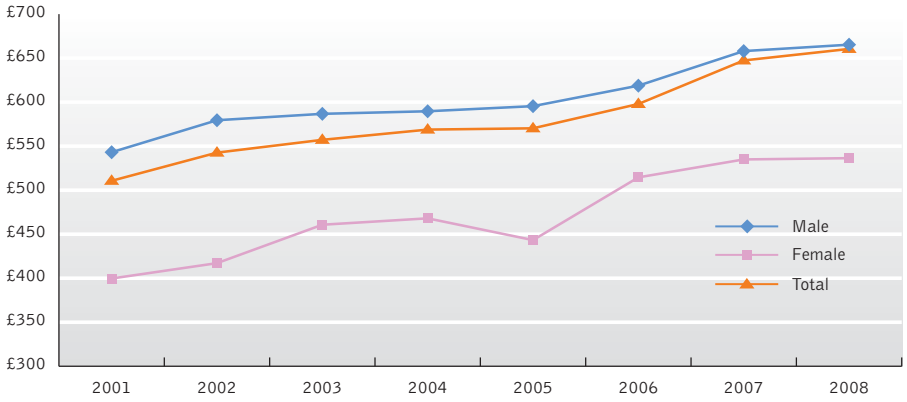
Female IT professionals and those in the It industry are less likely than their male counterparts to hold level 4 or 5 qualifications

Female IT professionals working full-time, earn on average 13% less than male IT professionals

Education pays, particularly for female IT professionals

Findings from Intellects 2008 perceptions of Equal Pay Survey[22] demonstrate females' lack of confidence in receiving pay equivalent to their male equivalents. When questioned, 69% and 70% of respondents didn't believe their pay reflected their experience or skills.

Figure 23: Gross weekly pay of full-time IT professionals by gender



Source: e-skills UK analysis of ONS LFS 2001-2008. Notes: Figures are annualised via a quarterly average.

8.2.2 Pay differences by age

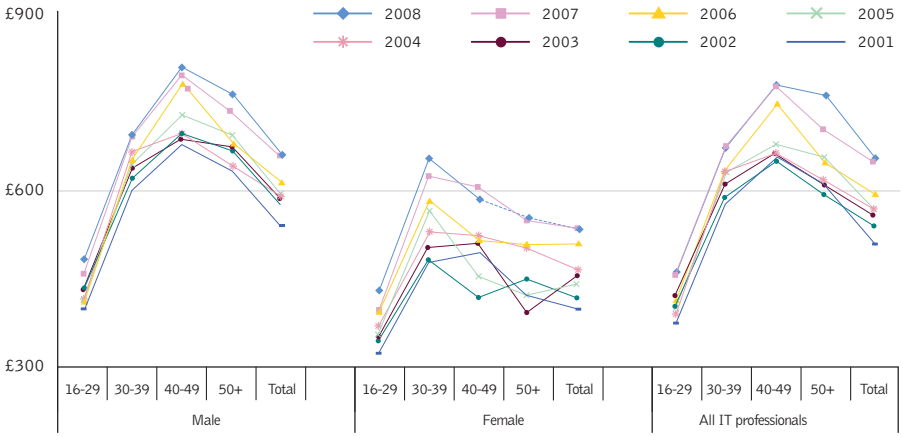
Figure 24 shows that whilst male IT professionals have consistently been rewarded most between the ages 40 and 49 years old, from 2001-2008, females have generally earned the most across their IT professional careers between the ages of 30 and 39 years old.

Each year (2001-2008) across all age groups female IT professionals have always earned less than male IT professionals.

Over this time period, the largest gap has consistently been in the 40-49 year old age bracket with full-time male IT professionals, on average, earning 30% more than full-time females in the same position.

[22] Perceptions of Equal Pay Survey, 2008, Intellect. 330 women from across the technology industry completed this survey.

Figure 24: Gross weekly pay of full-time IT professionals by gender and age



Source: e-skills UK analysis of ONS LFS 2001-2008. Notes: Figures are annualised via a quarterly average.

8.2.3 Pay differences by qualification

It pays dividends for IT professionals, and in particular female IT professionals to hold as higher a qualification as possible. From 2004-2008 male IT professionals with Higher Education qualifications or degrees have earned on average 13% more than those with GCE A-Level equivalents and 19% more than those with GCSE grades A-C or equivalent. Similarly female IT professionals holding Higher Education qualifications have earned on average 21% more than those with GCE A-Level equivalents and 29% more than those with GCSE grades A-C or equivalent.

Figure 25: Gross weekly pay of full-time IT professionals by gender and highest qualification held

Source: e-skills UK analysis of ONS LFS 2004-2008. Notes: Figures are annualised via a quarterly average.

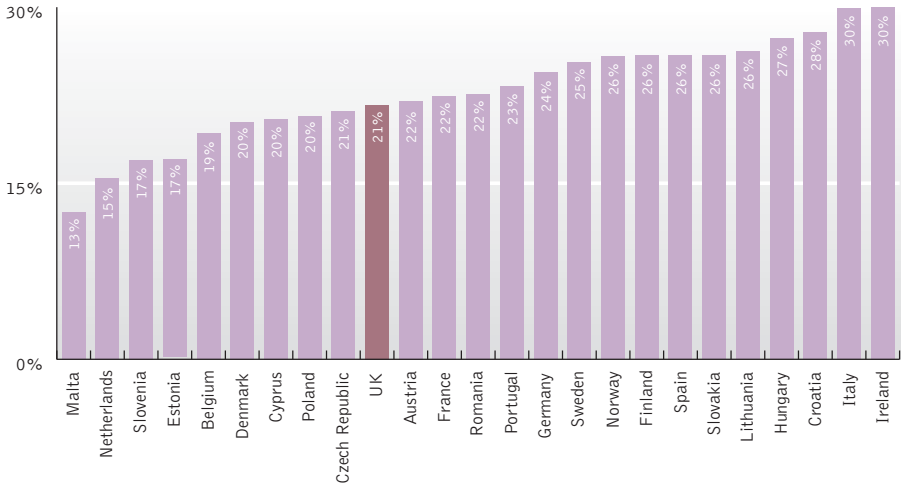
9. INTERNATIONAL COMPARISONS[23]

Gender imbalance in both the ICT industry (Fig 26) and in ICT occupations (Fig 27) is common across the globe. An international comparison of the labour market representation levels of females is shown in the graphs below.

9.1. Representation of women in the ICT industry

The representation of females in the ICT industry is greatest in Italy and Ireland (30%), with such proportions in the ICT industry in the UK being noticeably lower (21%).

Figure 26: Labour market representation of females in the ICT industry within selected countries



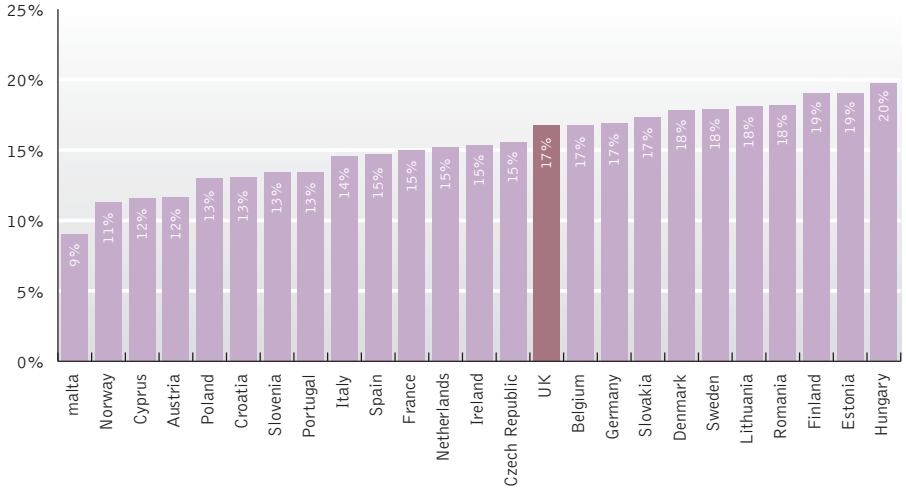
Source: e-skills UK analysis of Eurostat 2007 data

[23] Please note this section is based upon Eurostat 2007 data, previous sections are largely based on ONS LFS 2008 data, thus accounting for the differences in the proportion of female IT professionals and the proportion of females working in the IT industry.

9.2 Representation of women in ICT occupations

Figure 27: Labour market representation of females in ICT occupations within selected countries

Hungary has the highest proportion of females in ICT occupations. However, female ICT professionals in Hungary are still out proportioned by 4:1, with this ratio reaching as high as 9:1 in Malta.



Source: e-skills UK analysis of Eurostat 2007 data.

10. GLOSSARY OF TERMS

CPHC	Council of Professors and Heads of Computing
GCSE	General Certificate of Secondary Education
GVA	Gross Value Added
HE	Higher Education
HESA	Higher Education Statistics Agency
ICT	Information and Communications Technology
IT industry	This only includes those who work within the IT industry
IT professionals	This specifically refers to people employed in IT occupations
IT workforce	This encompasses people working in the IT industry as well as IT professionals working in other industries
JCQ	Joint Council for Qualifications
LFS	Labour Force Survey
ONS	Office for National Statistics
SSC	Sector Skills Council
UCAS	Universities and Colleges Admissions Service

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