wes
women's engineering society

Diversity in engineering

Exploring the inspirations, aspirations and destinations of potential engineers by gender, ethnicity and socioeconomic background

Sean McWhinnie and Jan Peters

Contents

Foreword by Meg Munn MP

There is no doubt that the career paths of women differ from those of men and tend to be more disrupted. Making connections across key transition points on the path to an engineering career is something that the Women's Engineering Society (WES) has done throughout its history; passing on the knowledge, wisdom and excitement of what lies ahead.

The HE STEM funded *Set to Lead* report contained the voices of over 4,500 engineering and technology students, including 1200 women. Twelve hundred contributions of the experiences, passion and commitment to studying a vibrant and useful subject and I'm delighted that the Society has been able to secure funding to extend this to ensure those voices are heard.

The support of the Royal Academy of Engineering has further enabled an examination of the *Set to Lead* data in more detail, update it, and add more context in terms of the socioeconomic background and aspirations of the next generation to inform our strategy.

Importantly making sure that experience of undergraduates is heard by teenagers is vital so they can understand the opportunities available and the passion felt, both of which may give them the incentive to explore engineering while at school.

The design agency that produced the output poster, supported by focus groups advocated making strong, repeated and clear associations between "girl" and "engineering" and produced the following straplines:

"It's time for engineering girls" and *"Engineering, it's in everything"*

The Society is keen to see a higher level, coordinated engagement strategy in order to present a clear and consistent message and offer an engagement programme for girls, whether in a single sex or mixed sex activity.

What strikes me about the report's findings is that while the diversity and engineering agenda broadens out to address other dimensions of diversity, it is clear that once students have made the transition to higher education to study engineering and technology subjects, **gender is a more significant factor than social class in determining occupation types.**

We need all the groups and organisations promoting engineering and technology as a career to make efforts to address this.

About this report

This report was written by Sean McWhinnie of Oxford Research and Policy in association with Jan Peters of Katalytik.

The report has been produced for the Women's Engineering Society (WES) and funded by the Royal Academy of Engineering. The report gives:

- An updated analysis of the HESA data presented in the Set to Lead report and a review of effect of ethnicity and socioeconomic background of engineering students on the destinations six months after completing their courses;
- The results of further analysis of the survey data presented in the Set to Lead report which focuses on the ethnic background of respondents;
- A summary of investigations into the careers advice and influences of background on subject choice among girls and provides the background to a poster campaign to inspire and connect with teenage girls and pass on to them the advice and experience of undergraduate engineers.

The original work upon which this report is based was the HE STEM funded Set to Lead project delivered by a collaboration between UCL Engineering and Katalytik. The study director was Jan Peters of Katalytik. This flow on work has been project managed by Jan Peters.

The Set to Lead project investigated and addressed the differences in the transition between men and women from engineering and technology degrees into relevant employment. The project outputs included research on career choices of engineering and technology undergraduates.

The Set to Lead project resources can be found through the UCL Engineering and Katalytik websites:

www.engineering.ucl.ac.uk
www.katalytik.co.uk

Sean McWhinnie established **Oxford Research and Policy** in 2009. Oxford Research and Policy is a consultancy that carries out research and evaluation and specialises in higher education, science policy, and equality and diversity

www.oxfordresearchandpolicy.co.uk

Katalytik was founded in 2004 by Jan Peters and specialises in evidence based policy development and implementation, making connections between education/ academia and industry. The key focus of the portfolio is inclusion and engagement in science and technology.

Jan Peters has had a vital involvement in many significant UK and international reports and projects related to women and science and engineering since 1999.

www.katalytik.co.uk

Acknowledgements

Thanks and appreciation to all the individuals, WES members, undergraduates and early career women for their support. Thanks to those who responded to the Survey of Engineering and Technology Undergraduates, to those individuals who acted as contacts in participating institutions, and to those who helped pilot the questionnaire.

Further thanks are due to the Royal Academy of Engineering for financial support.

The poster and website designers were Blitz Advertising.

Jan Peters and Sean McWhinnie
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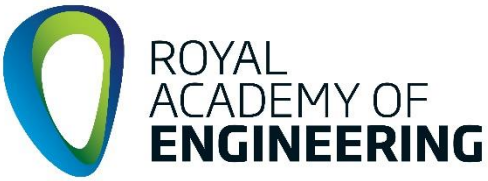

1 Introduction

This report considers the key transition stages of young people from school to engineering and technology courses in higher education as well as from undergraduate courses in higher education to employment and/or further study. The report highlights areas for possible interventions to help break the **accumulated disadvantage** felt by women and BME graduates from engineering and technology higher education courses.

The report is focused on higher education entrants and graduates. Similar issues to those highlighted in the report exist in further education with low participation rates for women and black and minority ethnic men and women on engineering and technology apprenticeship programmes.

The report is split into two parts, reflecting the distinctive elements of the work.

- Part one presents an updated analysis of the HESA data presented in Set to Lead with an additional review of the effects of the ethnicity and socio economic background of engineering and technology students.
- Part two considers the careers advice and influences of background on subject choice among girls.

Key findings and recommendations are drawn into Chapter 1 in sections 1.2 and 1.3, respectively.

1.1 Why is this topic important?

Retention of women in science, engineering and technology (SET) is an important issue, with economic and social justice implications. The overall retention rate of female SET graduates is far lower than that of males, 25% compared with 40%.[1] The situation, which contributes to the relative lack of women in senior positions in SET professions, is sometimes described as “the leaky pipeline”; as scientists and engineers flow along the science career pipeline – a notional path representing training and advancement – they "leak out" and are lost to science.[2]

Girls who study science A Levels are more attracted by medicine and pure science rather than by engineering and technology higher education courses. Possible explanations for this include a lack of role models and stereotyping by parents, teachers and society of careers suitable for girls. Convictions about girls’ suitability for engineering study and employment are dispelled by their academic achievements and yet still find their way into the media. Further, girls lack an identity with engineering.

This report presents the results of an analysis of Higher Education Statistics Agency (HESA) data on qualifiers in engineering and technology subjects and of the Destinations of Leavers from Higher Education (DLHE) of the same group of students, with a particular focus on ethnicity and socio economic class. In addition, the report presents the results of a survey of engineering and technology undergraduates with a focus on the responses of respondent by ethnicity.

This work was supported by focus groups held to learn more about the inspirations and intentions of girls whose parents are not engineers and where they have sourced information from; this is presented in part two.

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1 Report for the Office of Science and Technology and the Department of Trade and Industry, *Maximising Returns to Science, Engineering and Technology Careers,* London: DTI, 2002.

2 N. Angier, Women Swell Ranks of Science, But Remain Invisible at the Top, New York Times, May 21, 1991.

1.2 Key Findings

The main findings and recommendations are presented below, covering the career aspirations and destinations of undergraduates and an exploration of the key influences for teenagers that in turn affected the content of the WES poster, "Engineering, it's in everything" and associated website[3].

1.2.1 Findings from the analysis of HESA and Survey Data

The influence of parental background

Analysis of HESA data showed that:

- Overall there are few clear patterns. However students of computer science subjects are less likely to have parents with higher managerial and professional occupations than students of technology subjects, which in turn have a lower proportion than students of engineering subjects.
- For graduates from enhanced engineering first degree courses (e.g. course leading to MEng qualifications) there is relatively little difference between the main activities being undertaken by all the groups six months after completing their courses whatever the graduates' parents' occupations or gender.
- For graduates from bachelor first degree engineering and technology courses there are differences in the main activities six months after completing their courses by gender within a given parental occupation.
- Analysis of HESA data showed that for engineering enhanced first degree graduates similar patterns of activity are observed six months after completing their courses for all parental occupations.

Influence of gender

Analysis of HESA data showed that:

- Men are significantly more likely than women to be in engineering and technology roles six months after completion of their studies, and the difference grew between 2007/08 and 2009/10.
- Women from bachelor engineering and technology degree courses are significantly more likely than male graduates to enter non-graduate level jobs.
- Gender differences between the main activities six months after graduation are greater for bachelor degree graduates than for enhanced first degree graduates.
- For bachelor degree graduates, within each subject group similar patterns of activity and occupation six months after graduates complete their courses are observed for each group of students' parents' occupation but gender differences are observed for the engineering and computer science subject groups, with men more likely than women to be in engineering and technology occupations. The gender differences are much smaller for technology subject group graduates. The implication is that gender is a more significant factor than social class in determining occupation types.

[3] http://engineergirl.wes.org.uk

The influence of ethnicity

Analysis of HESA data showed that:

- White students are significantly more likely than BME students to be in full-time paid work: 68% of White male graduates from enhanced first degree courses in engineering were in full-time work six months after completion, compared to 49% of Asian male graduates.
- Higher proportions of Asian graduates than White graduates were undertaking further study. Similar patterns are observed for Black and Chinese graduates from enhanced first degree courses in engineering.

Analysis of the survey data showed that:

- BME UK nationals are less likely than White UK nationals to have undertaken some form of work experience during engineering and technology degree courses. Although the numbers are too low to draw any firm conclusions, the analysis also suggested that final year BME respondents had spent less time than White respondents undertaking work placements and/or internships during their courses.
- Overall 87% of UK national respondents were paid during their most recent work placement or internship. There were significant differences between the responses of White and BME male respondents.
- BME respondents are less likely than White respondents to have spent time working in an area relevant to their courses before starting their course.
- BME respondents in their final year were less likely to have undertaken a placement as part of their course, and/or an internship than White respondents. While on placement, BME respondents were less likely to have met a role model who inspired them, and they were less likely to be paid than White respondents.
- White male respondents are more confident about their possession of technical skills than BME male respondents, and both White and BME female respondents. This difference in confidence may differentially affect the career decisions of the different groups.
- Respondents ranked how important different factors were in their future careers:
    - Both White and BME survey respondents rank "A workplace culture where all staff are treated well" as the most important factor in a future job.
    - "A strong health and safety culture", was ranked 18th by White respondents and 9th by BME respondents, and "A strong equality and diversity culture" was ranked 20th by White respondents and 10th by BME respondents.
- Overall there is little difference between the knowledge of career options of White and BME survey respondents at undergraduate stage.

Overall

Analysis of HESA data, backed up by findings from the analysis of survey data, suggest that for UK national graduates from engineering and technology courses parental occupation is not a significant factor in determining activity and occupation six months after completion. In contrast, the gender and ethnicity of graduates is a significant factor in determining the activity and occupation of graduates from engineering and technology courses. White males show the greater confidence in their technical abilities and are more

likely than BME males, and White and BME females to be in engineering and technology roles six months after completing their courses.

1.2.2 Girls and career aspirations

A literature research was undertaken to understand better the key influences on teenage girls' career aspirations and was supplemented by a number of discussion groups of teenage girls and others with female engineering and technology undergraduates.

- The undergraduate discussion groups were convened to learn more about how students' backgrounds affect their decision to study engineering or technology and to collect advice that they might wish to pass on to aspiring female engineering and technologists still at school.
- The discussion groups comprising teenage girls were held to learn more of the effect of the girls' background on their attitudes to studying engineering or technology, and also to gauge their reactions to materials prepared for the "Engineering, it's in everything" campaign.

The Aspire project identified two types of girls who express science aspirations. "Bluestocking scientists" refer to themselves as "kind of nerds" that like studying. A smaller number of girls, who balance their interest in science with a more "girly" identity of fashion, being sociable and sporty, are termed "feminine scientists".

A framework for identifying target groups of girls for interventions was developed for this project based on descriptions in the literature and on the field work carried out as part of the project.

Girls can be grouped into those that naturally have a positive predisposition and attitude towards engineering and technology subjects – the "**do**" group - and those that "**don't**". Girls in the "**don't**" group may be capable in STEM subjects. Among the "**do**" group are those who "**will**" go on to follow a path that leads to STEM A Levels and possibly to the study of engineering or technology after school. Some of the "**do**" group, however, have clear ideas of careers outside engineering and technology such as wanting to be a doctor, lawyer or part of another clearly identified profession and hence "**won't**" go on to engineering or technology careers.

Among the "**don't**" group there are girls who have clear ideas of careers outside engineering and technology and hence also fall into the "**won't**" group.

There is also a group from among the "**don't**" girls who "**could**" follow engineering and technology paths. This group is of particular interest: they are the girls that "**could**" follow engineering or technology careers as they are capable in STEM subjects, but whose personal identities and influences are very different from the "**do**" group and consequently do not have a positive predisposition towards engineering and technology.

The main challenge is to engage the "**could**" group in discussion and debate during the critical period between year 5 and year 8 (ages 8 to 13) so that they have an innate awareness of what engineering is about.

A subsidiary challenge is to ensure that members of the "**will**" group also have the detailed knowledge and awareness to make the best choice of course in the event that they choose to follow an engineering or technology path and become "**do**" girls.

More generally, findings suggest that teenage girls:

- Have little knowledge about engineering or engineers;
- Believe engineering is for people who love mathematics and science;
- Do not understand what engineering is but they do understand that it is not "for them";
- Want a job with relevance – suggesting a job "for someone like me";
- Want to hear about careers and match how they align with their own career motivators: enjoyable, good working environment, making a difference, good income, flexibility.

Counter to this:

- Career influencers including educators are often not familiar with how to guide students towards engineering and are not receiving positive stories of engineering for their female audience;
- Engineering continues to be portrayed as challenging and with a less confident audience this does not fit with the personal identity of the "**could**" girls.

There remains a knowledge and communication gap that is preventing girls from entering engineering compounded by class and ethnic background cultural preferences for female occupations. The "Engineering, it's in everything" campaign and the supporting WES website offering insights into planning your career is part of the action to close the gap. **But more is needed**.

The general findings, and in particular the defined groupings of girls, helped to refine the target audience for the "Engineering, it's in everything" campaign poster:

- To enable the "**will**" girls to have a wider appreciation of engineering;
- To connect with the "**could**" girls.

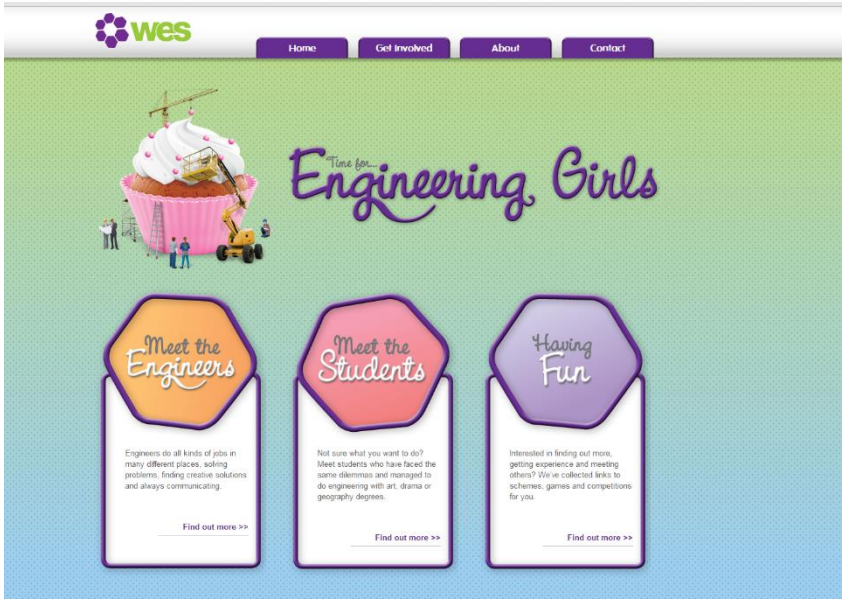

Figure 1: Image of the WES Engineer Girl website

Figure 2: Image of the front and back of the poster, "Engineering, it's in everything"

1.3 Bridging the gap – recommendations for action

Our recommendations for action to bridge the gap, involve several stakeholders:

Target: KS4 and KS5 BME school students and BME undergraduates

- Work placements and internship opportunities should be made more widely available for BME students both before and during engineering and technology study in higher education.
- More research is required into the different behaviours patterns of White and BME students in applying for and undertaking work placements and internships during undergraduate courses
  - ➢ *Stakeholders: Employers, teachers, career advisors and HE staff*

Target: KS3, KS4 and KS5 school students

- Access should be improved to information, case studies and STEM Ambassadors with information on the diverse nature of roles, skills needed and routes into various engineering and technology jobs.
- In association with STEMNET, schools might run bi-annual 'meet the engineer days' for years 9 and 10 to enable all students to meet a diverse range of engineers and find out about the range of jobs and industries in which engineers work.
  - ➢ *Stakeholders: Employers, professional engineering institutions careers advisors and teachers*

Target: KS2 and KS3 school students

- There should be greater interaction with STEM Ambassadors and exposure to discussions about jobs and roles in engineering and technology with explicit reference to women as an imperative to challenge stereotyping.
  - ➢ *Stakeholders: Employers and teachers*

Target: School students from BME backgrounds and from challenging schools

- Greater access should be provided to mentors from higher education, in particular students, and/or industry to talk about possible job roles, to provide feedback, and to challenge the students to achieve more.
- There should be more opportunities for pupils from challenging schools to attend summer camps which will inspiration and challenge.

  ➢ *Stakeholders: Employers, HE course tutors and careers advisors*

Target: BME undergraduates

- Greater awareness is needed that in general male and female BME UK national students (and White female students) will demonstrate lower levels of confidence in their own technical abilities than their White male peers.
- More effort is required to ensure take up of internships, vacation jobs and year in industry placements by BME students which in turn will help them build their personal identities and confidence as engineers.

  ➢ *Stakeholders: Employers, HE departments, HE staff and HE careers advisors*

Target: Women undergraduates

- There is a need to support networking and confidence boosting events for women (and BME) students and to ensure that all students are exposed to appropriate and relevant role models.
- Support should be available for a 'women in engineering and science' student group affiliated to the Women's Engineering Society to reduce the sense of isolation still felt by many.
- Support should be made available for students to attend national women in engineering / technology events or conferences.

  ➢ *Stakeholders: Employers, HE departments, and HE staff*

Target: Girls aged 8-13

- The poster campaign, "Engineering, it's in everything" should be extended using a variety of images and different role models with the same strap line.
- Posters and role models are not enough. Each poster should be associated to a Challenge, such as 'reverse engineer a cupcake' thereby connecting engineers (most likely through the STEM Ambassador programme) to girls in years 5 to 8, i.e. aged 8-13.
- Stronger links between university 'women in engineering and science' groups and schools would be a help.
- Greater effort is needed to make the positive connection between engineering and girls to reinforce the message that there is a positive and common connection.

  ➢ *Stakeholders: WES, WES members, professional engineering institutions, STEM Ambassadors*

Part One: Diversity on undergraduate engineering and technology courses

2 Engineering and technology first degree graduates

This section supplements the data presented in the research report of Set to Lead and updates some of the data presented in that report by giving an overview of the students completing engineering and technology first degrees between 2007/08 and 2010/11 in UK Higher Education Institutes (HEIs) and also analyses in more detail than the original report data relating to the ethnicity and social class of graduates. This section also presents a summary of the destinations of graduates from first degree programmes in engineering and technology, again with a focus on ethnicity and social class of graduates. The original report used HESA data for 2008/09 and 2009/10 and for the most part presented combined data for those years. Four years' data have been used in this section in order to given higher numbers of students, especially female students, in some ethnic and socio economic groups.

For most of the analyses based on ethnicity and social class the four years data have been combined. Despite this, numbers of students in some ethnic groups were too small for meaningful analyses. In some cases data for combined groups are presented (e.g. Asian representing combined data for Asian or Asian British Indian, Pakistani, and Bangladeshi as well as Other Asian backgrounds) and in other data for groups has not been presented. In all cases where data are presented the number of students in each group is given so that the reader is able to judge the significance of the analyses.

The data source for the report is the Higher Education Statistics Agency (HESA). HESA is the central source for the collection and dissemination of statistics about publicly funded UK higher education.

2.1 Background

There have been a number of reports published recently examining the supply and motivations of STEM graduates. Engineering UK publishes an annual report on the state of engineering which presents a comprehensive overview of data on the supply of engineers and of data relevant to the education and training of engineers.[4] These reports provide an excellent overview of key data relating to those studying engineering and technology subjects and a number of other STEM subjects, including changes in the numbers over the last few years. The 2011 report includes a section on women in engineering and technology which summarises some relevant data including international comparisons.

Another important report in the area of engineering undergraduates was published in 2006.[5] This report reviews relevant literature and presents the results of a survey of 970 engineering undergraduates. The Department for Business, Innovation and Skills published a major study of why some STEM graduates do not work in occupations related to their degree.[6] The research investigated why a significant proportion of STEM graduates do not enter STEM occupations and what factors are influencing their career decisions. Many of the findings in the 2006 CRAC report and the 2011 BIS report complement the findings presented in this report.

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4 Engineering UK 2011: The State of Engineering, Engineering UK, 2011 (http://www.engineeringuk.com/_db/_documents/Engineering_UK_Report_2011.pdf); Engineering UK 2012: The State of Engineering, Engineering UK, 2012 (http://www.engineeringuk.com/what_we_do/education_&_skills/engineering_uk_12.cfm).

5 The career thinking of UK engineering undergraduates, CRAC, 2007.

6 STEM Graduates in Non STEM Jobs, Department for Business, Innovation and Skills, 2011

2.2 Methodology

The survey tool used in this study was based on a survey originally used in a 2006 Royal Society of Chemistry survey of current PhD students in order to provide insights into female attrition from chemistry.[7] The survey focused on the career intentions of PhD students and while it could only predict their actual destinations, to a certain extent the survey revealed that, unlike male chemists, many female chemists are deterred from further chemistry research during the course of their PhD studies. It also revealed that of those students intending to stay in research fewer female than male chemists wanted an academic career, especially in the longer term.

The survey tool was also adapted for molecular bioscience PhD students and the results of that survey were published in 2009.[8] It has now been adapted and used for this study.

Thematic analysis of the female free text comments has been supplemented by focus groups with female students about their inspirations.

The target for the focus groups was students who are the first to go to university or the first to study engineering. So the awareness of engineering at school was lower than might be for other students whose parents were engineers or scientists.

2.3 The Data

HESA holds data on students registered for courses in UK HEIs, and collects data on the destinations of graduates from courses. Individual students are recorded as full time equivalents (FTEs) split between the subjects which they study: a full time physics student is recorded as 1.0 FTE, while a student splitting their time equally between physics and another subject will be recorded as 0.5 FTE physics.

The **HESA standard registration population** records students registered on a course in the period 1 August to 31 July of a particular year.

The population splits the student experience into 'years of study'. The first year is deemed to start on the commencement date of the student, with second and subsequent years starting on or near the anniversary of that date.

The **HESA qualifications obtained population** is a count of students associated with the award of an HE qualification (excluding HE institutional credits) during the period 1 August to 31 July of a particular year which were returned to HESA by 31 October 2010. This includes qualifications awarded from dormant, writing-up and sabbatical status students.

The **HESA Destinations of Leavers from Higher Education (DLHE) target population** contains all United Kingdom (UK) and European Union (EU) domiciled students reported to HESA during the period 1 August 2009 to 31 July in a particular year as obtaining relevant qualifications and whose study was full time or part time (including sandwich students and those writing-up theses). Awards from dormant status are not included in the target population. Eligible graduates are sent a questionnaire and asked to record details of what they are doing. The reference (census) dates for DLHE returns are 19 April (if the leaver obtained the

[7] Change of Heart - Career intentions and the chemistry PhD, Royal Society of Chemistry, 2008, London (http://www.rsc.org/images/ChangeofHeart_tcm18-139211.pdf).

[8] The Molecular Bioscience PhD and Women's Retention: A Survey and Comparison with Chemistry, Biochemical Society, London, 2009 (http://www.rsc.org/ScienceAndTechnology/Policy/Documents/MolecularBiosciencereport.asp)

qualification between 1 August and 31 December) and 10 January (if the leaver obtained the qualification between 1 January and 31 July).

Responses are coded into a main activity (e.g. full time work, part time work, further study only etc.). Where respondents are undertaking some form of further study its nature is recorded (e.g. registered on a course, registered as a research student, etc.). The work respondents are undertaking is coded using the standard occupations classification (SOC) and Standard Industrial Classification (SIC).

HESA implements a strategy in published and released tabulations designed to prevent the disclosure of personal information about any individual which has been followed in this report. This strategy involves rounding all numbers to the nearest multiple of 5. A summary of this strategy is as follows:

- 0, 1, 2 are rounded to 0;
- All other numbers are rounded to the nearest multiple of 5.

So, for example, 3 is represented as 5, 22 is represented as 20, 3286 is represented as 3285 while 0, 20, 55, 3510 remain unchanged.

2.4 Definition of an engineering student

For the purposes of this report an engineering or technology student is defined as a student who spends 50% or more of their time studying an engineering discipline. In other words, for engineering, instances are only counted where a student is recorded against engineering or technology discipline as 0.5 FTE or more.

Data in the report are presented as headcounts of students who spend 50% or more of their time studying a particular subject.

It should be noted that as a consequence of the definition used, the figures reported in this report may not match the numbers reported in other publications. In some cases authors report total FTEs reading a specific subject, in others authors may report a headcount of students who are reported as studying any amount of a specific subject.

The engineering and technology subjects considered in this report are listed in the following Table 1. The subjects are listed under their respective subject groups.

Table 1: Engineering and technology subjects used in this report (Source: HESA Student Data)

Engineering Subject Group
Aeronautical Engineering
Broadly-based programmes within engineering & technology
Chemical Engineering
Civil Engineering
Electrical Engineering
Electronic Engineering
General Engineering
Mechanical Engineering
Other Engineering
Production Engineering
Computer Sciences Subject Group
Artificial intelligence
Computing Science
Others in computer sciences
Software engineering
Technologies Subject Group
Biotechnology
Ceramics and Glasses
Maritime Technology
Metallurgy
Minerals Technology
Other Technologies
Others Materials Technology
Polymers and Textiles

2.5 The classification of occupations

The occupations of leavers from higher education are classified using the Standard Occupational Classification (SOC). SOC is a common classification of occupational information for the UK. Within the context of the classification, jobs are categorised in terms of their skill level and skill content. The classification is used for career information to labour market entrants, job matching by employment agencies and the development of government labour market policies.

In addition a further classification was undertaken as part of the analysis for this report. The standard occupations were classified as **graduate** or **non-graduate occupations** using a coding developed by the Warwick Institute for Employment Research.[9]

Finally, groups of SOC codes have been used to define engineering and technical, science and mathematics, and non-science, technical, engineering and mathematics (STEM) occupations.[10]

[9] P. Elias and K. Purcell, SOC (HE): A classification of occupations for studying the graduate labour market, Warwick Institute of Employment Research, 2004.

[10] Engineering UK 2011. The state of engineering, Engineering UK, 2011

2.6 Students completing first degree courses in engineering and technology in UK HEIs

This section is concerned with those who have completed first degree courses in engineering and technology subjects between 2007/08 and 2010/11.

Table 2: All full time students completing first degree courses in engineering and technology subjects in 2007/08, 2008/09, 2009/10 and 2010/11 (Source: HESA Student Data)*

Subject Group/Subject	2007/08	2008/09	2009/10	2010/11
Engineering Total	**16700**	**16875**	**17975**	**18430**
Aeronautical Engineering	1255	1340	1425	1495
Chemical Engineering	935	970	1175	1275
Civil Engineering	2930	3225	3575	3760
Electrical Engineering	105	95	110	135
Electronic Engineering	4705	4455	4650	4910
General Engineering	1815	1465	1410	1500
Mechanical Engineering	3830	4155	4350	4425
Production Engineering	985	1100	1190	850
Other Engineering	100	65	85	80
Broadly-based programmes within engineering & technology	40	10	0	5
Computer Sciences Total	**4630**	**4215**	**4175**	**4130**
Artificial intelligence	150	100	110	115
Computing Science	3365	3050	3015	3010
Software engineering	1110	1025	1020	965
Others in computer sciences	5	40	25	45
Technologies Total	**2630**	**2625**	**2805**	**2910**
Biotechnology	135	120	130	110
Ceramics and Glasses	30	20	15	20
Maritime Technology	200	155	195	200
Metallurgy	35	35	30	30
Minerals Technology	30	45	60	40
Polymers and Textiles	625	615	630	655
Other Technologies	1200	1260	1375	1480
Others Materials Technology	375	375	365	380
Grand Total	**23960**	**23715**	**24955**	**25470**

* Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Data on the numbers of full time students completing first degree courses in engineering and technology subjects in the academic years 2007/08, 2008/09, 2009/10 and 2010/11 are presented in Table 2 and the year on year percentage changes, and the overall percentage changes between 2007/08 and 2010/11, are presented in Table 3. The number of graduates in the engineering, computer sciences and technology subject groups all increased between 2007/08 and 2010/11, although they remained essentially steady between 2009/08 and 2008/09. The combined numbers in all three subject groups increased by 6.3% between 2007/08 and 2010/11 with year to year changes of a 1.0% fall between 2007/08 and 2008/09, a 5.2% rise between 2008/09 and 2009/10, and a 2.1% rise between 2009/10 and 2010/11

Table 3: Percentage change in the number of full time students completing first degree courses in engineering and technology subjects between 2007/08 and 2010/11 (Source: HESA Student Data)*

Subject Group/Subject	Percentage change			
	2007/08 to 2008/09	2008/09 to 2009/10	2009/10 to 2010/11	2007/08 to 2010/11
Engineering Total	**1.0**	**6.5**	**2.5**	**10.4**
Aeronautical Engineering	6.8	6.3	4.9	19.1
Chemical Engineering	3.7	21.1	8.5	36.4
Civil Engineering	10.1	10.9	5.2	28.3
Electrical Engineering	-9.5	15.8	22.7	28.6
Electronic Engineering	-5.3	4.4	5.6	4.4
General Engineering	-19.3	-3.8	6.4	-17.4
Mechanical Engineering	8.5	4.7	1.7	15.5
Production Engineering	11.7	8.2	-28.6	-13.7
Other Engineering	-35.0	30.8	-5.9	-20.0
Broadly-based programmes within engineering & technology				
Computer Sciences Total	**-9.0**	**-0.9**	**-1.1**	**-10.8**
Artificial intelligence	-33.3	10.0	4.5	-23.3
Computing Science	-9.4	-1.1	-0.2	-10.5
Software engineering	-7.7	-0.5	-5.4	-13.1
Others in computer sciences				
Technologies Total	**-0.2**	**6.9**	**3.7**	**10.6**
Biotechnology	-11.1	8.3	-15.4	-18.5
Ceramics and Glasses				
Maritime Technology	-22.5	25.8	2.6	0.0
Metallurgy				
Minerals Technology				
Polymers and Textiles	-1.6	2.4	4.0	4.8
Other Technologies	5.0	9.1	7.6	23.3
Others Materials Technology	0.0	-2.7	4.1	1.3
Grand Total	**-1.0**	**5.2**	**2.1**	**6.3**

* Data are based on headcounts of students who spend 50% or more of their time studying a particular subject. Percentage changes have not been presented where the number of students was fewer than 100.

Table 4: All full time students completing first degree courses in engineering and technology subjects by gender between 2007/08 and 2010/11 (Source: HESA Student Data)*

Subject Group/Subject	2007/08			2008/09			2009/10			2010/11		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Engineering Total	**85.9%**	**14.1%**	**16675**	**86.0%**	**14.0%**	**16875**	**85.1%**	**14.9%**	**17975**	**85.3%**	**14.7%**	**18430**
Aeronautical Engineering	90.1%	9.9%	1255	89.7%	10.3%	1340	89.5%	10.5%	1425	89.3%	10.7%	1495
Chemical Engineering	67.7%	32.3%	935	71.3%	28.7%	970	73.0%	27.0%	1175	71.5%	28.5%	1275
Civil Engineering	84.4%	15.6%	2930	83.6%	16.4%	3225	83.7%	16.3%	3575	83.4%	16.6%	3760
Electronic Engineering	87.2%	12.8%	4690	86.7%	13.3%	4455	86.3%	13.7%	4650	86.0%	14.0%	4910
General Engineering	79.6%	20.4%	1810	82.7%	17.3%	1465	79.6%	20.4%	1410	83.9%	16.1%	1500
Mechanical Engineering	91.6%	8.4%	3830	92.4%	7.6%	4155	91.2%	8.8%	4350	90.7%	9.3%	4425
Production Engineering	84.5%	15.5%	985	78.7%	21.3%	1100	76.4%	23.6%	1190	78.7%	21.3%	850
Computer Sciences Total	**76.5%**	**23.5%**	**4630**	**77.3%**	**22.7%**	**4215**	**76.3%**	**23.7%**	**4175**	**75.6%**	**24.4%**	**4130**
Computing Science	71.7%	28.3%	3365	72.8%	27.2%	3050	71.4%	28.6%	3015	71.5%	28.5%	3010
Software engineering	89.4%	10.6%	1110	89.6%	10.4%	1025	89.8%	10.2%	1020	89.0%	11.0%	965
Technologies Total	**61.3%**	**38.7%**	**2625**	**62.8%**	**37.2%**	**2625**	**64.3%**	**35.7%**	**2805**	**64.4%**	**35.6%**	**2910**
Polymers and Textiles	13.6%	86.4%	625	12.5%	87.5%	615	12.2%	87.8%	630	12.5%	87.5%	655
Other Technologies	80.8%	19.2%	1195	86.1%	13.9%	1260	88.3%	11.7%	1375	86.4%	13.6%	1480
Others Materials Technology	68.4%	31.6%	375	60.4%	39.6%	375	56.9%	43.1%	365	60.7%	39.3%	380
Total	**81.4%**	**18.6%**	**23930**	**81.9%**	**18.1%**	**23715**	**81.3%**	**18.7%**	**24955**	**81.3%**	**18.7%**	**25470**

* Subjects with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 5: Full-time UK domiciled students completing first degree courses in engineering and technology subjects by gender between 2007/08 and 2010/11 (Source: HESA Student Data)*

Subject Group/Subject	2007/08			2008/09			2009/10			2010/11		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Engineering Total	**87.1%**	**12.9%**	**10885**	**87.7%**	**12.3%**	**10870**	**86.8%**	**13.2%**	**11135**	**86.7%**	**13.3%**	**11585**
Aeronautical Engineering	90.4%	9.6%	935	89.5%	10.5%	985	89.3%	10.7%	950	89.0%	11.0%	965
Chemical Engineering	74.3%	25.7%	565	77.5%	22.5%	580	77.5%	22.5%	685	75.7%	24.3%	800
Civil Engineering	84.8%	15.2%	1985	85.3%	14.7%	2160	84.7%	15.3%	2380	85.0%	15.0%	2540
Electronic Engineering	88.7%	11.3%	2840	90.1%	9.9%	2640	89.2%	10.8%	2630	88.6%	11.4%	2635
General Engineering	82.9%	17.1%	1115	82.4%	17.6%	1020	79.7%	20.3%	955	82.8%	17.2%	1080
Mechanical Engineering	91.4%	8.6%	2615	92.4%	7.6%	2730	91.9%	8.1%	2780	90.8%	9.2%	2945
Production Engineering	84.4%	15.6%	715	80.9%	19.1%	675	79.1%	20.9%	660	82.0%	18.0%	540
Computer Sciences Total	**76.5%**	**23.5%**	**3950**	**77.1%**	**22.9%**	**3525**	**75.8%**	**24.2%**	**3315**	**76.0%**	**24.0%**	**3235**
Computing Science	71.2%	28.8%	2875	72.2%	27.8%	2535	70.1%	29.9%	2370	71.6%	28.4%	2370
Software engineering	90.7%	9.3%	955	90.2%	9.8%	890	90.9%	9.1%	830	90.7%	9.3%	740
Technologies Total	**61.0%**	**39.0%**	**2185**	**63.5%**	**36.5%**	**2205**	**65.1%**	**34.9%**	**2300**	**64.4%**	**35.6%**	**2400**
Polymers and Textiles	9.9%	90.1%	565	10.0%	90.0%	540	8.3%	91.7%	540	9.2%	90.8%	575
Other Technologies	83.1%	16.9%	1090	87.1%	12.9%	1150	88.9%	11.1%	1240	88.4%	11.6%	1310
Others Materials Technology	69.9%	30.1%	285	61.3%	38.7%	285	60.4%	39.6%	265	58.6%	41.4%	265
Total	**81.3%**	**18.7%**	**17020**	**82.2%**	**17.8%**	**16605**	**81.6%**	**18.4%**	**16745**	**81.6%**	**18.4%**	**17215**

* Subjects with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Data in Table 4 show the gender breakdown for all full-time students completing first degree courses in engineering and technology subjects in the academic years 2007/08, 2008/09, 2009/10 and 2010/11, and data in Table 5 show the same data restricted to UK domiciled students. As noted in the Set to Lead research report, there is considerable variation in the proportion of graduates who are female. In 2010/11 the proportions of all full-time graduates who were female ranged from 9% in mechanical engineering to 88% in polymers and textiles. At subject group level 15% of engineering subject graduates, 24% of computer science subject graduates and 36% of technology subject graduates were female in 2010/11. Even within a subject group there is considerable variation in the proportion of graduates who are female. 29% of chemical engineering graduates were female compared to 17% of civil engineering graduates, 14% of electronic engineering graduates, and 9% of mechanical engineering graduates in 2010/11.

While there was some variation in the proportions of students who were female at subject level between 2007/08 and 2010/11, overall the proportion of full-time graduates who were female varied relatively little over the time period under consideration, being 18.6% in 2007/08 and 18.7% in 2010/11. There is a similar picture for UK domiciled graduates; the proportion of graduates who were female was 18.7% in 2007/08 and 18.4% in 2010/11.

Table 6: Full time UK domiciled students completing first degree courses in engineering and technology subjects by subject, ethnicity and gender from 2007/08 and 2010/11 combined (Source: HESA Student Data)*

Subject Group/ Subject	Gender	Ethnicity of Students										Total
		White	Asian or Asian British - Indian	Asian or Asian British - Pakistani	Asian or Asian British - Bangladeshi	Other Asian background	Black or Black British - African	Black or Black British - Caribbean	Other Black background	Chinese	Other and mixed Ethnic background	
Engineering	**Male**	**29555**	**1670**	**970**	**305**	**880**	**1670**	**260**	**90**	**750**	**1390**	**37545**
	Female	**4010**	**290**	**130**	**60**	**185**	**330**	**70**	**15**	**200**	**270**	**5555**
Aeronautical Engineering	Male	2360	245	145	40	120	145	30	10	80	165	3340
	Female	290	25	10	0	15	15	5	5	10	15	390
Chemical Engineering	Male	1310	125	90	15	65	180	10	10	55	95	1945
	Female	325	45	20	10	25	110	5	0	35	25	600
Civil Engineering	Male	6065	270	170	50	180	290	35	20	125	265	7480
	Female	1055	45	10	10	40	40	20	0	40	65	1325
Electronic Engineering	Male	6885	445	285	105	240	590	105	30	200	365	9250
	Female	700	75	50	30	40	100	30	5	35	70	1135
General Engineering	Male	2705	95	55	20	70	105	20	5	65	90	3240
	Female	570	30	5	0	20	15	5	0	25	30	705
Mechanical Engineering	Male	8175	410	190	60	180	310	45	15	185	350	9915
	Female	655	50	20	5	35	45	5	0	30	45	895
Production Engineering	Male	1775	80	35	10	20	30	15	5	35	55	2065
	Female	375	25	5	5	10	5	0	0	20	15	465
Computer Sciences	**Male**	**6790**	**845**	**630**	**245**	**310**	**645**	**130**	**65**	**200**	**380**	**10240**
	Female	**1825**	**310**	**275**	**90**	**110**	**240**	**70**	**30**	**70**	**150**	**3180**
Computing Science	Male	4110	735	530	220	220	505	105	55	150	260	6890
	Female	1565	300	260	90	95	210	65	25	60	125	2800
Software Engineering	Male	2365	95	100	20	80	130	25	5	40	110	2975
	Female	195	10	15	5	15	30	5	5	10	15	300
Technologies	**Male**	**5035**	**120**	**60**	**20**	**35**	**80**	**45**	**15**	**45**	**170**	**5620**
	Female	**2645**	**135**	**45**	**10**	**55**	**65**	**45**	**10**	**80**	**160**	**3250**
Polymers and Textiles	Male	160	10	0	0	5	5	0	5	5	10	200
	Female	1680	75	20	5	15	20	25	5	45	85	1975
Other Technologies	Male	3740	55	40	10	5	40	30	5	15	110	4060
	Female	500	25	5	0	5	15	10	0	15	30	605
Others Materials Technology	Male	500	40	15	10	20	25	10	0	20	30	670
	Female	245	25	15	5	35	25	5	5	15	30	405
Total	**Male**	**41380**	**2635**	**1660**	**570**	**1225**	**2390**	**435**	**170**	**995**	**1940**	**53405**
	Female	**8485**	**735**	**450**	**160**	**355**	**635**	**180**	**55**	**350**	**580**	**11985**

* Students whose ethnicity is unknown and subjects with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 7: Percentage breakdown by gender of all full time UK domiciled students completing first degree courses in engineering and technology subjects by subject and ethnicity from 2007/08 and 2010/11 combined (Source: HESA Student Data)*

Subject Group/ Subject	Gender	Ethnicity of Students										Total
		White	Asian or Asian British - Indian	Asian or Asian British - Pakistani	Asian or Asian British - Bangladeshi	Other Asian background	Black or Black British - African	Black or Black British - Caribbean	Other Black background	Chinese	Other and mixed Ethnic background	
Engineering	**Male**	**88.1%**	**85.2%**	**88.2%**	**83.6%**	**82.6%**	**83.5%**	**78.8%**	**85.7%**	**78.9%**	**83.7%**	**87.1%**
	Female	**11.9%**	**14.8%**	**11.8%**	**16.4%**	**17.4%**	**16.5%**	**21.2%**	**14.3%**	**21.1%**	**16.3%**	**12.9%**
Aeronautical Engineering	Male	89.1%	90.7%	93.5%	100.0%	88.9%	90.6%	85.7%	66.7%	88.9%	91.7%	89.5%
	Female	10.9%	9.3%	6.5%	0.0%	11.1%	9.4%	14.3%	33.3%	11.1%	8.3%	10.5%
Chemical Engineering	Male	80.1%	73.5%	81.8%	60.0%	72.2%	62.1%	66.7%	100.0%	61.1%	79.2%	76.4%
	Female	19.9%	26.5%	18.2%	40.0%	27.8%	37.9%	33.3%	0.0%	38.9%	20.8%	23.6%
Civil Engineering	Male	85.2%	85.7%	94.4%	83.3%	81.8%	87.9%	63.6%	100.0%	75.8%	80.3%	85.0%
	Female	14.8%	14.3%	5.6%	16.7%	18.2%	12.1%	36.4%	0.0%	24.2%	19.7%	15.0%
Electronic Engineering	Male	90.8%	85.6%	85.1%	77.8%	85.7%	85.5%	77.8%	85.7%	85.1%	83.9%	89.1%
	Female	9.2%	14.4%	14.9%	22.2%	14.3%	14.5%	22.2%	14.3%	14.9%	16.1%	10.9%
General Engineering	Male	82.6%	76.0%	91.7%	100.0%	77.8%	87.5%	80.0%	100.0%	72.2%	75.0%	82.1%
	Female	17.4%	24.0%	8.3%	0.0%	22.2%	12.5%	20.0%	0.0%	27.8%	25.0%	17.9%
Mechanical Engineering	Male	92.6%	89.1%	90.5%	92.3%	83.7%	87.3%	90.0%	100.0%	86.0%	88.6%	91.7%
	Female	7.4%	10.9%	9.5%	7.7%	16.3%	12.7%	10.0%	0.0%	14.0%	11.4%	8.3%
Production Engineering	Male	82.6%	76.2%	87.5%	66.7%	66.7%	85.7%	100.0%	100.0%	63.6%	78.6%	81.6%
	Female	17.4%	23.8%	12.5%	33.3%	33.3%	14.3%	0.0%	0.0%	36.4%	21.4%	18.4%
Computer Sciences	**Male**	**78.8%**	**73.2%**	**69.6%**	**73.1%**	**73.8%**	**72.9%**	**65.0%**	**68.4%**	**74.1%**	**71.7%**	**76.3%**
	Female	**21.2%**	**26.8%**	**30.4%**	**26.9%**	**26.2%**	**27.1%**	**35.0%**	**31.6%**	**25.9%**	**28.3%**	**23.7%**
Computing Science	Male	72.4%	71.0%	67.1%	71.0%	69.8%	70.6%	61.8%	68.8%	71.4%	67.5%	71.1%
	Female	27.6%	29.0%	32.9%	29.0%	30.2%	29.4%	38.2%	31.3%	28.6%	32.5%	28.9%
Software Engineering	Male	92.4%	90.5%	87.0%	80.0%	84.2%	81.3%	83.3%	50.0%	80.0%	88.0%	90.8%
	Female	7.6%	9.5%	13.0%	20.0%	15.8%	18.8%	16.7%	50.0%	20.0%	12.0%	9.2%
Technologies	**Male**	**65.6%**	**47.1%**	**57.1%**	**66.7%**	**38.9%**	**55.2%**	**50.0%**	**60.0%**	**36.0%**	**51.5%**	**63.4%**
	Female	**34.4%**	**52.9%**	**42.9%**	**33.3%**	**61.1%**	**44.8%**	**50.0%**	**40.0%**	**64.0%**	**48.5%**	**36.6%**
Polymers and Textiles	Male	8.7%	11.8%	0.0%	0.0%	25.0%	20.0%	0.0%	50.0%	10.0%	10.5%	9.2%
	Female	91.3%	88.2%	100.0%	100.0%	75.0%	80.0%	100.0%	50.0%	90.0%	89.5%	90.8%
Other Technologies	Male	88.2%	68.8%	88.9%	100.0%	50.0%	72.7%	75.0%	100.0%	50.0%	78.6%	87.0%
	Female	11.8%	31.3%	11.1%	0.0%	50.0%	27.3%	25.0%	0.0%	50.0%	21.4%	13.0%
Others Materials Technology	Male	67.1%	61.5%	50.0%	66.7%	36.4%	50.0%	66.7%	0.0%	57.1%	50.0%	62.3%
	Female	32.9%	38.5%	50.0%	33.3%	63.6%	50.0%	33.3%	100.0%	42.9%	50.0%	37.7%
Total	**Male**	**83.0%**	**78.2%**	**78.7%**	**78.1%**	**77.5%**	**79.0%**	**70.7%**	**75.6%**	**74.0%**	**77.0%**	**81.7%**
	Female	**17.0%**	**21.8%**	**21.3%**	**21.9%**	**22.5%**	**21.0%**	**29.3%**	**24.4%**	**26.0%**	**23.0%**	**18.3%**

* Students whose ethnicity is unknown and subjects with fewer than 100 graduates have been excluded. Calculated proportions are based on headcounts of students who spend 50% or more of their time studying a particular subject.

Table 8: Percentage breakdown by ethnicity of all full time UK domiciled students completing first degree courses in engineering and technology subjects by subject and gender from 2007/08 and 2010/11 combined (Source: HESA Student Data)*

Subject Group/ Subject	Gender	Ethnicity of Students										Total
		White	Asian or Asian British - Indian	Asian or Asian British - Pakistani	Asian or Asian British - Bangladeshi	Other Asian background	Black or Black British - African	Black or Black British - Caribbean	Other Black background	Chinese	Other and mixed Ethnic background	
Engineering	**Male**	**78.7%**	**4.4%**	**2.6%**	**0.8%**	**2.3%**	**4.4%**	**0.7%**	**0.2%**	**2.0%**	**3.7%**	**37545**
	Female	**72.2%**	**5.2%**	**2.3%**	**1.1%**	**3.3%**	**5.9%**	**1.3%**	**0.3%**	**3.6%**	**4.9%**	**5555**
Aeronautical Engineering	Male	70.7%	7.3%	4.3%	1.2%	3.6%	4.3%	0.9%	0.3%	2.4%	4.9%	3340
	Female	74.4%	6.4%	2.6%	0.0%	3.8%	3.8%	1.3%	1.3%	2.6%	3.8%	390
Chemical Engineering	Male	67.4%	6.4%	4.6%	0.8%	3.3%	9.3%	0.5%	0.5%	2.8%	4.9%	1945
	Female	54.2%	7.5%	3.3%	1.7%	4.2%	18.3%	0.8%	0.0%	5.8%	4.2%	600
Civil Engineering	Male	81.1%	3.6%	2.3%	0.7%	2.4%	3.9%	0.5%	0.3%	1.7%	3.5%	7480
	Female	79.6%	3.4%	0.8%	0.8%	3.0%	3.0%	1.5%	0.0%	3.0%	4.9%	1325
Electronic Engineering	Male	74.4%	4.8%	3.1%	1.1%	2.6%	6.4%	1.1%	0.3%	2.2%	3.9%	9250
	Female	61.7%	6.6%	4.4%	2.6%	3.5%	8.8%	2.6%	0.4%	3.1%	6.2%	1135
General Engineering	Male	83.5%	2.9%	1.7%	0.6%	2.2%	3.2%	0.6%	0.2%	2.0%	2.8%	3240
	Female	80.9%	4.3%	0.7%	0.0%	2.8%	2.1%	0.7%	0.0%	3.5%	4.3%	705
Mechanical Engineering	Male	82.5%	4.1%	1.9%	0.6%	1.8%	3.1%	0.5%	0.2%	1.9%	3.5%	9915
	Female	73.2%	5.6%	2.2%	0.6%	3.9%	5.0%	0.6%	0.0%	3.4%	5.0%	895
Production Engineering	Male	86.0%	3.9%	1.7%	0.5%	1.0%	1.5%	0.7%	0.2%	1.7%	2.7%	2065
	Female	80.6%	5.4%	1.1%	1.1%	2.2%	1.1%	0.0%	0.0%	4.3%	3.2%	465
Computer Sciences	**Male**	**66.3%**	**8.3%**	**6.2%**	**2.4%**	**3.0%**	**6.3%**	**1.3%**	**0.6%**	**2.0%**	**3.7%**	**10240**
	Female	**57.4%**	**9.7%**	**8.6%**	**2.8%**	**3.5%**	**7.5%**	**2.2%**	**0.9%**	**2.2%**	**4.7%**	**3180**
Computing Science	Male	59.7%	10.7%	7.7%	3.2%	3.2%	7.3%	1.5%	0.8%	2.2%	3.8%	6890
	Female	55.9%	10.7%	9.3%	3.2%	3.4%	7.5%	2.3%	0.9%	2.1%	4.5%	2800
Software Engineering	Male	79.5%	3.2%	3.4%	0.7%	2.7%	4.4%	0.8%	0.2%	1.3%	3.7%	2975
	Female	65.0%	3.3%	5.0%	1.7%	5.0%	10.0%	1.7%	1.7%	3.3%	5.0%	300
Technologies	**Male**	**89.6%**	**2.1%**	**1.1%**	**0.4%**	**0.6%**	**1.4%**	**0.8%**	**0.3%**	**0.8%**	**3.0%**	**5620**
	Female	**81.4%**	**4.2%**	**1.4%**	**0.3%**	**1.7%**	**2.0%**	**1.4%**	**0.3%**	**2.5%**	**4.9%**	**3250**
Polymers and Textiles	Male	80.0%	5.0%	0.0%	0.0%	2.5%	2.5%	0.0%	2.5%	2.5%	5.0%	200
	Female	85.1%	3.8%	1.0%	0.3%	0.8%	1.0%	1.3%	0.3%	2.3%	4.3%	1975
Other Technologies	Male	92.1%	1.4%	1.0%	0.2%	0.1%	1.0%	0.7%	0.1%	0.4%	2.7%	4060
	Female	82.6%	4.1%	0.8%	0.0%	0.8%	2.5%	1.7%	0.0%	2.5%	5.0%	605
Others Materials Technology	Male	74.6%	6.0%	2.2%	1.5%	3.0%	3.7%	1.5%	0.0%	3.0%	4.5%	670
	Female	60.5%	6.2%	3.7%	1.2%	8.6%	6.2%	1.2%	1.2%	3.7%	7.4%	405
Total	**Male**	**77.5%**	**4.9%**	**3.1%**	**1.1%**	**2.3%**	**4.5%**	**0.8%**	**0.3%**	**1.9%**	**3.6%**	**53405**
	Female	**70.8%**	**6.1%**	**3.8%**	**1.3%**	**3.0%**	**5.3%**	**1.5%**	**0.5%**	**2.9%**	**4.8%**	**11985**

* Students whose ethnicity is unknown and subjects with fewer than 100 graduates have been excluded. Calculated proportions are based on headcounts of students who spend 50% or more of their time studying a particular subject.

Data on the numbers of UK domiciled full time students completing first degree courses in engineering and technology subjects broken down by ethnicity are shown in Table 6, the gender breakdown in each ethnic group by subject group and subject is shown in Table 7, and the breakdown by ethnicity within each subject group and subject is shown in Table 8.

In general, higher proportions of UK domiciled BME students than White students are female although there are variations between subjects. Overall all BME groups have higher proportions of students who are female graduating from engineering and technology subjects than the White group. The Black or Black British - Caribbean ethnic group has the highest proportion of students who are female, although this may reflect the relatively low achievement of Black or Black British - Caribbean males at school level.[11]

Data in Table 8 show that there is variation in the popularity of different engineering and technology subjects by ethnic group. Computer science subjects are more popular among BME groups than engineering or technology subjects.

The representation of ethnic groups in science, engineering and technology has been examined previously.[12]

Across all subjects 78% of male and 71% of female graduates are White. In the engineering subject group 79% male and 72% of female graduates are White, in computer sciences subject group 66% of male and 57% of female graduates are White, and in the technology subject group 90% of male and 81% of female graduates are White.

Data on the degree classification of all full time students completing first degree courses in engineering and technology subjects between 2007/08 and 2010/11, broken down by gender, are shown in Table 9. A more detailed breakdown showing the data for men and women separately, and breaking down the engineering data into those qualifying with enhanced first degrees and those qualifying with bachelor first degrees is shown in Table 10.

As noted in the research report of Set to Lead, **at the subject group level women are more likely than men to gain first and upper second class degrees**. Between 2007/08 and 2010/11 within each subject group White students are more likely than students in other BME groups to gain first and upper second class degrees. As the data in Table 10 illustrate, in general within each ethnic group, women are more likely to gain first and upper second class degrees than men.

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[11] See for example Strand, S. (2012). The White British-Black Caribbean achievement gap: Tests, tiers and teacher expectations. *British Educational Research Journal, 38, (1), 75-101.*

[12] Science, engineering and technology and the UK's ethnic minority population, Royal Society, 2004; Representation of Ethnic Groups in Chemistry and Physics, Institute of Physics and the Royal Society of Chemistry, 2007; Why choose physics and chemistry? The influences on physics and chemistry subject choices of BME students, The Institute of Physics and the Royal Society of Chemistry, 2008

Table 9: Degree classification of all UK domiciled full time students completing first degree courses in engineering and technology subjects by ethnicity from 2007/08 and 2010/11 combined (Source: HESA Student Data)*

Subject Group/Ethnicity	Degree Classification					Total
	1st class	Upper 2nd class	Lower 2nd class	3rd class / Pass	Unclassified	
Engineering	**22.2%**	**41.2%**	**24.1%**	**6.6%**	**6.0%**	**44485**
White	24.9%	42.7%	21.4%	5.1%	5.9%	33575
Asian or Asian British - Indian	15.3%	39.4%	30.5%	8.3%	6.5%	1960
Asian or Asian British - Pakistani	13.3%	35.8%	35.2%	11.2%	4.5%	1105
Asian or Asian British - Bangladeshi	12.6%	31.8%	38.9%	12.3%	4.4%	365
Other Asian background	13.6%	37.8%	31.8%	12.1%	4.6%	1065
Black or Black British - African	9.0%	34.0%	38.9%	13.4%	4.8%	2000
Black or Black British - Caribbean	8.6%	34.4%	42.3%	12.0%	2.8%	325
Other Black background	4.7%	37.7%	31.1%	19.8%	6.6%	105
Chinese	16.3%	39.8%	28.9%	9.5%	5.5%	950
Other and mixed Ethnic background	19.1%	38.6%	28.7%	8.9%	4.7%	1660
Computer Sciences	**16.9%**	**37.3%**	**31.3%**	**9.9%**	**4.5%**	**14025**
White	21.4%	40.2%	27.0%	7.1%	4.3%	8615
Asian or Asian British - Indian	11.8%	35.3%	36.5%	12.8%	3.6%	1155
Asian or Asian British - Pakistani	7.8%	31.5%	41.3%	12.7%	6.7%	910
Asian or Asian British - Bangladeshi	6.8%	32.8%	46.2%	12.1%	2.1%	340
Other Asian background	11.6%	31.9%	38.3%	14.2%	4.0%	425
Black or Black British - African	7.6%	32.4%	40.4%	15.8%	3.7%	885
Black or Black British - Caribbean	9.9%	32.2%	36.6%	17.3%	4.0%	200
Chinese	11.1%	33.9%	39.9%	11.8%	3.3%	270
Other and mixed Ethnic background	15.2%	38.1%	33.5%	9.5%	3.8%	530
Technologies	**18.9%**	**44.4%**	**27.6%**	**6.5%**	**2.5%**	**9090**
White	20.2%	46.0%	26.1%	5.2%	2.5%	7685
Asian or Asian British - Indian	11.3%	34.6%	39.3%	12.1%	2.7%	255
Asian or Asian British - Pakistani	3.0%	32.7%	36.6%	23.8%	4.0%	100
Black or Black British - African	7.6%	28.3%	42.1%	22.1%	0.0%	145
Chinese	12.1%	35.5%	37.1%	12.1%	3.2%	125
Other and mixed Ethnic background	18.7%	44.3%	30.0%	5.8%	1.2%	325
Grand Total	**20.7%**	**40.8%**	**26.0%**	**7.3%**	**5.2%**	**67600**

* Students whose ethnicity is unknown and groups with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 10: Degree classification of all UK domiciled full time students completing first degree courses in engineering and technology subjects by ethnicity and gender from 2007/08 to 2010/11 combined (Source: HESA Student Data)*

Subject Group and first degree/ Ethnicity	Gender	Degree Classification					Total
		1st class	Upper 2nd class	Lower 2nd class	3rd class / Pass	Unclassified	
Engineering Enhanced First Degrees							
White	Male	37.7%	46.5%	6.9%	0.4%	8.7%	10840
	Female	38.4%	45.7%	5.2%	0.4%	10.3%	1705
Asian or Asian British - Indian	Male	29.0%	52.4%	11.9%	0.4%	6.3%	490
	Female	25.7%	53.5%	12.9%	0.0%	7.9%	100
Asian or Asian British - Pakistani	Male	28.9%	53.1%	14.7%	0.0%	3.3%	210
	Female						
Asian or Asian British - Bangladeshi	Male						
	Female						
Other Asian background	Male	21.6%	55.9%	16.2%	0.5%	5.9%	205
	Female						
Black or Black British - African	Male	17.1%	57.0%	19.4%	1.6%	5.0%	260
	Female	24.5%	56.9%	14.7%	1.0%	2.9%	100
Black or Black British - Caribbean	Male						
	Female						
Other Black background	Male						
	Female						
Chinese	Male	29.3%	51.0%	11.7%	0.7%	7.3%	300
	Female	19.2%	60.6%	11.5%	0.0%	8.7%	105
Other and mixed Ethnic background	Male	31.0%	51.2%	12.3%	0.2%	5.2%	405
	Female						
Engineering Bachelor Degrees							
White	Male	17.2%	39.9%	30.4%	8.4%	4.2%	18715
	Female	17.0%	45.9%	28.5%	4.7%	4.0%	2305
Asian or Asian British - Indian	Male	9.3%	33.0%	38.9%	12.0%	6.8%	1180
	Female	11.6%	38.1%	36.0%	9.5%	4.8%	190
Asian or Asian British - Pakistani	Male	9.5%	30.6%	40.7%	14.5%	4.7%	760
	Female	5.6%	33.6%	43.0%	12.1%	5.6%	105
Asian or Asian British - Bangladeshi	Male	10.8%	24.9%	45.0%	15.3%	4.0%	250
	Female						
Other Asian background	Male	10.8%	31.7%	37.1%	16.0%	4.4%	675
	Female	10.6%	34.1%	37.4%	15.4%	2.4%	125
Black or Black British - African	Male	6.2%	27.7%	43.5%	17.3%	5.2%	1410
	Female	10.1%	36.4%	43.4%	7.9%	2.2%	230
Black or Black British - Caribbean	Male	6.0%	28.6%	47.0%	15.2%	3.2%	215
	Female						
Other Black background	Male						
	Female						
Chinese	Male	8.4%	28.7%	41.3%	17.3%	4.2%	450
	Female						
Other and mixed Ethnic background	Male	12.7%	34.1%	36.7%	12.4%	4.2%	985
	Female	16.8%	33.5%	33.5%	13.4%	2.8%	180

Computer Science Bachelor Degrees							
White	Male	20.5%	39.0%	28.4%	8.0%	4.0%	6505
	Female	22.1%	43.8%	25.3%	4.7%	4.2%	1805
Asian or Asian British - Indian	Male	11.9%	32.7%	37.4%	14.4%	3.6%	835
	Female	10.3%	42.4%	34.4%	9.0%	3.9%	310
Asian or Asian British - Pakistani	Male	7.5%	29.4%	41.1%	15.2%	6.8%	630
	Female	8.4%	36.5%	42.3%	6.2%	6.6%	275
Asian or Asian British - Bangladeshi	Male	7.3%	32.0%	45.7%	12.6%	2.4%	245
	Female						
Other Asian background	Male	11.7%	29.5%	37.7%	16.6%	4.5%	310
	Female	10.8%	36.9%	41.4%	8.1%	2.7%	110
Black or Black British - African	Male	6.7%	31.7%	40.9%	16.6%	4.1%	640
	Female	10.1%	32.4%	40.3%	14.3%	2.9%	240
Black or Black British - Caribbean	Male	9.2%	30.0%	34.6%	22.3%	3.8%	130
	Female						
Other Black background	Male						
	Female						
Chinese	Male	10.9%	28.6%	44.8%	13.0%	2.6%	190
	Female						
Other and mixed Ethnic background	Male	15.7%	38.4%	31.1%	11.4%	3.5%	370
	Female	14.0%	38.0%	38.0%	5.3%	4.7%	150
Technology Bachelor Degrees							
White	Male	15.8%	44.7%	29.3%	6.6%	3.5%	4760
	Female	25.4%	47.9%	22.4%	3.2%	1.0%	2590
Asian or Asian British - Indian	Male	6.3%	32.4%	45.0%	14.4%	1.8%	110
	Female	15.2%	33.3%	36.4%	11.4%	3.8%	130
Asian or Asian British - Pakistani	Male						
	Female						
Asian or Asian British - Bangladeshi	Male						
	Female						
Other Asian background	Male						
	Female						
Black or Black British - African	Male						
	Female						
Black or Black British - Caribbean	Male						
	Female						
Other Black background	Male						
	Female						
Chinese	Male						
	Female						
Other and mixed Ethnic background	Male						
	Female						

* Students whose ethnicity is unknown and groups with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 11: Full time UK domiciled students completing first degree courses in engineering and technology subjects by students' parents' occupation and gender from 2007/08 and 2010/11 combined (Source: HESA Student Data)*

Subject Group/Subject	Gender	Category of parental occupation of students								Total
		Higher managerial and professional occupations	Lower managerial and professional occupations	Intermediate occupations	Small employers and own account workers	Lower supervisory and technical occupations	Semi-routine occupations	Routine occupations	Never worked/ Unknown/ Unclassified	
Engineering	**Male**	**8090**	**8535**	**4110**	**2195**	**1820**	**3600**	**1335**	**9030**	**38715**
	Female	**1315**	**1320**	**610**	**275**	**225**	**570**	**195**	**1255**	**5760**
Aeronautical Engineering	Male	790	755	420	160	160	305	105	740	3430
	Female	95	85	55	20	15	40	20	75	400
Chemical Engineering	Male	505	495	195	110	80	195	55	375	2005
	Female	145	165	60	20	25	70	20	125	625
Civil Engineering	Male	1615	1750	790	530	340	650	265	1755	7700
	Female	330	355	145	85	50	120	35	245	1365
Electronic Engineering	Male	1625	1920	1070	435	435	965	375	2750	9575
	Female	195	215	120	50	50	140	55	335	1165
General Engineering	Male	875	710	370	165	120	260	105	810	3420
	Female	225	165	75	25	20	65	20	150	750
Mechanical Engineering	Male	2205	2325	1040	635	575	975	350	2040	10145
	Female	215	215	100	50	45	95	25	185	925
Production Engineering	Male	405	505	205	130	100	225	75	465	2115
	Female	95	115	50	20	20	35	20	120	475
Computer Sciences	**Male**	**1440**	**2025**	**1075**	**555**	**420**	**1175**	**560**	**3460**	**10710**
	Female	**340**	**590**	**305**	**210**	**110**	**425**	**180**	**1155**	**3310**
Computing Science	Male	915	1315	695	375	265	800	390	2475	7235
	Female	275	525	270	190	100	380	160	1015	2910
Software Engineering	Male	430	615	335	165	135	345	165	895	3090
	Female	40	45	30	15	5	35	20	125	320
Technologies	**Male**	**995**	**1310**	**595**	**265**	**240**	**530**	**250**	**1585**	**5775**
	Female	**545**	**845**	**330**	**225**	**110**	**345**	**140**	**770**	**3310**
Polymers and Textiles	Male	30	55	25	15	10	25	10	35	210
	Female	360	570	205	150	60	210	85	370	2010
Other Technologies	Male	640	935	445	175	180	400	195	1200	4170
	Female	85	120	60	30	30	75	25	195	620
Others Materials Technology	Male	155	155	70	40	20	60	25	170	690
	Female	65	95	35	30	10	40	15	120	410
Grand Total	**Male**	**10525**	**11875**	**5780**	**3010**	**2480**	**5310**	**2145**	**14075**	**55200**
	Female	**2195**	**2755**	**1245**	**705**	**440**	**1340**	**520**	**3180**	**12385**

* Subjects with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 12: Percentage breakdown by gender of all full time UK domiciled students completing first degree courses in engineering and technology subjects by subject and students' parents' occupation from 2007/08 and 2010/11 combined (Source: HESA Student Data)*

Subject Group/Subject	Gender	Category of parental occupation of students								Overall
		Higher managerial and professional occupations	Lower managerial and professional occupations	Intermediate occupations	Small employers and own account workers	Lower supervisory and technical occupations	Semi-routine occupations	Routine occupations	Never worked/ Unknown/ Unclassified	
Engineering	**Male**	**86.0%**	**86.6%**	**87.1%**	**88.9%**	**89.0%**	**86.3%**	**87.3%**	**87.8%**	**87.0%**
	Female	**14.0%**	**13.4%**	**12.9%**	**11.1%**	**11.0%**	**13.7%**	**12.7%**	**12.2%**	**13.0%**
Aeronautical Engineering	Male	89.3%	89.9%	88.4%	88.9%	91.4%	88.4%	84.0%	90.8%	89.6%
	Female	10.7%	10.1%	11.6%	11.1%	8.6%	11.6%	16.0%	9.2%	10.4%
Chemical Engineering	Male	77.7%	75.0%	76.5%	84.6%	76.2%	73.6%	73.3%	75.0%	76.2%
	Female	22.3%	25.0%	23.5%	15.4%	23.8%	26.4%	26.7%	25.0%	23.8%
Civil Engineering	Male	83.0%	83.1%	84.5%	86.2%	87.2%	84.4%	88.3%	87.8%	84.9%
	Female	17.0%	16.9%	15.5%	13.8%	12.8%	15.6%	11.7%	12.3%	15.1%
Electronic Engineering	Male	89.3%	89.9%	89.9%	89.7%	89.7%	87.3%	87.2%	89.1%	89.2%
	Female	10.7%	10.1%	10.1%	10.3%	10.3%	12.7%	12.8%	10.9%	10.8%
General Engineering	Male	79.5%	81.1%	83.1%	86.8%	85.7%	80.0%	84.0%	84.4%	82.0%
	Female	20.5%	18.9%	16.9%	13.2%	14.3%	20.0%	16.0%	15.6%	18.0%
Mechanical Engineering	Male	91.1%	91.5%	91.2%	92.7%	92.7%	91.1%	93.3%	91.7%	91.6%
	Female	8.9%	8.5%	8.8%	7.3%	7.3%	8.9%	6.7%	8.3%	8.4%
Production Engineering	Male	81.0%	81.5%	80.4%	86.7%	83.3%	86.5%	78.9%	79.5%	81.7%
	Female	19.0%	18.5%	19.6%	13.3%	16.7%	13.5%	21.1%	20.5%	18.3%
Computer Sciences	**Male**	**80.9%**	**77.4%**	**77.9%**	**72.5%**	**79.2%**	**73.4%**	**75.7%**	**75.0%**	**76.4%**
	Female	**19.1%**	**22.6%**	**22.1%**	**27.5%**	**20.8%**	**26.6%**	**24.3%**	**25.0%**	**23.6%**
Computing Science	Male	76.9%	71.5%	72.0%	66.4%	72.6%	67.8%	70.9%	70.9%	71.3%
	Female	23.1%	28.5%	28.0%	33.6%	27.4%	32.2%	29.1%	29.1%	28.7%
Software Engineering	Male	91.5%	93.2%	91.8%	91.7%	96.4%	90.8%	89.2%	87.7%	90.6%
	Female	8.5%	6.8%	8.2%	8.3%	3.6%	9.2%	10.8%	12.3%	9.4%
Technologies	**Male**	**64.6%**	**60.8%**	**64.3%**	**54.1%**	**68.6%**	**60.6%**	**64.1%**	**67.3%**	**63.6%**
	Female	**35.4%**	**39.2%**	**35.7%**	**45.9%**	**31.4%**	**39.4%**	**35.9%**	**32.7%**	**36.4%**
Polymers and Textiles	Male	7.7%	8.8%	10.9%	9.1%	14.3%	10.6%	10.5%	8.6%	9.5%
	Female	92.3%	91.2%	89.1%	90.9%	85.7%	89.4%	89.5%	91.4%	90.5%
Other Technologies	Male	88.3%	88.6%	88.1%	85.4%	85.7%	84.2%	88.6%	86.0%	87.1%
	Female	11.7%	11.4%	11.9%	14.6%	14.3%	15.8%	11.4%	14.0%	12.9%
Others Materials Technology	Male	70.5%	62.0%	66.7%	57.1%	66.7%	60.0%	62.5%	58.6%	62.7%
	Female	29.5%	38.0%	33.3%	42.9%	33.3%	40.0%	37.5%	41.4%	37.3%
Grand Total	**Male**	**82.7%**	**81.2%**	**82.3%**	**81.0%**	**84.9%**	**79.8%**	**80.5%**	**81.6%**	**81.7%**
	Female	**17.3%**	**18.8%**	**17.7%**	**19.0%**	**15.1%**	**20.2%**	**19.5%**	**18.4%**	**18.3%**

* Subjects with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 13: Percentage breakdown by students' parents' occupation of all full time UK domiciled students completing first degree courses in engineering and technology subjects by subject and gender from 2007/08 and 2010/11 combined (Source: HESA Student Data)* (Source: HESA Student Data)*

Subject Group/Subject	Gender	Category of parental occupation of students								Total
		Higher managerial and professional occupations	Lower managerial and professional occupations	Intermediate occupations	Small employers and own account workers	Lower supervisory and technical occupations	Semi-routine occupations	Routine occupations	Never worked/ Unknown/ Unclassified	
Engineering	**Male**	**20.9%**	**22.0%**	**10.6%**	**5.7%**	**4.7%**	**9.3%**	**3.4%**	**23.3%**	**38715**
	Female	**22.8%**	**22.9%**	**10.6%**	**4.8%**	**3.9%**	**9.9%**	**3.4%**	**21.8%**	**5760**
Aeronautical Engineering	Male	23.0%	22.0%	12.2%	4.7%	4.7%	8.9%	3.1%	21.6%	3430
	Female	23.8%	21.3%	13.8%	5.0%	3.8%	10.0%	5.0%	18.8%	400
Chemical Engineering	Male	25.2%	24.7%	9.7%	5.5%	4.0%	9.7%	2.7%	18.7%	2005
	Female	23.2%	26.4%	9.6%	3.2%	4.0%	11.2%	3.2%	20.0%	625
Civil Engineering	Male	21.0%	22.7%	10.3%	6.9%	4.4%	8.4%	3.4%	22.8%	7700
	Female	24.2%	26.0%	10.6%	6.2%	3.7%	8.8%	2.6%	17.9%	1365
Electronic Engineering	Male	17.0%	20.1%	11.2%	4.5%	4.5%	10.1%	3.9%	28.7%	9575
	Female	16.7%	18.5%	10.3%	4.3%	4.3%	12.0%	4.7%	28.8%	1165
General Engineering	Male	25.6%	20.8%	10.8%	4.8%	3.5%	7.6%	3.1%	23.7%	3420
	Female	30.0%	22.0%	10.0%	3.3%	2.7%	8.7%	2.7%	20.0%	750
Mechanical Engineering	Male	21.7%	22.9%	10.3%	6.3%	5.7%	9.6%	3.4%	20.1%	10145
	Female	23.2%	23.2%	10.8%	5.4%	4.9%	10.3%	2.7%	20.0%	925
Production Engineering	Male	19.1%	23.9%	9.7%	6.1%	4.7%	10.6%	3.5%	22.0%	2115
	Female	20.0%	24.2%	10.5%	4.2%	4.2%	7.4%	4.2%	25.3%	475
Computer Sciences	**Male**	**13.4%**	**18.9%**	**10.0%**	**5.2%**	**3.9%**	**11.0%**	**5.2%**	**32.3%**	**10710**
	Female	**10.3%**	**17.8%**	**9.2%**	**6.3%**	**3.3%**	**12.8%**	**5.4%**	**34.9%**	**3310**
Computing Science	Male	12.6%	18.2%	9.6%	5.2%	3.7%	11.1%	5.4%	34.2%	7235
	Female	9.5%	18.0%	9.3%	6.5%	3.4%	13.1%	5.5%	34.9%	2910
Software Engineering	Male	13.9%	19.9%	10.8%	5.3%	4.4%	11.2%	5.3%	29.0%	3090
	Female	12.5%	14.1%	9.4%	4.7%	1.6%	10.9%	6.3%	39.1%	320
Technologies	**Male**	**17.2%**	**22.7%**	**10.3%**	**4.6%**	**4.2%**	**9.2%**	**4.3%**	**27.4%**	**5775**
	Female	**16.5%**	**25.5%**	**10.0%**	**6.8%**	**3.3%**	**10.4%**	**4.2%**	**23.3%**	**3310**
Polymers and Textiles	Male	14.3%	26.2%	11.9%	7.1%	4.8%	11.9%	4.8%	16.7%	210
	Female	17.9%	28.4%	10.2%	7.5%	3.0%	10.4%	4.2%	18.4%	2010
Other Technologies	Male	15.3%	22.4%	10.7%	4.2%	4.3%	9.6%	4.7%	28.8%	4170
	Female	13.7%	19.4%	9.7%	4.8%	4.8%	12.1%	4.0%	31.5%	620
Others Materials Technology	Male	22.5%	22.5%	10.1%	5.8%	2.9%	8.7%	3.6%	24.6%	690
	Female	15.9%	23.2%	8.5%	7.3%	2.4%	9.8%	3.7%	29.3%	410
Grand Total	**Male**	**19.1%**	**21.5%**	**10.5%**	**5.5%**	**4.5%**	**9.6%**	**3.9%**	**25.5%**	**55200**
	Female	**17.7%**	**22.2%**	**10.1%**	**5.7%**	**3.6%**	**10.8%**	**4.2%**	**25.7%**	**12385**

* Subjects with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 14: Degree classification of all UK domiciled full-time students completing first degree courses in engineering and technology subjects by graduates' parents' occupations and gender from 2007/08 to 2010/11 combined (Source: HESA Student Data)*

Subject Group and first degree/ Ethnicity	Gender	Degree Classification					Total
		1st class	Upper 2nd class	Lower 2nd class	3rd class / Pass	Unclassified	
Engineering Enhanced First Degrees							
Higher managerial and professional occupations	Male	37.7%	46.3%	6.5%	0.5%	9.1%	2240
	Female	40.6%	41.3%	4.3%	0.5%	13.4%	420
Lower managerial and professional occupations	Male	37.7%	47.0%	6.2%	0.5%	8.6%	1930
	Female	36.0%	47.3%	7.1%	0.3%	9.3%	355
Intermediate occupations	Male	36.8%	46.6%	6.6%	0.2%	9.8%	875
	Female	38.8%	47.5%	5.8%	0.0%	7.9%	140
Small employers and own account workers	Male	37.1%	47.6%	8.6%	0.2%	6.6%	455
	Female						
Lower supervisory and technical occupations	Male	39.5%	45.7%	4.5%	0.0%	10.4%	335
	Female						
Semi-routine occupations	Male	38.2%	43.6%	7.7%	0.3%	10.2%	640
	Female	32.4%	49.1%	6.5%	0.0%	12.0%	110
Routine occupations	Male	37.3%	48.0%	4.5%	0.0%	10.2%	175
	Female						
Never worked/ Unknown/ Unclassified	Male	34.5%	48.2%	7.9%	0.1%	9.3%	985
	Female	37.0%	50.6%	2.6%	0.6%	9.1%	130
Engineering Bachelor Degrees							
Higher managerial and professional occupations	Male	18.1%	41.3%	29.2%	8.7%	2.7%	2095
	Female	17.3%	50.6%	27.3%	4.1%	0.7%	270
Lower managerial and professional occupations	Male	17.8%	42.1%	30.7%	6.8%	2.6%	2445
	Female	15.4%	45.1%	33.2%	4.2%	2.1%	335
Intermediate occupations	Male	17.4%	41.8%	28.9%	8.4%	3.6%	1265
	Female	14.9%	50.3%	29.8%	3.1%	1.9%	160
Small employers and own account workers	Male	15.9%	41.5%	32.6%	6.9%	3.0%	690
	Female						
Lower supervisory and technical occupations	Male	16.7%	45.5%	25.1%	9.8%	3.0%	640
	Female						
Semi-routine occupations	Male	15.7%	39.4%	33.5%	8.5%	3.0%	1205
	Female	18.1%	45.0%	25.1%	6.4%	5.3%	170
Routine occupations	Male	16.9%	43.0%	29.7%	8.4%	2.0%	500
	Female						
Never worked/ Unknown/ Unclassified	Male	16.4%	38.7%	30.9%	8.6%	5.4%	2900
	Female	18.3%	42.2%	26.4%	6.2%	6.9%	340

Computer Science Bachelor Degrees							
Higher managerial and professional occupations	Male	25.1%	43.9%	22.8%	6.3%	1.8%	710
	Female	25.4%	52.6%	17.9%	2.3%	1.7%	175
Lower managerial and professional occupations	Male	22.5%	42.2%	26.2%	6.0%	3.1%	1025
	Female	22.0%	42.5%	29.2%	5.3%	0.9%	320
Intermediate occupations	Male	18.6%	45.9%	27.3%	6.4%	1.7%	515
	Female	21.6%	49.1%	22.8%	3.6%	3.0%	165
Small employers and own account workers	Male	19.4%	34.7%	34.3%	9.5%	2.1%	240
	Female	13.6%	46.4%	32.7%	6.4%	0.9%	110
Lower supervisory and technical occupations	Male	20.1%	38.2%	31.7%	7.5%	2.5%	200
	Female						
Semi-routine occupations	Male	19.8%	35.7%	33.5%	7.9%	3.1%	545
	Female	15.2%	48.0%	30.9%	4.4%	1.5%	205
Routine occupations	Male	15.9%	41.3%	33.9%	7.4%	1.5%	270
	Female						
Never worked/ Unknown/ Unclassified	Male	16.6%	37.3%	32.6%	9.9%	3.7%	1360
	Female	21.8%	40.3%	31.1%	3.3%	3.5%	425
Technology Bachelor Degrees							
Higher managerial and professional occupations	Male	17.4%	45.3%	28.7%	5.5%	3.0%	470
	Female	31.3%	50.3%	15.3%	2.3%	0.7%	300
Lower managerial and professional occupations	Male	16.9%	43.0%	32.6%	5.3%	2.2%	625
	Female	26.1%	51.0%	19.3%	3.2%	0.4%	470
Intermediate occupations	Male	19.1%	47.3%	27.5%	5.0%	1.1%	260
	Female	33.3%	45.2%	18.3%	2.7%	0.5%	185
Small employers and own account workers	Male	18.8%	39.1%	31.3%	8.6%	2.3%	130
	Female	24.1%	42.9%	27.8%	3.8%	1.5%	135
Lower supervisory and technical occupations	Male	18.3%	43.7%	27.8%	9.5%	0.8%	125
	Female						
Semi-routine occupations	Male	17.9%	45.1%	29.8%	4.3%	3.0%	235
	Female	25.5%	45.0%	26.0%	3.5%	0.0%	200
Routine occupations	Male	14.3%	44.6%	32.1%	5.4%	3.6%	110
	Female						
Never worked/ Unknown/ Unclassified	Male	15.9%	47.1%	27.7%	6.3%	3.1%	685
	Female	20.9%	50.2%	24.5%	3.6%	0.7%	370

* Groups with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

The socio economic class, as indicated by the occupation of graduates' parents, and gender of all full time UK domiciled students completing first degree courses in engineering and technology subjects between 2007/08 and 2010/11 is shown in Table 11. The gender breakdown in each socio economic group by subject group and subject is shown in Table 12, and the breakdown by socio economic group within each subject group and subject is shown in Table 13.

As noted in the Set to Lead research report, although there is variation in the socio economic makeup of the student populations graduating in different subjects, and there are variations in the socio economic makeup of the male and female student populations within a specific subject, **overall there are few clear patterns**. However the data do indicate that **computer science subjects overall have a lower proportion of students with parents with higher managerial and professional occupations, than technology subjects which in turn have a lower proportion than engineering subjects**. Additionally computer science subjects have a higher proportion of students whose parents fall into the never worked, unknown or unclassified category of occupations than technology subjects which in turn have a higher proportion than engineering subjects.

At the subject group level the socio economic class makeup of the populations of men and women is similar.

From this it is not possible to say why there are variations in subject choices by socio economic class. It is possible that subjects that appear to link more clearly to jobs, such as computer science, are more attractive to students from lower socio economic classes. In turn, students from higher socio economic classes may have better access to information about the content and career opportunities arising from a wider range of subjects.

Data presented Table 14 show the degree classification of UK domiciled full-time graduates from engineering and technology first degree courses by social class and gender. **There is no clear pattern of achievement visible relative to graduates' parents' occupations.**

2.7 Destinations of first degree engineering and technology graduates 2007/08 to 2010/11

The main activities of full and part time UK domiciled students completing enhanced first degree courses in engineering subjects and bachelor degree courses in engineering, computer sciences and technology subjects six months after graduation in 2007/08, 2008/09, 2009/10 and 2010/11 are shown in Table 15, Table 16, Table 18, and Table 17, respectively, and in Figure 3, Figure 4, Figure 5, and Figure 6.

It should be noted that a number of graduates will not have settled into their career six months after graduation and consequently the proportions of graduates in specific roles will change with time. Nonetheless significant differences between the destinations of men and women should be taken note of as these are likely to indicate real effects.

Over the four years under consideration, in general the proportion of graduates entering full time paid work fell between 2007/08 and 2008/09 and then rose again in the subsequent two years. Similar patterns are observed for both men and women.

Among graduates from enhanced first degree courses in engineering subjects in 2007/08, 70% of male graduates and 67% of women were in full time paid work six months after completion. Overall, 79% of both men and women were undertaking some sort of work and 16% of men and 19% of women were undertaking some form of further study either as their only reported activity or while working. 7% of men and 6% of women were assumed to be unemployed. For 2008/09 graduates, 59% of male graduates and 57% of women were in full time paid work six months after completion. Overall, 70% of men and 74% of women were undertaking some sort of work and 18% of men and 22% of women were undertaking some form of further study either as their only reported activity or while working. 11% of men and 8% of women were assumed to be unemployed. By 2010/11 the proportion of graduates in full time paid work had risen again and the pattern of activities of graduates were almost the same as for 2007/08 graduates. 68% of male graduates and 66% of women were in full time paid work six months after completion. Overall, 79% of both men and women were undertaking some sort of work and 16% of men and 19% of women were undertaking some form of further study either as their only reported activity or while working. 8% of men and 6% of women were assumed to be unemployed.

Among graduates from bachelor first degree courses in engineering subjects in 2007/08, 60% of male graduates and 55% of women were in full time paid work six months after completion. Overall, 73% of men and 74% of women were undertaking some sort of work and 18% of men and 23% of women were undertaking some form of further study either as their only reported activity or while working. 11% of men and 9% of women were assumed to be unemployed. For 2008/09 graduates, 50% of male and 41% of women were in full time paid work six months after completion. Overall, 67% of men and 65% of women were undertaking some sort of work and 22% of men and 30% of women were undertaking some form of further study either as their only reported activity or while working. 13% of men and 11% of women were assumed to be unemployed. By 2010/11 the proportion of graduates in full time paid work had risen but not to the levels of the 2007/08. 56% of male graduates and 49% of women were in full time paid work six months after completion. Overall, 71% of men and 69% of women were undertaking some sort of work and 21% of men and 23% of women were undertaking some form of further study either as their only reported activity or while working. 11% of men and 10% of women were assumed to be unemployed.

Among graduates from bachelor first degree courses in computer science subjects in 2007/08, 57% of male graduates and 52% of women were in full time paid work six months after completion. Overall, 70% of men and 71% of women were undertaking some sort of work and 15% of men and 18% of women were

undertaking some form of further study either as their only reported activity or while working. 15% of men and 11% of women were assumed to be unemployed. For 2008/09 graduates, 48% of both male and female graduates were in full time paid work six months after completion. Overall, 66% of men and 70% of women were undertaking some sort of work and 17% of both men and women were undertaking some form of further study either as their only reported activity or while working. 19% of men and 14% of women were assumed to be unemployed. Like bachelor first degree engineering graduates by 2010/11 the proportion of graduates in full time paid work had risen again but the proportion of graduates in full time paid work had not risen to the levels of the 2007/08. 53% of male graduates and 51% of women were in full time paid work six months after completion. Overall, 72% of men and 74% of women were undertaking some sort of work and 14% of both men and women were undertaking some form of further study either as their only reported activity or while working. 15% of men and 13% of women were assumed to be unemployed.

Finally, among graduates from bachelor first degree courses in computer science subjects in 2007/08, 56% of male graduates and 59% of women were in full time paid work six months after completion. Overall, 72% of men and 76% of women were undertaking some sort of work and 16% of men and 12% of women were undertaking some form of further study either as their only reported activity or while working. 13% of men and 9% of women were assumed to be unemployed. For 2008/09 graduates, 49% of male and 56% of female graduates were in full time paid work six months after completion. Overall, 68% of men and 73% of women were undertaking some sort of work and 16% of men and 14% of women were undertaking some form of further study either as their only reported activity or while working. 15% of men and 10% of women were assumed to be unemployed. Like the other bachelor first degree subject group graduates by 2010/11 the proportion of graduates in full time paid work had risen again but the proportion of graduates in full time paid work had not risen to the levels of the 2007/08. 53% of male graduates and 57% of women were in full time paid work six months after completion. Overall, 73% of men and 80% of women were undertaking some sort of work and 13% of both men and 10% of men were undertaking some form of further study either as their only reported activity or while working. 15% of men and 9% of women were assumed to be unemployed.

Table 15: Main activities of full time and part time UK domiciled students completing enhanced first degree courses in engineering subjects by gender from 2007/08 to 2010/11 (Source: HESA Student Data)*

Main activity following graduation	2007/08		2008/09		2009/10		2010/11	
	Male	Female	Male	Female	Male	Female	Male	Female
Full time paid work only	1690	295	1660	260	1800	305	2200	370
	69.8%	67.4%	59.4%	56.9%	64.3%	63.4%	68.3%	66.4%
Part time paid work only	50	10	100	20	115	25	95	25
	2.0%	2.3%	3.6%	4.0%	4.1%	5.6%	2.9%	4.2%
Voluntary/unpaid work only	10	5	25	10	25	5	25	5
	0.5%	0.9%	0.9%	2.2%	0.8%	1.0%	0.7%	1.1%
Further study only	220	45	345	60	325	65	295	65
	9.1%	10.0%	12.4%	13.4%	11.6%	13.0%	9.1%	11.9%
Work and further study	160	40	170	40	145	35	230	40
	6.7%	8.7%	6.0%	8.4%	5.1%	7.0%	7.2%	7.4%
Not available for employment	100	15	180	30	105	10	105	15
	4.2%	3.9%	6.4%	6.2%	3.8%	2.3%	3.2%	2.7%
Assumed to be unemployed	170	25	300	40	265	35	250	35
	7.0%	5.9%	10.7%	8.4%	9.5%	6.8%	7.7%	6.0%
Other	20	5	20	5	25	5	25	0
	0.8%	0.9%	0.6%	0.7%	0.8%	0.8%	0.8%	0.4%
Explicit refusal	40	10	40	5	65	5	60	5
Total	**2460**	**445**	**2830**	**460**	**2860**	**490**	**3280**	**560**
Working	1910	345	1950	325	2080	375	2550	440
	79.0%	79.3%	69.9%	71.5%	74.3%	77.0%	79.1%	79.1%
Studying	380	80	515	100	470	95	525	105
	15.8%	18.7%	18.4%	21.8%	16.7%	20.0%	16.3%	19.3%

* Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

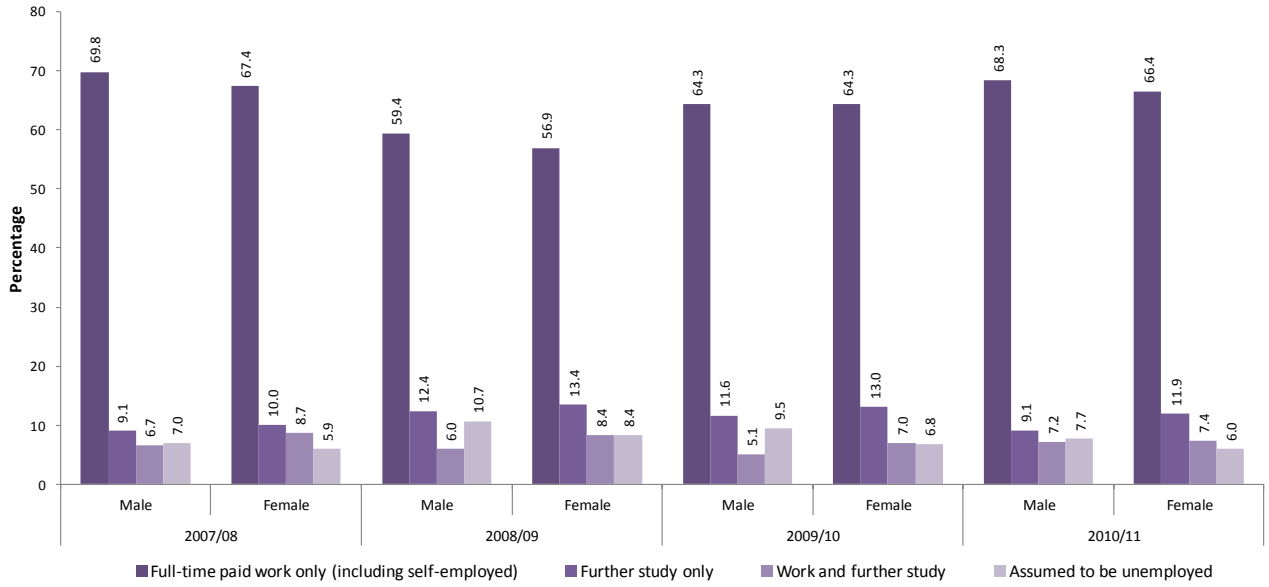

Figure 3: Main activity six months after graduation of UK domiciled students completing enhanced first degree courses in engineering subjects between 2007/08 and 2010/11 (Source: HESA DLHE Data)

Table 16: Main activities of full time and part time UK domiciled students completing bachelor first degree courses in engineering subjects by gender from 2007/08 to 2010/11 (Source: HESA Student Data)*

Main activity following graduation	2007/08		2008/09		2009/10		2010/11	
	Male	Female	Male	Female	Male	Female	Male	Female
Full time paid work only	3590	445	3075	305	3360	350	3405	375
	60.0%	55.5%	50.4%	40.8%	55.9%	46.6%	55.8%	49.3%
Part time paid work only	335	60	540	90	470	80	465	85
	5.6%	7.6%	8.8%	12.1%	7.8%	10.9%	7.6%	11.4%
Voluntary/unpaid work only	30	10	70	10	45	10	65	5
	0.5%	1.1%	1.1%	1.2%	0.7%	1.6%	1.0%	0.9%
Further study only	660	110	945	140	820	150	865	120
	11.0%	13.4%	15.5%	18.8%	13.6%	19.8%	14.2%	15.8%
Work and further study	430	75	395	80	395	50	405	55
	7.2%	9.5%	6.5%	10.7%	6.6%	6.7%	6.6%	7.2%
Not available for employment	200	25	190	35	140	20	145	30
	3.3%	3.2%	3.1%	4.6%	2.4%	2.8%	2.4%	3.9%
Assumed to be unemployed	660	70	815	80	700	70	690	80
	11.1%	8.6%	13.4%	10.9%	11.6%	9.5%	11.3%	10.3%
Other	80	10	80	10	80	15	60	10
	1.4%	1.1%	1.3%	1.1%	1.4%	2.1%	1.0%	1.0%
Explicit refusal	185	25	240	15	235	40	255	30
Total	**6170**	**830**	**6340**	**760**	**6245**	**790**	**6355**	**790**
Working	4380	590	4075	485	4270	495	4335	525
	73.3%	73.7%	66.8%	64.8%	71.0%	65.8%	71.0%	68.8%
Studying	1090	185	1335	220	1210	200	1270	175
	18.2%	22.9%	22.0%	29.5%	20.2%	26.5%	20.8%	23.0%

* Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

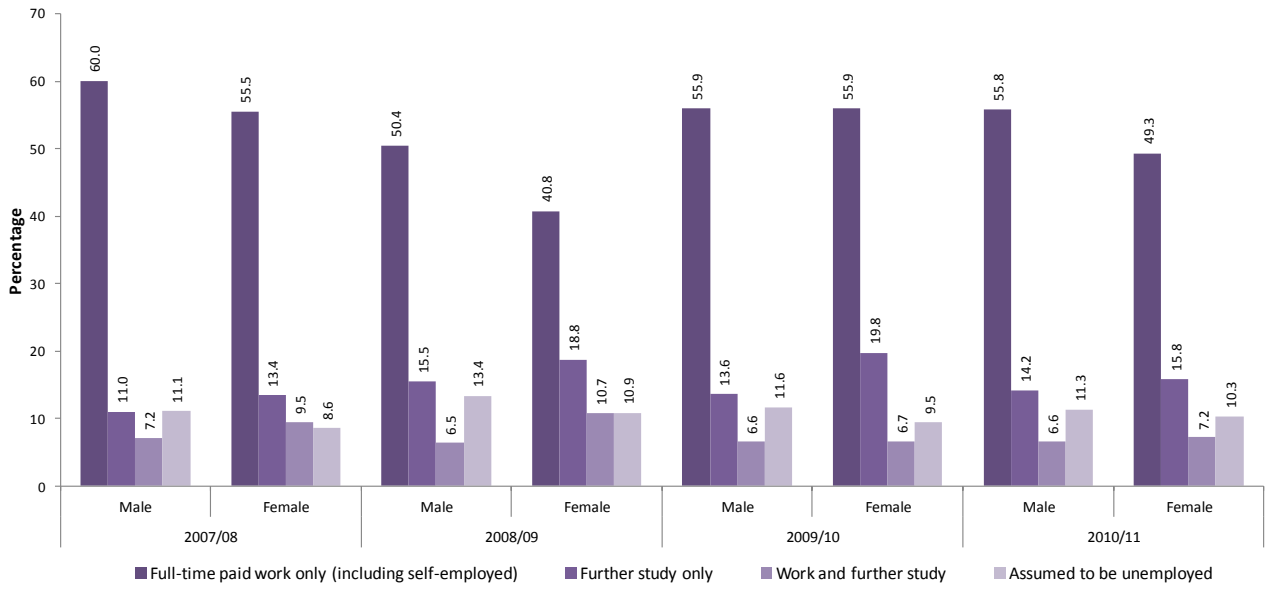

Figure 4: Main activity six months after graduation of UK domiciled students completing bachelor degree courses in engineering subjects between 2007/08 and 2010/11 (Source: HESA DLHE Data)

Table 17: Main activities of full time and part time UK domiciled students completing bachelor first degree courses in computer sciences subjects by gender from 2007/08 to 2010/11 (Source: HESA Student Data)*

Main activity following graduation	2007/08		2008/09		2009/10		2010/11	
	Male	Female	Male	Female	Male	Female	Male	Female
Full time paid work only	1340	455	1025	340	1095	340	1055	325
	56.9%	52.4%	47.9%	47.6%	53.6%	48.1%	52.7%	51.3%
Part time paid work only	195	100	230	105	230	110	245	95
	8.2%	11.6%	10.9%	14.7%	11.3%	15.6%	12.3%	15.1%
Voluntary/unpaid work only	20	5	20	5	20	10	40	15
	0.8%	0.8%	0.9%	1.0%	0.9%	1.7%	1.9%	2.2%
Further study only	250	105	235	80	200	75	185	60
	10.7%	12.3%	11.0%	10.9%	9.7%	10.5%	9.3%	9.1%
Work and further study	90	50	125	45	110	40	100	35
	3.9%	5.9%	5.8%	6.3%	5.5%	6.0%	5.1%	5.2%
Not available for employment	70	30	60	25	30	25	45	20
	2.9%	3.4%	2.9%	3.5%	1.4%	3.6%	2.3%	2.8%
Assumed to be unemployed	345	90	410	100	325	90	295	85
	14.6%	10.6%	19.1%	14.1%	15.8%	13.1%	14.9%	13.1%
Other	45	25	30	15	35	10	30	5
	2.0%	3.0%	1.5%	1.8%	1.8%	1.4%	1.6%	1.1%
Explicit refusal	115	30	100	40	115	25	85	40
Total	**2465**	**890**	**2235**	**755**	**2160**	**730**	**2085**	**675**
Working	1645	610	1400	495	1460	500	1435	470
	69.8%	70.7%	65.5%	69.6%	71.3%	71.4%	72.0%	73.8%
Studying	345	155	360	125	310	115	285	90
	14.6%	18.2%	16.8%	17.2%	15.2%	16.5%	14.4%	14.3%

* Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

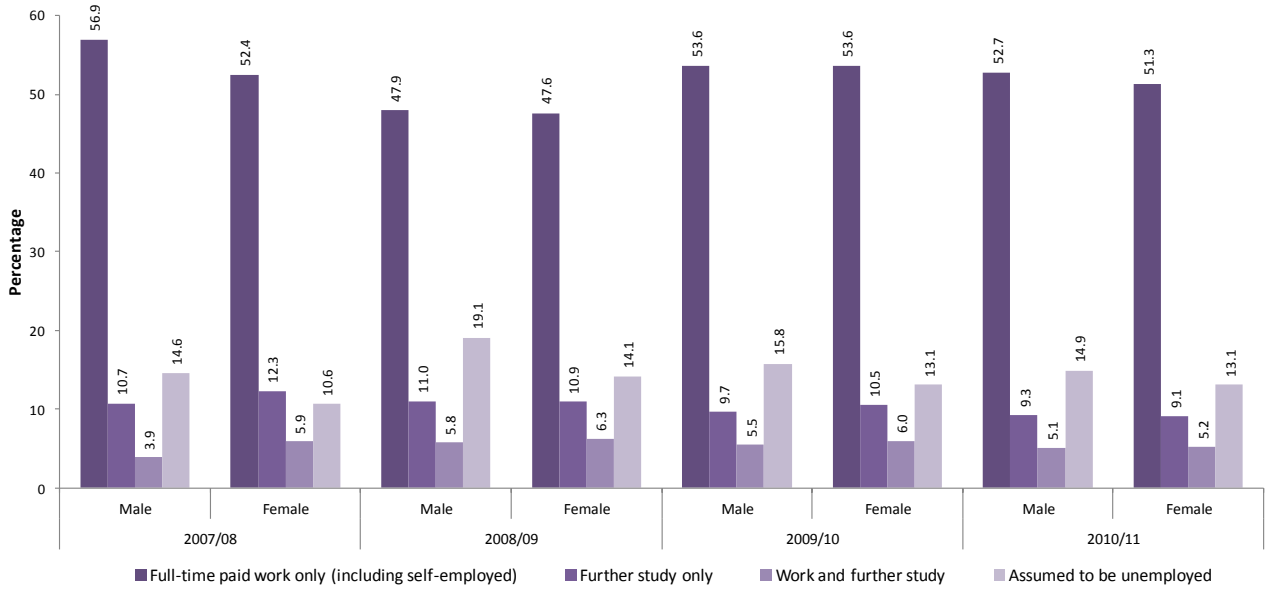

Figure 5: Main activity six months after graduation of UK domiciled students completing bachelor degree courses in computer science subjects between 2007/08 and 2010/11 (Source: HESA DLHE Data)

Table 18: Main activities of full time and part time UK domiciled students completing bachelor first degree courses in technology subjects by gender from 2007/08 to 2010/11 (Source: HESA Student Data)*

Main activity following graduation	2007/08		2008/09		2009/10		2010/11	
	Male	Female	Male	Female	Male	Female	Male	Female
Full time paid work only	590	385	535	370	625	395	640	380
	56.2%	58.8%	48.7%	55.8%	52.5%	61.7%	53.4%	56.8%
Part time paid work only	90	65	150	75	145	80	140	110
	8.6%	10.1%	13.5%	11.4%	12.4%	12.9%	11.8%	16.7%
Voluntary/unpaid work only	15	15	15	10	20	15	30	15
	1.2%	2.3%	1.5%	1.6%	1.8%	2.4%	2.4%	2.5%
Further study only	105	50	130	65	110	40	90	40
	10.0%	7.4%	11.6%	10.0%	9.2%	6.3%	7.5%	6.1%
Work and further study	60	30	45	30	40	35	65	25
	5.9%	4.4%	4.1%	4.3%	3.2%	5.2%	5.4%	4.0%
Not available for employment	30	35	50	40	40	20	35	30
	3.0%	5.5%	4.5%	5.7%	3.2%	3.3%	2.8%	4.5%
Assumed to be unemployed	130	60	165	70	190	45	175	60
	12.5%	9.3%	14.8%	10.2%	15.8%	7.2%	14.5%	8.6%
Other	30	15	15	5	25	5	25	5
	2.7%	2.1%	1.4%	0.9%	1.9%	1.1%	2.1%	0.7%
Explicit refusal	40	30	55	30	40	15	80	30
Total	**1090**	**680**	**1150**	**695**	**1230**	**655**	**1280**	**700**
Working	755	495	745	490	830	525	875	535
	71.9%	75.6%	67.8%	73.1%	69.9%	82.2%	73.0%	80.0%
Studying	165	75	175	95	150	75	155	70
	15.9%	11.8%	15.7%	14.3%	12.4%	11.5%	12.9%	10.1%

* Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

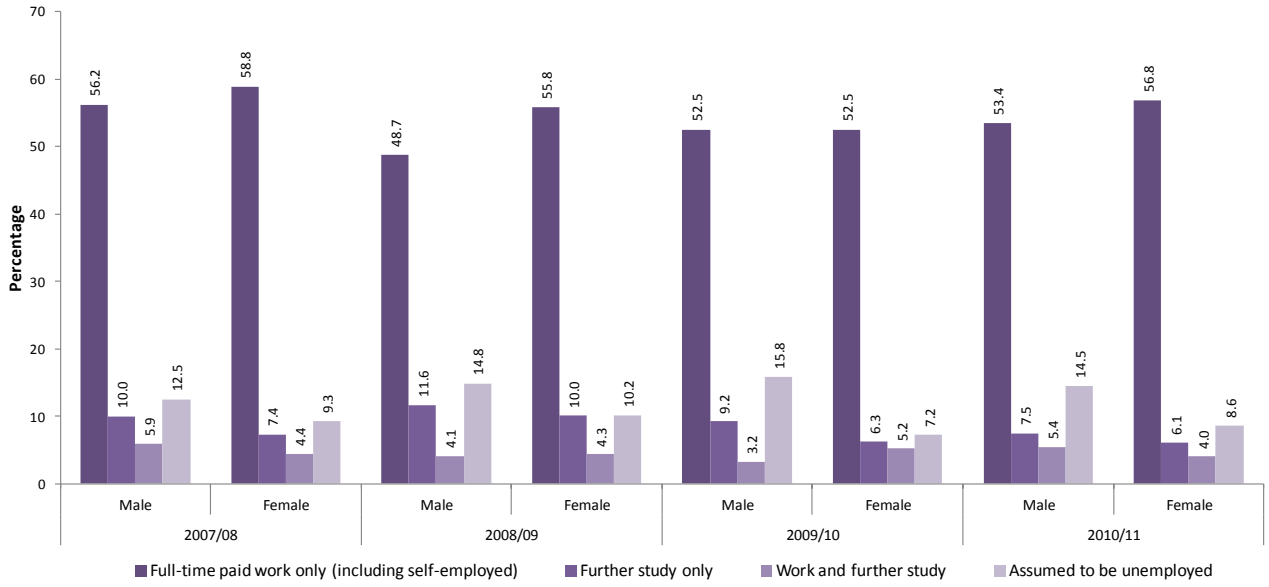

Figure 6: Main activity six months after graduation of UK domiciled students completing bachelor degree courses in technology subjects between 2007/08 and 2010/11 (Source: HESA DLHE Data)

In Table 19 data are presented on the occupations of graduates who had entered full or part time work, but were not undertaking any further study, six months after graduation. In the table groups of occupations have been defined as engineering and technology, science and mathematics, and non-science, technical, engineering and mathematics (STEM) occupations.[13]

In all cases shown in Table 19 men were more likely than women to be in engineering and technology occupations. Among enhanced first degree engineering graduates the proportion of males graduates entering engineering and technology occupations varied only slightly over the four years under consideration, being 81% in 2007/08, 78% in 2008/09, 77% in 2009/10, and 84% in 2010/11. The proportion of women entering engineering and technology occupations varied more being 79% in 2007/08, 71% in 2008/09, 69% in 2009/10, and 81% in 2010/11. Of course the proportion of graduates entering full and part time work did vary over the time period in question, falling between 2007/08 and 2008/09 before rising again.

Patterns of men and women graduates from bachelor degree courses in engineering, computer science and technology courses entering engineering and technology occupations varied. Among engineering bachelor graduates, the proportion of men entering engineering and technology varied from 68% in 2007/08 through 60% in 2008/09, 64% in 2009/10 to 66% in 2010/11. The proportion of women entering engineering and technology occupations varied more being 54% in 2007/08, 44% in 2008/09, 43% in 2009/10 and 47% in 2010/11. In general graduates not entering engineering and technology occupations were in non-STEM occupations rather than science and mathematics occupations. It is interesting to note that whereas the proportion of men entering engineering and technology was essentially the same in 2007/08 and 2010/11**, the proportion of women in engineering and technology roles did not recover to the same extent of men having fallen after 2007/08**.

63% of male bachelor degree graduates were in engineering and technology occupations compared to 44% of females. There is less difference among engineering graduates from enhanced first degree courses and both male and female graduates were more likely to be in engineering and technology occupations than male bachelor degree course graduates: 78% of men and 71% of women. Among bachelor degree course graduates in technology subjects, 54% of men and 41% of women were in engineering and technology occupations. Both male and female graduates from computer sciences bachelor degree courses were much more likely to be in non-STEM occupations than in engineering and technology occupations, 64% and 66%, respectively. 34% of men and 30% of women were in engineering and technology occupations.

The proportion of male graduates from computer science bachelor degree courses entering engineering and technology occupations varied relatively little between 2007/08 (68%) and 2010/11 (66%), but the proportion of women fell from 52% in 2007/08 to 39% in 2008/09, and did not recover, being 42% in 2009/10, and 41% in 2010/11. A significantly lower proportion of graduates from technology degree courses enter engineering and technology occupations than from engineering or computer science courses. 34% of men and 29% of women entered engineering and technology roles in 2007/08 and there was relatively little variation through to 2010/11. In 2010/11 32% of men and 30% of women entered engineering and technology occupations.

Overall, against a background of a varying proportion of graduates entering full time or part time paid work, the proportion of those graduates entering engineering and technology occupations fell from the 2007/09

[13] Engineering UK 2011: The state of engineering, Engineering UK, 2011.

level before recovering. However, **overall men are significantly more likely than women to be in engineering and technology roles six months after completion, and the gap between the proportions of men and women entering engineering and technology roles grew between 2007/08 and 2009/10**.

Table 19: The STEM occupations of full and part time UK domiciled students completing first degree courses in engineering and technology subjects who had entered full time or part paid work only six months after graduating by gender between 2007/08 and 2010/11 (Source: HESA DLHE Data)*

Subject and Degree	STEM occupations	2007/08		2008/09		2009/10		2010/11	
		Male	Female	Male	Female	Male	Female	Male	Female
Engineering Enhanced first degree	Engineering and technology	81.0%	79.0%	78.1%	70.7%	77.4%	69.0%	83.6%	80.9%
	Science and mathematics	1.8%	3.6%	1.7%	1.7%	1.2%	4.1%	1.0%	4.0%
	Non-STEM	17.2%	17.5%	20.3%	27.5%	21.4%	26.8%	15.4%	15.1%
	Total	1740	310	1775	285	1930	340	2310	395
Engineering Bachelor degree	Engineering and technology	68.1%	54.0%	60.4%	43.9%	63.7%	43.1%	66.2%	47.4%
	Science and mathematics	1.1%	3.5%	1.5%	6.2%	1.2%	4.1%	1.4%	4.7%
	Non-STEM	30.8%	42.5%	38.1%	49.9%	35.1%	52.8%	32.4%	47.9%
	Total	3940	515	3675	405	3860	445	3915	470
Computer Sciences Bachelor degree	Engineering and technology	56.6%	52.0%	49.4%	38.9%	56.6%	41.5%	56.2%	40.7%
	Science and mathematics	1.6%	5.7%	2.7%	5.6%	1.5%	6.1%	1.3%	5.3%
	Non-STEM	41.8%	42.3%	47.9%	55.6%	41.9%	52.4%	42.5%	54.0%
	Total	1550	560	1275	450	1345	460	1335	435
Technology Bachelor degree	Engineering and technology	33.6%	28.6%	34.6%	30.3%	32.3%	29.4%	32.3%	30.0%
	Science and mathematics	2.3%	4.3%	2.4%	4.1%	1.8%	3.3%	1.4%	3.3%
	Non-STEM	64.1%	67.1%	62.9%	65.6%	65.9%	67.3%	66.3%	66.7%
	Total	695	465	700	460	790	490	810	510

* The numbers of students completing enhanced degree courses in technology and computer science were too few to present data. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 20 presents data on the occupations of graduates from a selection of engineering and technology subjects who were undertaking full- or part time work, but not any further study, six months after graduation. The proportion of graduates who were in engineering and technology occupations varies from subject to subject and between men and women. **In all subjects women are less likely than men to be in engineering and technology occupations and in general the proportions of men and women entering engineering and technology roles fell between 2007/08 and 2008/09, before recovering**.

Table 20: The STEM occupations of full time and part time UK domiciled students completing first degree courses in selected engineering and technology subjects who entered full time or part paid work only by gender between 2007/08 and 2010/11 (Source: HESA DLHE Data)*

Subject	STEM occupations	2007/08		2008/09		2009/10		2010/11	
		Male	Female	Male	Female	Male	Female	Male	Female
Chemical Engineering	Engineering & Technology	74.9%	81.8%	79.0%	72.3%	68.1%	71.4%	75.2%	78.6%
	Science & Maths	2.0%	1.3%	2.6%	4.3%	2.0%	4.3%	1.3%	6.8%
	Non-STEM	23.1%	16.9%	18.5%	23.4%	29.9%	24.3%	23.6%	14.6%
	Total	200	75	195	45	250	70	315	105
Civil Engineering	Engineering & Technology	86.5%	82.7%	77.3%	74.2%	74.3%	68.8%	74.1%	68.6%
	Science & Maths	0.6%	1.7%	1.0%	2.8%	0.9%	3.7%	1.3%	4.0%
	Non-STEM	12.9%	15.6%	21.7%	23.0%	24.9%	27.5%	24.6%	27.4%
	Total	1050	175	1090	180	1175	220	1250	225
Computing Science	Engineering & Technology	51.8%	49.7%	45.9%	39.3%	51.7%	40.7%	52.5%	40.8%
	Science & Maths	1.8%	5.8%	2.4%	5.3%	1.8%	6.4%	1.3%	5.1%
	Non-STEM	46.3%	44.5%	51.7%	55.4%	46.5%	52.9%	46.2%	54.2%
	Total	1035	505	870	400	910	410	920	375
Electronic Engineering	Engineering & Technology	67.0%	46.9%	59.6%	36.3%	64.4%	36.7%	66.8%	46.1%
	Science & Maths	1.1%	2.8%	1.2%	4.8%	0.7%	4.8%	1.2%	2.8%
	Non-STEM	31.9%	50.3%	39.2%	58.9%	34.9%	58.5%	31.9%	51.1%
	Total	1485	180	1215	125	1325	145	1370	140
General Engineering	Engineering & Technology	66.4%	55.3%	61.8%	47.2%	65.0%	45.3%	71.1%	63.3%
	Science & Maths	1.7%	4.5%	1.5%	4.7%	1.8%	3.4%	1.1%	2.5%
	Non-STEM	32.0%	40.2%	36.7%	48.1%	33.2%	51.3%	27.8%	34.2%
	Total	725	130	665	105	615	115	710	120
Mechanical Engineering	Engineering & Technology	77.9%	65.7%	69.5%	67.3%	73.8%	67.6%	79.7%	68.2%
	Science & Maths	1.2%	1.5%	1.4%	4.1%	1.4%	5.9%	0.9%	6.6%
	Non-STEM	20.9%	32.8%	29.1%	28.6%	24.8%	26.5%	19.4%	25.2%
	Total	1335	135	1400	100	1535	100	1600	150
Other Technologies	Engineering & Technology	32.1%	25.3%	31.3%	20.3%	28.8%	20.2%	29.1%	31.6%
	Science & Maths	2.1%	2.3%	2.3%	3.8%	1.0%	1.1%	1.2%	3.2%
	Non-STEM	65.8%	72.4%	66.3%	75.9%	70.2%	78.7%	69.6%	65.3%
	Total	515	85	515	80	600	90	640	95
Others Materials Technology	Engineering & Technology	45.2%	20.0%	45.8%	18.9%	39.7%	30.2%	57.7%	18.9%
	Science & Maths	1.1%	11.1%	1.2%	13.2%	2.6%	5.7%	1.4%	1.9%
	Non-STEM	53.8%	68.9%	53.0%	67.9%	57.7%	64.2%	40.8%	79.2%
	Total	95	45	85	55	80	55	70	55
Polymers and Textiles	Engineering & Technology	21.9%	33.9%	44.4%	36.6%	26.1%	34.2%	34.6%	32.9%
	Science & Maths	3.1%	1.7%	0.0%	0.7%	0.0%	1.0%	0.0%	1.5%
	Non-STEM	75.0%	64.4%	55.6%	62.7%	73.9%	64.8%	65.4%	65.5%
	Total	30	290	25	285	25	310	25	330
Production Engineering	Engineering & Technology	57.1%	51.9%	54.3%	26.6%	59.7%	32.3%	67.6%	49.0%
	Science & Maths	0.9%	1.9%	2.1%	4.7%	0.0%	1.6%	1.3%	0.0%
	Non-STEM	42.0%	46.3%	43.6%	68.8%	40.3%	66.1%	31.1%	51.0%
	Total	350	55	335	65	355	60	375	50

* Counts of students are rounded to the nearest 5.

Table 21: The graduate occupations of full and part time UK domiciled students completing first degree courses in engineering and technology subjects who entered full or part time paid work only between 2007/08 and 2010/11 (Source: HESA DLHE Data)*

Course	Graduate occupations**	2007/08		2008/09		2009/10		2010/11	
		Male	Female	Male	Female	Male	Female	Male	Female
Engineering Enhanced first degree	Traditional graduate	4.7%	6.1%	3.8%	3.8%	3.2%	6.5%	3.1%	5.0%
	Modern graduate	33.2%	36.6%	32.2%	30.3%	32.1%	31.6%	35.6%	34.3%
	New graduate	43.8%	39.2%	40.8%	41.8%	40.5%	35.7%	43.7%	41.6%
	Niche graduate	12.0%	11.0%	12.9%	10.1%	13.6%	13.6%	10.9%	10.3%
	Non-graduate job	6.3%	7.1%	10.3%	13.9%	10.5%	12.7%	6.7%	8.8%
	Total	1740	310	1775	285	1930	340	2310	395
Engineering Bachelor degree	Traditional graduate	2.1%	2.5%	2.2%	4.2%	1.8%	2.9%	2.2%	5.1%
	Modern graduate	26.5%	24.9%	20.6%	17.9%	22.4%	20.1%	22.6%	17.1%
	New graduate	30.9%	26.4%	28.5%	20.6%	28.8%	23.0%	31.8%	26.5%
	Niche graduate	19.0%	17.7%	19.5%	17.4%	21.3%	20.5%	20.9%	18.8%
	Non-graduate job	21.5%	28.5%	29.3%	40.0%	25.7%	33.4%	22.5%	32.5%
	Total	3940	515	3675	405	3860	445	3915	470
Computer Sciences Bachelor degree	Traditional graduate	5.7%	10.0%	5.7%	8.7%	4.0%	7.8%	3.7%	6.4%
	Modern graduate	38.3%	25.9%	32.2%	24.9%	38.5%	24.1%	38.8%	25.1%
	New graduate	7.7%	8.4%	8.2%	6.9%	6.9%	7.2%	8.1%	10.6%
	Niche graduate	18.5%	18.2%	16.3%	16.0%	21.3%	17.6%	20.7%	17.7%
	Non-graduate job	29.8%	37.5%	37.6%	43.6%	29.3%	43.3%	28.8%	40.2%
	Total	1550	560	1275	450	1345	460	1335	435
Technology Bachelor degree	Traditional graduate	3.3%	2.2%	2.6%	3.5%	2.7%	3.1%	1.5%	2.0%
	Modern graduate	9.5%	4.7%	11.2%	3.5%	10.1%	3.9%	14.3%	3.9%
	New graduate	20.2%	23.9%	17.6%	26.4%	19.4%	26.1%	19.4%	24.5%
	Niche graduate	28.7%	29.2%	26.8%	26.1%	25.1%	27.6%	26.5%	27.8%
	Non-graduate job	38.3%	40.0%	41.9%	40.5%	42.7%	39.4%	38.3%	41.8%
	Total	695	465	700	460	790	490	810	510

* The numbers of students completing enhanced degree courses in technology and computer science were too few to present data. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

** Traditional graduate occupations include, e.g., solicitors, doctors, scientists, lecturers, secondary school teachers; modern graduate occupations include, e.g., senior managers in large organisations, IT professionals, primary school teachers; new graduate occupations include, e.g., occupational therapists, quantity surveyors, medical radiographers, public relations officers and management accountants; niche graduate occupations include, e.g., planning and quality control engineers, hotel and accommodation managers and nurses.

Table 21 presents data on the graduate occupations of full and part time UK domiciled students who were in full or part time paid work six months after graduation. The table presents occupations classified by whether or not they are graduate-level occupations. Those graduating from enhanced first degree courses in engineering subjects are significantly more likely to enter graduate occupations than those graduating from bachelor degree courses. **Female graduates from bachelor engineering and technology degree courses are significantly more likely than male graduates to enter non-graduate level jobs**.

Over the timescale under consideration, there was relatively little variation in the proportion of graduates from enhanced first degree engineering courses and bachelor technology degree courses in graduate-level occupations, albeit a significantly higher proportion of engineering enhanced first degree graduates are in graduate-level occupations than technology bachelor degree graduates. There is more year to year variation in the proportion of engineering and computer science bachelor degree graduates in graduate-level occupations. In both subject groups there is a fall in the proportion of graduates entering graduate-level occupations between 2007/08 and 2008/09, after which the proportions rise again. However, these data do

need to be considered together with data on the proportions of graduates entering full or part-time paid work, which fell between 2007/09 and 2008/09.

More detailed analysis of the occupations which graduates entered in 2008/09 and 2009/10 were presented in the Set to Lead research report. Data showed that the majority of those in non-graduate occupations are in sales and customer service occupations. **Within each subject group men are more likely than women to enter professional occupations and women are more likely than men to enter associate professional and technical occupations**.

2.7.1 Destinations of first degree engineering and technology graduates by ethnicity

Data on the occupations of graduates from engineering and technology first degree courses between 2007/08 and 2010/11 six months after completing, broken down by ethnicity, are shown in Table 22 through to Table 25. The four years' worth of data have been combined to give large enough populations of BME graduates for analysis. In addition, BME graduates have been grouped into broad ethnic groups, again to give large enough numbers for analysis. Data for groups with fewer than 100 members have not been reported.

Table 22 shows the main activities six months after completion of UK domiciled graduates from enhanced first degree engineering courses, and bachelor first degree courses in engineering, computer science, and technology by ethnic group and gender. **In all cases, White students are significantly more likely than BME students to be in full time paid work**. For example, 68% White male graduates from enhanced first degree courses in engineering were in full-time work six months after completion, compared to 49% of Asian male graduates. The respective figures for female graduates are 67% of White graduates and 51% of Asian graduates. Conversely, a higher proportion of Asian graduates than White graduates were assumed to be unemployed: 7% of White male graduates compared to 20% of Asian male graduates; and 5% of White female graduates compared to 16% of Asian female graduates. **Higher proportions of Asian graduates were undertaking further study, but whether this is because they could not get work is unknown**. Similar patterns are observed for Black and Chinese graduates from enhanced first degree courses in engineering.

The same patterns are observed for the graduates from bachelor degree courses, albeit the relative proportions of all ethnic groups entering full-time paid work are lower than for enhanced first degree engineering courses.

Table 23 presents a similar analysis to that in Table 22 except that data have been restricted to those graduating with first or upper second class degrees. Data presented earlier showed that BME students were less likely to obtain first or upper second class degrees than White students and so restricting the population by degree class allows a better comparison between groups, given that many firms will restrict their entrants by class of degree obtained.

The data presented in Table 23 show very similar patterns to those in Table 22 suggesting that **even among students with first and upper second class degrees, White students are significantly more likely than BME students to be in full-time paid work six months after completion**.

Table 24 presents data on the STEM occupations of graduates six months after completion, comparing groups who are in full-time or part-time paid work by ethnicity. Where groups are large enough to make comparisons, **White graduates are more likely than BME graduates to be in engineering and technology occupations, and are less likely to be in non-STEM occupations**.

Table 25 presents data on the graduate occupations of graduates six months after completion, comparing groups that are in full-time or part-time paid work by ethnicity. White graduates are more likely to be in graduate level occupations than BMEs students.

Table 26 presents data on the occupations of engineering and technology graduates by ethnicity and gender, grouped by whether or not individuals were in graduate-level occupations. For engineering graduates in graduate-level occupations, there was a greater difference between males than females. White male graduates were more likely to be in professional occupations than BME males; BME males were more likely to be in associate professional and technical occupations than White graduates. Similar patterns are observed for computer science graduates. **There are fewer differences between occupations of White and BME graduates among technology graduates, but there are significant gender differences, with White and BME women much more likely to be in associate professional and technical occupations than men**.

Among those in non-graduates occupations, BME graduates are significantly more likely than White graduates to be in sales and customer service occupations. There are also gender differences: women are more likely than men to be in administrative and secretarial occupations, personal service occupations, or sales and customer service occupations; men are more likely than women to be in associate professional occupations, skilled trades occupations, process, plant and machine operative occupations, or elementary occupations.

Overall, comparing graduates from engineering and technology degree courses with first or upper second class degrees, White graduates are more likely to be in full-time paid work than BME students, and of those students that are in paid work, White graduates are more likely than BME graduates to be in engineering and technology and graduate-level occupations.

Table 22: Main activities of full time and part time UK domiciled students completing first degree courses in engineering and technology subjects by ethnicity and gender from 2007/08 to 2010/11 combined (Source: HESA Student Data)*

Subject Group/ Ethnicity	Gender	Main Activity								Total of known activities
		Full-time paid work only (including self-employed)	Part-time paid work only	Voluntary/unpaid work only	Further study only	Work and further study	Not available for employment	Assumed to be unemployed	Other	
Engineering Enhanced First Degree										
White	M	67.8%	2.9%	0.6%	10.0%	6.5%	4.4%	7.2%	0.6%	9475
	F	67.0%	3.4%	1.4%	11.3%	8.0%	3.9%	4.5%	0.5%	1510
Asian or Asian British	M	48.8%	7.2%	1.3%	13.2%	5.5%	3.4%	19.5%	1.2%	765
	F	50.7%	7.5%	0.7%	18.5%	1.4%	4.1%	15.8%	1.4%	145
Black or Black British	M	43.5%	6.1%	3.7%	13.1%	3.7%	4.7%	22.4%	2.8%	215
	F									
Chinese	M	52.8%	2.6%	0.9%	15.0%	5.6%	5.2%	17.6%	0.4%	235
	F									
Other and mixed Ethnic background	M	60.4%	2.8%	2.5%	12.1%	5.6%	4.4%	10.3%	1.9%	320
	F									
Engineering Bachelor Degree										
White	M	61.3%	6.7%	0.7%	11.0%	6.9%	2.9%	9.5%	1.1%	19000
	F	54.5%	10.0%	1.0%	13.3%	8.6%	3.8%	7.7%	1.1%	2200
Asian or Asian British	M	34.3%	10.8%	1.5%	22.0%	6.5%	2.1%	21.1%	1.9%	2320
	F	34.3%	12.5%	1.1%	26.1%	7.1%	2.8%	14.4%	1.7%	355
Black or Black British	M	27.4%	11.1%	1.6%	25.1%	6.9%	2.2%	23.7%	2.0%	1270
	F	29.8%	11.1%	3.1%	28.0%	5.8%	2.7%	17.3%	2.2%	225
Chinese	M	27.1%	8.6%	1.0%	33.3%	3.6%	4.6%	18.8%	3.0%	305
	F									
Other and mixed Ethnic background	M	37.8%	9.6%	0.9%	23.7%	3.9%	3.9%	18.9%	1.4%	780
	F	29.6%	12.7%	2.1%	21.8%	12.7%	5.6%	13.4%	2.1%	140
Technology Bachelor Degree										
White	M	54.0%	11.7%	1.7%	8.6%	4.8%	3.4%	13.9%	1.8%	4045
	F	61.0%	12.5%	2.2%	6.0%	4.6%	4.6%	8.2%	0.9%	2150
Asian or Asian British	M	41.5%	7.6%	2.9%	21.1%	2.9%	1.8%	19.9%	2.3%	170
	F	41.1%	13.1%	2.3%	19.4%	4.0%	4.6%	12.6%	2.9%	175
Black or Black British	M									
	F									
Chinese	M									
	F									
Other and mixed Ethnic background	M	45.7%	9.5%	2.6%	15.5%	1.7%	4.3%	17.2%	3.4%	115
	F	57.3%	14.5%	0.9%	7.3%	4.5%	6.4%	9.1%	0.0%	110
Computer Science Bachelor Degree										
White	M	60.8%	8.8%	0.8%	8.4%	4.8%	2.2%	12.8%	1.4%	5475
	F	59.6%	11.7%	0.8%	9.4%	6.8%	3.4%	7.2%	1.0%	1740
Asian or Asian British	M	39.3%	15.3%	1.6%	11.9%	5.3%	2.5%	21.5%	2.5%	1690
	F	36.1%	18.5%	2.0%	12.7%	4.7%	3.2%	19.2%	3.6%	660
Black or Black British	M	34.7%	11.9%	2.9%	15.6%	7.1%	2.0%	23.2%	2.6%	690
	F	34.2%	14.9%	1.1%	13.9%	5.0%	2.1%	25.3%	3.6%	280
Chinese	M	32.3%	13.5%	2.6%	20.0%	2.6%	5.8%	21.3%	1.9%	155
	F									
Other and mixed Ethnic background	M	46.9%	8.9%	0.0%	11.9%	4.0%	4.3%	21.5%	2.6%	305
	F	34.6%	18.5%	3.8%	16.2%	3.1%	4.6%	16.9%	2.3%	130

* Students whose ethnicity is unknown and groups with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 23: Main activities of full-time and part-time UK domiciled students completing first degree courses in with first and upper second class degree classifications in engineering and technology subjects by ethnicity and gender from 2007/08 to 2010/11 combined (Source: HESA Student Data)*

Subject Group/ Ethnicity	Gender	Main Activity								Total of known activities
		Full-time paid work only (including self-employed)	Part-time paid work only	Voluntary/unpaid work only	Further study only	Work and further study	Not available for employment	Assumed to be unemployed	Other	
Engineering Enhanced First Degree										
White	Male	67.9%	2.7%	0.6%	10.5%	6.5%	4.6%	6.7%	0.5%	7960
	Female	67.0%	3.3%	0.9%	11.9%	7.4%	4.0%	4.8%	0.6%	1265
Asian or Asian British	Male	50.2%	6.5%	1.4%	13.9%	5.2%	3.3%	18.2%	1.3%	635
	Female	49.2%	8.2%	0.8%	21.3%	1.6%	4.1%	13.1%	1.6%	120
Black or Black British	Male	40.6%	7.3%	4.2%	16.4%	3.6%	5.5%	20.6%	1.8%	165
	Female									
Chinese	Male	51.9%	2.7%	0.0%	17.5%	4.9%	5.5%	16.9%	0.5%	185
	Female									
Other and mixed Ethnic background	Male	59.5%	2.7%	2.3%	14.4%	6.1%	4.9%	8.3%	1.9%	265
	Female									
Engineering Bachelor Degree										
White	Male	64.8%	4.7%	0.6%	11.6%	7.4%	2.5%	7.4%	1.0%	11385
	Female	57.5%	7.9%	1.2%	13.3%	9.2%	3.7%	6.5%	0.6%	1420
Asian or Asian British	Male	38.8%	8.9%	1.1%	24.7%	6.9%	2.2%	15.7%	1.7%	1025
	Female	37.7%	10.2%	1.2%	25.7%	7.2%	2.4%	15.0%	0.6%	165
Black or Black British	Male	28.3%	9.5%	1.3%	28.7%	7.3%	3.5%	19.2%	2.2%	465
	Female	29.9%	9.3%	1.9%	29.0%	4.7%	3.7%	18.7%	2.8%	105
Chinese	Male	33.6%	6.7%	1.7%	32.8%	4.2%	4.2%	12.6%	4.2%	120
	Female									
Other and mixed Ethnic background	Male	43.8%	9.2%	0.5%	24.2%	2.8%	4.1%	14.0%	1.5%	395
	Female									
Computer Science Bachelor Degree										
White	Male	66.0%	5.8%	0.6%	9.4%	4.9%	2.0%	10.2%	1.0%	3325
	Female	62.0%	10.3%	0.8%	10.3%	6.9%	2.9%	6.1%	0.8%	1175
Asian or Asian British	Male	46.4%	12.1%	1.7%	12.0%	6.6%	2.6%	16.2%	2.5%	685
	Female	40.8%	16.1%	0.9%	13.9%	4.7%	2.8%	17.1%	3.5%	315
Black or Black British	Male	37.3%	10.0%	1.5%	16.2%	9.6%	1.9%	21.2%	2.3%	260
	Female	38.1%	17.5%	2.4%	13.5%	4.0%	0.8%	19.8%	4.0%	125
Chinese	Male									
	Female									
Other and mixed Ethnic background	Male	51.9%	6.8%	0.0%	12.3%	4.9%	3.1%	19.8%	1.2%	160
	Female									

* Students whose ethnicity is unknown and groups with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 24: The STEM occupations of full time and part time UK domiciled students completing first degree courses with first or upper second degree classifications in engineering and technology subjects who had entered full-time or part-time paid work only six months after graduating by ethnicity and gender from 2007/08 to 2010/11 combined (Source: HESA Student Data)*

Subject Group/Ethnicity	Gender	STEM Occupations			Total
		Engineering and Technology	Science and Maths	Non-STEM	
Engineering Enhanced First Degree					
White	Male	83.5%	1.2%	15.3%	5600
	Female	79.3%	2.8%	17.9%	890
Asian or Asian British	Male	67.7%	2.2%	30.1%	360
	Female				
Black or Black British	Male				
	Female				
Chinese	Male	76.5%	0.0%	23.5%	100
	Female				
Other and mixed Ethnic background	Male	75.0%	2.4%	22.6%	165
	Female				
Engineering Bachelor Degree					
White	Male	71.5%	1.1%	27.3%	7890
	Female	53.9%	4.4%	41.7%	930
Asian or Asian British	Male	56.5%	2.1%	41.5%	485
	Female				
Black or Black British	Male	56.6%	2.9%	40.6%	175
	Female				
Chinese	Male				
	Female				
Other and mixed Ethnic background	Male	59.6%	2.9%	37.5%	210
	Female				
Computer Science Bachelor Degree					
White	Male	64.7%	1.5%	33.9%	2385
	Female	52.7%	4.4%	42.9%	850
Asian or Asian British	Male	58.4%	1.3%	40.4%	400
	Female	43.3%	2.8%	53.9%	180
Black or Black British	Male	53.7%	4.9%	41.5%	125
	Female				
Chinese	Male				
	Female				
Other and mixed Ethnic background	Male				
	Female				

* Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 25: The graduate occupations of full-time and part-time UK domiciled students completing first degree courses with first or upper second degree classifications in engineering and technology subjects who had entered full-time or part-time paid work only six months after graduating by ethnicity and gender from 2007/08 to 2010/11 combined (Source: HESA Student Data)*

Subject Group/Ethnicity	Gender	Graduate Occupation					Total
		Traditional graduate	Modern graduate	New graduate	Niche graduate	Non-graduate iob	
Engineering Enhanced First Degree							
White	Male	3.0%	35.7%	43.6%	10.8%	6.9%	5600
	Female	3.9%	37.0%	40.5%	9.4%	9.1%	890
Asian or Asian British	Male	6.1%	24.8%	36.8%	17.3%	15.0%	360
	Female						
Black or Black British	Male						
	Female						
Chinese	Male	1.0%	33.7%	37.8%	14.3%	13.3%	100
	Female						
Other and mixed Ethnic background	Male	3.7%	29.3%	43.9%	15.2%	7.9%	165
	Female						
Engineering Bachelor Degree							
White	Male	2.4%	26.7%	34.5%	19.6%	16.8%	7890
	Female	4.3%	24.7%	29.0%	18.3%	23.8%	930
Asian or Asian British	Male	3.3%	22.4%	23.0%	22.2%	29.2%	485
	Female						
Black or Black British	Male	3.4%	22.3%	17.1%	20.6%	36.6%	175
	Female						
Chinese	Male						
	Female						
Other and mixed Ethnic background	Male	2.4%	22.6%	26.4%	24.5%	24.0%	210
	Female						
Computer Science Bachelor Degree							
White	Male	6.5%	50.1%	8.7%	16.2%	18.6%	2385
	Female	10.7%	31.8%	9.8%	18.9%	28.8%	850
Asian or Asian British	Male	4.8%	33.3%	8.8%	21.3%	31.8%	400
	Female	5.6%	26.7%	8.9%	19.4%	39.4%	180
Black or Black British	Male	5.7%	36.6%	8.1%	18.7%	30.9%	125
	Female						
Chinese	Male						
	Female						
Other and mixed Ethnic background	Male						
	Female						

* Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 26: The standard occupation classification of full-time and part-time UK domiciled students completing first degree courses in engineering and technology subjects who entered full-time or part-paid work only in graduate and non-graduate roles by ethnicity and gender from 2007/08 to 2010/11 combined (Source: HESA DLHE Data)*

Role	Standard Occupational Classification	Engineering Subjects				Technology Subjects				Computer Sciences Subjects			
		White		BME		White		BME		White		BME	
		M	F	M	F	M	F	M	F	M	F	M	F
Occupations of those who entered graduate roles	Managers and Senior Officials	12.3%	13.1%	15.2%	9.0%	18.8%	14.3%	22.8%	12.0%	12.4%	12.5%	16.5%	13.3%
	Professional Occupations	67.6%	55.2%	58.0%	56.7%	30.4%	14.2%	25.2%	14.0%	62.0%	55.6%	50.4%	49.1%
	Associate Professional & Technical Occupations	19.8%	31.0%	25.8%	32.8%	49.7%	71.5%	50.4%	72.7%	25.0%	31.4%	32.2%	37.2%
	Administrative & Secretarial Occupations	0.1%	0.5%	0.5%	1.5%	0.8%	0.0%	0.8%	1.3%	0.1%	0.3%	0.2%	0.4%
	Skilled Trades Occupations	0.2%	0.2%	0.6%	0.0%	0.3%	0.0%	0.8%	0.0%	0.6%	0.3%	0.7%	0.0%
	Personal Service Occupations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Sales and Customer Service Occupations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Process, Plant & Machine Operatives	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Elementary Occupations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	9950	975	1260	200	1570	945	125	150	2800	800	855	285
Occupations of those who entered non-graduate roles	Managers and Senior Officials	1.3%	1.8%	2.0%	0.7%	1.9%	1.3%	6.0%	0.9%	2.0%	1.8%	2.1%	0.7%
	Professional Occupations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Associate Professional & Technical Occupations	9.9%	5.6%	8.6%	4.9%	6.3%	2.0%	0.0%	3.6%	16.3%	8.7%	9.9%	5.6%
	Administrative and Secretarial Occupations	13.1%	21.9%	12.6%	25.2%	14.0%	22.3%	20.5%	25.9%	17.7%	36.9%	18.7%	30.2%
	Skilled Trades Occupations	11.9%	2.9%	4.0%	2.1%	9.8%	6.3%	4.8%	0.9%	3.6%	0.9%	1.1%	0.3%
	Personal Service Occupations	4.1%	8.8%	3.4%	8.4%	4.5%	6.0%	2.4%	4.5%	5.2%	16.4%	4.0%	8.2%
	Sales and Customer Service Occupations	30.5%	39.3%	46.1%	46.9%	34.5%	46.5%	43.4%	57.1%	36.2%	30.8%	51.0%	50.2%
	Process, Plant and Machine Operatives	6.2%	1.4%	4.0%	2.1%	3.2%	0.9%	4.8%	1.8%	1.9%	0.2%	2.2%	0.7%
	Elementary Occupations	23.0%	18.3%	19.3%	9.8%	25.7%	14.8%	18.1%	5.4%	17.3%	4.3%	11.0%	4.3%
	Total	2925	445	745	145	1085	635	85	110	1010	440	625	305

* Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

2.7.2 Destinations of first degree engineering and technology graduates by socio economic class

Data on the occupations of White graduates from engineering and technology first degree courses between 2007/08 and 2010/11 six months after completing their courses broken down by the occupation of graduates' parents are shown in Table 27 through to Table 30. In the analyses, the four years' worth of data have been combined to give large enough populations for analysis. Data for groups with fewer than 100 members have not been reported. The data presented have been confined to White students because, as shown in the previous section, the destinations of White and BME graduates vary significantly. Confining the analysis to White students means that fewer variables are being compared.

Table 27 shows the main activities six months after completion of White UK domiciled graduates from enhanced first degree engineering courses, and bachelor first degree courses in engineering, computer science, and technology by the graduates' parental occupation and gender. For graduates from enhanced engineering degree courses there is relatively little difference between the main activities being undertaken by all the groups whatever the graduates' parents' occupations or gender. For graduates from bachelor engineering and technology courses, there are differences in the main activities by gender within a given parental occupation, but once again similar patterns of activities are displayed for each parental occupation. It was noted earlier that gender differences between the main activities six months after graduation are greater for bachelor degree graduates than for enhanced first degree graduates.

Table 28 presents a similar analysis to that in Table 27 except that data have been restricted to those graduating with first or upper second class degrees. The data presented in Table 28 show very similar patterns to those in Table 27.

Table 29 presents data on the STEM occupations of graduates six months after completion restricted to those graduating with first or upper second class degrees, comparing groups who are in full-time or part-time paid work by graduates' parents' occupations and gender. For engineering enhanced first degree graduates similar patterns are observed for all parental occupations. Gender comparisons are only possible for two occupation categories and so it is difficult to draw any firm conclusions about the effect of gender but the indication is that gender has little effect. For bachelor degree graduates, within each subject group similar patterns are observed between parental occupations but gender differences are observed for the engineering and computer science subject groups, with men more likely than women to be in engineering and technology occupations. The gender differences are much smaller for technology subject group graduates. **The implication is that gender is a more significant factor than social class in determining occupation types**.

Table 30 presents data on the graduate occupations of graduates six months after completion restricted to those graduating with first or upper second class degrees, comparing groups who are in full-time or part-time paid work by graduates' parents' occupation and gender. For graduates from engineering enhanced first degree courses there is little variation by parental occupation, and although gender comparisons are only possible for two occupation categories, the indication is that there is little gender difference. For bachelor degree graduates the overall patterns are similar within each subject group, but there are clear gender differences for engineering and computer science subject group graduates where, within each occupational category, women are less likely than men to be in graduate-level occupations. The gender differences are much smaller for technology subject group graduates. **As with the analysis for STEM occupations, the implication is that for bachelor engineering and technology graduates, gender is a more significant factor than social class in determining whether or not an individual is in a graduate level occupation six months after completion**.

Overall, the social class of graduates does not appear to be a significant factor determining the activity being undertaken six months after completing their courses. Considering just those graduates in full-time and part-time work, social class does not appear to be a significant factor in whether or not those graduates are in engineering and technology occupations, and/or whether they are in graduate-level occupations. **Of more significance is whether or not engineering graduates completed enhanced first degree, or bachelor degree courses**. For bachelor degree graduates, gender is a more significant factor in determining the main activity or graduates six months after completions, and, for those in full-time or part-time work, the kind of occupation undertaken.

Table 27: Main activities of full time and part time, White, UK domiciled students completing first degree courses in engineering and technology subjects by parental occupation of graduates and gender from 2007/08 to 2010/11 combined (Source: HESA Student Data)*

Subject Group/Occupation of graduates' parents	Gender	Main Activity								Total of known activities
		Full-time paid work only (including self-employed)	Part-time paid work only	Voluntary/unpaid work only	Further study only	Work and further study	Not available for employment	Assumed to be unemployed	Other	
Engineering Enhanced First Degree										
Higher managerial and professional occupations	M	67.8%	2.6%	0.8%	11.0%	5.8%	4.2%	7.1%	0.7%	2865
	F	67.7%	2.4%	1.2%	11.2%	8.2%	4.0%	4.2%	1.0%	500
Lower managerial and professional occupations	M	66.9%	3.0%	0.5%	10.3%	6.7%	4.9%	7.1%	0.6%	2450
	F	67.0%	3.1%	1.9%	10.4%	8.7%	5.0%	4.0%	0.0%	425
Intermediate occupations	M	67.7%	2.9%	0.5%	9.7%	7.0%	4.8%	6.7%	0.6%	1095
	F	61.3%	5.5%	0.6%	13.5%	7.4%	3.7%	8.0%	0.0%	165
Small employers and own account workers	M	65.9%	3.8%	1.1%	7.9%	6.0%	4.5%	9.9%	0.9%	555
	F									
Lower supervisory and technical occupations	M	69.4%	1.8%	0.5%	10.0%	6.6%	3.7%	7.1%	0.9%	440
	F									
Semi-routine occupations	M	68.6%	2.8%	0.1%	9.0%	8.4%	3.9%	6.5%	0.7%	725
	F	70.3%	5.4%	1.8%	9.0%	5.4%	2.7%	4.5%	0.9%	110
Routine occupations	M	72.1%	1.6%	0.5%	10.4%	6.6%	3.8%	4.9%	0.0%	185
	F									
Never worked/ Unknown/ Unclassified	M	69.2%	3.2%	0.3%	9.1%	6.2%	3.9%	7.8%	0.3%	1160
	F	65.5%	2.7%	2.7%	13.5%	9.5%	2.7%	3.4%	0.0%	150
Engineering Bachelor Degree										
Higher managerial and professional occupations	M	58.2%	6.7%	1.0%	14.7%	5.4%	3.0%	10.0%	1.0%	3115
	F	47.9%	9.2%	1.5%	20.7%	8.3%	3.4%	7.3%	1.7%	410
Lower managerial and professional occupations	M	56.9%	7.2%	1.0%	13.7%	5.6%	3.6%	10.5%	1.4%	3630
	F	56.2%	10.0%	0.9%	16.4%	6.8%	2.7%	6.2%	0.7%	440
Intermediate occupations	M	57.5%	8.4%	0.4%	12.5%	5.8%	2.8%	11.3%	1.1%	1800
	F	48.8%	11.7%	0.4%	14.2%	9.6%	4.2%	10.8%	0.4%	240
Small employers and own account workers	M	58.4%	7.2%	1.0%	10.5%	4.4%	4.6%	13.1%	0.8%	915
	F									
Lower supervisory and technical occupations	M	61.3%	8.7%	0.4%	10.3%	5.9%	3.9%	8.8%	0.7%	955
	F									
Semi-routine occupations	M	59.4%	10.2%	0.8%	10.9%	5.7%	2.3%	9.6%	1.1%	1410
	F	54.5%	16.9%	0.6%	12.4%	5.6%	2.2%	5.6%	2.2%	180
Routine occupations	M	61.2%	9.8%	0.2%	9.1%	5.6%	2.6%	9.3%	2.3%	605
	F									
Never worked/ Unknown/ Unclassified	M	67.1%	4.6%	0.5%	7.7%	9.5%	2.1%	7.7%	0.9%	6570
	F	57.9%	7.8%	1.2%	8.1%	11.3%	4.8%	8.1%	0.9%	680

Computer Science Bachelor Degree										
Higher managerial and professional occupations	M	62.4%	6.0%	1.1%	8.6%	6.0%	2.9%	12.0%	1.0%	925
	F	57.6%	9.4%	0.4%	12.1%	7.1%	5.4%	7.6%	0.4%	225
Lower managerial and professional occupations	M	61.7%	8.9%	0.6%	9.9%	4.4%	2.3%	11.1%	1.2%	1190
	F	65.1%	8.4%	0.9%	11.0%	5.5%	2.6%	5.8%	0.6%	345
Intermediate occupations	M	65.5%	7.4%	1.2%	6.9%	4.2%	2.2%	10.9%	1.7%	595
	F	63.1%	14.3%	0.0%	6.5%	5.4%	2.4%	7.1%	1.2%	170
Small employers and own account workers	M	58.1%	10.8%	0.4%	9.5%	3.7%	3.7%	13.7%	0.0%	240
	F									
Lower supervisory and technical occupations	M	57.8%	12.4%	0.4%	9.6%	5.2%	0.4%	12.0%	2.0%	250
	F									
Semi-routine occupations	M	59.2%	11.6%	1.2%	6.2%	3.0%	2.2%	14.9%	1.8%	500
	F	56.1%	12.8%	0.6%	9.1%	7.9%	3.0%	9.8%	0.6%	165
Routine occupations	M	57.1%	11.7%	1.5%	7.3%	4.0%	0.4%	15.8%	2.2%	275
	F									
Never worked/ Unknown/ Unclassified	M	59.4%	8.7%	0.5%	8.3%	5.4%	2.1%	14.0%	1.5%	1500
		57.4%	12.9%	1.0%	8.3%	8.3%	3.1%	7.0%	1.8%	610
Technology Bachelor Degree										
Higher managerial and professional occupations	M	54.5%	10.9%	2.6%	10.9%	3.2%	4.9%	11.8%	1.3%	695
	F	63.7%	11.3%	3.5%	5.9%	3.2%	4.3%	7.5%	0.5%	370
Lower managerial and professional occupations	M	54.9%	12.6%	1.2%	9.2%	3.4%	3.4%	13.6%	1.8%	890
	F	62.3%	10.9%	1.7%	5.5%	4.5%	5.0%	8.8%	1.2%	580
Intermediate occupations	M	47.6%	14.6%	1.9%	8.7%	3.2%	3.2%	18.2%	2.7%	410
	F	61.9%	11.7%	1.3%	9.4%	4.0%	4.5%	7.2%	0.0%	225
Small employers and own account workers	M	56.1%	9.8%	0.0%	9.8%	6.9%	4.0%	11.0%	2.3%	175
	F	68.3%	7.6%	2.8%	2.1%	4.1%	5.5%	8.3%	1.4%	145
Lower supervisory and technical occupations	M	56.1%	11.8%	1.6%	8.6%	2.7%	2.7%	14.4%	2.1%	185
	F									
Semi-routine occupations	M	52.1%	14.3%	1.2%	5.5%	7.6%	3.0%	13.7%	2.4%	330
	F	63.0%	15.0%	1.5%	7.0%	4.0%	4.0%	4.5%	1.0%	200
Routine occupations	M	60.8%	7.8%	2.6%	5.2%	5.2%	0.7%	15.7%	2.0%	155
	F									
Never worked/ Unknown/ Unclassified	M	54.3%	10.5%	1.7%	8.0%	6.6%	3.1%	14.2%	1.6%	1205
	F	54.3%	15.8%	2.4%	6.7%	5.8%	4.1%	10.0%	0.9%	460

* Groups with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 28: Main activities of full-time and part-time, White, UK domiciled students completing first degree courses in engineering and technology subjects with first or upper second degree classifications by parental occupation of graduates and gender from 2007/08 to 2010/11 combined (Source: HESA Student Data)*

Subject Group/ Subject	Gender	Main Activity								Total of known activities
		Full-time paid work only (including self-employed)	Part-time paid work only	Voluntary/unpaid work only	Further study only	Work and further study	Not available for employment	Assumed to be unemployed	Other	
Engineering Enhanced First Degree										
Higher managerial and professional occupations	M	67.8%	2.6%	0.8%	11.1%	5.7%	4.5%	6.8%	0.7%	2425
	F	68.0%	2.2%	0.5%	10.4%	8.7%	4.6%	4.4%	1.2%	415
Lower managerial and professional occupations	M	67.1%	2.9%	0.5%	10.6%	7.1%	5.2%	6.2%	0.3%	2090
	F	66.9%	3.4%	0.9%	12.3%	7.4%	5.1%	4.0%	0.0%	350
Intermediate occupations	M	67.4%	2.9%	0.5%	9.8%	7.3%	5.1%	6.4%	0.6%	930
	F	61.9%	4.3%	0.7%	14.4%	6.5%	3.6%	8.6%	0.0%	140
Small employers and own account workers	M	65.7%	3.6%	1.1%	8.2%	6.1%	4.8%	9.7%	0.8%	475
	F									
Lower supervisory and technical occupations	M	69.2%	1.6%	0.5%	11.4%	6.1%	3.7%	6.9%	0.5%	375
	F									
Semi-routine occupations	M	68.9%	2.0%	0.0%	10.2%	8.1%	4.2%	5.9%	0.7%	590
	F									
Routine occupations	M	72.3%	0.6%	0.6%	11.0%	6.5%	4.5%	4.5%	0.0%	155
	F									
Never worked/ Unknown/ Unclassified	M	69.7%	3.1%	0.3%	10.0%	6.0%	3.6%	7.1%	0.2%	920
	F	66.1%	1.6%	3.1%	14.2%	8.7%	2.4%	3.9%	0.0%	125
Engineering Bachelor Degree										
Higher managerial and professional occupations	M	61.6%	4.7%	0.6%	15.7%	5.8%	2.7%	7.9%	1.0%	1845
	F	49.1%	6.8%	1.8%	20.8%	9.7%	4.3%	6.1%	1.4%	280
Lower managerial and professional occupations	M	60.0%	5.7%	0.8%	14.5%	5.9%	3.0%	8.7%	1.5%	2165
	F	58.2%	7.3%	1.0%	17.8%	7.0%	2.4%	5.9%	0.3%	285
Intermediate occupations	M	61.0%	5.9%	0.2%	13.7%	6.7%	2.8%	8.9%	0.8%	1065
	F	52.3%	8.5%	0.0%	14.4%	10.5%	5.2%	9.2%	0.0%	155
Small employers and own account workers	M	60.5%	4.9%	1.1%	11.5%	4.3%	4.7%	12.1%	0.9%	530
	F									
Lower supervisory and technical occupations	M	63.7%	7.1%	0.5%	12.2%	6.3%	3.6%	6.3%	0.5%	610
	F									
Semi-routine occupations	M	63.1%	6.8%	0.7%	11.4%	6.4%	2.3%	7.9%	1.2%	820
	F	59.5%	14.4%	0.9%	9.9%	6.3%	2.7%	4.5%	1.8%	110
Routine occupations	M	65.4%	6.7%	0.3%	9.9%	6.4%	2.4%	7.2%	1.6%	375
	F									
Never worked/ Unknown/ Unclassified	M	70.9%	2.9%	0.5%	7.8%	10.0%	1.8%	5.5%	0.8%	3975
	F	61.3%	6.6%	1.4%	8.0%	11.6%	4.6%	6.4%	0.2%	440

Computer Science Bachelor Degree										
Higher managerial and professional occupations	M	66.1%	3.9%	0.8%	9.5%	5.8%	2.8%	10.3%	0.8%	635
	F	61.1%	9.0%	0.6%	13.8%	6.6%	3.0%	6.0%	0.0%	165
Lower managerial and professional occupations	M	66.8%	6.6%	0.3%	10.6%	4.6%	1.6%	8.5%	1.0%	765
	F	67.8%	7.3%	0.0%	12.0%	5.6%	2.6%	4.3%	0.4%	235
Intermediate occupations	M	71.5%	4.5%	0.8%	5.8%	5.5%	1.8%	9.7%	0.5%	380
	F	63.1%	13.9%	0.0%	6.6%	5.7%	2.5%	7.4%	0.8%	120
Small employers and own account workers	M	64.7%	7.4%	0.7%	13.2%	2.9%	2.2%	8.8%	0.0%	135
	F									
Lower supervisory and technical occupations	M	61.4%	9.0%	0.7%	13.1%	2.8%	0.0%	11.7%	1.4%	145
	F									
Semi-routine occupations	M	63.8%	8.3%	0.7%	7.2%	3.1%	2.4%	12.8%	1.7%	290
	F	63.3%	11.0%	0.0%	9.2%	5.5%	2.8%	8.3%	0.0%	110
Routine occupations	M	62.3%	6.9%	2.5%	8.8%	5.7%	0.6%	11.9%	1.3%	160
	F									
Never worked/ Unknown/ Unclassified	M	65.2%	5.4%	0.2%	9.7%	5.4%	2.3%	10.8%	1.0%	815
	F	58.3%	11.9%	1.5%	8.8%	9.1%	2.5%	6.3%	1.5%	395
Technology Bachelor Degree										
Higher managerial and professional occupations	M	53.6%	9.7%	2.4%	13.2%	4.0%	5.9%	9.9%	1.3%	455
	F	66.9%	10.2%	2.0%	5.8%	3.1%	4.4%	7.2%	0.3%	295
Lower managerial and professional occupations	M	55.3%	11.6%	1.9%	11.0%	3.4%	3.7%	11.4%	1.7%	535
	F	63.7%	9.5%	1.4%	5.4%	4.7%	5.4%	8.8%	1.1%	445
Intermediate occupations	M	52.1%	13.5%	1.9%	8.5%	2.3%	2.7%	15.1%	3.9%	260
	F	67.6%	9.1%	1.1%	8.5%	4.5%	4.5%	4.5%	0.0%	175
Small employers and own account workers	M	55.7%	8.5%	0.0%	13.2%	6.6%	4.7%	8.5%	2.8%	105
	F	67.0%	6.6%	2.8%	2.8%	2.8%	6.6%	10.4%	0.9%	105
Lower supervisory and technical occupations	M	58.0%	10.1%	1.7%	10.9%	3.4%	1.7%	12.6%	1.7%	120
	F									
Semi-routine occupations	M	54.1%	13.4%	1.4%	7.2%	6.7%	2.9%	13.9%	0.5%	210
	F	65.8%	13.2%	2.0%	6.6%	3.9%	3.3%	3.9%	1.3%	150
Routine occupations	M									
	F									
Never worked/ Unknown/ Unclassified	M	57.6%	9.0%	1.4%	8.9%	7.7%	3.3%	10.6%	1.6%	765
	F	56.0%	16.7%	2.6%	6.9%	5.5%	4.3%	7.2%	0.9%	350

* Groups with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 29 STEM or non-STEM occupations of full time and part time, White, UK domiciled students completing first degree courses in engineering and technology subjects with first or upper second degree classifications by parental occupation of graduates and gender from 2007/08 to 2010/11 combined (Source: HESA Student Data)*

Subject Group/ Subject	Gender	STEM occupations			Total
		Engineering and Technology	Science and Maths	Non-STEM	
Engineering Enhanced First Degree					
Higher managerial and professional occupations	Male	81.9%	1.2%	17.0%	1700
	Female	80.3%	3.1%	16.6%	290
Lower managerial and professional occupations	Male	82.4%	1.4%	16.1%	1455
	Female	76.0%	3.3%	20.7%	245
Intermediate occupations	Male	82.0%	0.9%	17.1%	650
	Female				
Small employers and own account workers	Male	89.9%	1.1%	9.0%	265
	Female				
Lower supervisory and technical occupations	Male	84.5%	0.9%	14.6%	330
	Female				
Semi-routine occupations	Male	89.4%	1.7%	8.9%	415
	Female				
Routine occupations	Male	83.2%	1.8%	15.0%	115
	Female				
Never worked/ Unknown/ Unclassified	Male	84.6%	0.7%	14.6%	670
	Female				
Engineering Bachelor Degree					
Higher managerial and professional occupations	Male	66.6%	1.7%	31.7%	1225
	Female	51.9%	5.1%	42.9%	155
Lower managerial and professional occupations	Male	65.9%	0.9%	33.1%	1415
	Female	46.0%	3.2%	50.8%	185
Intermediate occupations	Male	66.0%	1.8%	32.2%	710
	Female				
Small employers and own account workers	Male	75.8%	1.2%	23.1%	430
	Female				
Lower supervisory and technical occupations	Male	67.4%	1.4%	31.1%	345
	Female				
Semi-routine occupations	Male	68.9%	1.2%	29.9%	575
	Female	50.0%	1.2%	48.8%	80
Routine occupations	Male	72.5%	1.1%	26.4%	270
	Female				
Never worked/ Unknown/ Unclassified	Male	78.0%	0.8%	21.3%	2920
	Female	62.4%	5.0%	32.6%	300

Computer Science Bachelor Degree					
Higher managerial and professional occupations	Male	67.3%	2.3%	30.5%	445
	Female	53.8%	2.6%	43.6%	115
Lower managerial and professional occupations	Male	62.9%	0.5%	36.6%	560
	Female	53.7%	1.7%	44.6%	175
Intermediate occupations	Male	61.6%	1.7%	36.7%	290
	Female				
Small employers and own account workers	Male	63.7%	2.0%	34.3%	100
	Female				
Lower supervisory and technical occupations	Male	70.4%	2.0%	27.6%	100
	Female				
Semi-routine occupations	Male	67.5%	0.0%	32.5%	210
	Female				
Routine occupations	Male	67.3%	2.7%	30.0%	110
	Female				
Never worked/ Unknown/ Unclassified	Male	63.6%	1.7%	34.7%	575
	Female	50.2%	9.7%	40.1%	275
Technology Bachelor Degree					
Higher managerial and professional occupations	Male	33.4%	1.4%	65.2%	285
	Female	35.0%	0.9%	64.2%	225
Lower managerial and professional occupations	Male	33.8%	2.5%	63.7%	360
	Female	35.1%	4.0%	60.9%	325
Intermediate occupations	Male	34.7%	0.6%	64.7%	170
	Female	38.5%	1.5%	60.0%	135
Small employers and own account workers	Male				
	Female				
Lower supervisory and technical occupations	Male				
	Female				
Semi-routine occupations	Male	31.9%	2.8%	65.2%	140
	Female	28.3%	1.7%	70.0%	120
Routine occupations	Male				
	Female				
Never worked/ Unknown/ Unclassified	Male	42.4%	1.8%	55.9%	510
	Female	30.4%	2.4%	67.2%	255

* Groups with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

Table 30: Graduate occupations of full time and part time, White, UK domiciled students completing first degree courses in engineering and technology subjects with first or upper second degree classifications by parental occupation of graduates and gender from 2007/08 to 2010/11 combined (Source: HESA Student Data)*

Subject Group/ Subject	Gender	Graduate occupations					Total
		Traditional graduate	Modern graduate	New graduate	Niche graduate	Non-graduate job	
Engineering Enhanced First Degree							
Higher managerial and professional occupations	Male	3.9%	33.5%	44.7%	11.1%	6.7%	1700
	Female	5.5%	38.6%	37.6%	10.7%	7.6%	290
Lower managerial and professional occupations	Male	2.7%	38.3%	42.6%	9.0%	7.4%	1455
	Female	2.8%	35.8%	43.5%	8.1%	9.8%	245
Intermediate occupations	Male	2.1%	39.0%	39.6%	10.1%	9.1%	330
	Female						
Small employers and own account workers	Male	2.0%	35.1%	43.2%	12.3%	7.4%	650
	Female						
Lower supervisory and technical occupations	Male	3.0%	37.1%	46.4%	8.2%	5.2%	265
	Female						
Semi-routine occupations	Male	2.2%	34.9%	47.0%	12.0%	3.9%	415
	Female						
Routine occupations	Male	4.4%	37.2%	39.8%	11.5%	7.1%	115
	Female						
Never worked/ Unknown/ Unclassified	Male	2.5%	34.3%	42.9%	12.7%	7.6%	670
	Female						
Engineering Bachelor Degree							
Higher managerial and professional occupations	Male	4.3%	26.4%	34.2%	19.1%	16.1%	1225
	Female	5.8%	19.9%	33.3%	13.5%	27.6%	155
Lower managerial and professional occupations	Male	2.5%	24.9%	34.9%	18.9%	18.7%	1415
	Female	2.7%	22.5%	31.0%	20.9%	23.0%	185
Intermediate occupations	Male	0.6%	22.2%	33.4%	19.0%	24.8%	345
	Female						
Small employers and own account workers	Male	2.7%	26.3%	32.2%	18.0%	20.8%	710
	Female						
Lower supervisory and technical occupations	Male	3.3%	28.4%	35.0%	16.6%	16.8%	430
	Female						
Semi-routine occupations	Male	2.1%	27.5%	32.5%	17.0%	20.9%	575
	Female						
Routine occupations	Male	1.1%	32.0%	29.4%	14.5%	23.0%	270
	Female						
Never worked/ Unknown/ Unclassified	Male	1.8%	27.4%	35.9%	21.9%	13.0%	2920
	Female	5.0%	27.5%	26.2%	22.5%	18.8%	300

Computer Science Bachelor Degree							
Higher managerial and professional occupations	Male	8.6%	55.8%	9.0%	14.9%	11.7%	445
	Female	10.3%	34.2%	11.1%	21.4%	23.1%	115
Lower managerial and professional occupations	Male	5.2%	49.3%	9.6%	16.1%	19.8%	560
	Female	10.9%	29.1%	10.9%	20.0%	29.1%	175
Intermediate occupations	Male	7.1%	49.0%	14.3%	18.4%	11.2%	100
	Female						
Small employers and own account workers	Male	6.6%	43.6%	12.1%	19.4%	18.3%	290
	Female						
Lower supervisory and technical occupations	Male	4.9%	52.9%	5.9%	14.7%	21.6%	100
	Female						
Semi-routine occupations	Male	3.8%	54.5%	4.3%	17.2%	20.1%	210
	Female						
Routine occupations	Male	9.1%	43.6%	7.3%	9.1%	30.9%	110
	Female						
Never worked/ Unknown/ Unclassified	Male	6.6%	49.1%	7.1%	16.6%	20.6%	575
	Female	11.9%	28.5%	8.3%	18.8%	32.5%	275
Technology Bachelor Degree							
Higher managerial and professional occupations	Male	1.7%	17.4%	17.1%	29.6%	34.1%	285
	Female	0.9%	2.2%	30.1%	29.6%	37.2%	225
Lower managerial and professional occupations	Male	2.0%	12.0%	20.7%	30.4%	34.9%	360
	Female	3.7%	3.4%	25.2%	28.9%	38.8%	325
Intermediate occupations	Male						
	Female						
Small employers and own account workers	Male	2.4%	17.1%	17.1%	22.9%	40.6%	170
	Female	2.2%	1.5%	31.1%	37.8%	27.4%	135
Lower supervisory and technical occupations	Male						
	Female						
Semi-routine occupations	Male	2.8%	10.6%	17.7%	23.4%	45.4%	140
	Female	1.7%	7.5%	23.3%	29.2%	38.3%	120
Routine occupations	Male						
	Female						
Never worked/ Unknown/ Unclassified	Male	3.5%	13.5%	21.0%	28.4%	33.5%	510
	Female	2.4%	5.1%	25.7%	29.6%	37.2%	255

* Groups with fewer than 100 graduates have been excluded. Data are presented as headcounts of students who spend 50% or more of their time studying a particular subject. Counts of students are rounded to the nearest 5.

3 Survey of engineering and technology students

This section presents data based on analyses of the survey of engineering and technology students with a focus on ethnicity. The Set to Lead research report presented data with a focus on the gender of respondents. The number of black and minority ethnic (BME) respondents was relatively small which means that analysis by individual ethnic group proved difficult and therefore the majority of analyses presented below show respondents split into White and BME groups. In many cases respondents are also split by gender.

3.1 Methodology

Full details of the methodology were given in the Set to Lead research report. Cleaned data from a total of 4624 respondents were analysed in Excel, for the most part using Pivot Tables.

3.2 The sample demographics and results

Full details of the demographics of the sample are given in the Set to Lead research report. The analyses below focus on the differences between the responses of White and BME UK national respondents. The breakdown of the UK nationals by ethnicity and gender is shown in Table 31.

Overall 82.4% of UK nationals reported their ethnicity as White British, and another 3.6% reported their ethnicity as White Irish or White Other. 14.0% of respondents reported that they were Asian or Asian British, Black or Black British, Chinese, Mixed/Dual Heritage or of other ethnicity. No respondents reported their ethnicity as Black Caribbean.

Given the relatively low number of BME respondents, the respondents' ethnicities in the analyses below are grouped as White and BME. The low numbers of BME respondents mean that analyses such as those at subject level presented in the Set to Lead research report are not presented here.

Table 31: Ethnicity and gender of UK national respondents

Ethnicity	Gender							
	Male		Female		Did not wish to say		Overall	
	Count	%	Count	%	Count	%	Count	%
White British	2062	83.3%	598	79.6%	17	68.0%	2677	82.4%
White Irish	46	1.9%	30	4.0%	0	0.0%	76	2.3%
White Other	29	1.2%	13	1.7%	0	0.0%	42	1.3%
Asian or Asian British	147	5.9%	42	5.6%	3	12.0%	192	5.9%
Black or Black British	50	2.0%	20	2.7%	0	0.0%	70	2.2%
Black Caribbean	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Chinese	31	1.3%	16	2.1%	1	4.0%	48	1.5%
Mixed/Dual Heritage	77	3.1%	20	2.7%	1	4.0%	98	3.0%
Other	32	1.3%	12	1.6%	3	12.0%	47	1.4%
Total	**2062**	**83.3%**	**598**	**79.6%**	**17**	**68.0%**	**2677**	**82.4%**
White	**2137**	**86.4%**	**641**	**85.4%**	**17**	**68.0%**	**2795**	**86.0%**
BME	**337**	**13.6%**	**110**	**14.6%**	**8**	**32.0%**	**455**	**14.0%**

The age distributions of White and BMEs respondents by gender are shown in Table 32. 87% of White male respondents and 91% of White female respondents are aged between 18 and 22 years old, compared with 83% of BME male respondents and 91% of BME female respondents. There is relatively little difference in the age distributions of White and BME respondents.

Table 32: The age of UK national respondents by ethnicity and gender

Age	Distribution by ethnicity and gender							
	White				BME			
	Male		Female		Male		Female	
	Count	%	Count	%	Count	%	Count	%
17	15	0.7%	3	0.5%	2	0.6%	0	0.0%
18	403	18.9%	106	16.5%	49	14.5%	20	18.2%
19	467	21.9%	155	24.2%	73	21.7%	19	17.3%
20	443	20.7%	139	21.7%	67	19.9%	32	29.1%
21	359	16.8%	113	17.6%	69	20.5%	19	17.3%
22	192	9.0%	67	10.5%	23	6.8%	10	9.1%
23	83	3.9%	19	3.0%	14	4.2%	6	5.5%
24	30	1.4%	9	1.4%	8	2.4%	0	0.0%
25	27	1.3%	10	1.6%	9	2.7%	0	0.0%
26 and older	118	5.5%	20	3.1%	23	6.9%	4	3.6%
Total	**2137**	**100.0%**	**641**	**100.0%**	**337**	**100.0%**	**110**	**100.0%**

Table 33 shows the distribution of respondents by year of course, ethnicity and gender. The largest proportion of all groups, about a third, were in the first year of their course. About a quarter of respondents were in the second and third years of their courses, respectively. 20.1% of respondents, 19.1% of men and 23.5% of women, indicated that they were in the final year of their course. 20% of White male respondents, 22% of White female respondents, 19% of BME male respondents and 28% of BME female respondents indicated that they were in the final year of their course.

Table 33: UK national respondents' year of course by ethnicity and gender

Year of course	Distribution by ethnicity and gender							
	White				BME			
	Male		Female		Male		Female	
	Count	%	Count	%	Count	%	Count	%
1st	777	36.4%	223	34.8%	118	35.0%	36	32.7%
2nd	506	23.7%	156	24.3%	88	26.1%	22	20.0%
3rd	457	21.4%	133	20.7%	89	26.4%	34	30.9%
4th	319	14.9%	99	15.4%	35	10.4%	16	14.5%
5th	3	0.1%	1	0.2%	1	0.3%	0	0.0%
5+	75	3.5%	29	4.5%	6	1.8%	2	1.8%
Total	**2137**	**100.0%**	**641**	**100.0%**	**337**	**100.0%**	**110**	**100.0%**
Final year	**419**	**19.6%**	**143**	**22.3%**	**63**	**18.7%**	**31**	**28.2%**

3.3 Motivations for undertaking course

Respondents were asked to indicate the one or two main reasons why they decided to undertake their course. The results are shown in Table 34 and Table 35. Given the numbers of BME respondents there were no significant differences between the responses of White and BME respondents who selected one and two reasons. The most popular reason selected by both respondents who selected one and two reasons was, "Out of interest and enthusiasm for engineering".

Table 34: UK nationals respondents' main reason for undertaking their courses by ethnicity where respondents indicated a single reason

The main reasons for undertaking course	White	BME	Overall
Out of interest and enthusiasm for engineering	39.8%	39.3%	39.7%
The course qualification is a pre-requisite for the career I want	16.2%	10.3%	15.1%
I "wandered" into this course after my A-levels (or equivalent)	11.9%	13.7%	12.2%
To enhance my earning potential	8.4%	4.3%	7.6%
I have an aptitude for engineering	6.6%	7.7%	6.8%
I was inspired/encouraged by a family member/family friend	6.3%	6.0%	6.2%
I was influenced by other role models	1.4%	2.6%	1.6%
I was inspired/encouraged by a teacher	1.4%	0.9%	1.3%
Recognition that studying engineering could increase my chances of getting into a good university	0.4%	1.7%	0.6%
I realised that others I knew were applying for similar courses	0.2%	0.0%	0.2%
Don't know	2.1%	6.8%	3.0%
Other	5.3%	6.8%	5.6%
Total	**512**	**117**	**629**

Table 35: UK national respondents' main reasons for undertaking their courses by ethnicity where respondents indicated two reasons

The main reasons for undertaking course	White	BME	Overall
Out of interest and enthusiasm for engineering	61.0%	55.3%	60.3%
I have an aptitude for engineering	30.6%	32.1%	30.8%
The course qualification is a pre-requisite for the career I want	30.6%	28.2%	30.3%
To enhance my earning potential	28.6%	28.2%	28.5%
I was inspired/encouraged by a family member/family friend	15.7%	18.5%	16.1%
I "wandered" into this course after my A-levels (or equivalent)	11.4%	17.4%	12.2%
I was inspired/encouraged by a teacher	8.6%	4.1%	8.0%
I was influenced by other role models	5.9%	5.3%	5.8%
Recognition that studying engineering could increase my chances of getting into a good university	2.0%	3.5%	2.2%
I realised that others I knew were applying for similar courses	0.7%	0.9%	0.8%
Other	4.8%	6.5%	5.0%
Don't know	0.0%	0.0%	0.0%
Total	**2284**	**340**	**2624**

Respondents were asked whether they regretted undertaking their course. As shown in Table 36, only 3.4% of White respondents and 5.3% of BME respondents regretted undertaking their courses. Considering only the responses of those who expressed a firm opinion, there were no significant differences between the responses of White and BME respondents.

Table 36: Whether or not UK national respondents regret undertaking their courses by ethnicity

Do you regret undertaking your course?	Ethnicity		Total
	White	BME	
Yes	3.4%	5.3%	3.6%
No	88.2%	82.0%	87.4%
Don't Know	8.4%	12.7%	9.0%
Total	**2795**	**455**	**3250**

Table 37 presents the reasons students selected for why they do not regret undertaking their courses. The most popular reason selected by White and BME respondents is, "I enjoy my subject." Both White and BME females are more likely than White and BME males, respectively, to select this reason. However, BME respondents were less likely than White respondents to select "I enjoy my subject."

Table 37: UK national respondents' reasons for not regretting undertaking their courses by ethnicity and gender*

Reasons for not regretting undertaking course	White		BME		Overall
	Male	Female	Male	Female	
I enjoy my subject	33.4%	38.6%	25.4%	33.7%	33.7%
The course provides me with the skill set I need for the career I want	18.7%	19.2%	21.4%	21.1%	19.1%
The course will give me the qualification I need for the career I want	17.8%	16.0%	14.9%	16.8%	17.1%
Engineering/technology comes naturally to me	8.7%	2.9%	9.8%	3.2%	7.4%
The course enables me to get a better idea about my career plans	6.3%	7.5%	10.1%	4.2%	6.9%
The course gives me a better understanding of an engineer's/ technologist's work	4.8%	3.9%	7.6%	9.5%	5.1%
The course gives me the experience I need for the career I want	5.7%	6.6%	6.5%	6.3%	6.0%
I've made great friends	3.1%	4.8%	3.6%	4.2%	3.5%
Don't know	1.1%	0.4%	0.4%	1.1%	0.9%
Other reason	0.4%	0.0%	0.4%	0.0%	0.3%
Total	**1893**	**557**	**276**	**95**	**2821**

* Respondents were asked to select one reason.

3.4 Work/industrial placements

Respondents were questioned about their work experiences before starting their courses, whether their course includes a work placement, and whether they have under taken any work experience while undertaking their course. The respondents that had undertaken a placement as part of their course or a voluntary internship were questioned about their experiences and the effect that the work experience had on their future career intentions.

Table 38 shows that overall 61% of UK national respondents have an optional work placement, while 11% have a compulsory work placement as part of their course. **The differences between the responses of White and BME males and females, respectively, are not significant.**

Table 38: Whether UK national respondents' courses included an industrial placement by ethnicity and gender

Course includes an industrial placement	White		BME		Total
	Male	Female	Male	Female	
Yes, compulsory	10.4%	13.9%	10.0%	5.5%	10.9%
Yes, optional	62.4%	54.9%	58.4%	64.5%	60.6%
No	27.2%	31.2%	31.6%	30.0%	28.6%
Total	**2138**	**641**	**339**	**110**	**3228**

Table 39: Whether UK national respondents spent any time working in an area related to their course before beginning their courses by ethnicity and gender

Time spent working before course	White		BME		Total
	Male	Female	Male	Female	
Yes: a full time job	8.0%	3.9%	4.7%	2.7%	6.6%
Yes: a temporary placement	18.4%	18.9%	14.7%	13.6%	17.9%
Yes, other	5.6%	6.6%	7.1%	4.5%	5.9%
No	68.1%	70.7%	73.5%	79.1%	69.5%
Total	**2138**	**641**	**339**	**110**	**3228**

Table 39 shows that around 7% of respondents had a full time job before starting their course and around 24% of respondents had carried out some other kind of work related to their course. 70% of UK national respondents had not had any work related to their course: a higher proportion of females than males**. The differences between the responses of White and BME males are significant ($p<0.05$)**.

Overall 11% of all UK national respondents had undertaken a compulsory work placement and 16% had undertaken an internship, as shown in Table 40. Slightly higher proportions of White females than White males had undertaken work placements and internships. 72% of UK national respondents had not undertaken any kind of work placement or internship when they completed the questionnaire.

Table 40: Whether UK national respondents have spent time undertaking work experience as part of their course by ethnicity and gender

Nature of work placement	White		BME		Overall
	Male	Female	Male	Female	
Yes: (a) work placement(s) as part of my course	9.9%	13.7%	8.8%	8.2%	10.5%
Yes: (an) internship(s) which was(were) not part of my course	15.4%	18.1%	12.7%	11.8%	15.6%
Yes: both a work placement as part of my course and an internship	2.2%	2.7%	0.6%	0.9%	2.1%
No placement	72.5%	65.5%	77.9%	79.1%	71.9%
Total	**2138**	**641**	**339**	**110**	**3228**

Data on whether or not UK national respondents in their final year had undertaken any kind of work placement or internship when they completed the questionnaire by ethnicity and gender are shown in Table 41. Overall, 56% of White male and 68% of White women respondents, and 40% of BME male and 32% of BME women respondents in the final year of their course had undertaken at least one work placement or an internship. Comparing respondents that have had a work placement or internship with those that have not, there is a significant difference in the responses of White and BME male respondents and White and BME female respondents ($p<0.05$). **Clearly the indications are that BME UK national are less likely than White UK nationals to have undertaken some form of work experience during engineering and technology degree courses.** Although the numbers are too low to draw any firm conclusions, the analysis also suggested that **final year BME respondents had spent less time than White respondents undertaking work placements and/or internships during their courses.**

Table 41: Whether UK national respondents in their final year have spent time undertaking work experience as part of their course by ethnicity and gender

Nature of work placement	White		BME		Overall
	Male	Female	Male	Female	
Yes: (a) work placement(s) as part of my course	20.0%	27.3%	14%	10%	20.6%
Yes: (an) internship(s) which was(were) not part of my course	30.5%	34.3%	24%	23%	30.3%
Yes: both a work placement as part of my course and an internship	5.3%	6.3%	2%	0%	4.9%
No placement	44.2%	32.2%	60%	68%	44.2%
Total	**419**	**143**	**63**	**31**	**656**

Respondents were asked whether, during their most recent placement, they met role models who inspired them to pursue a career in engineering/technology and the results are shown in Table 42. Overall 52% of UK national respondents agreed, and 26% of respondents strongly agreed that they had met positive role models. There is a significant different between the responses of White and BME respondents ($p<0.1$).

Table 42: Whether UK domiciled respondents met inspiring role models during their most recent placements by ethnicity

During my most recent placement, I met role models who inspired me to pursue a career in engineering/technology	Ethnicity		Overall
	White	BME	
Strongly agree	25.8%	26.5%	25.9%
Agree	52.6%	43.9%	51.7%
Disagree	19.1%	22.4%	19.5%
Strongly disagree	2.5%	7.1%	3.0%
Total	**810**	**98**	**908**

Table 43 shows that overall 87% of UK national respondents were paid during their most recent work placement or internship. There were significant differences between the responses White and BME male respondents ($p<0.1$).

Table 43: Whether or not UK national respondents' most recent work placements or internship were paid by ethnicity and gender

Work placement paid	White		BME		Overall
	Male	Female	Male	Female	
Yes	88.8%	84.2%	81%	87%	87.0%
No	11.2%	15.8%	19%	13%	13.0%
Total	**590**	**221**	**75**	**23**	**909**

Although some of the analyses of White and BME UK national respondents were limited by the number of respondents, especially when gender was taken into account, a number of differences between the experiences of White and BME respondents are apparent. In general, White and BME respondents report that they are equally likely to have a compulsory or optional industrial placement as part of their courses. **However, BME respondents are less likely than White respondents to have spent time working in an area relevant to their courses before starting their course**.

BME respondents in their final year were also less likely to have undertaken a placement as part of their course, and/or an internship than White respondents. While on placement, BME respondents were less likely to have met a role model who inspired them, and they were less likely to be paid than White respondents.

3.5 Respondents' views of the skills they possess

Respondents were asked whether they believed that they possessed the majority of general skills that employers often look for. 'General skills' were defined as non-technical or transferable skills, e.g. communication, team-working and problem-solving skills. The results, broken down by year of study, ethnicity and gender, are shown in Table 44, and illustrate that there are no significant differences between the responses of White and BME respondents.

Table 44: Whether UK national respondents believe they possess the majority of general skills that employers often look for by whether or not respondents are in their final year of study, ethnicity and gender

Year of study	Possess General Skills	White		BME		Overall
		Male	Female	Male	Female	
Final Year	Yes	95%	97%	91%	97%	95%
	No	1%	1%	3%	3%	2%
	Don't know	4%	2%	6%	0%	4%
	Total	**419**	**143**	**64**	**31**	**657**
Other years	Yes	92%	94%	84%	87%	91%
	No	2%	1%	5%	3%	2%
	Don't know	7%	5%	10%	10%	7%
	Total	**1719**	**498**	**275**	**79**	**2571**

Table 45: Whether UK domiciled respondents believe they possess the majority of technical skills that employers often look for whether or not respondents are in their final year of study, ethnicity and gender.

Year of study	Possess Technical Skills	White		BME		Overall
		Male	Female	Male	Female	
Final Year	Yes	72%	60%	58%	52%	67%
	No, but I expect to by the time I complete my course	12%	19%	25%	26%	16%
	No	8%	8%	5%	10%	8%
	Don't know	8%	13%	13%	13%	10%
	Total	**419**	**143**	**64**	**31**	**657**
Other Years	Yes	33%	21%	35%	18%	30%
	No, but I expect to by the time I complete my course	62%	74%	55%	76%	64%
	No	2%	2%	5%	3%	2%
	Don't know	3%	3%	5%	4%	3%
	Total	**1719**	**498**	**275**	**79**	**2571**

Respondents were also asked whether they believed that they possessed the majority of technical skills that employers often look for. The results, broken down by year of study, ethnicity and gender, are shown in Table 45. The data show that overall the proportions of respondents that believe they possess the technical skills employers look for increases as the length of time spent studying increases. **It is interesting to note that in the final year White males are more confident about their possession of technical skills than BME males and both White and BME females**.

Table 46: Whether respondents in their final year believe they possess the majority of technical skills that employers often look for by whether or not they have undertaken a period of work placement and/or an internship and gender.

Year of study	Possess Technical Skills	White		BME		Overall
		Male	Female	Male	Female	
Undertaken work placement/ internship	Yes	78%	66%	68%	60%	73%
	No, but I expect to by the time I complete my course	9%	16%	20%	20%	12%
	No	6%	9%	8%	10%	7%
	Don't know	8%	8%	4%	10%	8%
	Total	**234**	**97**	**25**	**10**	**366**
Not undertaken work placement/ internship	Yes	64%	48%	51%	48%	59%
	No, but I expect to by the time I complete my course	17%	24%	28%	29%	20%
	No	10%	7%	3%	10%	9%
	Don't know	9%	22%	18%	14%	12%
	Total	**185**	**46**	**39**	**21**	**291**

Table 46 presents data on whether respondents in their final year believe they possess the majority of technical skills that employers often look for broken down by whether or not they have undertaken a period of work placement and/or an internship and gender. Again it is interesting to note that White males are more confident about their possession of technical skills while both White and BME female respondents, and BME male respondents share a similar pattern of responses in their final year.

Overall, there are few significant differences between White and BME respondents' assessments of whether or not they have the general skills that employers look for, a higher proportion of White male than BME male, or White and BME female respondents believe they possess the technical skills that employers generally look for. The proportion of respondents who believe they have the technical skills employers look for increases as respondents progress through their courses, and it also increases if respondents undertake work placements. Although the number of BME respondents is relatively small, it appears that all BME respondents are less likely than White men to believe they have the technical skills employers look for, although they are as likely as White women to believe they have the technical skills employers look for. **Given that all respondents undertake the same courses these data suggest that BME respondents, along with White women, have less confidence in their technical abilities than White men which may in turn differentially affect their career decisions**.

3.6 Career intentions of respondents

3.6.1 The effect of respondents' courses on career intentions

Respondents were asked what effects their experiences as an engineering/technology students have on their intention to pursue a career in engineering or technology. The results for UK national respondents by ethnicity and gender are presented in Table 47. Overall between 60 and 70% of both White and BME, men and women state that their experiences have made them more intent on pursuing a career in engineering or technology.

Table 47: The effect of UK domiciled respondents' experiences as engineering/technology students on their intentions to pursue a career in engineering/technology by year of study, ethnicity and gender

Year of study	Ethnicity	Gender	My experience as an engineering/technology student has…				Total
			…made me more intent on pursuing a career in engineering/ technology	…had no influence my career intentions	…given me doubts about pursuing a career in engineering/ technology	…persuaded me that I definitely don't want to pursue a career in engineering/ technology	
Final Year	White	Male	66.6%	15.5%	15.0%	2.9%	419
		Female	61.5%	11.9%	21.7%	4.9%	143
		All	65.3%	14.6%	16.7%	3.4%	562
	BME	Male	62.5%	15.6%	17.2%	4.7%	64
		Female	67.7%	9.7%	16.1%	6.5%	31
		All	64.2%	13.7%	16.8%	5.3%	95
Other Years	White	Male	70.6%	18.4%	9.5%	1.5%	1719
		Female	64.5%	18.3%	14.7%	2.6%	498
		All	69.2%	18.4%	10.6%	1.8%	2217
	BME	Male	63.6%	19.3%	14.9%	2.2%	275
		Female	60.8%	21.5%	13.9%	3.8%	79
		All	63.0%	19.8%	14.7%	2.5%	354
Total			**67.7%**	**17.7%**	**12.3%**	**2.2%**	**3228**

3.6.2 Respondents' plans for the future

The 4303 respondents who had not yet accepted a job offer were asked what they intended to do once they had completed their courses. The results for UK nationals, broken down by year of study, ethnicity and gender, are presented in Table 48. Overall 71% of respondents stated that they intended to seek, or take up, paid work. There were no clear differences between White and BME respondents given the low number of BME respondents but the data do indicate that BME respondents are more likely than White respondents to state that they plan to undertake further study, and less likely to indicate that they plan to take some time off.

Table 48: Intentions of UK domiciled respondents who had not already accepted a job offer on, or shortly after, completing their courses by year of study, ethnicity and gender

Intention	Final year				Other Years				Total
	White		BME		White		BME		
	Male	Female	Male	Female	Male	Female	Male	Female	
Seek, or take up, paid work	70.2%	72.7%	69.1%	64.3%	72.2%	71.3%	65.9%	63.6%	70.9%
Undertake further study	5.8%	8.2%	16.4%	17.9%	9.4%	10.9%	16.5%	22.1%	10.4%
Take some time off	11.1%	11.8%	1.8%	3.6%	8.1%	8.4%	4.0%	2.6%	7.9%
Seek, or take up, voluntary work	0.9%	0.0%	1.8%	0.0%	0.6%	0.4%	1.5%	3.9%	0.8%
Don't know	9.1%	4.5%	5.5%	14.3%	8.0%	7.9%	10.6%	6.5%	8.2%
Other	2.9%	2.7%	5.5%	0.0%	1.7%	1.0%	1.5%	1.3%	1.8%
Total	**342**	**110**	**55**	**28**	**1651**	**478**	**273**	**77**	**3014**

Table 49 presents data on whether UK national respondents intend to seek employment as an engineer/technologist or undertake further study in engineering/technology on completion of their studies by year of study, ethnicity and gender. Overall, 77% of respondents answered that they did intend to seek employment as an engineer/technologist or undertake further study in engineering/technology. Given the low number of BME respondents in their final year, there is little discernible difference between the intentions of White and BME respondents. In other years the intentions of White and BME respondents are similar.

Table 49: Whether UK national respondents who had not already accepted a job offer intend to seek employment as an engineer/technologist or undertake further study in engineering/technology on completion of their studies, having taken any time off that they intend to by year of study, by year of study, ethnicity and gender

Engineering/ technology employment or further study	Final Year				Other Years				Overall
	White		BME		White		BME		
	Male	Female	Male	Female	Male	Female	Male	Female	
Yes	74.6%	69.1%	69%	54%	79.7%	74.1%	74.0%	75%	76.8%
No	10.2%	14.5%	4%	18%	5.1%	7.9%	6.2%	7%	6.7%
Don't know	15.2%	16.4%	27%	29%	15.1%	18.0%	19.8%	18%	16.5%
Total	**342**	**110**	**55**	**28**	**1651**	**478**	**273**	**77**	**3014**

3.7 Factors important in careers

Respondents were asked how important it was for them to a have a career that involved a number of different factors. Respondents were asked to rate the factors as very important, important, somewhat important, or not important. The results broken down by ethnicity are shown in Table 50.

Table 50: Ranking of UK domiciled respondents' ratings of the importance of different aspects in their career by ethnicity

Quality	White (N=2230)		BME (N=362)	
	Rank	Score*	Rank	Score*
A workplace culture where all staff are treated well	1	353.4	1	357.7
Being creative and intellectually stimulated	2	342.9	4	341.7
Job security	3	340.4	3	344.8
Good professional development opportunities	4	338.6	2	346.7
Having the potential for promotions	5	330.4	5	331.5
Lots of variety in the work	6	324.7	12	313.8
Making a positive difference to the company	7	316.9	6	331.5
Holding a respected position	8	311.4	11	314.6
Prospects for receiving a high salary	9	311.0	8	321.8
A variety of roles available	10	305.6	13	307.7
Making a positive contribution to society	11	300.4	7	322.4
Living in a pleasant area	12	298.4	15	301.4
Prospects for a leadership role	13	295.9	14	303.3
Having opportunities to socialise outside of work	14	294.8	19	283.7
Having independence and personal autonomy	15	290.4	16	297.0
Access to state-of-the-art equipment/resources	16	287.4	17	292.3
Having a reasonable commute to work	17	279.1	18	292.3
A strong health and safety culture	18	274.2	9	316.0
Opportunities to travel	19	268.4	20	275.4
A strong equality and diversity culture	20	256.8	10	314.9
Flexible working hours	21	250.5	22	272.9
Autonomy at work	22	249.8	23	268.8
The amount of holiday	23	248.3	24	266.9
Extensive benefits packages and/or bonuses	24	245.2	21	273.8
Working at a fast pace	25	226.1	26	236.5
Working at a relaxed pace	26	221.3	25	241.4

* Scores were calculated by multiplying the percentage of respondents in each of the categories very important, important, somewhat important and not important by 4, 3, 2, or 1 respectively and summing the individual products. The scores were then ordered for males and females to produce the rank orders.

Table 50 presents a ranking of the factors derived by calculating a score based on summed products of the percentage of respondents indicating each level of importance and the level weighting such that very important was weighted as 4, and not important was weighted as 1. For example, if 100% of respondents indicated that a factor was important the score would be 300.

The rankings for White and BME respondents are similar: in fact although the order varies slightly, the top five and the bottom six factors for White and BME are the same. **Both White and BME respondents rank "A workplace culture where all staff are treated well" as the most important factor**.

There are some notable differences between the two lists: "A strong health and safety culture", was ranked 18th by White respondents and 9th by BME respondents, and "A strong equality and diversity culture" was ranked 20th by White respondents and 10th by BME respondents.

3.8 Awareness of career opportunities

Respondents were asked to rate their awareness of the career options open to them as an engineering/ technology graduate. The results broken down by whether respondents are in their final year, by whether they had received careers advice and by ethnicity are shown in Table 51. 71% of White and BME respondents report having received some careers support during their undergraduate studies.

Table 51: UK national respondents' reported awareness of career options within academia by whether they are in their final year, whether they have received careers support and ethnicity

Awareness of career options as an engineering/ technology graduate	Final year				Other years				Overall
	Received support		Not received support		Received support		Not received advice		
	White	BME	White	BME	White	BME	White	BME	
Very Good	18.8%	21%	14.4%	5%	15.7%	17.7%	8.7%	10.7%	14.6%
Good	51.3%	49%	31.7%	52%	46.5%	46.6%	32.3%	33.9%	43.3%
Adequate	26.0%	23%	32.7%	19%	29.1%	28.5%	37.4%	30.4%	30.4%
Poor	3.9%	3%	10.6%	19%	8.2%	5.2%	17.6%	22.3%	9.9%
Very Poor	0.0%	3%	10.6%	5%	0.5%	2.0%	3.9%	2.7%	1.8%
Total	**462**	**73**	**104**	**21**	**1520**	**249**	**709**	**112**	**3250**

Overall 88% of UK national respondents rate their awareness of career options as adequate or better. 93% of respondents in their final year of study rated their awareness of career options as adequate or better, compared to 87% of respondents in earlier years. Comparing those respondents who had received careers support with those who had not and were in their final year, 96% of White respondents and 95% of BME respondents who had received support rated their awareness of career options as adequate or better, compared to 79% of White and 76% of BME respondents who had not received support. There were no significant differences between the responses of White and BME respondents in their final year, although in the case of those who had not received advice this was in part due to the low number of BME respondents.

Of those respondents in other years of study, 91% of White and 93% of BME respondents who had received support rated their awareness as adequate or better, compared to 78% of White and 75% of BME respondents who had not received support.

Figure 7 illustrates well that once respondents have received careers support men's and women's ratings of their awareness of the career options as an engineering/ technology graduate is very similar, but if they have not received careers support women rate their awareness lower than men.

Overall there is little difference between the reported knowledge of career options of White and BME respondents.

Figure 7: UK national respondents' reported awareness of career options by whether they are in their final year, whether they have received careers support and ethnicity

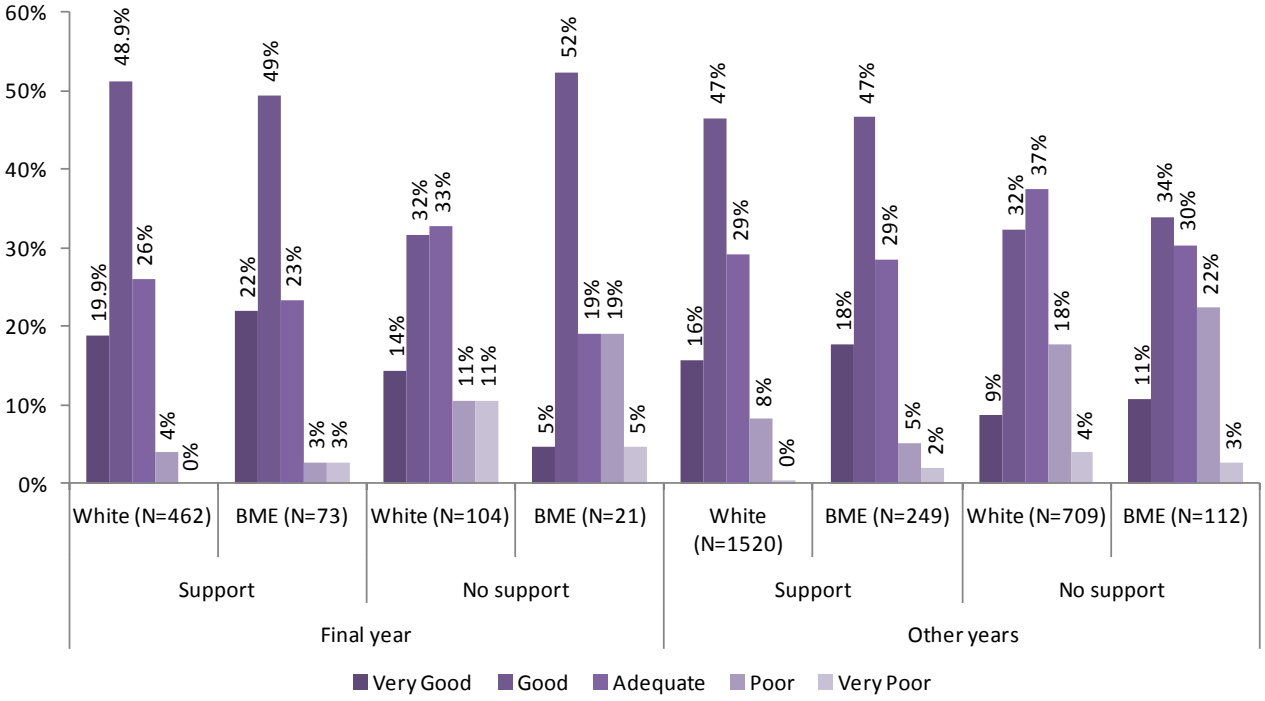

Table 52: Sources of careers support used by UK domiciled respondents who reported having received careers support during their undergraduate studies by ethnicity

Type of careers support received	White	BME	Overall
University careers service	76.1%	75.6%	76.1%
Industrial placement supervisor	26.8%	22.2%	26.1%
Careers/recruitment fairs	62.4%	62.3%	62.4%
Academic staff in your department	45.0%	41.4%	44.5%
Family	50.6%	46.0%	50.0%
Friends	45.7%	49.1%	46.2%
Other	3.3%	1.9%	3.1%
Total	**1983**	**324**	**2307**

Those respondents who had received careers support were asked to specify its source. The results are shown in Table 52. The most common sources of careers support are university careers services, 76%, and careers/recruitment fairs, 62%. There were similar patterns for White and BME respondents.

The types of careers support received by respondents are shown in Table 53. The most common types of career support are writing a CV, the types of jobs available, and where to look for jobs. The patterns of advice received by White and BME respondents are similar.

Table 53: Types of careers support received by UK domiciled respondents who reported having received careers support during their undergraduate studies by ethnicity

Type of careers support received	White	BME	Overall
Types of jobs available	66.5%	60.2%	65.6%
Where to look for jobs	59.9%	60.5%	60.0%
Filling out application forms	32.8%	32.4%	32.7%
Writing a CV	63.0%	64.8%	63.2%
Insights into working in particular jobs e.g. pay, conditions	40.6%	39.2%	40.4%
Interview techniques	40.7%	41.4%	40.8%
Other	1.8%	1.9%	1.8%
Total	**1983**	**324**	**2307**

Respondents were asked whether or not they had been given the chance to learn about or practise specific skills and the results are shown in Table 54. 81% of respondents reported having had the chance to practise presentation skills, 57% to practise leadership skills, and 87% to practise team working. For respondents in their final year of study the figures are 90%, 64% and 89%, respectively. **Women are more likely than men to report having had the opportunity to practise presentation and team working skills**.

Table 54: Whether or not UK domiciled respondents have been given the chance to learn about or practise specific skills by ethnicity

Skill	White	BME	Overall
Presentation skills	81.2%	79.0%	80.9%
Leadership skills	56.7%	56.2%	56.6%
Team working	87.0%	86.1%	86.9%
Total	**1983**	**324**	**2307**

4 Summary and conclusions

The main purpose of the analyses carried out were to:

- Update some of the analyses of HESA data presented in the Set to Lead research report by extending the timeframe covered from 2008/09 and 2009/10 to 2007/08, 2008/09, 2009/10 and 2010/11 and examining year to year changes;
- Investigate any differences between the destinations of UK domiciled graduates six months after completing first degrees in engineering and technology subjects as a function of their ethnic origin or socio economic class as measured by their parents' occupations; and
- Examine differences between the course experiences and career ambitions of White and BME students.

1.1 Engineering and technology first degree graduates

Analysis of the HESA Qualifiers and DLHE data show that there is considerable variation in the proportions of graduates from first degree courses in engineering and technology subjects who are female ranging from 9% in mechanical engineering to 88% in polymers and textiles in 2010/11. At subject group level 15% of engineering subject graduates, 24% of computer science subject graduates and 36% of technology subject graduates were female in 2010/11. Overall the proportion of female graduates from full-time courses varied relatively little over the time period under consideration, being 18.6% in 2007/08 and 18.7% in 2010/11.

Between 2007/08 and 2010/11, across all subjects, 78% of male and 71% of female UK domiciled graduates are White. In the engineering subject group 79% male and 72% of female graduates are White, in the computer sciences subject group 66% of male and 57% of female graduates are White, and in the technology subject group 90% of male and 81% of female graduates are White.

In general, higher proportions of UK domiciled BME students than White students are female although there are variations between subjects. Overall all BME groups have higher proportions of students who are female graduating from engineering and technology subjects than the White group. The Black or Black British - Caribbean ethnic group has the highest proportion of students who are female, although this may reflect the relatively low achievement of Black or Black British - Caribbean males at school level.

Although there is variation in the socio economic makeup of the student populations graduating in different subjects, and there are variations in the socio economic makeup of the male and female student populations within a specific subject, overall there are few clear patterns. What the data do indicate is that computer science subjects overall have a lower proportion of students with parents with higher managerial and professional occupations, than technology subjects which in turn have a lower proportion than engineering subjects. Additionally, computer science subjects have a higher proportion of students whose parents fall into the never worked, unknown or unclassified category of occupations than technology subjects which in turn have a higher proportion than engineering subjects.

At the subject group level the socio economic class makeup of the populations of men and women is similar.

4.1.1 Ethnic composition

There are also variations in the ethnic compositions of the male and female student populations within a specific subject. In all three subject groups and in the majority of subjects a higher proportion of men than women are White. Within subject groups the proportion of graduates who are White varies from computer sciences with 65% of male and 58% of female graduates, through the engineering subject group with 79% male and 73% of female graduates to the technology subject group with 90% of male and 82% of female graduates. The data show that in comparison to the ethnicity makeup of the whole graduating population of UK domiciled students White students are under-represented in engineering and technology subjects, and male White students are over-represented in computer science subjects. The proportion of White female students in mathematics and computer science subjects is in line with expectation. It is clear that there are differences in the popularity of engineering and technology subjects both in respect of gender and ethnicity.

4.1.2 Socioeconomic status

Although there is variation in the socio economic makeup of the student populations graduating in different subjects, and there are variations in the socio economic makeup of the male and female student populations within a specific subject, there are no clear patterns. At the subject group level the socio economic class makeup of the populations of men and women is similar.

4.1.3 Attainment differences by ethnic group and socio economic class

Overall, at the subject group level women are more likely than men to gain first and upper second class degrees. Between 2007/08 and 2010/11 within each subject group White students are more likely than students in other BME groups to gain first and upper second class degrees. In general within each ethnic group, women are more likely to gain first and upper second class degrees than men.

There is no clear relationship between the degree classification that graduates achieve and their parents' occupation.

4.1.4 Employment

Over the four years under consideration, in general the proportion of graduates entering full time paid work fell between 2007/08 and 2008/09 and then rose again in the subsequent two years. Similar patterns are observed for both men and women.

Men were more likely than women to be in engineering and technology occupations six months after completion of their courses. Overall, against a background of a varying proportion of graduates entering full time or part time paid work, the proportion of those graduates entering an engineering and technology occupation fell from the 2007/09 level before recovering. However, overall men are significantly more likely than women to be in engineering and technology roles six months after completion, and the gap between the proportions of men and women entering engineering and technology roles grew between 2007/08 and 2009/10.

Those graduating from enhanced first degree courses in engineering subjects are significantly more likely to enter graduate-level occupations than those graduating from bachelor degree courses. Female graduates from bachelor engineering and technology degree courses are significantly more likely than male graduates to enter non-graduate level jobs.

4.1.5 Destinations by ethnicity

White students are significantly more likely than BME students to be in full time paid work. For example, 68% White male graduates from enhanced first degree courses in engineering were in full-time work six months after completion, compared to 49% of Asian male graduates. The respective figures for female graduates are 67% of White graduates and 51% of Asian graduates. Conversely, a higher proportion of Asian graduates than White graduates were assumed to be unemployed: 7% of White male graduates compared to 20% of Asian male graduates; and 5% of White female graduates compared to 16% of Asian female graduates. Higher proportions of Asian graduates were undertaking further study, but whether this is because they could not get work is unknown. Similar patterns are observed for Black and Chinese graduates from enhanced first degree courses in engineering.

Overall, comparing graduates from engineering and technology degree courses with first or upper second class degrees, White graduates are more likely to be in full-time paid work than BME students, and of those students that are in paid work, White graduates are more likely than BME Graduates to be in engineering and technology and graduate-level occupations.

4.1.6 Destinations by socio economic class

For graduates from enhanced engineering degree courses there is relatively little difference between the main activities being undertaken by all the groups whatever the graduates' parents' occupations or by gender. For graduates from bachelor engineering and technology courses, there are differences in the main activities by gender within a given parental occupation, but once again similar patterns of activities are displayed for each parental occupation.

Examining data restricted to engineering enhanced first degree graduates graduating with first or upper second class degrees, similar patterns of STEM occupations six months after completion are observed for all parental occupations. It is difficult to draw any firm conclusions about the effect of gender but the indication is that gender has little effect.

For bachelor degree graduates, within each subject group similar patterns are observed between parental occupations but gender differences are observed for the engineering and computer science subject groups, with men more likely than women to be in engineering and technology occupations. The gender differences are much smaller for technology subject group graduates. The implication is that gender is a more significant factor than social class in determining occupation types.

For graduates from engineering enhanced first degree courses there is little variation by parental occupation whether or not a graduate-level occupation is being undertaken, and the indication is that there is little gender difference. For bachelor degree graduates the overall patterns are similar within each subject group, but there are clear gender differences for engineering and computer science subject group graduates where women are less likely than men to be in graduate-level occupations. The gender differences are much smaller for technology subject group graduates. As with the analysis for STEM occupations, the implication is that for bachelor engineering and technology graduates, gender is a more significant factor than social class in determining whether or not an individual is in a graduate level occupation six months after completion.

Overall, the social class of graduates does not appear to be a significant factor in the activity being undertaken six months after completion, or, for those in full-time and part-time work, does not appear to be a significant factor in whether or not graduates are in engineering and technology, and/or graduate-level occupations. Of more significance is whether or not engineering graduates completed enhanced first degree, or bachelor degree courses. For bachelor degree graduates, gender is a more significant factor in determining the main activity of graduates six months after completions, and, for those in full-time or part-time work, the kind of occupation undertaken.

4.2 Survey of engineering and technology graduates

Overall 82.4% of UK nationals reported their ethnicity as White British, and another 3.6% reported their ethnicity as White Irish or White Other. 14.0% of respondents reported that they were Asian or Asian, Black or Black British, Chinese, Mixed/Dual Heritage or of other ethnicity. No respondents reported their ethnicity as Black Caribbean.

Given the relatively low number of BME respondents, the respondents' ethnicities in the analyses carried out were grouped as White and BME.

87% of White male respondents and 91% of White female respondents are aged between 18 and 22 years old, compared with 83% of BME male respondents and 91% of BME female respondents. There is relatively little difference in the age distributions of White and BME respondents.

4.2.1 Motivations for undertaking course

Given the numbers of BME respondents there were no significant differences between the responses of White and BME respondents who selected one and two reasons as a motivation for taking a particular course. The most popular reason selected by respondents who selected one and two reasons was, "Out of interest and enthusiasm for engineering".

Only 3.4% of White respondents and 5.3% of BME respondents reported that they regretted undertaking their courses. Considering only the responses of those who expressed a firm opinion, there were no significant differences between the responses of White and BME respondents.

The most popular reason selected by White and BME respondents for why they do not regret undertaking their courses is, "I enjoy my subject." Both White and BME females are more likely than White and BME males, respectively, to select this reason. However, BME respondents were less likely than White respondents to select "I enjoy my subject."

4.2.2 Work/industrial placements

Overall 61% of UK national respondents have an optional work placement, but only 11% have a compulsory work placement as part of their course. The differences between the responses of White and BME males and females, respectively, are not significant.

Around 7% of respondents had a full time job before starting their course and around 24% of respondents had carried out some other kind of work related to their course. 70% of UK national respondents had not had any work related to their course: a higher proportion of females than males. The differences between the responses of White and BME males are significant.

Overall 11% of all UK national respondents had undertaken a compulsory work placement and 16% had undertaken an internship. Slightly higher proportions of White females than White males had undertaken work placements and internships. 72% of UK national respondents had not undertaken any kind of work placement or internship when they completed the questionnaire.

56% of White male and 68% of White women respondents, and 40% of BME male and 32% of BME women respondents in the final year of their course had undertaken at least one work placement or an internship. Comparing respondents that have had a work placement or internship with those that have not, there is a significant difference in the responses of White and BME male respondents and White and BME female respondents ($p<0.05$). Clearly the indications are that BME UK national are less likely than White UK nationals to have undertaken some form of work experience during engineering and technology degree courses.

52% of UK national respondents agreed that during their most recent work placement they met role models who inspired them to pursue a career in engineering/technology, and 26% of respondents strongly agreed that they had met positive role models. **There is a significant difference between the responses of White and BME respondents ($p<0.1$) with BME respondents being less likely to agree than White respondents**.

Although some of the analyses of White and BME UK national respondents were limited by the number of respondents, a number of differences between the experiences of White and BME respondents are apparent. In general, White and BME respondents report that they are equally likely to have a compulsory or optional industrial placement as part of their courses. However**:**

- **BME respondents are less likely that White respondents to have spent time working in an area relevant to their courses before starting their course;**
- **BME respondents in their final year were also less likely to have undertaken a placement as part of their course, and/or an internship than White respondents;**
- **While on placement, BME respondents were less likely to have met a role model who inspired them; and**
- **BME respondents were less likely to be paid than White respondents.**

4.2.3 Respondents' views of the skills they possess

Respondents were asked whether they believed that they possessed the majority of general skills that employers often look for: there are no significant differences between the responses of White and BME respondents. Respondents were also asked whether they believed that they possessed the majority of technical skills that employers often look for. Overall the proportions of respondents that believe they possess the technical skills employers look for increases as the length of time spent studying increases. **White males are more confident about their possession of technical skills than BME male and both White and BME females**.

Overall, there are few significant differences between White and BME respondents' assessments of whether or not they have the general skills that employers look for, a higher proportion of White male than BME male, or White and BME female respondents believe they possess the technical skills that employers generally look for. The proportion of respondents who believe they have the technical skills employers look for increases as respondents' progress through their courses, and it also increases if respondents undertake

work placements. Although the number of BME respondents are relatively small, it appears that BME respondents are less likely than White men to believe they have the technical skills employers look for, although they are as likely as White women to believe they have the technical skills employers look for. **Given that all respondents undertake the same courses these data suggest that BME respondents, along with White women, have less confidence in their technical abilities than White men which may in turn differentially affect their career decisions**.

4.3 Career intentions of respondents

Respondents were asked what effects their experiences as an engineering/technology student had on their intention to pursue a career in engineering or technology. Overall between 60 and 70% of both White and BME men and women state that their experiences have made them more intent on pursuing a career in engineering or technology.

71% of respondents who had not yet accepted a job offer stated that they intended to seek, or take up, paid work. There were no clear differences between White and BME respondents given the low number of BME respondents but the data do indicate that BME respondents are more likely than White respondents to state that they plan to undertake further study, and less likely to indicate that they plan to take some time off.

77% of respondents answered that they did intend to seek employment as an engineer/technologist or undertake further study in engineering/technology. Given the low number of BME respondents in their final year, there is little discernible difference between the intentions of White and BME respondents. In other years the intentions of White and BME respondents are similar.

4.3.1 Factors important in careers

Respondents were asked how important it was for them to a have a career which involved a number of different factors. The rankings for White and BME respondents are similar: in fact although the order varies slightly, the top five and the bottom six factors for White and BME are the same. Both White and BME respondents rank "A workplace culture where all staff are treated well" as the most important factor.

There are some notable differences between the two lists: "A strong health and safe culture", was ranked 18th by White respondents and 9th by BME respondents, and "A strong equality and diversity culture" was ranked 20th by White respondents and 10th by BME respondents.

4.3.2 Awareness of career opportunities

71% of White and BME respondents report having received some careers support during their undergraduate studies.

Overall 88% of UK national respondents rate their awareness of career options as adequate or better. 93% of respondents in their final year of study rated their awareness of career options as adequate or better, compared to 87% of respondents in earlier years. Comparing those respondents who had received careers support with those who had not, in their final year 96% of White respondents and 95% of BME respondents who had received support rated their awareness of career options as adequate or better, compared to 79% of White and 76% of BME respondents who had not received support. There were no significant differences between the responses of White and BME respondents in their final year.

Overall there is little difference between the knowledge of career options White and BME respondents.

4.4 Conclusions

Analysis of HESA data suggest that there have been few changes in the patterns of participation in engineering and technology first degree courses, or in the destinations of graduates from these courses over the period 2007/08 to 2010/11. There was a fall in the proportion of graduates going into full-time or part-time paid work between 2007/08 and 2008/09, but this proportion rose over the next two years with the net result that there was little overall change. Against the background of a fall in the proportion of graduates going in to full- or part-time paid work, the proportion of those going onto engineering and technology roles also fell between 2007/08 and 2008/09, before rising again. Graduates from enhanced degree courses were more likely to enter graduate-level roles than those from bachelor courses, albeit they are also more likely to gain first or upper second class degrees which in turn is likely to affect their ability to gain employment.

The Set to Lead research report highlighted the differences between the employment destinations of male and female engineering and technology graduates. Although survey data suggested that men and women had similar career intentions with respect to gaining employment in engineering and technology roles, HESA data showed that men were more likely than women to be in engineering and technology roles six months after completing their courses. The survey data also showed that men were more confident than women in their technical abilities and in their ability to make a good engineer or technologist. The suggestion is that the greater "career confidence" of men results in them being more likely to apply for and secure engineering and technology roles. The data also showed that undertaking good quality internships or work placements increased the confidence of both men and women, but that the confidence gap between the genders remained.

The analysis of HESA data in this report suggest that BME graduates from engineering and technology courses are less likely than White graduate to gain first or upper second class degrees. Even when the degree class of graduates is taken into account, White graduates with first or upper second class degrees are more likely than BME graduates with first or upper second class degrees to be in be full-time paid work six months after completing their courses, and of those that are in work, White graduates are more likely to be in engineering and technology and graduate-level roles.

In contrast, the socio economic class of graduates, as measured by their parents' occupation, appears to have little effect on the attainment of graduates or on their destinations. In fact a graduate's gender, or whether or not they graduated from an enhanced or bachelor first degree course, effects their destination more than their social class. There is evidence that social class is a determinant in whether or not an individual enters higher education, but the evidence, at least for engineering and technology graduates, is that social class is not a major factor in determining employment in engineering and technology roles.

The low number of BME respondents meant that analysis of the data collected for the survey of engineering and technology students with respect to ethnicity was only possible by comparing White UK nationals with BME UK nationals as a whole. Nonetheless the analysis did find a number of differences between the two populations, some significant.

White and BME respondents appeared to share similar motivations for undertaking engineering and technology courses, and appeared equally likely to state that they intended to seek employment as an engineering /technologist or undertake further study in engineering/technology. Also, there was little

difference in the knowledge of career options of White and BME respondents, and for the most part White and BME respondents ranked factors important in their careers similarly.

White respondents in their final year were more likely than BME respondents to have had some relevant work experience before undertaking their course, and were significantly more likely than BME respondents to have undertaken at least one work placement or an internship. The reasons for the differences are not known especially as White and BME respondents were equally likely to have work placements as part of their courses. The implication is that where placements are optional BME students are less likely to take them up, and that BME students are also less likely than White students to obtain internships. Whether BME students are less likely than White students to apply for the internships, or whether they are less likely to be offered them once they have applied, is unknown.

Undertaking a work placement or internship is likely to increase a student's confidence in their technical skills, and is also likely to increase their employability. The data from the survey suggest that BME students' employability compared with White students' is disadvantaged.

Overall the survey data do suggest that BME respondents are less likely to have relevant work experience than White respondents, and that they also have less confidence in their technical skills than White male respondents. These data might go some way to explain why BME graduates with first or upper second class degrees are less likely to enter full-time or part-time work, or to enter engineering or technology roles than White students.

Looking at the whole picture though, comparing White and BME graduates, BME graduates are less likely to gain first class or upper second class degrees, and they are less likely to have relevant work experience, and have less confidence in their technical skills. It is not the purpose of this report to suggest reasons for the observed differences between White and BME groups. However, as was the case for gender in the Set to Lead research report, findings from the survey might go some way to explain some of the differences in patterns of activity six months after White and BME graduates complete their courses. However, the numbers of BME respondents/graduates are smaller than female respondents/graduates, and it not always appropriate to group all ethnic groups together as has been necessary for analysis of the survey data, so drawing firm conclusions that apply to all ethnic groups must only be attempted with caution.

In contrast to the findings for ethnicity, and as noted above, social class does not appear to be a major factor in degree class or activity on graduation.

In conclusion, the findings suggest that while gender and ethnicity are factors in attainment and subsequent employment of engineering and technology graduates, social class does not have a major effect.

Part two: Young women, careers advice and student experiences

5 Voices of early career engineers and women engineering students

5.1 Introduction

The second purpose of this project was to share the 'voices' of early career engineers and women engineering students with younger women to help share their experiences and promote diversity of engineering both in terms of the people who do it and the job roles and industries they can work in.

This section revisits the free text responses collected in the Set to Lead survey and reports on students' influences, decision making and aspirations which were explored through discussion groups to shape the literature and supporting web space.

This additional evidence was gathered to build up the picture of how the women came to be studying engineering and technology to inform steps that might be taken to increase the pool of women undergraduates. Family background was also explored in terms of socio economic status as well as ethnic heritage.

Information from the literature helped to contextualise some of the findings.

The aim was to enrich the quantitative work as well as to inform possible policy solutions to 'solve' the problem of the low participation of women in engineering and technology.

Parental education and employment role was used as a proxy for socio economic status in the discussions.

The final part of this section outlines the poster and website produced by WES to pass on advice collected from the study participants to teenage girls.

5.2 Methodology

The free text contributions in the Set to Lead survey were collated and analysed and supplemented by a series of focus groups at Sheffield Hallam (SHU), Aston and Cardiff Universities. Participants were sourced using WES student members and student groups and staff at SHU and Cardiff. An online survey was also launched to try and capture inputs from students with parents who do not work in managerial jobs and have never been to university. Nineteen students took part in the discussions.

Recruitment for the discussion groups aimed to attract White and British Black and other minority ethnic students from families with low income and no history of attending university or studying science or other technical subjects. Students who were 'natural' engineers and had been encouraged by an engineer parent from an early age and others who had anticipated a more creative / artistic career path were welcomed to promote a healthy discussion.

In addition to discussion groups with undergraduates, in response to a request by the designers of the output material, focus groups with girls in the target age group for the output materials, agreed as age 11-16, were held. In total 46 girls and 7 boys from Dorset and London took part in discussions about engineering and science and issues of concern. Semi structured conversations were held using a *proforma* as guidance.

5.3 Background research

There is an extensive literature on girls in engineering and this section is NOT an exhaustive review, but provides some references for context.

Some girls are drawn to mechanical or construction toys and projects and like to tinker with things and investigate how things work, but many more girls don't have this same inclination, or are not exposed to these toys

Fewer than half UK state schools send girls on to study physics at A level.[14] While not taking A level physics alone is not responsible for the low numbers of girls going on to study engineering, it certainly closes off a significant number of engineering and technology courses and shapes the thinking about career options.

Most girls do not have any identity of themselves as engineers because they don't have any idea about what engineers do. There is a significant gap that needs to be addressed by teachers, parents and the profession, building the identity for girls of "I'm an engineer" or "I'm a scientist".

There were two significant surveys about engagement and appreciation of science and engineering by young people in progress at the time of this project by Reiss (2012) - the UPMAP[15] project - and Archer (2012) in Aspires. The Aspires[16] project investigated why there is little or no gender distinction in attitudes towards science at age 10 and the subsequent failure to engage young people, particularly girls, with pursuing scientific careers. The project aims to create a new vision of why careers in science matter, both within schools and in the wider context of society. The project's preliminary findings suggest that little has changed over the last 20 to 30 years despite many interventions.

The Aspire project identified two types of girls who express science aspirations. "bluestocking scientists" refer to themselves as "kind of nerds" that like studying. A smaller number of girls, who balance their interest in science with a more "girly" identity of fashion, being sociable and sporty, are termed "feminine scientists".

A major survey in the USA in 2005[17] echoes the findings of work undertaken for the DTI in 1998 and the evaluation of its "Go for it" poster campaign in the now out of print "Get With It" report:

- High school girls believe engineering is for people who love maths and science;
- They do not understand what engineering is but that it is not a field "for them";
- Girls want a job with relevance – suggesting a job "for someone like me";
- Career influencers that includes educators are not familiar with how to guide students towards engineering and are not receiving the positive stories of engineering for the female audience;
- Engineering continues to be portrayed as challenging and with a less confident audience this does not fit with their personal identity;
- Girls want to hear about careers and match how they align with their own career motivators: enjoyable, good working environment, making a difference, good income, flexibility.

The Aspires project interim report talks of a robust body of evidence that interest in science is formed by the age of 14 and that at age 14, students with an expectation of a science related career were 3.4 times

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14 It's Different for Girls. The influence of schools Institute of Physics, October 2012.

15 http://www.ioe.ac.uk/study/departments/cpat/4814.html

16 http://www.kcl.ac.uk/sspp/departments/education/research/aspires/aims.aspx

17 http://www.eweek.org/site/pdfs/EWEPFinal.pdf Extraordinary Women Engineers

more likely to earn a physical science or engineering degree than students without similar expectations. The Aspires findings show that class, gender and ethnic background have a disproportionate influence on the aspiration to work in science or medicine:

- 45% of the most socially advantaged pupils in the Aspires survey aspire to become a doctor compared to just 22% of the least advantaged;
- 23% of the most socially advantaged pupils aspire to become a scientist compared to just 9% of disadvantaged pupils;
- 60% of South Asian students and 54% of Black students aspire to medicine compared to 30% of White students;
- Pupils from South Asian backgrounds are most likely to aspire to become a scientist (23%) compared to 18% of Black student and 13% of White students.

5.4 A framework for targeting interventions

A framework for identifying target groups of girls for interventions was developed for this project based on descriptions in the literature and the on the field work carried out as part of the project.

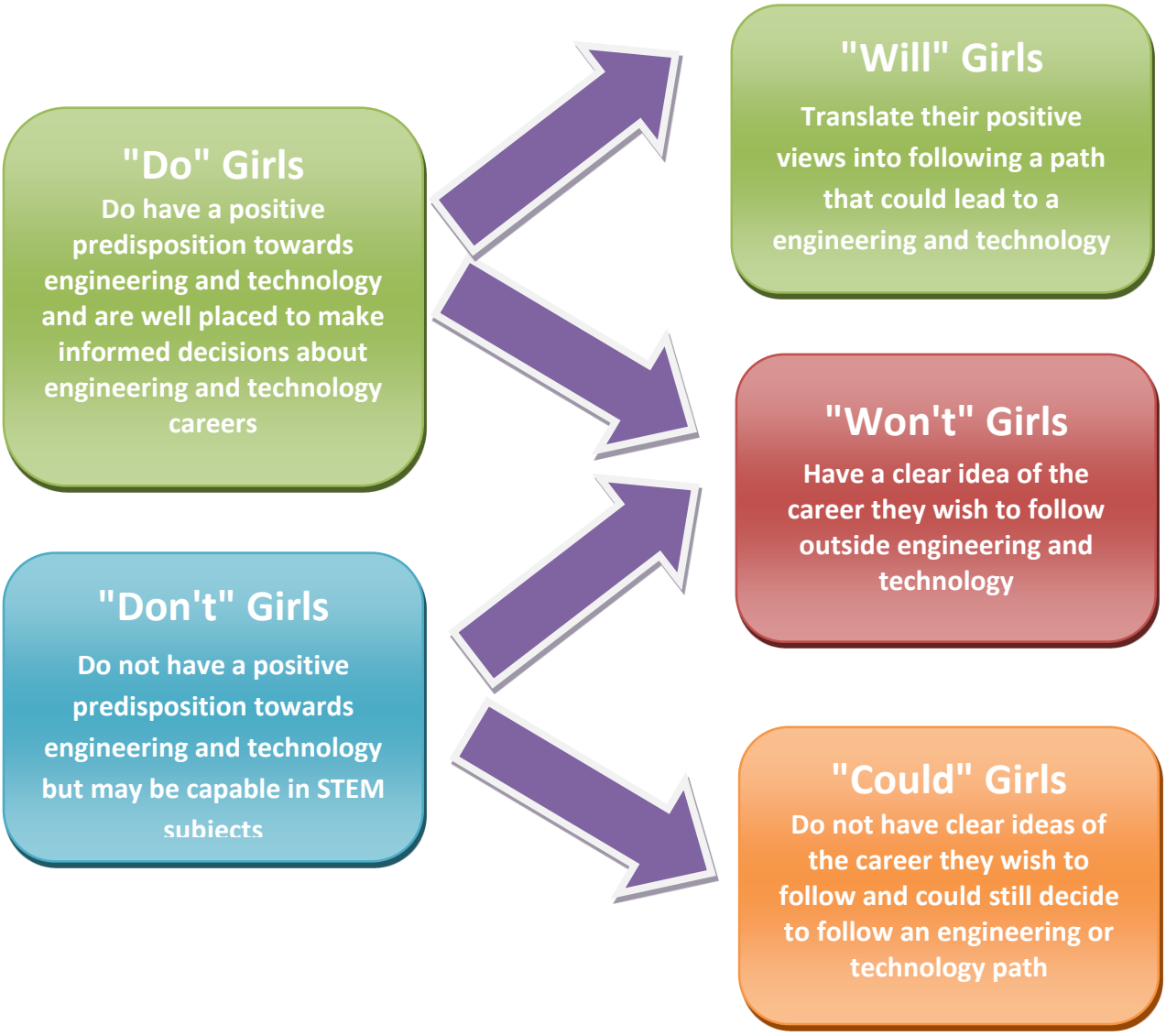


Figure 8: Framework for identifying groups of girls for targeting with information

Girls can be grouped into those that naturally have a positive predisposition and attitude towards engineering and technology subjects – those that "**do**" and those that "**don't**". Girls in the "**don't**" group may be capable in STEM subjects. Among the "**do**" group are those who "**will**" go on to follow a path that leads to STEM A Levels and possibly to the study of engineering or technology after school. Some of the "**do**" group, however, have clear ideas of careers outside engineering and technology such as wanting to be a doctor, lawyer or part of another clearly identified profession and hence "**won't**" go on to engineering or technology careers.

Among the "**don't**" group there are girls who have clear ideas of careers outside engineering and technology and hence also fall into the "**won't**" group.

There is also a group from among the "**don't**" girls who "**could**" follow engineering and technology paths. This group is of particular interest: they are the girls that "**could**" follow engineering or technology careers as they are capable in STEM subjects, but whose personal identities and influences are very different from the "**do**" group and consequently do not have a positive predisposition towards engineering and technology.

The main challenge is to engage the "**could**" group in discussion and debate during the critical period between year 5 and year 8 (ages 8 to 13) so that they have an innate awareness of what engineering is about.

A subsidiary challenge is to ensure that members of the "**will**" group also have the detailed knowledge and awareness to make the best choice of course in the event that they choose to follow an engineering or technology path and become "**do**" girls.

The general findings, and in particular the defined groupings of girls, helped to refine the target audience for the "Engineering, it's in everything" campaign poster:

- To enable the "**will**" girls, both the Aspire project-termed "bluestocking scientists" and "feminine scientists", to have a wider appreciation of engineering;
- To connect with the "**could**" girls.

5.5 Analysis of students' perceptions and experiences in decision making

This section draws together the comments from undergraduate engineers about their experiences and aspirations post-graduation against a context of class and ethnic background where possible.

The discussion groups held for this study were necessarily small and aimed to add some current perceptions and experiences to guide the poster designers, rather than make a statistically significant statement about the attitudes, aspirations and views of teenage girls.

5.5.1 Parental employment and gender

Parental role and employment was used as a proxy for socio economic familial status. "Middle class" undergraduate students expressed a sense of parental pressure at secondary school to know what they wanted to do post A levels. Those whose parents had professional jobs who had "always known" what they wanted to be were frustrated with their parents attitudes. When this kind of comment was made it was by students whose parents worked in healthcare and had known they wanted to be doctors / nurses from an early age and couldn't understand their daughters' uncertainty.

In one discussion around class issues, students from wealthy and low income homes discussed how they weren't pushed, or were discouraged, from studying engineering or technology subjects, though for different reasons:

- Students from low income backgrounds/low achieving schools because parents and families were proud and delighted about what they were doing and had achieved; and
- Students from wealthy backgrounds (in one case) were studying engineering and technology because there was a simple expectation of success and no pressure to work anywhere specifically, and also (in another case) there was parental opposition to studying engineering and an expectation that she would join the family (non-technical) business.

The students involved in this discussion found it valuable to gain an insight into the challenges they each faced and that just because your parents might have more money, be better paid or have a higher status job – studying for your degree could be just as hard.

Middle income background students reported that they felt parental pressure and were pushed to achieve and succeed and spoke more of challenging themselves.

> Jess is of mixed heritage from the Caribbean and Africa and was educated in the UK. Her mother is a nurse and her father an accountant. Up to year 11 she was told she had to be a doctor. But she hated biology. She swapped biology A Level for forensic science (BTEC) and it wasn't until UCAS day she realised that maths and physics lead to engineering. Her school were supportive but her parents…are still really keen for her to do medicine.

One Asian student whose family run a supermarket and factory were pushing their daughter to do optometry "because it is a good career for girls." She even started the course and hated it. Her mother went so far as visiting her course leader to persuade him to persuade her to stay. He sided with her daughter and said, "Why would you want to spend your career sitting in a 4x4 room?"

Career choices are stereotyped by ethnic background and gender. Parental influence is increasingly significant as the cost of a university degree rises.

Data presented in Part 1 showed gendered and ethnic background influences on course choice. This is supported by comments by participants.

> Ruby is from an affluent background and has lived all over Africa moving around with her father's expanding factories. Her parents didn't want her to do engineering and on occasions have tried to stop her returning to the UK. Nonetheless her father is paying for her. She has struggled because she hasn't been pushed or encouraged.

Lauren is from a white working class family. At 14 she didn't like labs but was keen to investigate how things are made. Her comprehensive school peers were also mostly from low income backgrounds with little aspiration for further study "let alone science or engineering". She was engaged by engineering during a Manchester University outreach day for underachieving schools – a hovercraft day. Her parents were thrilled she wanted to do engineering and really encouraged her to go for it. Lauren says, *"The hardest thing about going to school with many others from low income backgrounds is that only two others went on to university and also to do science."*

5.5.2 Comments about the university experience - gender issues

There were a small number (n=15 out of 284) of comments from women on gender related issues in the Set to Lead survey. Two thirds of these reported negative, belittling comments from male lecturers.

When being a female engineer was raised in discussion groups, it was dealt with humour and anecdotes. These ranged from (appreciated) "support and caring from male peers on social nights out" to widespread acknowledgement of the male peers being more immature and "behaving like a kid brother" and "being annoying". Some comments drawn from the Set to Lead survey are shown below.

One respondent noted offensive remarks from a lecturer but was still happy to work as a female engineer:

> *"There is one [lecturer] who makes sly insults at females and though they are meant to be interpreted as a joke I do find them slightly offensive, especially seeing as he is a professional lecturer. But otherwise I have no problems at all with being a female in a male dominated environment and have no problem getting my ideas across and being heard when being placed in groups with all boys but for the exception of myself. I have no fears about entering into the working environment or being a female engineer."*

The next two respondents learnt different things from their work experience. In the case of the first the world of work was seen as less equitable than higher education, and in the case of the second, work experience was what made the difference in terms of keeping the respondent in engineering:

> *"I have found that although at university, as a female, I have been treated equally however doing placements have realised this is not the case in the working world and that there is still a lot of criticism directed at female engineers. I also noted the lack of female engineers in the companies."*

> *"I intend to work for a civil engineering contracting company. This decision was based upon my work experience which I found myself. The university had taught me little to pursue this line of work as all courses seem driven by the aim to become consultant design engineers. One or two lecturers seem to treat females different to males and unfortunately there will always be a few students who are ignorant and treat you unfairly also. However my experience on site has taught me that is the*

minority. If it had not been for my work experience my experience at university may have turned me away from the civil engineering sector."

Some respondents reported feeling that they had to prove themselves women in engineering:

"Regarding the whole "women in engineering" thing: I feel I have been treated equally by lecturers and other students. However, there is the usual joke about girls getting in purely because they are girls. At the moment, I laugh about it but I still sometimes feel the need to prove that I didn't get in just because I am a girl. I imagine I am not the only one to feel that way. However, I am not sure much can be done about it..."

Others wanted some female role models:

"Initially I thought that the male/female divide in computing was an exaggeration, but I've become very aware of the imbalance. Although I do not feel that any of the lecturers are sexist, or treat me any different, I think it would have been better if I had at least 1 female lecturer, just so I could see someone like myself, and have someone to relate to."

A number of female respondents reported positive experiences in higher education which have reinforced their determination to follow an engineering/technical career:

"I have come across some inequality in this field in general, this I think is just because there aren't as many women, so sexism can be common. This wouldn't put many women off though, most girls on my course can definitely hold themselves, and a few men may even be scared by a few of them rather than the other way around. I wasn't so sure before whether I'd be a part of this particular field after university, but now I can't think of not being part of it. It's much better than anyone said it would be."

"University experiences have been very positive. The problems that I have experienced have actually been in the workplace, it's probably the positive experiences at college that has made me realise that there is a "glass ceiling"."

But not all experiences were positive:

"I underestimated the natural sexism that comes with working in a predominantly male environment, and if I seek a job in this area I don't think I will reach my full potential. Therefore I am unlikely to now seek a job in engineering."

5.5.3 Influence and relevance of careers advice

These comments are summarised from the discussion groups with girls in years 7, 8, 9 and 10. Where appropriate they are reinforced by comments from the undergraduate discussion groups. These discussions were held to inform the messaging and design of the 'Voices' project literature.

Awareness of engineering

- Girls in year 7 and 8 had little appreciation of engineering and engineers. It is likely that this is also the case for boys. Preconceptions of the work engineers do were around fixing cars and washi machines. There was little connectivity to buildings, phones or even climate change, for example. When pushed to talk about designing buildings they could only think of an architect.
- In year 9 and 10 the responses were more detailed and included 'creating', 'designing', 'making' cars and buildings.

- Girls were concerned about climate change, poverty and pollution.
- Pupils in years 7, 8 and 9 felt they hadn't been made aware of what engineering was about. Some schools are taking options in year 8 and these girls had been advised to take triple science only if they were doing medicine or engineering. But no-one backed this up by telling them what engineering was about. Other than that "it was for boys".

Careers advice

Girls told us that school careers advice is delivered through class or year group talks normally during year 8 or 9 depending when GCSE options are chosen. Engineering is talked of as one subject or career. This approach doesn't appear to impart useful information to the girls about the diversity of routes, courses and job functions open to them with an engineering qualification.

University students claimed a "massive lack of awareness" while at school about engineering careers calling for:

- Improved communication chains. They felt that they should not have had to rely on mathematics and physics teachers or family friends for information;
- Improved careers software. They were critical of careers software they had encountered: "If a combination of maths and art or physics and art are entered the only output is architecture."
- Better information. They bemoaned the lack of knowledge of the diversity of engineering courses available.

Most chose engineering because they were good at mathematics and physics with decisions being informed by casual remarks from friends' parents and then being made "on UCAS day" or even results day.

Undergraduates (years 1, 2 and 3) spoke of their experience of careers advisors at school as being poorly informed about the different types of engineering and also the variety in courses ranging from very theoretical courses to others which are project based. Participants reported that they weren't encouraged by their schools to do engineering, or that they weren't even told they needed two sciences for medicine. The view was expressed that "Girls MUST know by year 10 what's needed" and currently there is no scope for keeping your options open and deciding later unless you do sciences and maths.

Francine is white European and found her school career tutor was not very helpful in supporting her career choices saying sarcastically "really" and "no-one else wants to do it" AND "you're a girl." She felt unsupported and in her sixth form even among the boys few wanted to go on to engineering. She says:

"My mum still hasn't got a clue what I do. She thinks I'm fixing cars or something, and now it's all my (humanities) house mates who haven't got a clue."

Ebun's father is a PhD civil engineer. Even so she says "*no-one was giving me much help in choosing my options*".

Others nodded and agreed. "*No-one's telling you that maths and physics are core and even further maths*"

5.5.4 Diverse A Levels and engineering

The pen pictures that follow illustrate some routes chosen into engineering by young women who chose to study an A Level mix reflecting their favourite subjects or subjects they were 'good at'. The purpose is to illustrate that you don't have to choose straight sciences or just maths and physics.

"I was always making, creating, investigating and playing with things when young. My mum helped me rediscover my childhood plans to be a great inventor by taking me to university open days."

"I did my undergraduate in Germany in biotechnology – a mix of science and process technology. I really liked the technology side and so I'm doing a Masters in biochemical engineering. My father is a baker and no one in my family or even my village has been to university let alone done a PhD. They just don't understand."

"I took Maths, Physics and Drama. I'm a farmer's daughter and a practical individual. Drama was my first love at sixth form and preferred choice for higher education. A chance comment supported by my physics teacher about the jobs his friends were doing shifted my thoughts to engineering and made me realise that technology plays a vital role in businesses."

"I did maths physics and art. I'm an artist at heart and now finally happy on my mechanical engineering course – we've finally started to draw! I'm managing to balance my course with art, spending my spare time capturing the views around Cardiff and socialising."

"I studied maths, further maths and geography and am the first in my family to go to university (although all my brothers have now too) and am loving my civil engineering and environment course. I'm developing my CV by taking on the role of training manager for the university Engineers Without Borders group and setting up courses such as solar energy installation for other students to improve their skills and also the chance of gaining work experience."

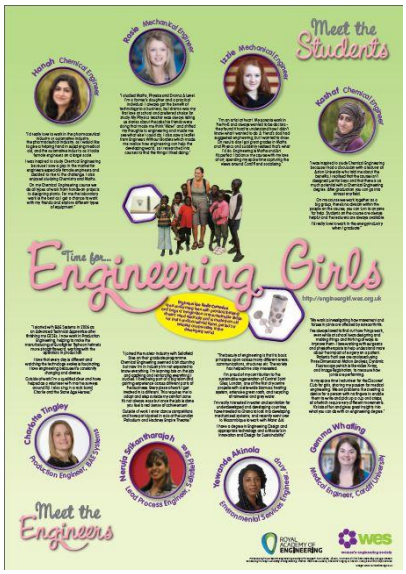
A big trigger for students seems to have been Engineers Without Borders (EWB) leaflets, seen while at school. Despite this, the girls said their awareness of the link between civil engineering qualifications and international development and disaster relief in securing water and safe buildings wasn't there. The school girls in the focus groups reinforced this.

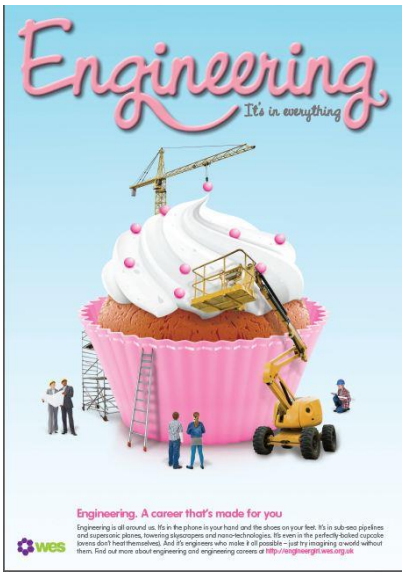
5.6 Passing on advice: a WES campaign

As well as being reviewed for issues and themes, the free text contributions in the Set to Lead survey were examined for advice from undergraduates to teenagers. A significant number of responses reinforced the view that engineering degrees offer a broad skill set and open many doors and have helped to refine students' awareness of the industry sector(s) of interest for possible work. Respondents expressed a lot of support for undertaking internships and work placements although a tiny number commented that they found the placements menial and sapped confidence.

Using the information from the survey and the focus groups, a poster and sub-domain of the WES website was produced for the Women's Engineering Society to pass on this information to girls and parents. The poster design was based around the feedback from the focus groups; pandering to the craze for cupcakes and baking among teenage girls. The concept was to develop a series of posters over time and to make surprising links between objects and engineering, in this instance to follow the poster with material and challenges exploring the engineering behind various consumer products, starting with cupcake manufacturing.

The colour scheme proposed and approved was a 1950's palette using the strap line "Engineering, it's in everything". The "pinkness" of the cake image was debated hotly with the prevailing view that it appealed to early teens and therefore was acceptable.





The URL is for the website is: http://engineergirl.wes.org.uk. The poster creators were keen to make the repeated connection between the words engineer and girl to make a positive reinforcement. With their track record in the long running (20 years) Royal Society of Chemistry 'Not all chemists wear white coats' campaign, they are well placed to comment.

Advice to teenagers from undergraduate women engineers, to assist with course choice are shown below arranged in themes. The advice, provided the basis of the content for the website.

Make sure you research your options

Go to lots of career talks, fairs or open days all through school and take the opportunity to talk to people about their work and career path

We went to a great open day at Loughborough University. The placements system seemed really good there and the talk really inspired me.

I looked at lots of year out options to buy time – both "Year in Industry" and "Engineers Without Borders" are very interesting. It was the "help the world" – I can contribute. I like maths and art and it was the perfect fit.

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It's OK to have no idea what you want to be in year 7, year 8 or even year 13

Keep your options open. Choose maths and another science and something you enjoy for A level

Most students had no idea in sixth form what they wanted to do. For example, S was going to do Geography, I art and R2 drama. S took a year in industry.

Before university I had no idea what I was going to do. I still don't, but now I know more about my options.

Start working on your CV early. Some work experience and relevant skills will give you a step ahead.

Sometimes, you will feel afraid and dumb. Don't be scared by it, you will slowly learn that you can help society in your own way. You don't have to be top in the class to do that. Discover what you are passionate about. Passion will guide you to where you want to go eventually.

Is it all boys?

It's true – on many engineering and technology courses there are more boys!

University is such a big place- there are other girls on other courses. I met Rosie at a bus stop, I didn't even know she was on my course.

In year 12 and 13 I got a scholarship to go to a private sixth form that had been all boys. So in sixth form I enjoyed being in a minority and didn't want a course that was all "lads, lads, lads", I worried about fitting in. But there are women at University!

Apply to do a year in industry

Try doing a year in industry – you get the chance to work alongside engineers and find out what they really do

I wouldn't have done my course if I hadn't met women engineers at National Rail. I felt like, "this is something I could do and I would fit in."

Even if you get a place at University straightaway the interview practice is invaluable.

Being encouraged to do a placement year by university was the best career advice. It has given me so much experience and improved my confidence greatly. It has also confirmed that yes, I do want to pursue a career within engineering.

Engineering – just opens doors – to real jobs that can literally change the world

I take away the ability to manage time, balance sport, academic study, a social life and other commitments.

Assignments (including blogging about robotics developments) and encouragement from lecturers helped me discover the field of medical robotics where I will specialise.

University has taught me how to think and has given me valuable problem solving skills that I can apply to any job.

I started university knowing I wanted to be an Engineer, now I know I'd like to go into international development.

There are a lot of different options and opportunities once you graduate and not only engineering related.

Staff have expert knowledge and readily help you and give you more ideas for future prospects.

My university careers services "bombard" us with information, of the different companies we can apply to. Weekly updates and events have gradually shaped what I should do for my future.

Can I get a good job? And what about the money?

Current women engineering students who were just about to graduate share how their horizons have expanded

The diversity of my course (giving me architecture and engineering skills) will give me greater flexibility with my future career.

Chemical Engineering is really diverse and full of topics with lots of branches of engineering. I would love to go and work in waste water treatment.

My civil engineering course will enable me to work in a renewable energy consultancy. It's also given me teamwork, autonomy at work, confidence and other skills.

I've learned that one doesn't need to be brilliant at everything. It's important to be competent with a broad range of skills; soft skills in particular are extremely important. Developing a professional attitude, working hard and nurturing good 'all round' ability is more important in the long run.

University has at least given me a direction (design/manufacture) and introduced something I knew nothing about which I now love.

I want to go into a sector involved with improving the environment, maybe involving re-designing of technology e.g. fuel that is more sustainable for cars.

As a chemical engineer I would like to go into the new energy sector, finding cleaner, cheaper and more resourceful energies for the globe.

I feel confident about going into any aspect in the aviation industry.

I see myself becoming a medical consultant and head of my own large company

I intend on going to Sandhurst and to be an Engineering Officer in the Royal Electrical and Mechanical Engineers.

The pharmaceutical industry, working on the process and biochemical engineering side of production is for me.

But what's engineering like?

Choosing a course – some universities teach on a project basis from year 1 while others do a more theoretical start – find out what would suit you best

If you search maths and physics and art – the only thing that comes out of career surveys is architecture, but there's so much more you can do.

*It's everything maths **and** art*

Maths and physics can open so many doors, so girls open your eyes. Females have a different view of the world and are more into detail

It's important to come to university not to do a course that's totally girls

5.7 Conclusion

There is a good deal of literature about the factors that influence young peoples' career choices and how the factors affect girls and boys differently. In particular, in the context of the current work, there is a body of research that discusses how girls' attitudes to STEM subjects and careers vary from boys'. Girls' choices are to a degree influenced by their self-identity and how the image they have of a particular subject and career fits with that identify. The more familiar girls are with STEM subjects, and the kind of careers that they might lead to, the better able they are to make objective choices. Such familiarity might be gained through having a parent who is a professional scientist or engineer, or having contact with an inspiring teacher. Such contacts are likely to be scarcer for girls from more deprived backgrounds or other backgrounds where contact with STEM professionals is less likely.

It is therefore important that better quality information about modern engineering and technology is made available to girls at the age when they are developing their self-image and thinking about future careers, and in a way that allows girls to see engineering and technology as compatible with themselves as individuals. Importantly this information needs imparting in the formative years when girls still engage with science to the same extent as boys, i.e., in school years 5 and 6.

The "Engineering, it's in everything" poster and website, in part informed by the findings of this study, is one attempt to communicate with young women in a context with which they identify. One poster won't change the attitudes and views of young women in school. But repeated associations of words, positive connections and refreshing images updated and disseminated through multiple channels can help engage and then offer the potential to inspire more girls from diverse backgrounds to consider and appreciate engineers and engineering and perhaps come to believe that engineering is a career for them.

The framework suggested in this section highlights key target groups of girls and suggests delivering initiatives in a way that engages with them in an appropriate manner earlier than is currently done – in years 5 to 8 in a connected manner with common messaging.

In addition girls planning for university need further information about subject choice and the variation in degrees available. The work has also identified in Part One that BME students studying engineering and technology degree courses are less likely to have undertaken relevant work prior to their course.

As work in Part One and others have shown socioeconomic background affects the likelihood of attending university and to some extent choice of subjects. An individual's ethnic background has a large effect on subject choice.

6 Appendices

6.1 Appendix A: The occupations and employment type of UK domiciled students completing first degree courses in engineering and technology

Table 55: The occupations of full- and part-time UK domiciled students completing first degree courses in engineering and technology subjects who entered full- or part-time work paid work only by ethnicity and gender from 2007/08 to 2010/11 combined (Source: HESA DLHE Data)

Standard Occupational Classification	Engineering Subjects				Technology Subjects				Computer Sciences Subjects			
	White		BME		White		BME		White		BME	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Managers and Senior Officials	**8.3%**	**8.2%**	**9.1%**	**5.5%**	**11.6%**	**8.9%**	**15.0%**	**7.1%**	**9.4%**	**8.7%**	**10.4%**	**6.7%**
Corporate managers	6.5%	6.1%	6.4%	4.6%	8.2%	7.0%	9.3%	5.9%	7.5%	7.0%	7.0%	4.9%
Managers and proprietors in agriculture and services	1.8%	2.1%	2.6%	0.9%	3.4%	1.9%	5.8%	1.1%	1.9%	1.8%	3.4%	1.9%
Professional Occupations	**61.8%**	**54.9%**	**45.7%**	**45.3%**	**21.0%**	**9.6%**	**19.0%**	**9.3%**	**47.3%**	**36.1%**	**29.8%**	**24.2%**
Business and public service professionals	2.6%	3.2%	2.7%	3.7%	1.0%	1.0%	1.3%	1.1%	3.2%	3.0%	3.1%	3.2%
Health professionals	0.0%	0.1%	0.0%	0.2%	0.0%	0.1%	0.0%	0.7%	0.0%	0.1%	0.0%	0.0%
Science and technology professionals	58.0%	49.6%	41.2%	38.0%	17.4%	7.4%	13.7%	4.8%	40.1%	16.2%	25.1%	15.2%
Teaching and research professionals	1.1%	2.0%	1.7%	3.4%	2.6%	1.1%	4.0%	2.6%	3.9%	16.8%	1.6%	5.9%
Associate Professional and Technical Occupations	**13.9%**	**16.3%**	**17.7%**	**19.0%**	**30.9%**	**43.0%**	**28.8%**	**42.8%**	**22.0%**	**23.3%**	**22.6%**	**20.7%**
Business and public service associate professionals	4.8%	7.7%	8.7%	9.4%	7.5%	21.8%	13.3%	18.6%	6.5%	10.6%	9.2%	11.6%
Culture, media and sports occupations	4.3%	4.6%	3.4%	4.3%	17.4%	18.1%	13.7%	15.6%	4.9%	3.1%	2.8%	1.3%
Health and social welfare associate professionals	0.1%	0.3%	0.2%	0.7%	0.1%	0.2%	0.0%	1.9%	0.1%	0.5%	0.2%	0.5%
Protective service occupations	0.2%	0.6%	0.4%	0.4%	0.4%	0.3%	0.0%	1.5%	0.4%	1.2%	0.3%	0.7%
Science and technology associate professionals	4.6%	3.1%	4.9%	4.3%	5.4%	2.7%	1.8%	5.2%	10.1%	7.9%	10.1%	6.6%
Administrative and Secretarial Occupations	**2.5%**	**4.8%**	**4.5%**	**8.5%**	**5.9%**	**8.9%**	**8.0%**	**11.5%**	**4.6%**	**13.2%**	**7.9%**	**15.7%**
Administrative occupations	2.4%	3.8%	4.2%	7.3%	5.7%	7.7%	7.5%	8.9%	4.5%	11.7%	7.4%	13.5%
Secretarial and related occupations	0.1%	1.0%	0.3%	1.2%	0.3%	1.2%	0.4%	2.6%	0.1%	1.4%	0.5%	2.2%
Skilled Trades Occupations	**2.2%**	**0.6%**	**1.6%**	**0.9%**	**4.0%**	**2.5%**	**2.2%**	**0.4%**	**1.3%**	**0.5%**	**0.9%**	**0.2%**
Skilled agricultural trades	0.2%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Skilled construction and building trades	0.3%	0.0%	0.2%	0.2%	0.4%	0.1%	0.4%	0.0%	0.1%	0.0%	0.1%	0.0%
Skilled metal and electrical trades	1.2%	0.4%	1.3%	0.2%	1.2%	0.0%	0.4%	0.0%	0.7%	0.2%	0.5%	0.2%
Textiles, printing and other skilled trades	0.5%	0.2%	0.2%	0.5%	2.1%	2.4%	1.3%	0.4%	0.5%	0.3%	0.3%	0.0%

Standard Occupational Classification	Engineering Subjects				Technology Subjects				Computer Sciences Subjects			
	White		BME		White		BME		White		BME	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Personal Service Occupations	**0.8%**	**2.1%**	**1.1%**	**2.7%**	**1.8%**	**2.4%**	**1.3%**	**1.9%**	**1.3%**	**5.8%**	**1.7%**	**4.2%**
Caring personal service occupations	0.3%	1.3%	0.6%	2.5%	0.8%	1.3%	0.9%	1.9%	0.7%	5.1%	1.1%	3.5%
Leisure and other personal service occupations	0.5%	0.8%	0.5%	0.2%	1.0%	1.1%	0.4%	0.0%	0.6%	0.6%	0.6%	0.7%
Sales and Customer Service Occupations	**5.3%**	**8.3%**	**13.7%**	**14.6%**	**13.4%**	**18.5%**	**16.4%**	**24.2%**	**9.2%**	**10.9%**	**21.2%**	**25.8%**
Customer service occupations	1.0%	1.4%	3.3%	2.3%	2.6%	2.2%	3.1%	4.5%	1.9%	2.0%	5.1%	5.9%
Sales occupations	4.3%	6.9%	10.4%	12.3%	10.9%	16.3%	13.3%	19.7%	7.2%	8.9%	16.1%	19.9%
Process, Plant and Machine Operatives	**1.0%**	**0.2%**	**1.2%**	**0.5%**	**1.3%**	**0.4%**	**1.8%**	**0.7%**	**0.5%**	**0.1%**	**0.9%**	**0.3%**
Process, plant and machine operatives	0.6%	0.2%	0.6%	0.5%	0.7%	0.3%	0.9%	0.7%	0.3%	0.1%	0.2%	0.3%
Transport and mobile machine drivers and operatives	0.4%	0.0%	0.6%	0.0%	0.6%	0.1%	0.9%	0.0%	0.2%	0.0%	0.7%	0.0%
Elementary Occupations	**4.2%**	**4.4%**	**5.4%**	**3.0%**	**10.0%**	**5.9%**	**7.5%**	**2.2%**	**4.5%**	**1.5%**	**4.6%**	**2.2%**
Elementary administration and service occupations	3.3%	4.3%	4.8%	3.0%	7.9%	5.7%	6.2%	2.2%	3.7%	1.4%	3.6%	2.0%
Elementary trades, plant and storage related occupations	1.0%	0.1%	0.6%	0.0%	2.1%	0.2%	1.3%	0.0%	0.7%	0.1%	1.0%	0.2%
Total*	**19545**	**2480**	**2870**	**565**	**2790**	**1610**	**225**	**270**	**3975**	**1245**	**1505**	**595**

* Counts of students are rounded to the nearest 5.

Table 56: The occupations of full- and part-time UK domiciled students completing first degree courses in engineering subjects who entered full- or part-time paid work only by ethnicity and gender from 2007/08 to 2010/11 combined (Source: HESA DLHE Data)

Standard Occupational Classification	Engineering Subjects									
	White		Asian		Black		Chinese		Other	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Managers and Senior Officials	8.3%	8.2%	9.5%	5.6%	8.8%	6.5%	7.3%	4.3%	8.9%	4.7%
Corporate managers	6.5%	6.1%	6.6%	4.4%	5.9%	5.0%	4.3%	4.3%	7.3%	4.7%
Managers and proprietors in agriculture and services	1.8%	2.1%	2.9%	1.2%	2.9%	1.4%	3.0%	0.0%	1.6%	0.0%
Professional Occupations	**61.8%**	**54.9%**	**44.8%**	**46.6%**	**38.6%**	**39.6%**	**55.6%**	**49.3%**	**51.2%**	**47.2%**
Business and public service professionals	2.6%	3.2%	2.9%	4.8%	1.7%	2.2%	3.4%	0.0%	3.1%	5.7%
Health professionals	0.0%	0.1%	0.1%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%
Science and technology professionals	58.0%	49.6%	40.2%	38.2%	34.4%	33.1%	51.7%	46.4%	46.3%	38.7%
Teaching and research professionals	1.1%	2.0%	1.6%	3.6%	2.5%	3.6%	0.4%	2.9%	1.7%	2.8%
Associate Professional and Technical Occupations	**13.9%**	**16.3%**	**17.6%**	**18.5%**	**17.5%**	**18.0%**	**21.4%**	**24.6%**	**16.8%**	**17.9%**
Business and public service associate professionals	4.8%	7.7%	10.3%	10.0%	5.6%	9.4%	13.7%	14.5%	5.8%	4.7%
Culture, media and sports occupations	4.3%	4.6%	2.6%	1.6%	4.0%	5.0%	2.1%	4.3%	5.6%	9.4%
Health and social welfare associate professionals	0.1%	0.3%	0.1%	1.2%	0.7%	0.7%	0.0%	0.0%	0.3%	0.0%
Protective service occupations	0.2%	0.6%	0.2%	0.4%	1.0%	0.0%	0.4%	1.4%	0.2%	0.0%
Science and technology associate professionals	4.6%	3.1%	4.4%	5.2%	6.2%	2.9%	5.1%	4.3%	4.9%	3.8%
Administrative and Secretarial Occupations	**2.5%**	**4.8%**	**4.6%**	**7.6%**	**6.1%**	**8.6%**	**3.0%**	**10.1%**	**3.5%**	**9.4%**
Administrative occupations	2.4%	3.8%	4.2%	6.8%	5.9%	6.5%	3.0%	7.2%	3.0%	9.4%
Secretarial and related occupations	0.1%	1.0%	0.3%	0.8%	0.2%	2.2%	0.0%	2.9%	0.5%	0.0%
Skilled Trades Occupations	**2.2%**	**0.6%**	**1.3%**	**0.8%**	**2.0%**	**2.2%**	**1.3%**	**0.0%**	**2.1%**	**0.0%**
Skilled agricultural trades	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Skilled construction and building trades	0.3%	0.0%	0.3%	0.0%	0.2%	0.7%	0.0%	0.0%	0.0%	0.0%
Skilled metal and electrical trades	1.2%	0.4%	0.9%	0.0%	1.9%	0.7%	0.9%	0.0%	1.7%	0.0%
Textiles, printing and other skilled trades	0.5%	0.2%	0.1%	0.8%	0.0%	0.7%	0.4%	0.0%	0.3%	0.0%
Personal Service Occupations	**0.8%**	**2.1%**	**0.9%**	**2.0%**	**1.3%**	**5.0%**	**0.9%**	**0.0%**	**1.4%**	**2.8%**
Caring personal service occupations	0.3%	1.3%	0.5%	1.6%	0.8%	5.0%	0.0%	0.0%	0.9%	2.8%
Leisure and other personal service occupations	0.5%	0.8%	0.4%	0.4%	0.5%	0.0%	0.9%	0.0%	0.5%	0.0%
Sales and Customer Service Occupations	**5.3%**	**8.3%**	**16.6%**	**17.7%**	**14.8%**	**15.1%**	**5.6%**	**10.1%**	**8.6%**	**9.4%**
Customer service occupations	1.0%	1.4%	4.3%	2.4%	3.4%	2.9%	0.4%	2.9%	1.7%	0.9%
Sales occupations	4.3%	6.9%	12.3%	15.3%	11.5%	12.2%	5.1%	7.2%	6.8%	8.5%

Process, Plant and Machine Operatives	**1.0%**	**0.2%**	**1.2%**	**0.8%**	**1.9%**	**0.0%**	**0.4%**	**0.0%**	**0.9%**	**0.9%**
Process, plant and machine operatives	0.6%	0.2%	0.7%	0.8%	0.7%	0.0%	0.4%	0.0%	0.3%	0.9%
Transport and mobile machine drivers and operatives	0.4%	0.0%	0.5%	0.0%	1.2%	0.0%	0.0%	0.0%	0.5%	0.0%
Elementary Occupations	**4.2%**	**4.4%**	**3.7%**	**0.4%**	**8.9%**	**5.0%**	**4.7%**	**1.4%**	**6.6%**	**7.5%**
Elementary administration and service occupations	3.3%	4.3%	3.0%	0.4%	8.3%	5.0%	4.3%	1.4%	6.3%	7.5%
Elementary trades, plant and storage related occupations	1.0%	0.1%	0.7%	0.0%	0.7%	0.0%	0.4%	0.0%	0.3%	0.0%
Total*	**19550**	**2480**	**1470**	**250**	**595**	**140**	**265**	**75**	**570**	**105**

* Counts of students are rounded to the nearest 5.

Table 57: The occupations of full- and part-time UK domiciled students completing first degree courses in computer science subjects who entered full- or part-paid work only by ethnicity and gender from 2007/08 to 2010/11 combined (Source: HESA DLHE Data)

Standard Occupational Classification	Computer Science Subjects									
	White		Asian		Black		Chinese		Other	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Managers and Senior Officials	**9.4%**	**8.7%**	**11.0%**	**6.3%**	**7.7%**	**6.5%**	**13.2%**	**16.7%**	**11.4%**	**5.8%**
Corporate managers	7.5%	7.0%	7.8%	4.4%	4.6%	4.3%	7.9%	12.5%	6.9%	5.8%
Managers and proprietors in agriculture and services	1.9%	1.8%	3.1%	1.9%	3.1%	2.2%	5.3%	4.2%	4.6%	0.0%
Professional Occupations	**47.3%**	**36.1%**	**26.9%**	**22.9%**	**30.7%**	**27.5%**	**28.9%**	**16.7%**	**44.0%**	**27.5%**
Business and public service professionals	3.2%	3.0%	2.7%	2.2%	4.3%	5.1%	5.3%	8.3%	2.3%	2.9%
Health professionals	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Science and technology professionals	40.1%	16.2%	22.6%	14.9%	24.5%	16.7%	23.7%	8.3%	40.0%	15.9%
Teaching and research professionals	3.9%	16.8%	1.6%	5.8%	1.8%	5.8%	0.0%	0.0%	1.7%	8.7%
Associate Professional and Technical Occupations	**22.0%**	**23.3%**	**23.2%**	**21.5%**	**22.4%**	**19.6%**	**19.7%**	**20.8%**	**21.1%**	**18.8%**
Business and public service associate professionals	6.5%	10.6%	9.5%	12.4%	8.3%	10.1%	11.8%	12.5%	8.6%	10.1%
Culture, media and sports occupations	4.9%	3.1%	2.6%	1.1%	2.8%	0.7%	1.3%	0.0%	4.6%	4.3%
Health and social welfare associate professionals	0.1%	0.5%	0.1%	0.8%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%
Protective service occupations	0.4%	1.2%	0.3%	0.6%	0.3%	1.4%	0.0%	0.0%	0.6%	0.0%
Science and technology associate professionals	10.1%	7.9%	10.8%	6.6%	11.0%	7.2%	6.6%	8.3%	6.3%	4.3%
Administrative and Secretarial Occupations	**4.6%**	**13.2%**	**8.2%**	**14.6%**	**8.0%**	**18.8%**	**3.9%**	**16.7%**	**8.0%**	**14.5%**
Administrative occupations	4.5%	11.7%	7.7%	12.4%	7.4%	16.7%	2.6%	16.7%	8.0%	11.6%
Secretarial and related occupations	0.1%	1.4%	0.4%	2.2%	0.6%	2.2%	1.3%	0.0%	0.0%	2.9%
Skilled Trades Occupations	**1.3%**	**0.5%**	**0.8%**	**0.0%**	**0.9%**	**0.7%**	**1.3%**	**0.0%**	**1.1%**	**0.0%**
Skilled agricultural trades	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Skilled construction and building trades	0.1%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Skilled metal and electrical trades	0.7%	0.2%	0.4%	0.0%	0.3%	0.7%	0.0%	0.0%	1.1%	0.0%
Textiles, printing and other skilled trades	0.5%	0.3%	0.3%	0.0%	0.3%	0.0%	1.3%	0.0%	0.0%	0.0%
Personal Service Occupations	**1.3%**	**5.8%**	**1.1%**	**2.8%**	**3.7%**	**8.0%**	**0.0%**	**4.2%**	**1.7%**	**4.3%**
Caring personal service occupations	0.7%	5.1%	0.6%	1.9%	2.5%	7.2%	0.0%	4.2%	1.1%	4.3%
Leisure and other personal service occupations	0.6%	0.6%	0.4%	0.8%	1.2%	0.7%	0.0%	0.0%	0.6%	0.0%

Sales and Customer Service Occupations	**9.2%**	**10.9%**	**24.0%**	**29.8%**	**20.2%**	**15.9%**	**18.4%**	**25.0%**	**9.1%**	**24.6%**
Customer service occupations	1.9%	2.0%	6.0%	7.7%	4.6%	4.3%	5.3%	0.0%	1.1%	1.4%
Sales occupations	7.2%	8.9%	18.0%	22.0%	15.6%	11.6%	13.2%	25.0%	8.0%	23.2%
Process, Plant and Machine Operatives	**0.5%**	**0.1%**	**0.9%**	**0.6%**	**1.5%**	**0.0%**	**1.3%**	**0.0%**	**0.0%**	**0.0%**
Process, plant and machine operatives	0.3%	0.1%	0.1%	0.6%	0.3%	0.0%	1.3%	0.0%	0.0%	0.0%
Transport and mobile machine drivers and operatives	0.2%	0.0%	0.8%	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Elementary Occupations	**4.5%**	**1.5%**	**4.1%**	**1.7%**	**4.9%**	**2.9%**	**13.2%**	**0.0%**	**3.4%**	**4.3%**
Elementary administration and service occupations	3.7%	1.4%	2.8%	1.4%	4.3%	2.9%	11.8%	0.0%	3.4%	4.3%
Elementary trades, plant and storage related occupations	0.7%	0.1%	1.3%	0.3%	0.6%	0.0%	1.3%	0.0%	0.0%	0.0%
Total*	**3975**	**1245**	**930**	**365**	**325**	**140**	**75**	**25**	**175**	**70**

* Counts of students are rounded to the nearest 5.

Table 58: The occupations of full- and part-time UK domiciled ethnically White students completing first degree courses in engineering subjects who entered full- or part-time paid work only by the occupation of graduates' parents and gender from 2007/08 to 2010/11 combined (Source: HESA DLHE Data)

Standard Occupational Classification	Engineering Subjects															
	Higher managerial and professional occupations		Lower managerial and professional occupations		Intermediate occupations		Small employers and own account workers		Lower supervisory and technical occupations		Semi-routine occupations		Routine occupations		Never worked and long-term unemployed/ Unclassified/ Unknown	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Managers and Senior Officials	**7.0%**	**5.8%**	**8.5%**	**9.7%**	**8.4%**	**10.6%**	**8.0%**	**7.7%**	**4.6%**	**5.8%**	**6.8%**	**6.2%**	**5.3%**	**4%**	**10.7%**	**10.0%**
Corporate managers	5.2%	4.3%	6.7%	7.2%	6.9%	6.7%	4.7%	7.7%	3.2%	4.2%	5.0%	3.8%	4.1%	4.2%	8.9%	8.0%
Managers and proprietors in agriculture and services	1.8%	1.5%	1.8%	2.6%	1.5%	3.9%	3.4%	0.0%	1.4%	1.7%	1.7%	2.4%	1.2%	0.0%	1.8%	2.0%
Professional Occupations	**65.0%**	**61.5%**	**60.7%**	**54.9%**	**59.9%**	**50.4%**	**58.8%**	**58.7%**	**67.3%**	**60.0%**	**62.0%**	**53.6%**	**57.7%**	**38.0%**	**60.6%**	**50.9%**
Business and public service professionals	3.6%	4.3%	2.6%	4.1%	3.1%	1.6%	2.3%	3.8%	2.5%	3.3%	1.5%	2.8%	2.0%	1.4%	2.2%	2.2%
Health professionals	0.0%	0.0%	0.1%	0.2%	0.0%	0.4%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Science and technology professionals	60.0%	53.8%	56.9%	49.1%	55.9%	46.9%	56.1%	54.8%	63.8%	55.0%	59.2%	50.2%	54.2%	36.6%	57.3%	46.4%
Teaching and research professionals	1.4%	3.4%	1.2%	1.5%	1.0%	1.6%	0.4%	0.0%	1.0%	1.7%	1.3%	0.5%	1.6%	0.0%	1.1%	2.4%
Associate Professional and Technical Occupations	**13.7%**	**14.9%**	**14.2%**	**16.6%**	**12.5%**	**14.6%**	**13.3%**	**18.3%**	**10.6%**	**16.7%**	**13.2%**	**11.4%**	**14.0%**	**23.9%**	**15.2%**	**18.8%**
Business and public service associate professionals	6.1%	7.4%	5.3%	8.2%	4.1%	5.9%	5.1%	6.7%	2.7%	8.3%	4.2%	3.8%	4.4%	9.9%	4.3%	9.7%
Culture, media and sports occupations	4.0%	4.3%	5.1%	5.5%	4.3%	3.9%	4.4%	6.7%	3.3%	5.0%	3.7%	6.6%	4.1%	4.2%	4.1%	3.3%
Health and social welfare associate professionals	0.1%	0.2%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	4.2%	0.2%	0.4%
Protective service occupations	0.2%	0.3%	0.1%	0.7%	0.2%	1.2%	0.1%	1.0%	0.1%	0.8%	0.3%	0.0%	0.4%	1.4%	0.2%	0.4%
Science and technology associate professionals	3.3%	2.7%	3.6%	1.9%	3.7%	3.5%	3.8%	3.8%	4.6%	2.5%	5.0%	0.9%	5.2%	4.2%	6.5%	5.1%
Administrative and Secretarial Occupations	**2.7%**	**3.9%**	**2.4%**	**4.4%**	**3.6%**	**7.5%**	**2.4%**	**1.9%**	**2.6%**	**3.3%**	**2.4%**	**5.2%**	**3.2%**	**7.0%**	**2.1%**	**5.5%**
Administrative occupations	2.5%	2.2%	2.2%	3.8%	3.5%	6.3%	2.2%	1.9%	2.6%	3.3%	2.3%	5.2%	3.2%	1.4%	2.0%	4.7%
Secretarial and related occupations	0.1%	1.7%	0.2%	0.7%	0.1%	1.2%	0.2%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	5.6%	0.1%	0.7%

Skilled Trades Occupations	**1.3%**	**0.7%**	**1.7%**	**0.3%**	**2.3%**	**0.4%**	**4.3%**	**0.0%**	**2.8%**	**0.0%**	**1.7%**	**0.0%**	**2.7%**	**0.0%**	**2.7%**	**1.6%**
Skilled agricultural trades	0.1%	0.2%	0.2%	0.0%	0.4%	0.0%	1.5%	0.0%	0.0%	0.0%	0.1%	0.0%	0.2%	0.0%	0.1%	0.0%
Skilled construction and building trades	0.2%	0.0%	0.2%	0.0%	0.2%	0.0%	1.7%	0.0%	0.2%	0.0%	0.0%	0.0%	0.2%	0.0%	0.4%	0.0%
Skilled metal and electrical trades	0.6%	0.5%	1.0%	0.0%	1.0%	0.0%	0.7%	0.0%	1.8%	0.0%	0.9%	0.0%	1.1%	0.0%	1.8%	1.3%
Textiles, printing and other skilled trades	0.3%	0.0%	0.3%	0.3%	0.7%	0.4%	0.3%	0.0%	0.7%	0.0%	0.7%	0.0%	1.2%	0.0%	0.4%	0.4%
Personal Service Occupations	**0.8%**	**2.7%**	**1.2%**	**2.1%**	**0.8%**	**2.8%**	**1.2%**	**0.0%**	**1.0%**	**0.0%**	**0.7%**	**1.4%**	**1.1%**	**5.6%**	**0.4%**	**2.0%**
Caring personal service occupations	0.3%	1.4%	0.5%	1.4%	0.3%	2.0%	0.7%	0.0%	0.3%	0.0%	0.3%	0.9%	0.4%	4.2%	0.1%	1.3%
Leisure and other personal service occupations	0.5%	1.4%	0.7%	0.7%	0.5%	0.8%	0.5%	0.0%	0.7%	0.0%	0.3%	0.5%	0.7%	1.4%	0.3%	0.7%
Sales and Customer Service Occupations	**4.2%**	**6.0%**	**5.5%**	**8.5%**	**6.7%**	**6.7%**	**5.5%**	**10.6%**	**6.6%**	**10.0%**	**7.9%**	**15.6%**	**7.8%**	**15.5%**	**4.1%**	**6.6%**
Customer service occupations	0.8%	1.2%	1.0%	1.7%	1.2%	0.8%	0.5%	1.0%	1.1%	1.7%	1.1%	2.4%	1.4%	0.0%	1.0%	1.3%
Sales occupations	3.3%	4.8%	4.5%	6.8%	5.5%	5.9%	5.0%	9.6%	5.4%	8.3%	6.8%	13.3%	6.4%	15.5%	3.1%	5.3%
Process, Plant and Machine Operatives	**0.8%**	**0.0%**	**0.9%**	**0.0%**	**1.3%**	**0.4%**	**0.9%**	**0.0%**	**0.7%**	**0.8%**	**0.5%**	**0.0%**	**2.5%**	**0.0%**	**1.2%**	**0.7%**
Process, plant and machine operatives	0.5%	0.0%	0.4%	0.0%	0.6%	0.4%	0.4%	0.0%	0.5%	0.0%	0.3%	0.0%	1.1%	0.0%	0.8%	0.7%
Transport and mobile machine drivers and operatives	0.3%	0.0%	0.4%	0.0%	0.7%	0.0%	0.5%	0.0%	0.2%	0.8%	0.2%	0.0%	1.4%	0.0%	0.5%	0.0%
Elementary Occupations	**4.5%**	**4.4%**	**4.8%**	**3.4%**	**4.6%**	**6.7%**	**5.5%**	**2.9%**	**3.8%**	**3.3%**	**4.7%**	**6.6%**	**5.7%**	**5.6%**	**3.0%**	**3.8%**
Elementary administration and service occupations	3.7%	4.4%	3.8%	3.2%	3.9%	6.3%	2.8%	2.9%	2.9%	3.3%	4.1%	6.6%	3.9%	5.6%	2.3%	3.8%
Elementary trades, plant and storage related occupations	0.8%	0.0%	1.1%	0.2%	0.7%	0.4%	2.6%	0.0%	0.9%	0.0%	0.6%	0.0%	1.8%	0.00%	0.8%	0.0%
Total*	**4025**	**585**	**4025**	**585**	**1955**	**255**	**985**	**105**	**975**	**120**	**1490**	**210**	**565**	**70**	**5525**	**550**

* Counts of students are rounded to the nearest 5.

Table 59: The occupations of full- and part-time UK domiciled ethnically White students completing first degree courses in technology subjects who entered full or part-time paid work only by the occupation of graduates' parents and gender from 2007/08 to 2010/11 combined (Source: HESA DLHE Data)

Standard Occupational Classification	Technology Subjects															
	Higher managerial and professional occupations		Lower managerial and professional occupations		Intermediate occupations		Small employers and own account workers		Lower supervisory and technical occupations		Semi-routine occupations		Routine occupations		Never worked and long-term unemployed/ Unclassified/ Unknown	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Managers and Senior Officials	**11.2%**	**10.4%**	**11.6%**	**7.6%**	**5.6%**	**11.8%**	**12.3%**	**11.7%**	**6.1%**	**9.7%**	**6.7%**	**7.6%**	**22.9%**	**8%**	**14.5%**	**7.7%**
Corporate managers	7.4%	8.7%	7.8%	6.5%	4.1%	7.7%	9.0%	10.8%	4.6%	6.5%	4.5%	5.1%	14.7%	4.5%	10.9%	6.1%
Managers and proprietors in agriculture and services	3.8%	1.7%	3.8%	1.2%	1.5%	4.1%	3.3%	0.9%	1.5%	3.2%	2.2%	2.5%	8.3%	3.0%	3.6%	1.5%
Professional Occupations	**23.0%**	**8.0%**	**19.7%**	**11.1%**	**21.3%**	**12.4%**	**19.7%**	**8.1%**	**23.7%**	**12.9%**	**20.5%**	**8.2%**	**17.4%**	**7.6%**	**21.1%**	**8.6%**
Business and public service professionals	1.6%	0.0%	0.6%	0.7%	0.4%	1.2%	0.0%	1.8%	0.8%	1.6%	1.8%	1.9%	0.9%	0.0%	1.0%	1.5%
Health professionals	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Science and technology professionals	19.0%	7.3%	17.2%	8.8%	16.9%	10.7%	18.0%	5.4%	21.4%	8.1%	16.1%	5.1%	13.8%	6.1%	17.0%	6.1%
Teaching and research professionals	2.4%	0.7%	1.9%	1.6%	4.1%	0.6%	1.6%	0.9%	1.5%	3.2%	2.7%	1.3%	2.8%	1.5%	3.1%	0.6%
Associate Professional and Technical Occupations	**30.8%**	**44.8%**	**34.1%**	**41.9%**	**28.8%**	**43.8%**	**33.6%**	**47.7%**	**26.7%**	**35.5%**	**27.7%**	**42.4%**	**24.8%**	**36.4%**	**31.1%**	**43.9%**
Business and public service associate professionals	7.6%	25.3%	8.6%	24.5%	6.7%	21.9%	9.0%	21.6%	5.3%	14.5%	5.8%	19.6%	10.1%	22.7%	7.1%	17.2%
Culture, media and sports occupations	17.0%	16.7%	19.4%	14.4%	16.5%	20.1%	20.5%	23.4%	15.3%	16.1%	18.3%	20.3%	11.9%	9.1%	16.8%	22.4%
Health and social welfare associate professionals	0.2%	0.0%	0.3%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%
Protective service occupations	0.2%	0.0%	0.6%	0.7%	0.0%	0.0%	0.8%	0.9%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.6%	0.3%
Science and technology associate professionals	5.8%	2.8%	5.2%	2.3%	5.2%	1.8%	3.3%	1.8%	6.1%	4.8%	3.6%	2.5%	1.8%	4.5%	6.6%	3.1%
Administrative and Secretarial Occupations	**4.4%**	**10.1%**	**4.7%**	**9.7%**	**9.7%**	**8.3%**	**5.7%**	**5.4%**	**6.9%**	**12.9%**	**5.4%**	**8.9%**	**6.4%**	**3.0%**	**6.6%**	**8.6%**
Administrative occupations	4.4%	9.4%	4.5%	8.6%	9.0%	7.7%	5.7%	3.6%	5.3%	11.3%	4.9%	6.3%	5.5%	3.0%	6.6%	7.4%
Secretarial and related occupations	0.0%	0.7%	0.2%	1.2%	0.7%	0.6%	0.0%	1.8%	1.5%	1.6%	0.4%	2.5%	0.9%	0.0%	0.0%	1.2%

Skilled Trades Occupations	**3.6%**	**1.4%**	**3.4%**	**3.0%**	**3.0%**	**1.8%**	**4.1%**	**0.0%**	**5.3%**	**3.2%**	**4.9%**	**3.2%**	**1.8%**	**3.0%**	**4.9%**	**3.4%**
Skilled agricultural trades	0.2%	0.0%	0.3%	0.2%	0.4%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%
Skilled construction and building trades	0.4%	0.0%	0.3%	0.0%	0.4%	0.6%	0.8%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%
Skilled metal and electrical trades	1.2%	0.0%	1.3%	0.0%	0.7%	0.0%	0.8%	0.0%	0.0%	0.0%	1.8%	0.0%	0.9%	0.0%	1.5%	0.0%
Textiles, printing and other skilled trades	1.8%	1.4%	1.6%	2.8%	1.5%	1.2%	1.6%	0.0%	3.8%	3.2%	3.1%	3.2%	0.9%	3.0%	2.5%	3.4%
Personal Service Occupations	**2.2%**	**1.0%**	**2.3%**	**2.3%**	**0.7%**	**3.0%**	**2.5%**	**2.7%**	**2.3%**	**3.2%**	**2.2%**	**1.9%**	**0.9%**	**3.0%**	**1.4%**	**3.1%**
Caring personal service occupations	0.8%	0.7%	0.8%	0.7%	0.0%	2.4%	2.5%	1.8%	0.8%	3.2%	1.3%	1.9%	0.0%	1.5%	0.8%	1.2%
Leisure and other personal service occupations	1.4%	0.3%	1.6%	1.6%	0.7%	0.6%	0.0%	0.9%	1.5%	0.0%	0.9%	0.0%	0.9%	1.5%	0.6%	1.8%
Sales and Customer Service Occupations	**13.2%**	**17.0%**	**12.5%**	**19.2%**	**18.0%**	**14.2%**	**13.1%**	**18.0%**	**15.3%**	**19.4%**	**19.2%**	**21.5%**	**12.8%**	**24.2%**	**11.0%**	**18.4%**
Customer service occupations	2.6%	2.4%	2.3%	2.5%	3.7%	1.2%	0.0%	3.6%	3.8%	3.2%	3.1%	2.5%	3.7%	0.0%	2.3%	1.8%
Sales occupations	10.6%	14.6%	10.2%	16.7%	14.2%	13.0%	13.1%	14.4%	11.5%	16.1%	16.1%	19.0%	9.2%	24.2%	8.8%	16.6%
Process, Plant and Machine Operatives	**2.2%**	**0.0%**	**1.1%**	**0.0%**	**0.4%**	**0.6%**	**1.6%**	**0.9%**	**0.8%**	**0.0%**	**1.3%**	**0.6%**	**0.9%**	**1.5%**	**1.1%**	**0.6%**
Process, plant and machine operatives	1.0%	0.0%	0.8%	0.0%	0.4%	0.6%	1.6%	0.9%	0.0%	0.0%	0.4%	0.6%	0.0%	1.5%	0.6%	0.3%
Transport and mobile machine drivers and operatives	1.2%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.9%	0.0%	0.9%	0.0%	0.5%	0.3%
Elementary Occupations	**9.4%**	**7.3%**	**10.5%**	**5.1%**	**12.4%**	**4.1%**	**7.4%**	**5.4%**	**13.0%**	**3.2%**	**12.1%**	**5.7%**	**11.9%**	**13.6%**	**8.3%**	**5.8%**
Elementary administration and service occupations	7.8%	7.3%	8.9%	4.6%	10.1%	4.1%	5.7%	5.4%	9.9%	3.2%	8.5%	5.7%	9.2%	13.6%	6.0%	5.5%
Elementary trades, plant and storage related occupations	1.6%	0.0%	1.6%	0.5%	2.2%	0.0%	1.6%	0.0%	3.1%	0.0%	3.6%	0.0%	2.8%	0.00%	2.3%	0.3%
Grand Total	**500**	**290**	**640**	**430**	**270**	**170**	**120**	**110**	**130**	**60**	**225**	**160**	**110**	**65**	**800**	**325**

* Counts of students are rounded to the nearest 5.

Table 60: The occupations of full- and part-time UK domiciled ethnically White students completing first degree courses in computer science subjects who entered full- or part-time paid work only by the occupation of graduates' parents and gender from 2007/08 to 2010/11 combined (Source: HESA DLHE Data)

Standard Occupational Classification	Computer Science Subjects															
	Higher managerial and professional occupations		Lower managerial and professional occupations		Intermediate occupations		Small employers and own account workers		Lower supervisory and technical occupations		Semi-routine occupations		Routine occupations		Never worked and long-term unemployed/ Unclassified/ Unknown	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Managers and Senior Officials	**8.7%**	**8.5%**	**9.7%**	**9.8%**	**8.5%**	**4.6%**	**8.3%**	**8.5%**	**7.0%**	**15.7%**	**9.0%**	**5.3%**	**3.6%**	**7%**	**11.7%**	**9.8%**
Corporate managers	6.7%	7.8%	7.8%	7.4%	6.9%	3.8%	6.7%	6.8%	6.5%	11.8%	7.4%	4.4%	2.6%	5.5%	9.4%	7.7%
Managers and proprietors in agriculture and services	2.1%	0.7%	1.9%	2.3%	1.6%	0.8%	1.7%	1.7%	0.5%	3.9%	1.6%	0.9%	1.0%	1.8%	2.3%	2.1%
Professional Occupations	**57.4%**	**39.9%**	**47.6%**	**35.5%**	**48.0%**	**43.5%**	**44.4%**	**32.2%**	**42.7%**	**41.2%**	**44.3%**	**38.1%**	**43.8%**	**38.2%**	**43.0%**	**31.9%**
Business and public service professionals	4.4%	3.9%	3.2%	3.5%	4.5%	2.3%	2.2%	0.0%	2.7%	3.9%	2.5%	1.8%	2.1%	3.6%	2.6%	3.3%
Health professionals	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Science and technology professionals	49.1%	20.3%	41.0%	14.8%	38.8%	21.4%	37.2%	16.9%	37.8%	13.7%	39.9%	15.9%	35.4%	16.4%	36.0%	14.2%
Teaching and research professionals	3.8%	15.7%	3.5%	17.2%	4.7%	19.8%	5.0%	15.3%	2.2%	23.5%	1.9%	20.4%	6.3%	18.2%	4.4%	14.2%
Associate Professional and Technical Occupations	**20.0%**	**23.5%**	**21.5%**	**26.6%**	**23.0%**	**19.8%**	**25.6%**	**32.2%**	**23.2%**	**13.7%**	**21.0%**	**23.0%**	**22.4%**	**16.4%**	**22.8%**	**23.1%**
Business and public service associate professionals	7.4%	13.7%	7.4%	13.3%	5.6%	9.2%	9.4%	16.9%	8.6%	3.9%	5.5%	12.4%	5.7%	7.3%	5.3%	8.2%
Culture, media and sports occupations	4.6%	3.9%	5.0%	3.5%	6.3%	3.8%	6.7%	5.1%	4.9%	0.0%	3.8%	4.4%	2.1%	1.8%	5.0%	2.3%
Health and social welfare associate professionals	0.0%	0.0%	0.0%	0.0%	0.2%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	1.2%
Protective service occupations	0.1%	0.7%	0.7%	1.2%	0.2%	0.8%	0.0%	0.0%	0.5%	2.0%	0.5%	0.9%	0.5%	0.0%	0.3%	1.9%
Science and technology associate professionals	7.8%	5.2%	8.4%	8.6%	10.7%	5.3%	9.4%	10.2%	9.2%	7.8%	11.2%	5.3%	14.1%	7.3%	11.8%	9.6%
Administrative and Secretarial Occupations	**3.4%**	**12.4%**	**3.8%**	**14.8%**	**5.4%**	**15.3%**	**4.4%**	**6.8%**	**8.6%**	**7.8%**	**5.7%**	**13.3%**	**8.3%**	**10.9%**	**3.8%**	**13.5%**
Administrative occupations	3.4%	9.8%	3.8%	13.3%	5.1%	13.7%	3.9%	6.8%	8.6%	7.8%	5.2%	13.3%	8.3%	7.3%	3.8%	12.1%
Secretarial and related occupations	0.0%	2.6%	0.0%	1.6%	0.2%	1.5%	0.6%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	3.6%	0.1%	1.4%

Skilled Trades Occupations	**0.6%**	**0.0%**	**1.1%**	**0.8%**	**1.1%**	**0.8%**	**1.7%**	**0.0%**	**3.2%**	**0.0%**	**1.1%**	**0.0%**	**1.0%**	**0.0%**	**1.7%**	**0.7%**
Skilled agricultural trades	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%
Skilled construction and building trades	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Skilled metal and electrical trades	0.0%	0.0%	0.7%	0.0%	0.4%	0.0%	1.1%	0.0%	1.6%	0.0%	0.5%	0.0%	0.0%	0.0%	1.3%	0.5%
Textiles, printing and other skilled trades	0.4%	0.0%	0.3%	0.8%	0.7%	0.8%	0.6%	0.0%	1.1%	0.0%	0.3%	0.0%	1.0%	0.0%	0.3%	0.2%
Personal Service Occupations	**0.7%**	**3.3%**	**1.6%**	**3.1%**	**0.7%**	**3.8%**	**1.7%**	**1.7%**	**1.6%**	**0.0%**	**0.8%**	**2.7%**	**0.5%**	**1.8%**	**2.0%**	**11.4%**
Caring personal service occupations	0.1%	2.6%	0.7%	2.0%	0.7%	3.1%	0.6%	1.7%	0.5%	0.0%	0.0%	2.7%	0.0%	1.8%	1.6%	10.7%
Leisure and other personal service occupations	0.6%	0.7%	0.9%	1.2%	0.0%	0.8%	1.1%	0.0%	1.1%	0.0%	0.8%	0.0%	0.5%	0.0%	0.4%	0.7%
Sales and Customer Service Occupations	**6.1%**	**9.8%**	**9.3%**	**7.8%**	**8.0%**	**11.5%**	**8.9%**	**15.3%**	**8.6%**	**19.6%**	**12.0%**	**16.8%**	**12.0%**	**23.6%**	**10.2%**	**8.2%**
Customer service occupations	1.0%	1.3%	2.3%	2.3%	2.0%	3.1%	1.1%	3.4%	1.6%	2.0%	3.0%	3.5%	2.6%	0.0%	1.9%	1.4%
Sales occupations	5.0%	8.5%	7.1%	5.5%	6.0%	8.4%	7.8%	11.9%	7.0%	17.6%	9.0%	13.3%	9.4%	23.6%	8.3%	6.8%
Process, Plant and Machine Operatives	**0.1%**	**0.7%**	**0.3%**	**0.0%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.1%**	**0.0%**	**0.8%**	**0.0%**
Process, plant and machine operatives	0.1%	0.7%	0.1%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.4%	0.0%
Transport and mobile machine drivers and operatives	0.0%	0.0%	0.2%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	0.4%	0.0%
Elementary Occupations	**3.0%**	**2.0%**	**5.0%**	**1.6%**	**4.7%**	**0.8%**	**5.0%**	**3.4%**	**4.9%**	**2.0%**	**6.0%**	**0.9%**	**6.3%**	**1.8%**	**3.8%**	**1.4%**
Elementary administration and service occupations	2.5%	1.3%	4.2%	1.6%	3.6%	0.8%	3.3%	3.4%	4.9%	2.0%	5.2%	0.9%	5.2%	1.8%	3.3%	1.4%
Elementary trades, plant and storage related occupations	0.4%	0.7%	0.8%	0.0%	1.1%	0.0%	1.7%	0.0%	0.0%	0.0%	0.8%	0.0%	1.0%	0.00%	0.6%	0.0%
Total*	**675**	**155**	**890**	**255**	**450**	**130**	**180**	**60**	**185**	**50**	**365**	**115**	**190**	**55**	**1040**	**430**

* Counts of students are rounded to the nearest 5.

6.2 Appendix B: List of Tables

6.3 Appendix C: List of Figures