Jobs for the boys?

Research report of **Set to Lead**

Career intentions and destinations of engineering and technology undergraduates in UK higher education institutions

funded by HE STEM

Set to Lead is an HE STEM funded project developed by an association of UCL with Katalytik and Oxford Policy and Research

This report was written by Sean McWhinnie of Oxford Research and Policy in association with Jan Peters of Katalytik for the HE STEM Set to Lead project.

Set to Lead was funded by the HE STEM project and delivered by a collaboration between UCL and Katalytik. The study director was Jan Peters of Katalytik.

Set to Lead is an innovative project connecting industry and universities to co-create new resources for academics delivering project based leadership and team building courses in engineering and technology.

The project set out to investigate and address the differences in the transition between men and women from engineering and technology degrees into relevant employment. The project outputs were shaped by interactive discussions with employers, academics and students. Resources focused on embedding inclusive messages within them and on improving the levels of personal insights of both male and female students.

The aim was to raise awareness in universities of the growing need in industry for less transactional and more of a transformational style of management and leadership, the latter style being associated more often with women, and the use of strengths and values based tools.

The project included:

- Pilot open days for women students at Arup and Microsoft.
- Video material of inspiring leaders capturing leadership insights and role models talking about their careers and leadership.
- Dialogue with academics and employers to discuss employability, leadership insights and skills and training tools in order to produce an up to date resource on models and materials in use.
- Development of scenarios to stimulate thinking about decision making and responsibility.
- Research on career choices of engineering and technology undergraduates.
- Production of a good practice guide on making assessment centres inclusive

The 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 critical involvement in many significant UK and international reports and projects related to women and science and engineering since 1999.

www.katalytik.co.uk

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Contents

Contents 3

Foreword 5

Executive summary 6

Acknowledgements 13

1. Introduction 14

2. Engineering and technology first degree graduates 16

2.1 The Data 16

2.2 Definition of an engineering student 17

2.3 The classification of occupations 18

2.4 Students completing first degree courses in engineering and technology in UK HEIs 19

2.5 Destinations of first degree engineering and technology graduates 28

3. Survey of engineering and technology graduates 36

3.1 Methodology 36

3.2 The sample demographics and results 38

3.3 Motivations for undertaking course 41

3.4 Work/industrial placements 44

3.5 Respondents' views of the skills they possess 50

3.6 Career intentions of respondents 53

3.6.1 The effect of respondents' courses on career intentions 53

3.6.2 Respondents' plans for the future 55

3.7 Factors important in careers 61

3.8 Awareness of career opportunities 64

3.9 Respondents' opinions 67

4. Conclusions and discussion 70

4.1 Engineering and technology first degree graduates 70

4.1.1 Attainment differences 70

4.1.2 Ethnic composition 70

4.1.3 Socioeconomic status 70

4.1.4 Employment differences 71

4.1.5 Technology versus engineering graduates 71

4.1.6 Employment type 72

4.2 Survey of engineering and technology graduates 72

4.2.1 Reasons for course choice 72
4.2.2 Influence of work experience 73
4.2.3 Undergraduate course experiences 73
4.2.4 Employment intent and career awareness 74
4.2.5 Course experiences and influences 76
4.3 Comparison of survey respondents' career intentions with DLHE data 76
5. Recommendations 81
6. Appendices 83
6.1 Appendix A: The occupations and employment type of UK domiciled students completing first degree courses in engineering and technology 83
6.2 Appendix B: Subjects studied by respondents to the survey of engineering and technology graduates 85
6.3 Appendix C: Most popular potential employers of respondents 88
6.4 Appendix D: Survey of engineering and technology undergraduates 91
6.5 Appendix E: List of Tables 106
6.6 Appendix F: List of Figures 111

Foreword

I am very pleased to have the opportunity to introduce this report presenting the findings of research carried out as part of the HE STEM funded 'SET to Lead' project.

This study builds on previous excellent work investigating the career paths of engineering graduates, by CRAC and BIS, with an in depth analysis of the HESA destinations of leavers from higher education data and data from an on-line survey of 4,500 engineering and technology undergraduates on their career intentions.

It is well known that smaller proportions of women than men register for undergraduate degree programmes in engineering and technology subjects. Although, to a large extent, this difference arises because only around 20% of those taking A-level physics are women, in undergraduate programmes in mechanical and electrical engineering the proportion of women is still only around 12%. The evidence shows moreover that female graduates from engineering and technology degree programmes are less likely than men to enter engineering and technology-related roles once they have graduated. This research confirms findings that in part this may be due to women having lower "career confidence" than men. Indeed, it is clear that, on average, female survey respondents had lower confidence in their technical abilities than men. Encouragingly though, those women who had positive experiences during work placements or internships appeared to be more confident than other women. Presumably real-world workplace experiences prove to women that they are as good as men!

It is important that all students benefit fully from their higher education experience and that we set them on the road to a successful career. We have a strong commitment to developing a large and diverse engineering and technology 'talent pool' that can support the 'innovation economy'.

Recommendations and the design of resources for Set to Lead were supported by conversations with academics and employers. The content of the materials focuses on personal development and self-awareness. It is based on insights and experience from engineers in technical leadership roles. The materials were designed to be used by academics to support existing course materials and can be accessed from the UCL Engineering and Katalytik websites.

The broad picture that the findings present is not new, but we have cast an interesting light onto what undergraduate students expect and their experiences on their course. Higher Education Institutions intent on ensuring that women benefit from their studies and experiences to the same extent as men would do well to heed the messages. Policy makers, employers and professional bodies and trade organisations too, should take note.

Professor Anthony Finkelstein
Dean of Engineering
UCL

Executive summary

This report presents the results of research conducted as part of the SET to Lead project by Oxford Research and Policy and Katalytik Ltd, funded by the National HE STEM programme into the career intentions of engineering and technology undergraduate students in the UK in December 2011 and January 2012. The project also encompassed secondary analysis of Higher Education Statistics Agency (HESA) Destinations of Leavers from Higher Education (DLHE) data.

The research confirms previous work that women are less likely than men to be working in engineering and technology roles six months after graduating from undergraduate engineering and technology courses even though women in the final year of undergraduate engineering courses are as likely as men to express the intention to work in engineering and technology roles. The reasons for these differences appear to be related to the relatively lower confidence of women in their technical abilities and in the career options open to them. The data also suggest that undertaking good quality industrial placements and receiving good careers advice does increase women's confidence and hence, it must be assumed, their likelihood of applying successfully for engineering and technical roles.

Analysis of HESA data

HESA data from 2008/09 and 2009/10 were examined. There is considerable variation in the number of graduates from subject groups and individual engineering and technology subjects who are female ranging from 9% in mechanical engineering to 88% in polymers and textiles in 2009/10. At subject group level, 15% of engineering subject graduates, 24% of computer science subject graduates and 36% of technology subject graduates were female in 2009/10.

In engineering subjects 64% of male and 56% of female students completing first degree courses in engineering and technology subjects are domiciled in the UK. Computer sciences subjects and technologies subjects have higher proportions of UK domiciled students. 81% of male and 83% of female students in computer sciences subjects are UK domiciled, in comparison to 84% of male and 81% of female students in technologies sciences subjects. The proportion of UK domiciled students does vary from subject to subject, more so for females than males. A slightly higher proportion of men than women graduated from enhanced first degree courses in engineering and technology subjects: in 2009/10, 22% of males and 20% of females graduated from enhanced first degree courses.

At the subject group level, women are more likely than men to gain first and upper second class degrees. In engineering 65% of women and 58% of men, in computer sciences 55% of women and 52% of men, and in technology 69% of women and 58% of men gained first class or upper second class degrees. There is some variation in the patterns of degree classes attained by undergraduates in individual subjects but in all cases except "other technologies" a higher proportion of women than men gained first class or upper second class degrees. Those who graduate with enhanced first degrees are more likely to do so with first class or upper second class degrees than those graduating with bachelor degrees.

Across all engineering and technology subjects 81% of male and 82% of female graduates are White. In the engineering subject group 79% male and 73% of female graduates are White, in computer sciences subject group 65% of male and 58% of female graduates are White, and in the technology subject group 90% of male and 82% of female graduates are White.

There are no clear patterns in the socio economic class make up, as indicated by the occupation of graduates' parents, of the student populations graduating in different subjects or of the male and female student populations within a specific subject.

The main activities of full and part time UK domiciled students completing bachelor degree courses in engineering, technology and computer sciences subjects, and enhanced first degree courses in engineering subjects in 2008/09 and 2009/10 were examined for the six month period following graduation.

In engineering, enhanced first degree graduates are more likely than bachelor degree graduates to be in full time work and less likely to be undertaking further study. This suggests that those with enhanced first degrees either find it easier to find jobs and/or are more confident to enter the job market than those graduating with bachelor degrees.

Among graduates from bachelor degree courses in engineering subjects 62% of men and 54% of women were undertaking some sort of work while 25% of men and 36% of women were undertaking some form of further study either as their only reported activity or while working. 16% of men and 11% of women were assumed to be unemployed. Among graduates from enhanced first degree courses 70% of men and 71% of women were undertaking some sort of work, 19% of men and 23% of women were undertaking some form of further education and 10% of men and 8% of women were assumed to be unemployed.

Among bachelor degree course technology subjects 65% of men and 74% of women were undertaking some sort of work, 15% of men and 14% of women were undertaking some form of further study and 16% of men and 9% of women were assumed to be unemployed. Among computer sciences subjects bachelor course graduates 64% of men and 65% of women were undertaking some sort of work, 17% of men and 19% of women were undertaking some form of further study and 18% of men and 15% of women were assumed to be unemployed.

Among those graduates who were working in full or part time work men were more likely than women to be in engineering and technology occupations. For example in engineering subjects 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 where both male and female graduates were more likely to be in engineering and technology occupations than bachelor degree course graduates: 78% of men and 71% of women.

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. In engineering subjects and technology subjects women are more likely than men to enter non-graduate level jobs. 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.

Survey of engineering and technology undergraduates

A questionnaire was developed for students undertaking engineering and technology undergraduate courses in UK higher education institutes (HEIs). The questionnaire was designed to collect information on the characteristics and personal circumstances of the respondents, information on why they chose the course they did, whether or not they had any work experience related to engineering and technology and their experience of undertaking that work, and their plans for the future.

The questionnaire was administered on line using SurveyMonkey. A pilot was run with engineering postgraduate researchers at Cambridge University.

The link was emailed to 53 HEI contacts on 8 November 2011. A reminder was sent on 9 December 2011 and a final reminder was sent on 6 January 2012. The survey closed on 15 January 2012. Cardiff University contacted the project team after the survey had closed and a separate survey link was published for Cardiff

students which closed on 14 February 2012. The survey was also publicised through engineering and technology learned societies and a number of student engineering societies.

It is not known how many HEI contacts and learned societies did distribute the link or, in the case of HEI contacts, the reminders.

A total of 6073 individuals began the survey. Once the data had been cleaned a total of 4624 responses remained for analysis.

Overall 23.9% of those who indicated their gender were female which is a significantly higher proportion than that in the majority of engineering and technology subjects. The largest proportion of both males and females, about a third, were in the first year of their course, and about a quarter of respondents are 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.

Respondents were asked to indicate the one or two main reasons why they decided to undertake their course. The most popular reason selected by respondents was, "Out of interest and enthusiasm for engineering". However, women are less likely to have selected this reason than men. Women are also less likely than men to have selected, "I have an aptitude for engineering", and more likely to have selected, "I "wandered" into this course after my A-levels (or equivalent)". Women were also more likely than men to have been inspired to undertake their course by a family member/family friend and/or teacher. The data also suggested that women undertaking engineering and technology courses are less enthusiastic than men about engineering and technology and have less confidence in their ability, and that as the year of study increases women retrospectively are less likely to say they undertook their courses "Out of interest and enthusiasm for engineering". Only 3.4% of respondents regretted undertaking their courses

58% of respondents have an optional work placement, but only 12% have a compulsory work placement as part of their course. At the time of completing the survey 53% of men and 59% of women in the final year of their course had undertaken at least one workplace or an internship. It is notable that 74% of respondents had a formal induction and two thirds had a mentor. Only 32% of respondents agreed that they had received adequate supervision. This may reflect that the students are used to more directive situations at school and during their courses.

69% of men and 67% stated that their placement made them more intent on pursuing a career in engineering/technology. The more positive respondents' experiences of their placement the more likely they are to be more intent on pursuing a career in engineering/technology. Overall it is clear that providing students with good experiences during their work placements positively affects students' attitudes towards careers in engineering and technology.

87% of respondents in their first year of study believe they possess the majority of general skills employers often look for. This proportion rises to 91% in the third year and 92% in the fourth year.

The proportions of respondents that believe they possess the technical skills employers look for increases as the length of time spent studying increases. However, in every year of study a higher proportion of males than females believe they possess the technical skills that employers often look for. Among those in the final year of their course who had undertaken a work placement and/or an internship 77% of men and 63% of women believed they had the technical skills that employers often look for. However among those who had not undertaken a work placement and/or an internship 59% of men and 45% of women believed they had the technical skills that employers often look for. Since male and female respondents undertake the same courses these data suggest that women have less confidence in their technical abilities than men.

Overall between 60 and 70% of both men and women state that their experiences as an engineering/technology student had made them more intent on pursuing a career in engineering or technology. Those who had undertaken a work placement were more positive about their experiences than those who had not.

6.9% of respondents had already accepted a job offer at the time they completed the survey. Of those, 83% had chosen a course or job that required an engineering or technology qualification.

The 4303 respondents who had not yet accepted a job offer were asked what they intended to do once they had completed their courses. Overall 67% of respondents stated that they intended to seek, or take up, paid work. 71% of respondents registered for enhanced first degrees and 63% of those registered for bachelor degrees stated that they intended to seek paid work. In contrast 12% of respondents registered for enhanced first degrees and 19% of those registered for bachelor degrees stated that they planned to undertake further study. 77% of respondents intend to seek employment as an engineer/technologist or undertake further study in engineering/technology. The commitment to working as an engineer/technologist or undertake further study in engineering/technology fell as the year of study increased: 74% of males and 69% of females in their final year compared to 79% of males and 75% of females in other years of study.

Undertaking an industrial placement is a significant factor in reinforcing respondents' intentions to seek employment as an engineer/technologist or undertake further study in engineering/technology. Undertaking an industrial placement appears to affect women's intentions toward seeking employment as an engineer/technologist more than men's.

Respondents who had not accepted a job offer and who indicated that they intended to seek employment as an engineer/technologist or undertake further study in engineering/technology were asked to indicate what they were most likely to do on completion of their courses after having taken any time off. In general the intention to undertake further study falls as the year of study increases. Those registered for bachelor degree courses are significantly more likely to intend to undertake further study, in particular masters courses, than those registered for enhanced first degrees. 22.6% of respondents registered for bachelor degrees courses intend to undertake a masters course, compared to 5.7% of those registered for enhanced first degree courses. Women are less likely than men to express an intention to work as an engineer or technologist in industry or commerce, and in general women are more likely than men to express an intention to work as an engineer or technologist in the public sector.

Respondents were asked how important it was for them to a have a career which involved a number of different factors. The rankings of importance for men and women are very similar. Both men and women rank "A workplace culture where all staff are treated well" as the most important factor.

The two factors for which the rankings of men and women differ the most are "A strong health and safe culture" and "A strong equality and diversity culture" both ranked higher by women than men.

The data also suggested that students' ideas of the factors which are important to them change little during the course of their studies, and that the small differences between the rankings expressed by men and women are maintained throughout the course of students' studies.

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. In their final year 96% of respondents who had received support rated their awareness of career options as adequate or better, compared to 82% of respondents who had not received support. Of those in other years of study, 91% of respondents who had received support rated their awareness as adequate or better, compared to 79% of respondents who had

not received support. There were significant differences between the responses of men and women who had not received careers support with women reporting that they were less aware of career options than men.

Respondents were asked how strongly they agreed or disagreed with a number of statements. 82% of female respondents strongly agreed or agreed that they had been treated as equals, and 6% disagreed or strongly disagreed.

There were some differences between the responses of men and women. Men did not agree as strongly as women that, "Women students get as much out of the course as men," or that "Women students integrate as well as men into the course." These responses suggest men feel more strongly than women that women do not integrate as well as men into engineering and technology courses and therefore lose out.

Interestingly, 69% of men and 60% of women neither agreed nor disagreed that there should be more female lecturers.

Men were more confident than women that they would make a good engineer or technologist. 50% of men and 47% of women agreed and 37% of men and 28% of women strongly agreed with the statement, "I feel confident that I will make a good engineer/technologist." Again this is an example where overall women appear less confident than men in respect of their ability to undertake a career as an engineer or a technologist.

Comparison of DLHE and survey data

Although not possible to compare directly all the main activities identified in the DLHE data with the survey the data do allow some interesting comparisons:

- 74% of male and 72% of final year female respondents thought that they were likely to be working in engineering and technology roles when completing their studies while the DLHE data shows that 50% of male and 39% of female graduates in 2008/09 and 2009/10 were working in engineering and technology roles six months after completing their courses
- While only 10% of male and 8% of female respondents expected to be working in non-engineering and technology roles, DLHE data shows that 23% of male and 27% of female graduates are in such roles

The most notable issue arising from the comparisons is that while similar proportions of male and female final year respondents expect to be working in engineering roles after completing their courses (about three quarters), in reality a significantly smaller proportion of female than male graduates are working in engineering roles six months after completing their courses.

This may be linked to the gender-related issues identified from the survey which suggested that women had less confidence in their technical abilities and in their knowledge of the job market than men. Although the evidence is sketchy, and more work is needed, the company survey data collected as part of the SET to Lead project provides some circumstantial evidence that women who do apply for roles are as likely as men who apply for similar roles to be offered and accept roles. The conclusion from the survey is that women are less confident in their technical abilities than men, and consequently the suspicion must be that women are less likely than men to apply for engineering and technology roles during their course or shortly afterwards.

The recommendations flowing from the study findings are presented alongside the stakeholder(s) considered to be the most appropriate to take them forward.

The relatively lower confidence of women than men in their technical abilities and in the career opportunities open to them is of paramount importance. While the anecdotal evidence from employers is that women perform as well as men during the interview and assessment process, the data show that women are less likely than men to end up on a technical career path. Improving the career confidence of women to support their technical competence is a key priority and the following recommendation will help realise this:

1. Undertaking work placements and internships are shown in the study to correlate with increased confidence and likelihood of realising a STEM job. These placements must be of a high quality and offer a positive experience. A "code of practice" for employers to sign up to should be developed setting out the key elements of positive work placements. In addition a related checklist setting out the key elements of positive work placements could support students in researching suitable work placements.

   ► *HEIs, Engineering and technology employers, Engineering and technology trade bodies, Student groups*

2. Good quality careers advice provided through careers services is vital and in addition opportunities for careers support should be brought closer to engineering and technology students. Women-only or women-targeted careers sessions should be held in engineering and technology departments, and the possibility of incorporating careers modules into courses in order to build the career confidence of women in particular should be considered seriously.

   ► *HEIs*

3. Where work placements are a voluntary element of a course HEIs should encourage students to undertaken these, stressing the positive impact that undertaking workplacements has on employability.

   ► *HEIs*

4. Internship programmes enable students to gain experience of working in technical roles and opportunities for these should be increased. Given that good quality internships are likely to have a positive effect on students' attitudes towards careers in engineering and technology roles, some funding should be provided through central government for these programmes. Internships provided should be paid, but perhaps government funding could be used to top up students' salaries so that employers can employ a larger number of interns.

   ► *HEIs, Engineering and technology employers, BIS*

5. Staff in HEI engineering and technology departments should be made aware that women are likely to have lower "career confidence" than men in that they are likely to be less confident in their technical abilities and in the career opportunities open to them and that this translates into women being less likely than men to end up in technical jobs.

   ► *HEIs, Engineering and technology departments, Professional bodies*

6. Engineering and technology employers and learned societies should find opportunities to engage with female engineering and technology undergraduates. For example, employers should consider holding women's career days/open days, the purpose of which should be to tackle head-on women's relative lack of confidence.

   ► *Engineering and technology employers, Engineering and technology learned societies*

7. The visibility of women in senior technical roles needs to be increased so the women undergraduates see that women do have successful careers as engineers and technologists.

   ► *Engineering and technology employers, HEIs*

8. To gain greater insight into the undergraduate experience, a diary study, as in recent work by Seron, would deepen the appreciation of the career paths of male and female engineering undergraduates.

   ► *BIS, Royal Academy of Engineering*

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Sean McWhinnie
June 2012

1. Introduction

Female retention 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]

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. In addition, the report presents the results of a survey of engineering and technology undergraduates.

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.[3] 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.[4] 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.[5] 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.

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.[6] 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.

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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.

3 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).

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

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

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

The survey tool was also adapted for molecular bioscience PhD students and the results of that survey were published in 2009.[7]

[7] 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)

2. Engineering and technology first degree graduates

This section presents an overview of the students completing engineering and technology first degrees, in UK Higher Education Institutes (HEIs). This section also presents a summary of the destinations of graduates from first degree programmes in engineering and technology.

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 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 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 (eg 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.

2.2 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 an 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

* Counts of students are rounded to the nearest 5.

2.3 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.[8]

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.[9]

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

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

2.4 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.

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

Subject Group/Subject	2008/09	2009/10
Engineering Total	16875	17975
Aeronautical Engineering	1340	1425
Chemical Engineering	970	1175
Civil Engineering	3225	3575
Electrical Engineering	95	110
Electronic Engineering	4455	4650
General Engineering	1465	1410
Mechanical Engineering	4155	4350
Production Engineering	1100	1190
Other Engineering	65	85
Broadly-based programmes within engineering & technology	10	0
Computer Sciences Total	4215	4175
Artificial intelligence	100	110
Computing Science	3050	3015
Software engineering	1025	1020
Others in computer sciences	40	25
Technologies Total	2625	2805
Biotechnology	120	130
Ceramics and Glasses	20	15
Maritime Technology	155	195
Metallurgy	35	30
Minerals Technology	45	60
Polymers and Textiles	615	630
Other Technologies	1260	1375
Others Materials Technology	375	365
Grand Total	23715	24955

* 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 2008/09 and 2009/10 are presented in Table 2. The number of graduates in the engineering, computer sciences and technology subject groups all increased between 2008/09 and 2009/10 and the combined numbers in all three subject groups increased by 5.2% between 2008/09 and 2009/10.

Table 3 shows the breakdown by domiciled male and female students completing first degree engineering and technology subjects in the academic years 2008/09 and 2009/10 combined. In engineering subjects 64% of male and 56% of female students are domiciled in the UK. The proportion of UK domiciled students does vary from subject to subject, more so for females than males. In the majority of subjects under consideration, a higher proportion of male than female students completing first degree courses are UK

domiciled. Among males the subjects with the lowest proportion of UK domiciled students are electronic engineering and production engineering both with 60% and the subject with the highest proportion of UK domiciled students is aeronautical engineering with 70%. Among females similar subject patterns are found but there is greater variation. The subject with the lowest proportion of UK domiciled female students is electronic engineering with 44% and the subject with the highest proportion of UK domiciled students is aeronautical engineering with 71%.

Computer sciences subjects and technologies subjects have higher proportions of UK domiciled students. 81% of male and 83% of female students in computer sciences subjects are UK domiciled, and 84% of male and 81% of female students in technologies sciences subjects are UK domiciled.

Table 3: All full time students completing first degree courses in engineering and technology subjects by domicile and gender in 2008/09 and 2009/10 combined(Source: HESA Student Data)*

Subject Group/Subject	Male				Female				Total
	UK	EU	Overseas	Total	UK	EU	Overseas	Total	
Engineering Total	64.4%	9.1%	26.5%	29820	55.9%	11.0%	33.1%	5030	34850
Aeronautical Engineering	69.8%	9.0%	21.2%	2475	71.1%	9.1%	19.9%	285	2765
Chemical Engineering	63.2%	2.4%	34.5%	1550	47.7%	3.5%	48.7%	595	2145
Civil Engineering	67.8%	13.6%	18.6%	5690	61.4%	14.1%	24.5%	1110	6800
Electronic Engineering	60.0%	6.0%	34.1%	7875	44.4%	5.0%	50.5%	1230	9105
General Engineering	68.6%	13.6%	17.7%	2335	69.1%	11.6%	19.2%	540	2875
Mechanical Engineering	65.0%	6.7%	28.3%	7810	62.2%	6.2%	31.6%	695	8505
Production Engineering	60.2%	16.6%	23.2%	1775	51.8%	33.4%	14.8%	515	2290
Computer Sciences Total	81.2%	5.2%	13.6%	6440	82.7%	3.4%	13.9%	1945	8390
Computing Science	79.8%	5.1%	15.1%	4375	83.5%	3.3%	13.2%	1695	6070
Software Engineering	84.8%	4.7%	10.5%	1835	77.3%	3.8%	19.0%	210	2045
Technologies Total	83.9%	6.0%	10.1%	3455	81.3%	6.1%	12.6%	1980	5430
Polymers and Textiles	64.3%	3.2%	32.5%	155	89.5%	2.8%	7.7%	1095	1245
Other Technologies	91.5%	5.2%	3.3%	2300	84.8%	8.3%	6.8%	335	2635
Others Materials Technology	76.8%	3.0%	20.2%	435	70.3%	7.5%	22.2%	305	740
Overall Total	68.8%	8.2%	23.0%	39715	67.3%	8.3%	24.4%	8955	48670

* Subjects with fewer than 100 graduates have been excluded. Counts of students are rounded to the nearest 5.

A breakdown of male and female graduates between enhanced first degree and bachelor degree full time courses is shown in Table 4. The data show that a slightly higher proportion of men than women graduate from enhanced first degree courses: in 2009/10, 22% of males and 20% of females graduated from enhanced first degree courses.

Table 4: All full time students completing enhanced first degree and bachelor degree courses in engineering and technology subjects by gender in 2008/09 and 2009/10 (Source: HESA Student Data)*

First Degree	2008/09			2009/10		
	Male	Female	Total	Male	Female	Total
Enhanced First Degree	22.2%	19.7%	21.8%	21.8%	19.7%	21.4%
Bachelor Degree	77.8%	80.3%	78.2%	78.2%	80.3%	78.6%
Total	19420	4290	23715	20295	4660	24955

* Counts of students are rounded to the nearest 5.

Table 5 shows the gender split of graduates from subject groups and individual engineering and technology subjects. There is considerable variation in the proportion of graduates who are female ranging from 9% in mechanical engineering to 88% in polymers and textiles in 2009/10. At subject group level 15% of engineering subject graduates, 24% of computer science subject graduates and 36% of technology subject graduates were female in 2009/10. Even within a subject group there is considerable variation in the proportion of graduates who are females. 23% of chemical engineering graduates were female compared to 16% of civil engineering graduates, 14% of electronic engineering graduates, and 9% of mechanical engineering graduates in 2009/10.

Table 5: All full time students completing first degree courses in engineering and technology subjects by gender 2008/09 and 2009/10 (Source: HESA Student Data)*

Subject Group/Subject	2008/09			2009/10		
	Male	Female	Total	Male	Female	Total
Engineering Total	**86.0%**	**14.0%**	**16875**	**85.1%**	**14.9%**	**17975**
Aeronautical Engineering	89.7%	10.3%	1340	89.5%	10.5%	1425
Chemical Engineering	71.3%	28.7%	970	73.0%	27.0%	1175
Civil Engineering	83.6%	16.4%	3225	83.7%	16.3%	3575
Electronic Engineering	86.7%	13.3%	4455	86.3%	13.7%	4650
General Engineering	82.7%	17.3%	1465	79.6%	20.4%	1410
Mechanical Engineering	92.4%	7.6%	4155	91.2%	8.8%	4350
Production Engineering	78.7%	21.3%	1100	76.4%	23.6%	1190
Computer Sciences Total	**77.3%**	**22.7%**	**4215**	**76.3%**	**23.7%**	**4175**
Computing Science	72.8%	27.2%	3050	71.4%	28.6%	3015
Software engineering	89.6%	10.4%	1025	89.8%	10.2%	1020
Technologies Total	**62.8%**	**37.2%**	**2625**	**64.3%**	**35.7%**	**2805**
Polymers and Textiles	12.5%	87.5%	615	12.2%	87.8%	630
Other Technologies	86.1%	13.9%	1260	88.3%	11.7%	1375
Others Materials Technology	60.4%	39.6%	375	56.9%	43.1%	365
Total	**81.9%**	**18.1%**	**23715**	**81.3%**	**18.7%**	**24955**

* Subjects with fewer than 100 graduates have been excluded. Counts of students are rounded to the nearest 5.

Table 6 presents data on the gender split of graduates from engineering and technology subjects broken down by domicile and Figure 1 below shows the proportions of male students by domicile for engineering and technology subjects. While noting the variation in the proportions of male and female students by subject, it is interesting to note that there are similar patterns in the proportions of male and female students in the populations of UK, EU and overseas-domiciled students completing first degrees in the UK.

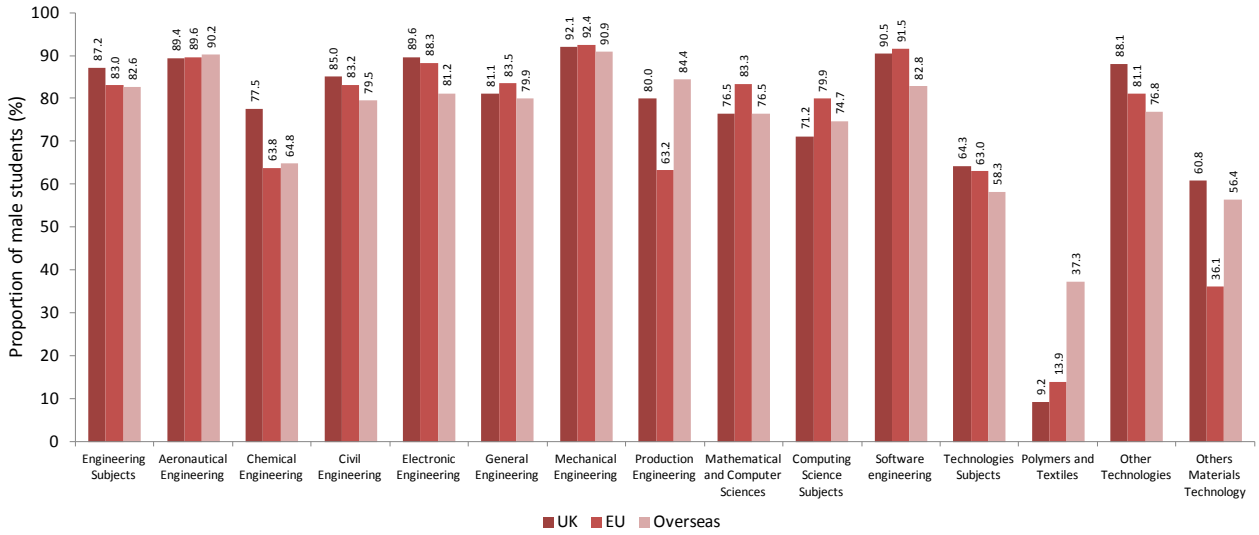

Figure 1: Proportions of male full time students completing first degree courses in engineering and technology subjects by domicile in 2008/09 and 2009/10 combined (Source: HESA Student Data)

Table 6: All full time students completing first degree courses in engineering and technology subjects by gender and domicile in 2008/09 and 2009/10 combined(Source: HESA Student Data)*

Subject Group/Subject	UK			EU			Overseas			Overall Total
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Engineering Total	**87.2%**	**12.8%**	**22005**	**83.0%**	**17.0%**	**3270**	**82.6%**	**17.4%**	**9575**	**34850**
Aeronautical Engineering	89.4%	10.6%	1930	89.6%	10.4%	250	90.2%	9.8%	580	2765
Chemical Engineering	77.5%	22.5%	1265	63.8%	36.2%	60	64.8%	35.2%	825	2145
Civil Engineering	85.0%	15.0%	4540	83.2%	16.8%	930	79.5%	20.5%	1330	6800
Electronic Engineering	89.6%	10.4%	5270	88.3%	11.7%	530	81.2%	18.8%	3305	9105
General Engineering	81.1%	18.9%	1975	83.5%	16.5%	380	79.9%	20.1%	520	2875
Mechanical Engineering	92.1%	7.9%	5510	92.4%	7.6%	565	90.9%	9.1%	2430	8505
Production Engineering	80.0%	20.0%	1335	63.2%	36.8%	465	84.4%	15.6%	485	2290
Computer Sciences Total	**76.5%**	**23.5%**	**6840**	**83.3%**	**16.8%**	**400**	**76.5%**	**23.5%**	**1150**	**8390**
Computing Science	71.2%	28.8%	4905	79.9%	20.1%	280	74.7%	25.3%	885	6070
Software Engineering	90.5%	9.5%	1720	91.5%	8.5%	95	82.8%	17.2%	235	2045
Technologies Total	**64.3%**	**35.7%**	**4505**	**63.0%**	**37.0%**	**325**	**58.3%**	**41.7%**	**600**	**5430**
Polymers and Textiles	9.2%	90.8%	1075	13.9%	86.1%	35	37.3%	62.7%	135	1245
Other Technologies	88.1%	11.9%	2390	81.1%	18.9%	150	76.8%	23.2%	100	2635
Others Materials Technology	60.8%	39.2%	550	36.1%	63.9%	35	56.4%	43.6%	155	740
Overall Total	**81.9%**	**18.1%**	**33350**	**81.4%**	**18.6%**	**3995**	**80.7%**	**19.3%**	**11325**	**48670**

* Subjects with fewer than 100 graduates have been excluded. Counts of students are rounded to the nearest 5.

Data on the degree classification of all full time students completing first degree courses in engineering and technology subjects in 2008/09 and 2009/10 broken down by gender are shown in Table 7. At the subject group level women are more likely than men to gain first and upper second class degrees. In engineering 65% of women and 58% of men, in computer sciences 55% of women and 52% of men, and in technology 69% of women and 58% of men gained first class or upper second class degrees. Higher proportions of females gain first and upper second class degrees in all other subject groups except medicine and dentistry,

where the majority of degrees are not classified and social studies, where 63% of males and 62% of females gained first or upper second class degrees in 2008/09 and 2009/10 combined. In general there are no clear patterns in respect of the relative attainment of males and females and, say, the proportion of female undergraduates in a particular subject group.

Table 7: Degree classification of all full time students completing first degree courses in engineering and technology subjects by gender 2008/09 and 2009/10 combined (Source: HESA Student Data)*

Subject Group/Subject	Gender	Degree Classification					Total
		1st class	Upper 2nd class	Lower 2nd class	3rd class / Pass	Unclassified	
Engineering Total	**Male**	**19.9%**	**38.2%**	**26.0%**	**8.9%**	**7.0%**	**29820**
	Female	**22.8%**	**41.8%**	**23.2%**	**5.5%**	**6.6%**	**5030**
Aeronautical Engineering	Male	21.8%	39.7%	24.8%	6.0%	7.6%	2475
	Female	22.6%	40.8%	26.8%	4.9%	4.9%	285
Chemical Engineering	Male	23.3%	40.1%	26.3%	7.5%	2.8%	1550
	Female	27.7%	46.1%	18.5%	5.7%	2.0%	595
Civil Engineering	Male	17.4%	41.6%	28.4%	8.2%	4.4%	5690
	Female	22.6%	44.0%	22.9%	5.1%	5.4%	1110
Electronic Engineering	Male	21.0%	34.1%	28.0%	11.9%	4.9%	7875
	Female	25.1%	38.3%	27.3%	6.7%	2.7%	1230
General Engineering	Male	14.7%	31.0%	20.0%	10.0%	24.3%	2335
	Female	17.2%	32.2%	15.0%	4.8%	30.9%	540
Mechanical Engineering	Male	22.1%	39.3%	23.7%	7.5%	7.4%	7810
	Female	26.1%	40.5%	24.3%	5.5%	3.6%	695
Production Engineering	Male	14.1%	46.0%	29.1%	7.4%	3.4%	1775
	Female	13.2%	54.2%	24.9%	5.0%	2.7%	515
Computer Sciences Total	**Male**	**16.5%**	**35.0%**	**30.8%**	**12.5%**	**5.2%**	**6440**
	Female	**15.8%**	**39.4%**	**32.1%**	**8.1%**	**4.6%**	**1945**
Computing Science	Male	13.8%	34.8%	33.0%	12.8%	5.6%	4375
	Female	14.7%	39.2%	33.1%	8.3%	4.7%	1695
Software Engineering	Male	21.3%	35.8%	26.3%	12.2%	4.4%	1835
	Female	22.7%	40.8%	26.1%	6.6%	3.8%	210
Technologies Total	**Male**	15.7%	42.0%	31.1%	8.2%	3.0%	3455
	Female	25.2%	43.5%	25.3%	5.1%	1.0%	1980
Polymers and Textiles	Male	19.5%	26.6%	37.0%	16.9%	0.0%	155
	Female	31.1%	42.8%	22.2%	3.8%	0.0%	1095
Other Technologies	Male	12.1%	43.7%	32.1%	8.1%	4.0%	2300
	Female	12.5%	42.6%	33.9%	7.7%	3.3%	335
Others Materials Technology	Male	19.3%	40.2%	32.4%	7.6%	0.5%	435
	Female	18.3%	44.8%	30.1%	6.9%	0.0%	305
Overall Total	**Male**	**22.9%**	**42.7%**	**23.3%**	**5.9%**	**5.1%**	**13845**
	Female	**25.6%**	**46.6%**	**20.1%**	**3.4%**	**4.2%**	**3075**

* Subjects with fewer than 100 graduates have been excluded. Counts of students are rounded to the nearest 5.

Considering the data for individual subjects presented in Table 7, there is some variation in the patterns of degree classes attained by undergraduates but in all cases, except other technologies, a higher proportion of women than men gained first class or upper second class degrees. There are a number of possible explanations for the higher attainment of females. In many subjects female entrants to degree courses on average have higher tariffs[10] than male entrants. For example, the tariffs of male and female accepted applicants to engineering subject group courses in 2007[11] are shown in Figure 2. The figure illustrates the higher tariff scores of female accepted applicants compared to those of male accepted applicants.

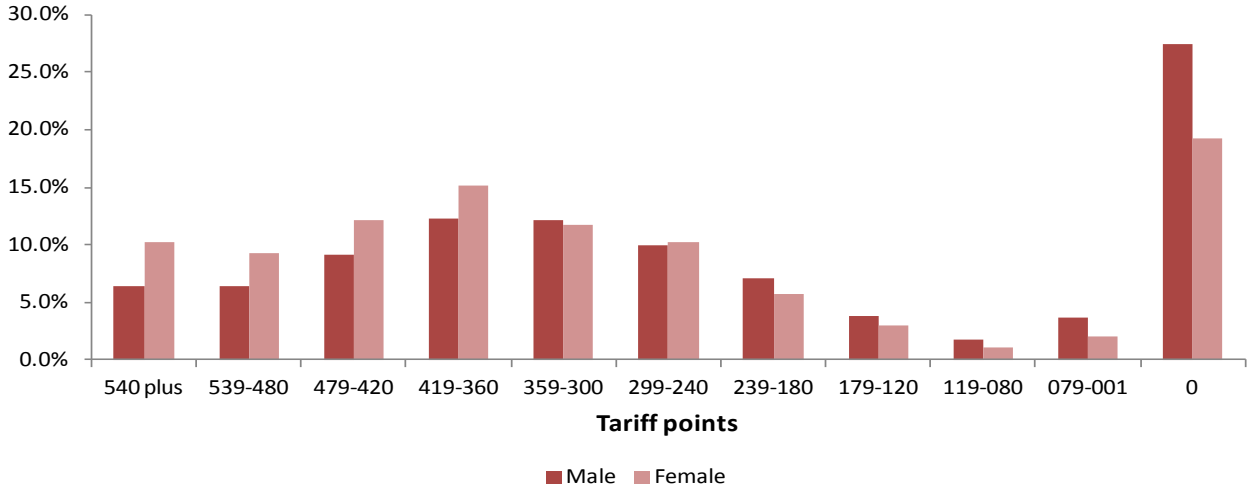

Figure 2: Tariff points of accepted applicants to engineering courses in 2007 by gender (Source: UCAS)

Table 8: Degree classification of full time students completing first degree courses in the engineering subject group by whether they qualify with an enhanced or bachelor first degree and gender 2008/09 and 2009/10 combined (Source: HESA Student Data)*

First Degree	Gender	Degree Classification					Total
		1st class	Upper 2nd class	Lower 2nd class	3rd class / Pass	Unclassified	
Enhanced first degree	Male	33.4%	46.1%	10.1%	1.4%	9.1%	6640
	Female	31.8%	45.8%	10.1%	1.8%	10.6%	1410
Bachelor degree	Male	16.0%	36.0%	30.5%	11.0%	6.4%	23185
	Female	19.2%	40.3%	28.4%	7.0%	5.0%	3615

* Counts of students are rounded to the nearest 5.

[10] The Tariff establishes agreed equivalences between different types of qualifications and reports achievement for entry to higher education in a numerical format. This allows comparisons between applicants with different types and volumes of achievement. Students can collect Tariff points from a range of different qualifications, e.g. GCE A level with BTEC Nationals. There is no ceiling to the number of points that can be accumulated. Full details of tariffs are published on the UCAS website (www.ucas.com/students/ucas_tariff/tarifftables/)

[11] 2007 was chosen to illustrate this point as the majority of thee entrants are likely to have graduated in the academic year 2009/10.

Data in Table 8 illustrates that those who graduate with enhanced first degrees are more likely to do so with first class or upper second class degrees than those graduating with bachelor degrees. 80% of male and 78% of female graduates from enhanced first degree courses do so with first class or upper second class degrees compared to 52% of male and 60% of female graduates from bachelor degree courses.

The ethnicity and gender of all full time UK domiciled students completing first degree courses in engineering and technology subjects in 2008/09 and 2009/10 is shown in Table 9. The subject choices of different ethnic groups varies leading to variation in the ethnic composition of student populations studying the different subjects. 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. The representation of ethnic groups in science, engineering and technology has been examined previously.[12]

Across all subjects 81% of male and 82% of female graduates are White. In the engineering subject group 79% male and 73% of female graduates are White, in computer sciences subject group 65% of male and 58% of female graduates are White, and in the technology subject group 90% of male and 82% of female graduates are White. Looking at engineering subjects in more detail, there is more variation in the proportion of females than males who are White. For male graduates, the proportion that is White ranges from 68% in aeronautical engineering to 86% in production engineering. For female graduates, the proportion that is White ranges from 52% in chemical engineering to 83% in general engineering. There is also considerable variation in the proportions of students of other ethnicities by subject. In particular the proportion of female students who are of Black African ethnicity varies from 1% in production engineering to 19% in chemical engineering.

Within the computer sciences subject group, computer sciences has a relatively low proportion of both male and female graduates who are White, 58% and 55% respectively, and consequently has relatively high proportions of other ethnicities most notably Indian, 11% of male and 12% of female graduates, and Pakistani, 8% of male and 9% of female graduates.

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[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: Percentage breakdown by gender of all full time UK domiciled students completing first degree courses in engineering and technology subjects by ethnicity 2008/09 and 2009/10 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**	**78.6%**	**4.3%**	**2.7%**	**0.8%**	**2.4%**	**4.2%**	**0.8%**	**0.2%**	**2.1%**	**3.8%**	**18600**
	Female	**72.7%**	**4.7%**	**2.1%**	**1.0%**	**3.3%**	**5.7%**	**1.2%**	**0.3%**	**3.6%**	**5.3%**	**2700**
Aeronautical Engineering	Male	70.7%	6.4%	4.9%	1.1%	4.0%	4.0%	0.8%	0.4%	2.7%	5.0%	1670
	Female	73.4%	5.5%	2.0%	0.0%	4.0%	5.0%	1.0%	1.0%	3.5%	4.5%	200
Chemical Engineering	Male	67.5%	5.8%	5.0%	0.4%	3.9%	9.4%	0.8%	0.4%	2.7%	4.0%	950
	Female	51.5%	6.2%	3.3%	1.8%	4.4%	19.3%	0.0%	0.0%	6.9%	6.6%	275
Civil Engineering	Male	81.3%	3.5%	2.3%	0.7%	2.4%	3.6%	0.6%	0.2%	1.7%	3.6%	3755
	Female	81.5%	2.4%	0.6%	0.8%	2.4%	3.8%	1.4%	0.0%	2.3%	5.0%	665
Electronic Engineering	Male	74.2%	4.8%	3.3%	1.2%	2.8%	6.2%	1.2%	0.4%	1.9%	4.0%	4570
	Female	59.7%	8.3%	3.8%	2.3%	4.2%	8.3%	3.0%	0.2%	3.0%	7.2%	530
General Engineering	Male	83.5%	2.8%	1.6%	0.9%	2.0%	2.6%	0.6%	0.2%	2.8%	3.1%	1500
	Female	83.2%	3.5%	1.4%	0.6%	1.7%	1.2%	1.2%	0.3%	2.9%	4.1%	345
Mechanical Engineering	Male	81.8%	4.3%	2.0%	0.6%	1.8%	3.1%	0.4%	0.1%	2.1%	3.9%	4965
	Female	74.5%	3.6%	2.4%	0.7%	4.9%	4.1%	0.2%	0.5%	4.1%	4.9%	410
Production Engineering	Male	86.2%	3.8%	1.6%	0.4%	1.1%	1.3%	1.0%	0.3%	1.4%	3.0%	1040
	Female	81.5%	4.2%	1.9%	0.4%	1.9%	0.8%	0.4%	0.4%	5.0%	3.5%	260
Computer Sciences	**Male**	**65.4%**	**8.4%**	**5.9%**	**2.4%**	**3.3%**	**6.6%**	**1.4%**	**0.6%**	**2.1%**	**3.9%**	**5005**
	Female	**57.7%**	**10.8%**	**7.9%**	**3.2%**	**3.2%**	**7.7%**	**2.3%**	**0.9%**	**2.3%**	**4.0%**	**1540**
Computing Science	Male	58.4%	10.7%	7.5%	3.3%	3.5%	7.7%	1.7%	0.8%	2.5%	4.1%	4670
	Female	55.9%	11.7%	8.6%	3.5%	3.0%	8.0%	2.6%	0.8%	2.1%	3.9%	3320
Software Engineering	Male	78.6%	4.0%	3.1%	0.5%	3.1%	4.4%	0.9%	0.2%	1.4%	3.8%	1660
	Female	86.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	13.3%	1505
Technologies	**Male**	**90.0%**	**1.9%**	**0.9%**	**0.4%**	**0.7%**	**1.4%**	**0.8%**	**0.3%**	**0.7%**	**2.9%**	**2805**
	Female	**81.5%**	**4.0%**	**1.3%**	**0.4%**	**1.7%**	**2.3%**	**1.4%**	**0.3%**	**2.3%**	**4.8%**	**1580**
Polymers and Textiles	Male	75.3%	6.2%	2.1%	1.0%	1.0%	3.1%	1.0%	2.1%	1.0%	7.2%	1060
	Female	86.3%	3.1%	1.0%	0.3%	0.5%	1.1%	1.2%	0.2%	1.9%	4.3%	95
Other Technologies	Male	92.5%	1.0%	0.9%	0.2%	0.2%	1.0%	0.8%	0.2%	0.5%	2.5%	2310
	Female	80.6%	4.7%	0.7%	0.0%	1.1%	3.2%	1.4%	0.0%	2.9%	5.4%	2035
Others Materials Technology	Male	76.5%	6.2%	0.9%	0.9%	3.7%	3.1%	1.2%	0.3%	2.5%	4.6%	535
	Female	56.9%	7.1%	3.8%	1.9%	8.1%	6.2%	2.4%	0.9%	4.7%	8.1%	325
Total	**Male**	**77.3%**	**4.9%**	**3.1%**	**1.1%**	**2.4%**	**4.4%**	**0.9%**	**0.3%**	**1.9%**	**3.7%**	**26410**
	Female	**71.1%**	**6.1%**	**3.4%**	**1.4%**	**2.9%**	**5.3%**	**1.6%**	**0.4%**	**2.9%**	**4.8%**	**5815**
All subjects	**Male**	**81.3%**	**4.7%**	**2.6%**	**0.9%**	**1.4%**	**2.9%**	**0.9%**	**0.2%**	**1.3%**	**3.7%**	**236929**
	Female	**82.2%**	**4.1%**	**2.2%**	**0.9%**	**1.1%**	**3.0%**	**1.4%**	**0.3%**	**1.0%**	**3.8%**	**320573**

* Students whose ethnicity is unknown and subjects with fewer than 100 graduates have been excluded. Counts of students are rounded to the nearest 5.

Table 10: Percentage breakdown of all full time UK domiciled students completing first degree courses in engineering and technology subjects by gender and category of parental occupation 2008/09 and 2009/10 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**	**20.7%**	**21.9%**	**10.8%**	**5.8%**	**4.5%**	**9.2%**	**3.3%**	**23.8%**	**20050**
	Female	**20.4%**	**21.7%**	**10.8%**	**5.9%**	**4.6%**	**9.2%**	**3.4%**	**24.1%**	**17555**
Aeronautical Engineering	Male	23.8%	19.4%	12.9%	5.2%	4.3%	9.1%	2.9%	22.5%	1730
	Female	24.5%	21.6%	13.7%	4.4%	3.9%	10.3%	3.4%	18.1%	205
Chemical Engineering	Male	25.7%	24.6%	9.6%	5.5%	2.9%	9.9%	2.7%	19.1%	980
	Female	25.0%	24.3%	8.1%	5.3%	2.5%	10.6%	1.8%	22.5%	285
Civil Engineering	Male	20.6%	23.2%	10.4%	7.5%	4.2%	8.4%	3.3%	22.4%	3860
	Female	23.2%	27.4%	11.3%	5.6%	3.4%	8.7%	1.9%	18.6%	680
Electronic Engineering	Male	17.1%	19.6%	11.2%	4.9%	4.3%	10.1%	3.9%	28.8%	4725
	Female	17.0%	19.8%	10.8%	4.2%	4.9%	10.6%	5.1%	27.5%	545
General Engineering	Male	25.9%	21.6%	11.1%	5.2%	3.2%	6.6%	3.1%	23.4%	1600
	Female	32.4%	21.7%	9.6%	2.9%	3.2%	7.5%	2.9%	19.8%	375
Mechanical Engineering	Male	20.7%	23.1%	10.6%	6.0%	5.6%	9.3%	3.4%	21.3%	5080
	Female	22.9%	24.7%	10.2%	6.5%	3.5%	8.8%	2.5%	21.0%	435
Production Engineering	Male	18.0%	23.1%	10.3%	6.1%	5.7%	10.9%	3.4%	22.6%	1070
	Female	18.4%	22.5%	13.1%	5.6%	4.1%	6.7%	3.7%	25.8%	265
Computer Sciences	**Male**	**11.5%**	**18.0%**	**9.4%**	**5.2%**	**4.1%**	**11.0%**	**5.6%**	**35.1%**	**5040**
	Female	**12.0%**	**18.5%**	**9.9%**	**4.6%**	**4.2%**	**10.4%**	**5.3%**	**35.2%**	**3965**
Computing Science	Male	12.5%	18.8%	9.8%	4.9%	3.9%	10.3%	5.2%	34.7%	3490
	Female	9.9%	18.0%	8.1%	6.7%	3.8%	14.3%	6.3%	32.9%	1415
Software Engineering	Male	13.3%	20.5%	10.9%	5.3%	4.4%	11.0%	5.3%	29.2%	1555
	Female	12.3%	16.0%	9.2%	5.5%	1.2%	12.9%	7.4%	35.6%	165
Technologies	**Male**	**17.2%**	**24.6%**	**10.3%**	**5.6%**	**4.0%**	**9.4%**	**3.8%**	**25.2%**	**3855**
	Female	**17.2%**	**24.1%**	**10.5%**	**4.5%**	**4.6%**	**9.2%**	**3.7%**	**26.2%**	**2465**
Polymers and Textiles	Male	17.5%	27.4%	11.6%	6.7%	3.3%	9.7%	4.2%	19.7%	1075
	Female	13.1%	26.3%	16.2%	4.0%	7.1%	9.1%	6.1%	18.2%	100
Other Technologies	Male	16.0%	24.4%	10.6%	4.4%	4.9%	9.8%	4.6%	25.4%	2390
	Female	16.0%	24.7%	10.7%	4.2%	4.9%	9.6%	4.6%	25.2%	2105
Others Materials Technology	Male	18.4%	22.2%	9.5%	7.7%	3.5%	8.7%	2.4%	27.7%	550
	Female	22.8%	22.5%	9.3%	6.9%	3.9%	6.9%	1.5%	26.3%	335
Grand Total	**Male**	**18.7%**	**21.4%**	**10.6%**	**5.6%**	**4.5%**	**9.4%**	**3.7%**	**26.1%**	**23985**
	Female	**18.5%**	**22.3%**	**9.9%**	**6.2%**	**3.6%**	**10.3%**	**4.2%**	**25.0%**	**4960**

* Subjects with fewer than 100 graduates have been excluded. 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 in 2008/09 and 2009/10 is shown in Table 10. Although there is variation in the socio economic make up of the student populations graduating in different subjects, and there are variations in the socio economic make up 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 make up of the populations of men and women is similar.

2.5 Destinations of first degree engineering and technology graduates

The main activities of full and part time UK domiciled students completing bachelor degree courses in engineering, technology and computer sciences subjects, and enhanced first degree courses in engineering subjects six months after graduation in 2008/09 and 2009/10 are shown in Table 11 and in Figure 3 (engineering subjects), Figure 4 (technology subjects) and Figure 5 (computer sciences subjects).

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.

Among graduates from bachelor degree courses in engineering subjects 50% of men entered full time work compared to 39% of women. Overall, 62% of men and 54% of women were undertaking some sort of work (full time, part time, self-employed or voluntary/unpaid). In contrast, 25% of men and 36% of women were undertaking some form of further study either as their only reported activity or while working. 16% of men and 11% of women were assumed to be unemployed.

Among graduates from enhanced first degree courses in engineering 61% of men entered full time work compared to 59% of women. Overall, 70% of men and 71% of women were undertaking some sort of work and 19% of men and 23% of women were undertaking some form of further study either as their only reported activity or while working. 10% of men and 8% of women were assumed to be unemployed.

Comparing the main activities six months after graduation of full time and part time UK domiciled students completing bachelor and enhanced first degree courses in engineering subjects shows that patterns of activity of male and female graduates from enhanced are more similar than those from bachelor degrees. Furthermore, enhanced first degree graduates are more likely than bachelor degree graduates to be in full time work and less likely to be undertaking further study. This suggests that those with enhanced first degrees either find it easier to find jobs and/or are more confident to enter the job market than those graduating with bachelor degrees.

Among bachelor degree course technology subjects a different pattern is observed. 50% of men and 59% of women entered full time work. Overall, 65% of men and 74% of women were undertaking some sort of work and 15% of men and 14% of women were undertaking some form of further study either as their only reported activity or while working. 16% of men and 9% of women were assumed to be unemployed.

The patterns of activity of among male and female bachelor degree graduates are more similar in the computer sciences subjects than those in engineering and technology subjects. Among computer sciences subjects, bachelor course graduates 50% of men entered full time work compared to 45% of women. Overall, 64% of men and 65% of women were undertaking some sort of work and 17% of men and 19% of women were undertaking some form of further study either as their only reported activity or while working. 18% of men and 15% of women were assumed to be unemployed.

Table 11: Main activities of full time and part time UK domiciled students completing bachelor degree courses in engineering and technology subjects by gender in 2008/09 and 2009/10 combined (Source: HESA Student Data)*

Main activity following graduation	Engineering Subjects				Technology Subjects		Computer Sciences Subjects	
	Enhanced first degree		Bachelor degree		Bachelor degree		Bachelor degree	
	Male	Female	Male	Female	Male	Female	Male	Female
Full time paid work only	3395	570	6045	575	1030	710	1660	460
	60.6%	58.6%	49.6%	38.5%	49.7%	59.0%	50.0%	45.4%
Part time paid work only	210	45	935	135	265	125	360	150
	3.7%	4.6%	7.7%	9.1%	12.7%	10.5%	10.9%	14.7%
Voluntary/unpaid work only	50	15	110	15	35	20	30	15
	0.9%	1.6%	0.9%	1.1%	1.6%	1.7%	1.0%	1.4%
Further study only	730	150	2310	415	235	110	370	130
	13.0%	15.3%	18.9%	27.8%	11.4%	9.0%	11.1%	12.8%
Work and further study	320	70	795	115	75	65	185	65
	5.7%	7.2%	6.5%	7.8%	3.7%	5.2%	5.6%	6.2%
Not available for employment	285	40	340	45	75	55	65	35
	5.1%	4.0%	2.8%	3.1%	3.5%	4.6%	1.9%	3.4%
Assumed to be unemployed	575	75	1495	160	330	110	585	145
	10.2%	7.9%	12.3%	10.5%	15.8%	9.0%	17.6%	14.5%
Other	45	5	160	30	35	10	60	15
	0.8%	0.7%	1.3%	2.1%	1.6%	0.9%	1.8%	1.6%
Explicit refusal	100	15	445	65	85	40	175	50
Total	5710	985	12635	1560	2160	1245	3490	1070

* The numbers of students completing enhanced degree courses in technology and computer science were too few to present data. Counts of students are rounded to the nearest 5.

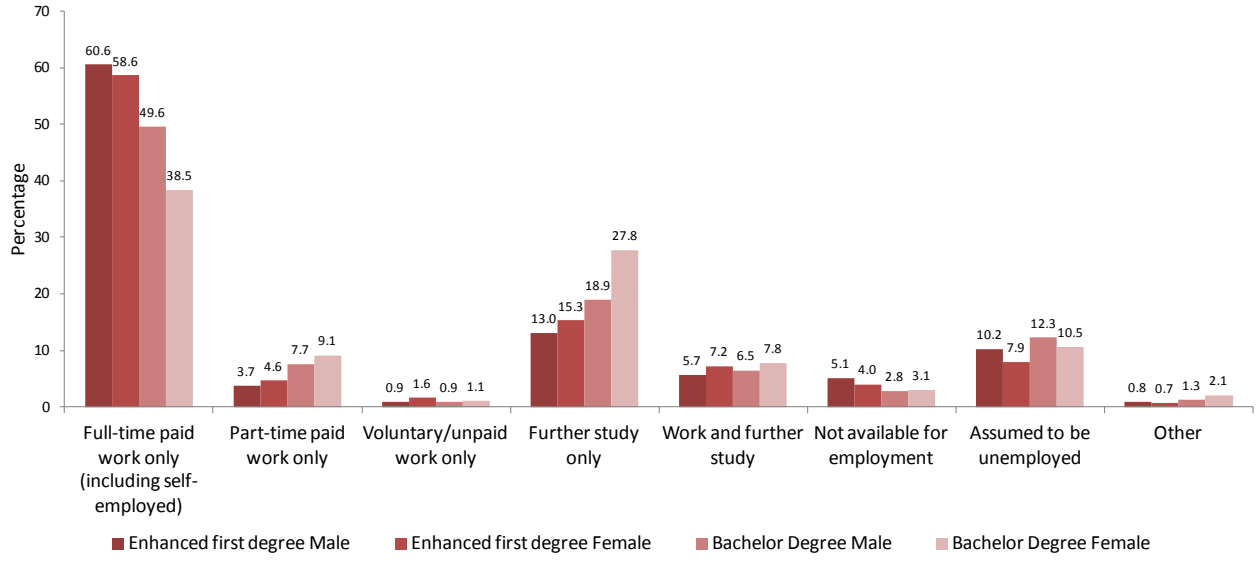

Figure 3: Main activity six months after graduation of UK domiciled students completing bachelor and enhanced first degree courses in engineering subjects 2008/09 and 2009/10 combined (Source: HESA DLHE Data)

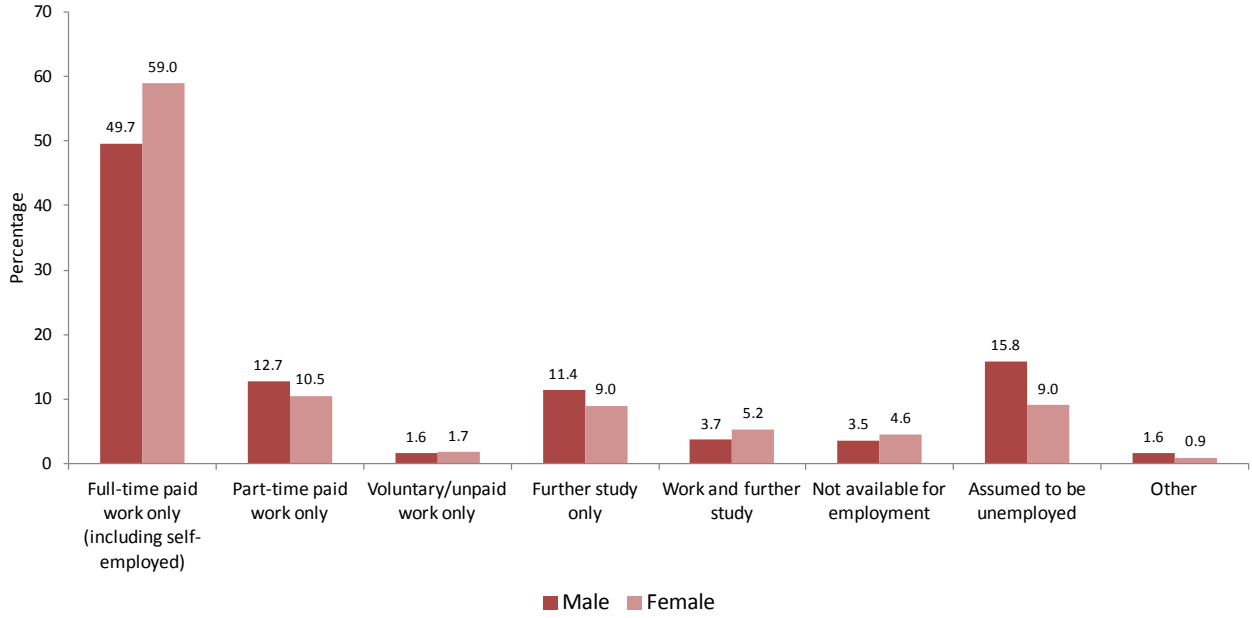

Figure 4: Main activity six months after graduation of UK domiciled students completing bachelor degree courses in technology subjects 2008/09 and 2009/10 combined (Source: HESA DLHE Data)

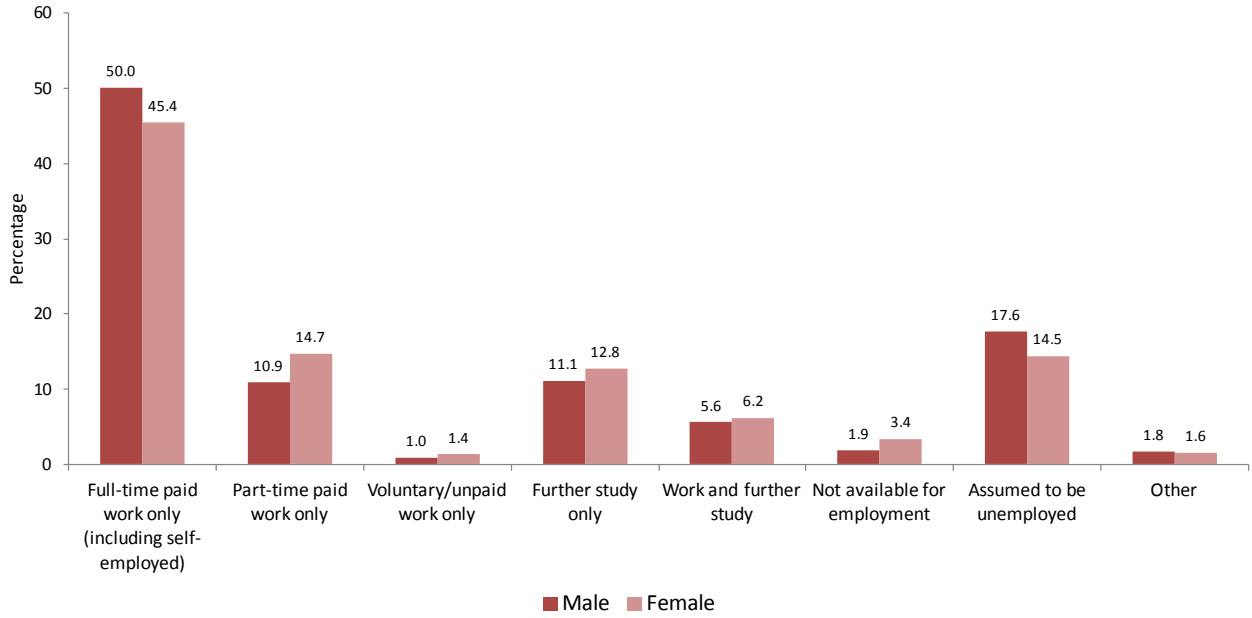

Figure 5: Main activity six months after graduation of UK domiciled students completing bachelor degree courses in computer sciences 2008/09 and 2009/10 combined (Source: HESA DLHE Data)

In Table 12 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]

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

In all cases shown in Table 12 men were more likely than women to be in engineering and technology occupations. In engineering subjects, 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 subjects 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.

Table 12: 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 2008/09 and 2009/10 combined (Source: HESA DLHE Data)*

STEM occupations	Engineering Subjects				Technology Subjects		Computer Sciences Subjects	
	Enhanced first degree		Bachelor degree		Bachelor degree		Bachelor degree	
	Male	Female	Male	Female	Male	Female	Male	Female
Engineering and technology	78.1%	70.7%	62.8%	43.8%	53.7%	41.1%	33.6%	30.0%
Science and mathematics	1.5%	2.8%	1.2%	4.7%	1.9%	5.6%	1.9%	3.6%
Non-STEM	20.4%	26.5%	35.9%	51.5%	44.3%	53.3%	64.4%	66.4%
Total	3805	640	7800	880	2670	910	1505	950

* The numbers of students completing enhanced degree courses in technology and computer science were too few to present data. Counts of students are rounded to the nearest 5.

In all the cases considered in Table 12 there are significant differences between the patterns of occupations of men and women with women significantly less likely than men to be in engineering and technology occupations.

Table 13 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 chemical engineering the proportions of men and women in engineering and technology occupations is relatively high and the difference between the proportion of men and women is low, 73% and 72%, respectively. In electronic engineering the difference between the proportions of men and women who were in engineering and technology occupations is large, 62% and 37%, respectively. It is interesting to note that in contrast to electronic engineering the figures for mechanical engineering are 72% of men and 68% of women.

Table 13: 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 2008/09 and 2009/10 combined (Source: HESA DLHE Data)*

Subject	STEM occupations	Male	Female
Chemical Engineering	Engineering and Technology	72.9%	71.8%
	Science and Maths	2.2%	4.3%
	Non-STEM	24.9%	23.9%
	Total	445	115
Civil Engineering	Engineering and Technology	75.7%	71.2%
	Science and Maths	0.9%	3.3%
	Non-STEM	23.4%	25.5%
	Total	2265	395
Computing Science	Engineering and Technology	48.9%	40.0%
	Science and Maths	2.1%	5.8%
	Non-STEM	49.0%	54.2%
	Total	1780	805
Electronic Engineering	Engineering and Technology	62.1%	36.5%
	Science and Maths	0.9%	4.8%
	Non-STEM	37.0%	58.7%
	Total	2540	270
General Engineering	Engineering and Technology	63.3%	46.2%
	Science and Maths	1.6%	4.0%
	Non-STEM	35.1%	49.8%
	Total	1280	225
Mechanical Engineering	Engineering and Technology	71.7%	67.5%
	Science and Maths	1.4%	5.0%
	Non-STEM	26.9%	27.5%
	Total	2935	200
Other Technologies	Engineering and Technology	30.0%	20.2%
	Science and Maths	1.6%	2.4%
	Non-STEM	68.4%	77.4%
	Total	1120	170
Others Materials Technology	Engineering and Technology	42.9%	24.5%
	Science and Maths	1.9%	9.4%
	Non-STEM	55.3%	66.0%
	Total	160	105
Polymers and Textiles	Engineering and Technology	36.0%	35.3%
	Science and Maths	0.0%	0.8%
	Non-STEM	64.0%	63.8%
	Total	50	595
Production Engineering	Engineering and Technology	57.1%	29.4%
	Science and Maths	1.0%	3.2%
	Non-STEM	41.9%	67.5%
	Total	690	125

* Counts of students are rounded to the nearest 5.

Table 14: The nature of further study of full and part time UK domiciled students completing first degree courses in engineering and technology subjects and going on to further study only or work and further study by gender 2008/09 and 2009/10 combined (Source: HESA DLHE Data)

Engineering and Technology Subject Group	Gender	Nature of Further Study			
		Registered on a course	Registered as a research student	Engaged in private, unsupervised study	Preparing a professional portfolio of my work
Engineering Subjects	Male	3245	885	160	205
		72.2%	19.7%	3.6%	4.5%
	Female	630	165	10	35
		75.0%	19.7%	1.4%	3.9%
Technology Subjects	Male	305	90	15	15
		71.5%	21.7%	3.8%	3.1%
	Female	165	35	10	10
		75.5%	15.7%	4.2%	4.6%
Computer Sciences Subjects	Male	600	105	65	35
		74.4%	13.2%	7.8%	4.6%
	Female	235	10	10	10
		87.9%	4.2%	4.5%	3.4%

* Counts of students are rounded to the nearest 5.

Table 14 presents data on the nature of further study of full and part time UK domiciled students six months after graduating from first degree courses in engineering and technology in 2008/09 and 2009/10. The overall proportions of full and part time UK domiciled students six months after graduating and registered as research students are shown in Table 15. In engineering subjects a higher proportion of females than males go on to study as a research student; this may well be related to the fact that women get higher proportions of first class and upper second class degrees. However in technology and computer sciences subjects lower proportions of females than males go on to research studentships.

Table 15: Proportions of full time and part time UK domiciled students completing first degree courses in engineering and technology subjects and registered as a research student six months after completion by gender 2008/09 and 2009/10 combined (Source: HESA DLHE Data)

Engineering and Technology Subject Group	First Degree	
	Male	Female
Engineering Subjects	4.5%	5.9%
Technology Subjects	3.6%	2.4%
Computer Sciences Subjects	2.3%	0.8%

Table 16: 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 2008/09 to 2009/10 combined (Source: HESA DLHE Data)*

Graduate occupations**	Engineering Subjects				Technology Subjects		Computer Sciences Subjects	
	Enhanced first degree		Bachelor degree		Bachelor degree		Bachelor degree	
	Male	Female	Male	Female	Male	Female	Male	Female
Traditional graduate occupations	3.5%	4.9%	1.9%	3.5%	4.8%	8.5%	2.4%	3.4%
Modern graduate occupations	32.3%	31.3%	21.5%	19.6%	36.3%	24.9%	10.5%	3.3%
New graduate occupations	40.8%	38.6%	29.0%	21.8%	7.4%	7.0%	18.8%	25.5%
Niche graduate occupations	13.0%	12.1%	20.3%	18.2%	18.9%	16.7%	26.1%	27.4%
Non-graduate job	10.4%	13.2%	27.3%	36.9%	32.6%	42.9%	42.2%	40.5%
Total	3805	640	7800	880	2670	910	1505	950

* The numbers of students completing enhanced degree courses in technology and computer science were too few to present data. 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 16 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. In engineering subjects and technology subjects women are more likely than men to enter non-graduate level jobs.

Table 17 presents data on the occupations of full 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 roles and non-graduate roles. Data show 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.

A more detailed breakdown of the occupations of full and part time UK domiciled students completing first degree courses in engineering and technology subjects who were in full time or part paid work six months after graduating is presented in Appendix A in Table 63. Also in Appendix A, Figure 10 presents data on the types of employers of full and part time UK domiciled students completing first degree courses in engineering and technology subjects who were in full time or part paid work six months after graduating.

Table 17: 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 gender 2008/09 and 2009/10 combined (Source: HESA DLHE Data)*

Role	Standard Occupational Classification	Engineering Subjects		Technology Subjects		Computer Sciences Subjects	
		Male	Female	Male	Female	Male	Female
Occupations of those who entered graduate roles	Managers and Senior Officials	11.1%	10.6%	11.8%	15.1%	18.3%	12.5%
	Professional Occupations	72.0%	66.6%	60.4%	53.1%	33.9%	15.7%
	Associate Professional & Technical Occupations	16.5%	22.3%	26.8%	31.5%	47.0%	71.5%
	Administrative & Secretarial Occupations	0.2%	0.5%	0.1%	0.2%	0.6%	0.3%
	Skilled Trades Occupations	0.2%	0.1%	0.8%	0.2%	0.2%	0.0%
	Personal Service Occupations	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%
	Process, Plant & Machine Operatives	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%
	Total	9085	1110	1890	525	950	580
Occupations of those who entered non-graduate roles	Managers and Senior Officials	1.6%	1.7%	2.3%	1.8%	1.7%	1.3%
	Professional Occupations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Associate Professional & Technical Occupations	7.8%	2.2%	14.2%	4.8%	5.2%	2.1%
	Administrative and Secretarial Occupations	13.2%	25.5%	18.5%	32.4%	13.9%	23.7%
	Skilled Trades Occupations	10.2%	2.5%	2.9%	0.5%	10.2%	4.9%
	Personal Service Occupations	4.3%	9.1%	4.9%	12.5%	4.7%	4.9%
	Sales and Customer Service Occupations	34.4%	38.2%	40.4%	42.9%	34.1%	47.7%
	Process, Plant and Machine Operatives	5.8%	1.7%	2.2%	0.8%	3.8%	1.5%
	Elementary Occupations	22.6%	19.1%	14.7%	4.3%	26.6%	13.9%
	Total	2525	410	875	390	640	390

* Counts of students are rounded to the nearest 5.

3. Survey of engineering and technology graduates

3.1 Methodology

A questionnaire was developed for students undertaking engineering and technology undergraduate courses in UK higher education institutes (HEIs). The questionnaire was based on the questionnaires used in the 2006 study of chemistry PhD students[14], the 2008 study of molecular bioscience students[15], and the 2011 study of postdoctoral researchers in chemistry and physics.[16] The questionnaire was designed to collect information on the characteristics and personal circumstances of the respondents, information on why they chose the course they did, whether or not they had any work experience related to engineering and technology and their experience of undertaking that work, and their plans for the future. The questionnaire also collected information on respondents' views on other issues such as whether they felt that male and female students are treated equally and what the top companies are to work for.

The questionnaire was administered online using SurveyMonkey. A pilot was run with engineering postgraduate researchers at Cambridge University. The participants were asked to think back to when they were undertaking undergraduate studies when completing the survey. Once the participants had completed the survey a discussion was held to collect feedback and the questionnaire was altered in the light of that feedback. The final questionnaire is presented in Appendix D.

The survey gave those who participated the opportunity to participate in a prize draw with Amazon vouchers offered as prizes. Participants were also invited to provide contact details in case any follow up was carried out.

A variety of means were used to publicise the survey. Institutions with significant numbers of engineering and technology undergraduates were contacted to ask whether an email containing the link to the survey could be distributed. Some HEIs agreed to distribute the link through their engineering and/or technology faculties. In other institutions the relevant engineering and technology departments were contacted directly. HEI contacts were asked to distribute an email containing a link to the survey to all relevant students. HEI contacts were also told that the expectation was that it would be necessary to send out one or two reminders.

The link was emailed to 53 HEI contacts on 8 November 2011. A reminder was sent on 9 December 2011 and a final reminder was sent on 6 January 2012. The survey closed on 15 January 2012.

Cardiff University contacted the project team after the survey had closed and a separate survey link was published for Cardiff students with the chance to win a single Amazon voucher on 31 January 2012. The survey for Cardiff students closed on 14 February 2012.

The survey was also publicised by contacting engineering and technology learned societies and asking them to distribute the link. Additionally a number of student engineering societies were also contacted and asked to publicise the survey.

It is not known how many HEI contacts and learned societies did distribute the link or, in the case of HEI contacts, the reminders.

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

[15] The Molecular Bioscience PhD and Women's Retention: A Survey and Comparison with Chemistry, Biochemical Society, 2008 (http://www.biochemistry.org/Portals/0/SciencePolicy/Docs/Molecular%20Biosciences%20Report%20For%20Web.pdf)

[16] Mapping the future: Physics and Chemistry Postdoctoral Researchers' Experiences and Career Intentions (http://www.iop.org/publications/iop/2011/page_50579.html)

A total of 6031 individuals began the main survey and 42 began the Cardiff survey. The data from both surveys were downloaded as Excel files and combined. Responses were removed from the dataset for the following reasons: respondents had only completed a small portion of the survey; respondents were not studying for undergraduate qualifications; and/or respondents were not studying engineering or technology subjects. Once the data had been cleaned a total of 4624 responses remained for analysis.

Processed data were analysed in Excel, for the most part using Pivot Tables.

3.2 The sample demographics and results

A total of 4624 responses were analysed. The breakdown of the respondents by gender is shown in Table 18. Overall, 23.9% of those indicated their gender were female which is significantly higher proportion than that in the majority of engineering and technology subjects (see Table 5). In general females are more likely than males to respond to surveys. The majority of analyses in this report are presented disaggregated by gender so the over representation of females is not a significant issue.

Table 18: Gender and domicile of respondents

Gender	Respondent domicile							
	UK		Other EU		Outside EU		Overall	
	Count	%	Count	%	Count	%	Count	%
Male	2681	75.7	366	78.5	439	71.4	3486	75.4
Female	833	23.5	98	21.0	165	26.8	1096	23.7
Did not wish to say	29	0.8	2	0.4	11	1.8	42	0.9
Total	3543	100.0	466	100.0	615	100.0	4624	100.0
Proportion by domicile	76.6		10.1		13.3		100.0	

Respondents were asked to indicate the broad subject area(s) of their degree course by choosing one or two close match(es) from a list, or by indicating an alternative. Where alternatives were provided the responses were standardised. A full list of the subjects/combinations of subjects and the number of respondents studying each is presented in Appendix A. Each of the subjects was assigned to a subject group or to a combination of subject groups. The numbers of respondents in each subject group or subject group combination is presented in Table 19.

Table 19: The subject group and gender of respondents

Subject Group(s)	Respondent gender			Total
	Male	Female	Did not wish to say	
Engineering	2521	743	28	3292
	76.6%	22.6%	0.9%	100.0%
Technology	86	54	2	142
	60.6%	38.0%	1.4%	100.0%
Computer Science	662	211	9	882
	75.1%	23.9%	1.0%	100.0%
Engineering and Technology	130	72	3	205
	63.4%	35.1%	1.5%	100.0%
Engineering and Computer Sciences	86	16	0	102
	84.3%	15.7%	0.0%	100.0%
Computer Science and Technology	1	0	0	1
	100.0%	0.0%	0.0%	100.0%

The subjects with over 100 respondents are shown in Table 20. Where appropriate analyses will be presented for the main subject groups and the most popular subjects.

Table 20: The most popular subjects of respondents by gender

Subject	Gender			Total
	Male	Female	Did not wish to say	
Aeronautical/Aerospace Engineering	332	73	2	407
	81.6%	17.9%	0.5%	100.0%
Chemical/Process Engineering	173	115	2	290
	59.7%	39.7%	0.7%	100.0%
Civil/Structural Engineering	455	202	3	660
	68.9%	30.6%	0.5%	100.0%
Computing Science/Artificial Intelligence/Software Engineering/Information Technology (IT)	657	210	8	875
	75.1%	24.0%	0.9%	100.0%
Electrical/Electronic Engineering	421	71	2	494
	85.2%	14.4%	0.4%	100.0%
Materials Science/Metallurgy	81	50	2	133
	60.9%	37.6%	1.5%	100.0%
Mechanical Engineering	679	120	8	807
	84.1%	14.9%	1.0%	100.0%

As shown in Table 21 the majority (86%) of respondents were aged between 18 and 22.

Table 21: The age of respondents by gender

Age	Distribution by gender			Total
	Male	Female	Overall	
17	0.8%	0.5%	0.7%	34
18	15.7%	14.9%	15.5%	715
19	21.1%	21.4%	21.1%	977
20	20.5%	22.1%	20.8%	962
21	17.6%	18.9%	17.9%	829
22	9.8%	11.6%	10.3%	474
23	4.9%	4.1%	4.7%	217
24	2.0%	1.7%	1.9%	88
25	1.6%	1.3%	1.6%	74
26-30	3.4%	1.8%	3.1%	142
31-35	1.2%	1.1%	1.2%	56
36-40	0.6%	0.3%	0.5%	23
41+	0.8%	0.5%	0.7%	33
Total	100.0%	100.0%	100.0%	4624

Table 22 shows the distribution of respondents by year of course and gender. The largest proportion of both males and females, 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.

Table 22: Respondents' year of course by gender

Year of course	Distribution by gender			Total
	Male	Female	Overall	
1st	36.9%	32.9%	35.9%	1660
2nd	24.5%	24.7%	24.7%	1140
3rd	22.7%	23.7%	23.0%	1065
4th	12.9%	15.1%	13.4%	619
5th	2.7%	3.3%	2.9%	132
5+	0.2%	0.2%	0.2%	8

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 23 and Table 24. The most popular reason selected by both respondents who selected one and two reasons was, "Out of interest and enthusiasm for engineering". However, women are less likely to have selected this reason than men. Women in both populations were less likely than men to have selected, "I have an aptitude for engineering", and more likely to have selected, "I wandered into this course after my A-levels (or equivalent)". Women were also more likely than men to have been inspired to undertake their course by a family member/family friend and/or teacher.

Analysis of the data for those respondents selecting two reasons by year of study showed some variations. Most notable is that the proportion of women who selected "Out of interest and enthusiasm for engineering" was 59% for those in their first year of study, 60% for those in their second year of study, 47% for those in their third year of study, and 51% for those in their fourth year of study. In contrast the proportion of men who selected "Out of interest and enthusiasm for engineering" varied between 61% and 58% by year of study. The data suggest that women undertaking engineering and technology courses are less enthusiastic than men about engineering and technology and have less confidence in their ability, and that as the year of study increases women retrospectively are less likely to say they undertook their courses "Out of interest and enthusiasm for engineering".

Table 23: Respondents' main reason for undertaking their courses by gender where respondents indicated a single reason

The main reason for undertaking course	Male	Female	Overall
Out of interest and enthusiasm for engineering	38.7%	30.7%	36.5%
The course qualification is a pre-requisite for the career I want	16.7%	14.9%	16.2%
I "wandered" into this course after my A-levels (or equivalent)	7.9%	16.5%	10.2%
I have an aptitude for engineering	9.9%	5.7%	8.8%
To enhance my earning potential	7.6%	7.3%	7.5%
I was inspired/encouraged by a family member/family friend	6.7%	8.8%	7.2%
I was influenced by other role models	1.8%	1.9%	1.9%
I was inspired/encouraged by a teacher	1.8%	1.5%	1.8%
Recognition that studying engineering could increase my chances of getting into a good university	0.6%	1.1%	0.7%
I realised that others I knew were applying for similar courses	0.3%	0.0%	0.2%
Don't know	3.3%	3.8%	3.4%
Other	4.7%	7.7%	5.5%
Total	**706**	**261**	**967**

Table 24: Respondents' main reasons for undertaking their courses by gender where respondents indicated two reasons

The main reason for undertaking course	Male	Female	Overall
Out of interest and enthusiasm for engineering	59.5%	54.6%	58.4%
I have an aptitude for engineering	34.1%	21.8%	31.3%
The course qualification is a pre-requisite for the career I want	30.8%	29.3%	30.5%
To enhance my earning potential	28.7%	25.3%	27.9%
I was inspired/encouraged by a family member/family friend	17.2%	20.7%	18.0%
I "wandered" into this course after my A-levels (or equivalent)	9.2%	17.4%	11.1%
I was inspired/encouraged by a teacher	5.6%	13.7%	7.5%
I was influenced by other role models	6.3%	7.3%	6.5%
Recognition that studying engineering could increase my chances of getting into a good university	2.8%	3.0%	2.9%
I realised that others I knew were applying for similar courses	1.3%	0.2%	1.1%
Don't know	0.9%	1.7%	1.1%
Other	3.6%	5.0%	3.9%
Total	**2780**	**835**	**3615**

Respondents were asked whether they regretted undertaking their course. As shown in Table 25, only 3.4% of respondents regretted undertaking their courses. There were no significant differences between the responses of males and females.

Table 25: Whether or not respondents regret undertaking their courses by gender

Do you regret undertaking your course?	Gender		Total
	Male	Female	
Yes	3.4%	3.6%	3.4%
No	87.4%	85.7%	87.0%
Don't Know	9.2%	10.7%	9.6%
Total	**3486**	**1096**	**4582**

Table 26 presents the reasons students selected for why they do not regret undertaking their courses. The most popular reason selected by males and females is, "I enjoy my subject." In fact, females are more likely than males to select this reason which is in contrast to the reasons given by respondents for undertaking

courses in the first place. The most popular reasons respondents gave for regretting undertaking their courses were, "The course is not what I expected," and, "I no longer want to work in engineering."

Table 26: Respondents' reasons for not regretting undertaking their courses by gender*

Reasons for not regretting undertaking course	Male	Female	Overall
I enjoy my subject	30.4%	35.9%	31.7%
The course provides me with the skill set I need for the career I want	19.7%	20.0%	19.8%
The course will give me the qualification I need for the career I want	16.9%	15.9%	16.6%
Engineering/technology comes naturally to me	9.3%	3.9%	8.0%
The course enables me to get a better idea about my career plans	7.2%	8.5%	7.5%
The course gives me a better understanding of an engineer's/technologist's work	7.0%	5.6%	6.6%
The course gives me the experience I need for the career I want	5.7%	5.8%	5.7%
I've made great friends	2.6%	3.9%	2.9%
Don't know	0.5%	0.0%	0.4%
Other reason	0.8%	0.4%	0.7%
Total	**3048**	**939**	**3987**

* 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 27 shows that around 58% of respondents have an optional work placement, but only 12% have a compulsory work placement as part of their course. Table 28 shows that there are some variations between subjects: respondents reading chemical/process engineering or materials science/metallurgy are more likely to have compulsory work placements than those reading other subjects.

Table 27: Whether respondents' courses included an industrial placement by gender

Course includes an industrial placement	Gender		Total
	Male	Female	
Yes, compulsory	11.6%	14.1%	12.2%
Yes, optional	59.6%	52.9%	58.0%
No	28.8%	32.9%	29.8%
Total	**3486**	**1096**	**4582**

Table 28: Whether respondents' courses included an industrial placement by subject

Subject	Course includes an industrial placement			Total
	Yes, compulsory	Yes, optional	No	
Aeronautical/Aerospace Engineering	4%	63%	33%	407
Chemical/Process Engineering	5%	78%	17%	290
Computing Science/Artificial Intelligence/Software Engineering/ IT	27%	55%	18%	875
Electrical/Electronic Engineering	6%	59%	34%	494
Materials Science/Metallurgy	32%	34%	34%	133
Mechanical Engineering	5%	63%	32%	807

Table 29: Whether respondents spent any time working in an area related to their course before beginning their courses by gender

Time spent working before course	Gender		Overall
	Male	Female	
Yes: a full time job	7.1%	3.5%	6.2%
Yes: a temporary placement	17.2%	16.1%	16.9%
Yes, other	5.6%	5.2%	5.5%
No	70.2%	75.3%	71.4%
Total	**3486**	**1096**	**4582**

Table 29 shows that around 6% of respondents had a full time job before starting their course and around 22% of respondents had carried out some other kind of work related to their course. 71% of respondents had not had any work related to their course: a higher proportion of females, 75%, than males, 70%.

Overall 12% of respondents had undertaken a compulsory work placement and 18% had undertaken an internship, as shown in Table 30. Slightly higher proportions of females than males had undertaken work placements and internships. 73% of respondents had not undertaken any kind of work placement or internship when they completed the questionnaire. As would be expected, the proportion of students who had undertaken some kind of work placement is very low in the first year. This increases thereafterso that among respondents in their third year 20% of males and 22% of females had undertaken a compulsory work placement, and 27% of males and 31% of females had undertaken an internship. For respondents in their fourth year 36% of males and 39% of females had undertaken a compulsory work placement, and 37% of males and 44% of females had undertaken an internship. Women are more likely than men to have undertaken some form of work placement or internship. For respondents in their third year 56% of men and 49% of women had not undertaken a work placement or an internship, and for respondents in their fourth year 33% of men and 28% of women had not undertaken a work placement or an internship.

Overall, 55% of respondents, 53% of men and 59% of women, in the final year of their course had undertaken at least one work placement or an internship.

Table 30: Whether respondents have spent time undertaking work experience as part of their course by year of study and gender

Nature of work placement	Male					Female					Overall
	Year of study					Year of study					
	1st	2nd	3rd	4th	Overall	1st	2nd	3rd	4th	Overall	
Yes: (a) work placement(s) as part of my course	0.6%	3.6%	16.9%	29.7%	9.5%	0.0%	5.2%	20.8%	28.3%	11.8%	10.1%
Yes: (an) internship(s) which was(were) not part of my course	1.8%	15.1%	24.1%	31.5%	15.0%	1.7%	13.3%	30.0%	33.7%	17.3%	15.6%
Yes: both a work placement as part of my course and an internship	0.4%	0.7%	2.9%	5.8%	2.2%	0.3%	0.7%	0.8%	10.2%	2.6%	2.2%
No placement	97.2%	80.6%	56.1%	33.0%	73.3%	98.1%	80.8%	48.5%	27.7%	68.3%	72.1%
Total	**1287**	**855**	**792**	**451**	**3486**	**361**	**271**	**260**	**166**	**1096**	**4582**

Among the respondents who had undertaken work placements 72% had undertaken one period, 21% had undertaken two periods, and 8% had undertaken more than two periods, see Table 31. Table 32 shows the total time respondents had spent undertaking work placements and/or internships.

Table 31: Respondents' number of periods of work placement and/or internship since beginning their course by gender

Number of work placements	Gender		Overall
	Male	Female	
1	73.2%	66.9%	71.5%
2	19.6%	23.9%	20.8%
More than 2	7.2%	9.2%	7.8%
Total	**930**	**347**	**1277**

Table 32: Length of time respondents have spent on work placement since beginning their course by gender

Time spent undertaking work placement	Gender		Overall
	Male	Female	
1-3 months	40.5%	37.8%	39.8%
4-6 months	18.5%	17.9%	18.3%
7-9 months	7.8%	11.8%	8.9%
10-12 months	13.4%	16.7%	14.3%
More than 12 months	19.7%	15.9%	18.6%
Total	**930**	**347**	**1277**

Table 33: Proportions of male and female respondents that agreed with statements about their most recent work placement or internship by gender

During my most recent work placement....	Gender		Overall
	Male	Male	
I worked in a laboratory/workshop	89.2%	88.5%	89.0%
I was given formal safety training	87.7%	87.0%	87.5%
I did essentially the same thing for the whole of my placement*	83.9%	82.4%	83.5%
I learnt about the commercial objectives of the company	77.7%	76.7%	77.4%
I did a variety of things during my placement	75.7%	75.2%	75.6%
I was given a formal induction course	73.5%	74.4%	73.8%
I had a mentor	66.0%	66.6%	66.2%
I was invited to work social events	60.5%	57.6%	59.7%
I attended training courses	52.4%	49.0%	51.4%
There was a special programme of training for placement students	42.9%	36.6%	41.2%
I worked in the field	32.3%	31.7%	32.1%
I was given adequate supervision	32.0%	30.5%	31.6%
Total	**930**	**347**	**1277**

Respondents were asked whether they agreed with a number of statements about their most recent work placement, or, if they had not undertaken a placement as part of their course, their most recent internship. The results are shown in Table 33: the experiences of males and females are broadly similar.

The majority of statements are about factual matters. Three statements, "I did essentially the same thing for the whole of my placement", "I did a variety of things during my placement" and "I was given adequate supervision," are matters of opinion. Interestingly although the first two statements in this group of three might be seen as mutually exclusive, the majority of respondents agreed with both of them suggesting that respondents had interpreted the statements as referring to different aspects of their role. Presumably the majority of respondents agreed that they carried out the same role throughout their placement, but did a variety of things within that role.

It is notable that 74% of respondents had a formal induction and two thirds had a mentor. The statement with the lowest proportion of respondents agreeing was, "I was given adequate supervision." Only 32% of respondents agreed that they had received adequate supervision. This may reflect that the students are used to more directive situations at school and during their courses.

It was interesting to note how many "positive" statement respondents agreed with: of the 12 statements 11 are positive and one, "I did essentially the same thing for the whole of my placement" is negative. Table 34 shows the proportions of respondents who agreed with positive statements. The distributions of the number of positive statements selected by men and women are very similar. The median number of positive statements for men and women is 8.

Table 34: Proportions of male and female respondents that agreed with positive statements about their most recent work placement or internship

Number of positive statement with which respondents agreed about work placement	Gender		Overall
	Male	Female	
0	0.3%	0.0%	0.2%
1	0.8%	0.6%	0.7%
2	1.4%	2.3%	1.6%
3	2.8%	2.9%	2.8%
4	5.2%	8.4%	6.0%
5	8.8%	8.9%	8.8%
6	13.4%	12.4%	13.2%
7	16.0%	15.9%	16.0%
8	16.5%	16.4%	16.4%
9	14.6%	13.3%	14.3%
10	13.3%	12.7%	13.2%
11	6.9%	6.3%	6.7%
Total	**930**	**347**	**1277**

Respondents were asked how readily they would accept a job offer to work in their placement company permanently and the results are shown in Table 35 broken down by gender and the number of positive statements about their most recent work placement or internship with which respondents agreed. The

data suggest that the more positive respondents' experiences of their work placement the more readily they are to accept an offer to work in their placement company permanently.

Table 35: How readily respondents would accept a job offer to work in their placement company permanently by gender and by the number of positive statements about their most recent work placement or internship with which respondents agreed

Gender	Number of positive statements	Readiness to accept job offer in placement most recent placement company					Total
		Yes definitely without hesitation	Probably, but I would need to think about it	I might, but I would apply to other companies as well	I'm not sure one way or the other	Definitely not	
Male	0-5	14.5%	20.7%	31.8%	11.7%	21.2%	179
	6	24.0%	36.8%	30.4%	5.6%	3.2%	125
	7	17.4%	31.5%	34.2%	8.7%	8.1%	149
	8	31.4%	30.7%	24.2%	6.5%	7.2%	153
	9	33.1%	33.1%	25.0%	4.4%	4.4%	136
	10	39.5%	32.3%	23.4%	1.6%	3.2%	124
	11	45.3%	21.9%	25.0%	4.7%	3.1%	64
	Overall	**27.2%**	**29.7%**	**28.2%**	**6.7%**	**8.3%**	**930**
Female	0-5	6.3%	22.5%	38.8%	12.5%	20.0%	80
	6	18.6%	25.6%	32.6%	4.7%	18.6%	43
	7	20.0%	25.5%	41.8%	5.5%	7.3%	55
	8	33.3%	22.8%	33.3%	7.0%	3.5%	57
	9	39.1%	34.8%	23.9%	0.0%	2.2%	46
	10	61.4%	18.2%	18.2%	0.0%	2.3%	44
	11	50.0%	18.2%	31.8%	0.0%	0.0%	22
	Overall	**28.5%**	**24.2%**	**32.6%**	**5.5%**	**9.2%**	**347**

The effect of respondents' most recent industrial placement on their career intentions by gender and by the number of positive statements about their most recent work placement or internship with which respondents agreed is shown in Table 36. Overall, 69% of men and 67% stated that their placement made them more intent on pursuing a career in engineering/technology. The data also show that the more positive respondents' experiences of their placement are the more likely they are to be more intent on pursuing a career in engineering/technology. Although there are no obvious gender differences in these data, it is clear that overall providing students with good experiences during their work placements does positively affect students' attitudes towards careers in engineering and technology.

Table 36: Effect of respondents' most recent industrial placement on their career intentions by gender and by the number of positive statements about their most recent work placement or internship with which respondents agreed

Number of positive statements	Effect of most recent industrial placement on career intention						Totals	
	My placement made me more intent on pursuing a career in engineering/ technology		My placement had no effect on my career intentions		My placement made me less intent on pursuing a career in engineering/ technology			
	Male	Female	Male	Female	Male	Female	Male	Female
0-5	44.7%	37.5%	35.8%	40.0%	19.6%	22.5%	179	80
6	66.4%	60.5%	20.8%	25.6%	12.8%	14.0%	125	43
7	69.1%	69.1%	20.8%	18.2%	10.1%	12.7%	149	55
8	73.2%	77.2%	16.3%	19.3%	10.5%	3.5%	153	57
9	75.0%	76.1%	17.6%	15.2%	7.4%	8.7%	136	46
10	89.5%	88.6%	4.8%	11.4%	5.6%	0.0%	124	44
11	78.1%	86.4%	10.9%	13.6%	10.9%	0.0%	64	22
Overall	**68.9%**	**66.6%**	**19.7%**	**22.8%**	**11.4%**	**10.7%**	**930**	**347**

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 37. 51% of respondents agreed, and 26% of respondents strongly agreed that they had met positive role models. There were no significant different between the responses of men and women.

Table 37: Whether respondents met inspiring role models during their most recent placements by gender

During my most recent placement, I met role models who inspired me to pursue a career in engineering/technology	Gender		Overall
	Male	Female	
Strongly agree	25.9%	24.8%	25.6%
Agree	50.9%	51.6%	51.1%
Disagree	20.2%	20.2%	20.2%
Strongly disagree	3.0%	3.5%	3.1%
Total	**930**	**347**	**1277**

Table 38 shows that overall 84% of respondents were paid during their most recent work placement or internship. There were no significant gender differences.

Table 38: Whether or not respondents' most recent work placements or internship were by gender

Work placement paid	Gender		Overall
	Male	Female	
Yes	84.8%	82.7%	84.3%
No	15.2%	17.3%	15.7%
Total	**930**	**347**	**1277**

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 and gender, are shown in Table 39, and illustrate that there are no significant differences between the responses of men and women. Interestingly around 87% of respondents in their first year of study believe they possess the majority of general skills employers often look for. This proportion rises to 91% in the third year and 92% in the fourth year. Examination of the data broken down by the most popular subjects suggests that there are no significant differences between the subjects.

Table 39: Whether respondents believe they possess the majority of general skills that employers often look for by year of study and gender

Year of study	Gender	Possess general skills			Total
		Yes	No	Don't know	
1st year	All	86.6%	2.7%	10.7%	1660
	Male	86.5%	2.6%	10.9%	1287
	Female	87.0%	2.5%	10.5%	361
2nd Year	All	87.7%	3.9%	8.4%	1140
	Male	86.9%	4.4%	8.7%	855
	Female	90.8%	2.2%	7.0%	271
3rd Year	All	90.8%	3.1%	6.1%	1065
	Male	90.5%	3.0%	6.4%	792
	Female	91.5%	3.5%	5.0%	260
4th Year	All	92.2%	2.4%	5.3%	619
	Male	91.6%	2.7%	5.8%	451
	Female	94.0%	1.8%	4.2%	166
Total	**Overall**	**88.9%**	**3.0%**	**8.1%**	**4624**

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 and gender, are shown in Table 40. 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. However, in every year of study a higher proportion of males than females believe they possess the technical skills that employers often look for. Interestingly, the proportions of both men and women who say that they don't have, or don't know if they have, the technical skills employers look for increases the longer individuals have spent on their courses: in the fourth year of study 12% of men and 21% of women believe they do not possess, or do not know if they possess, the technical skills employers look for compared to 4% of men and women and in the first year of study.

Table 40: Whether respondents believe they possess the majority of technical skills that employers often look for by year of study and gender.

Year of study	Gender	Possess technical skills				Total
		Yes	No, but I expect to by the time I complete my course	No	Don't know	
1st year	All	23.2%	72.5%	1.6%	2.7%	1660
	Male	26.1%	69.5%	1.9%	2.5%	1287
	Female	11.6%	84.5%	0.8%	3.0%	361
2nd Year	All	32.6%	60.6%	3.9%	2.9%	1140
	Male	35.9%	58.0%	3.5%	2.6%	855
	Female	22.5%	69.4%	4.4%	3.7%	271
3rd Year	All	47.2%	39.4%	5.9%	7.4%	1065
	Male	50.5%	36.9%	5.8%	6.8%	792
	Female	38.1%	47.3%	5.8%	8.8%	260
4th Year	All	63.0%	22.6%	6.5%	7.9%	619
	Male	67.4%	20.6%	4.9%	7.1%	451
	Female	50.6%	28.3%	10.8%	10.2%	166
Total	**Overall**	**38.2%**	**53.3%**	**3.9%**	**4.6%**	**4624**

Table 41: 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.

Work placement/ internship	Gender	Possess technical skills				Total
		Yes	No, but I expect to by the time I complete my course	No	Don't know	
Undertaken work placement/ internship	All	72.4%	14.1%	6.5%	7.1%	510
	Male	76.6%	10.5%	5.4%	7.6%	354
	Female	63.2%	22.4%	8.6%	5.9%	152
Not undertaken work placement/ internship	All	55.3%	24.0%	8.6%	12.1%	421
	Male	59.0%	22.8%	8.3%	9.9%	312
	Female	45.3%	26.4%	9.4%	18.9%	106

Table 41 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. 72% of respondents in their final year who have undertaken a work placement or an internship, compared to 55% of respondents who have not,

believe they possess the technical skills that employers often look for. In both cases, females are less likely than men to believe they possess the technical skills that employers often look for: among those who have undertaken a work placement and/or an internship 77% of men and 63% of women believe they have the technical skills that employers often look for and among those who have not undertaken a work placement and/or a internship 59% of men and 45% of women believe they have the technical skills that employers often look for.

Overall, although there are few significant differences between male and female in respondents' assessments of whether or not they have the general skills that employers look for, a higher proportion of male than 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. However, the proportion of respondents who believe they do not have, or do not know if they have, the technical skills employers look for also increases as respondents progress through their courses. In all cases women are less likely than men to believe they have the technical skills employers look for, and more likely to believe they do not have, or do not know if they have, the technical skills employers look for. Given that male and female respondents undertaken the same courses these data suggest that women have less confidence in their technical abilities than men which may in turn differentially affect career decisions of men and women.

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 student had on their intention to pursue a career in engineering or technology. The results are presented in Table 42 and Figure 6. Overall between 60 and 70% of both men and women state that their experiences have made them more intent on pursuing a career in engineering or technology. The proportions of men and women with doubts about pursuing a career in engineering or technology, or definitely not wanting to pursue a career in engineering or technology, does rise from the first year of study onwards. Although the proportion of women with doubts about pursuing or not wanting to pursue a career in engineering or technology is higher than the proportion of men, the difference between the genders is not significant.

Table 42: The effect of respondents' experiences as an engineering/technology student on their intentions to pursue a career in engineering/technology by year of study and gender

Year of study	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	
1st year	All	69.3%	21.6%	7.5%	1.5%	1660
	Male	70.1%	21.1%	7.5%	1.3%	1287
	Female	67.9%	22.7%	7.2%	2.2%	361
2nd Year	All	69.3%	15.4%	13.7%	1.7%	1140
	Male	70.5%	15.8%	12.2%	1.5%	855
	Female	65.3%	14.0%	18.5%	2.2%	271
3rd Year	All	64.6%	14.4%	17.7%	3.4%	1065
	Male	65.4%	15.9%	15.9%	2.8%	792
	Female	61.9%	9.6%	23.1%	5.4%	260
4th Year	All	69.0%	14.2%	13.6%	3.2%	619
	Male	69.2%	15.1%	12.9%	2.9%	451
	Female	68.7%	12.0%	15.1%	4.2%	166
Total	**Overall**	**68.3%**	**17.1%**	**12.4%**	**2.2%**	**4624**

Examination of the data in terms of those respondents that had undertaken a work placement and/or internship showed that there are differences between the career intentions of those who had undertaken work placements and those that had not, as shown in Figure 7. Respondents who have undertaken a work placement have been affected to a greater extent to pursue careers in engineering and technology than those respondents who have not. There are significant differences between the overall responses of those who have and those have not undertaken work placements. The data in Figure 7 might suggest that there are differences between the responses of men and women who have not undertaken work placements but it should be borne in mind that the numbers of women in any particular year of study are relatively small.

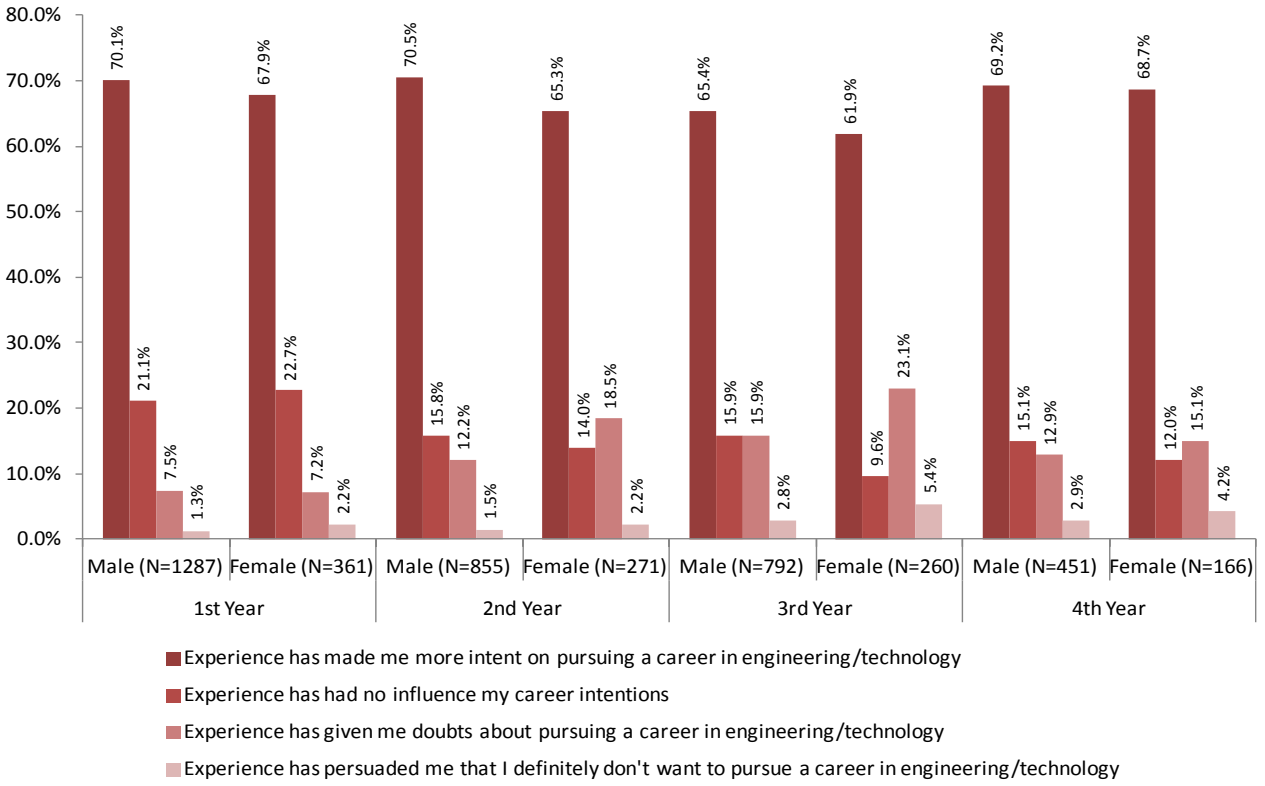


Figure 6: The effect of respondents' experiences as an engineering/technology student on the intentions to pursue a career in engineering/technology by year of study and gender

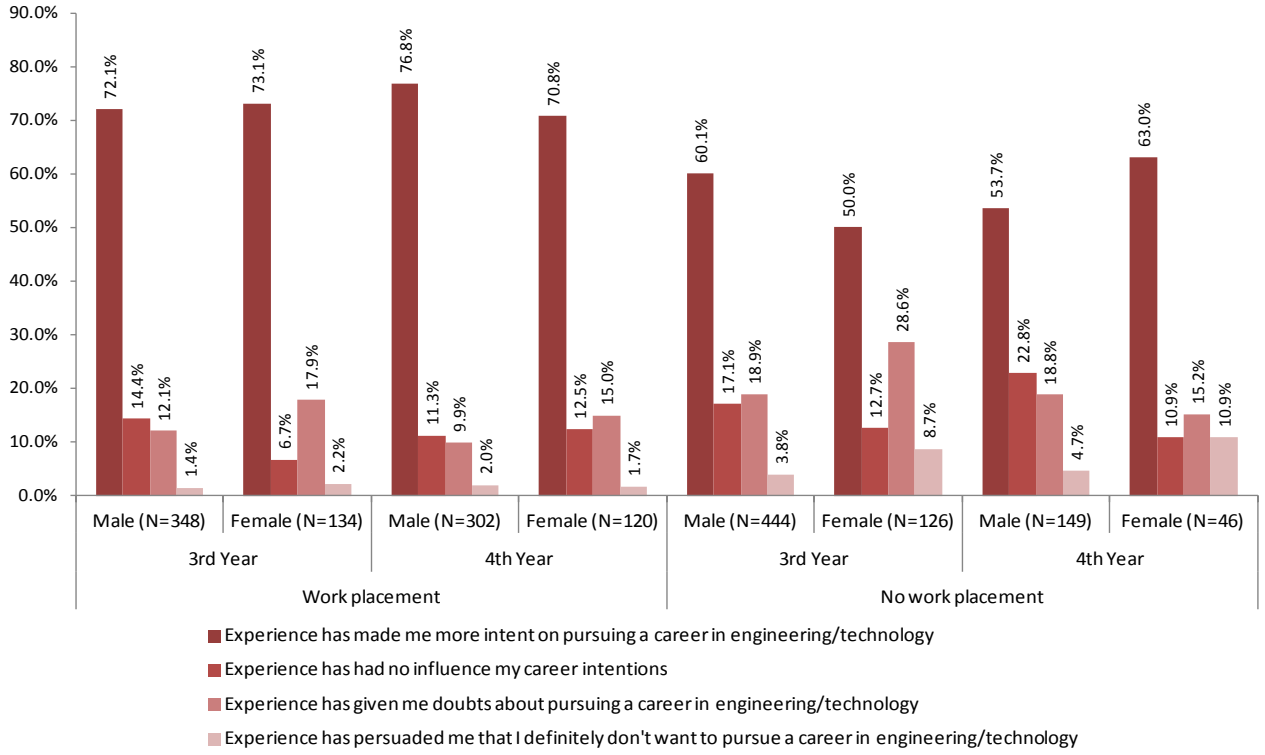


Figure 7: The effect of respondents' experiences as an engineering/technology student on their intention to pursue a career in engineering/technology by year of whether or not respondents undertaken a work placement, year of study and gender

Overall it is clear that men and women who have undertaken a work placement or internship related to engineering or technology are more intent on pursuing an engineering or technology career than those men and women who have not.

3.6.2 Respondents' plans for the future

321 of the 4624 respondents (6.9%) had already accepted a job offer at the time they completed the survey. Of these, 83% had chosen a course or job that required an engineering or technology qualification. Of the 47 respondents who accepted a course or job not requiring an engineering or technology qualification, 25 had begun their courses expecting to use their qualifications. A range of reasons were given for changing their minds such as, " I have become more interested in another field," " I was put off by my work experience," or, " I have tried and failed to get jobs directly related to my degree."

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, broken down by year of study and gender, are presented in Table 43. Overall 67% of respondents stated that they intended to seek, or take up, paid work. There were no clear gender differences in the results although in general females are less likely than males to state that they plan to seek paid work and more likely to state that they plan to undertake further study. The proportion of respondents planning to seek paid work was highest for those in their fourth year of study, and lowest for those in their third year of study. Correspondingly, respondents in their fourth year of study were least likely to state that they planned to undertake further study. Examining the data broken down by qualification aim showed that those respondents registered for an enhanced first degree (e.g. MEng) were more likely to state that they intended to seek paid work than those registered for bachelor degrees, 71% and 63%, respectively, and less likely to state that they planned to undertake further study, 12% and 19%, respectively.

Table 43: Intentions of respondents who had not already accepted a job offer on, or shortly after, completing their courses by year of study and gender

	1st year		2nd Year		3rd Year		4th Year		
	Male	Female	Male	Female	Male	Female	Male	Female	Overall
Seek, or take up, paid work	66.6%	64.5%	69.3%	69.6%	63.4%	62.8%	74.1%	72.9%	67.3%
Undertake further study	16.0%	17.2%	15.3%	15.2%	16.0%	20.1%	9.2%	11.8%	15.1%
Take some time off (e.g. a gap year)	6.0%	5.2%	6.6%	4.9%	7.4%	9.6%	7.0%	5.6%	6.6%
Seek, or take up, voluntary work	1.0%	0.9%	1.1%	1.1%	1.2%	0.8%	1.3%	0.0%	1.1%
Don't know	8.9%	11.5%	6.3%	8.0%	8.6%	5.9%	7.0%	6.9%	8.0%
Other	1.5%	0.9%	1.5%	1.1%	3.3%	0.8%	1.3%	2.8%	1.9%
Total	**1241**	**349**	**823**	**263**	**729**	**239**	**371**	**144**	**4303**

Table 44 presents data on whether respondents intend to seek employment as an engineer/technologist or undertake further study in engineering/technology on completion of their studies. Overall, 77% of respondents answered that they did intend to seek employment as an engineer/technologist or undertake further study in engineering/technology. There is no clear trend in moving through the years of study, however in all years of study females are less likely than males to state that they intend to seek employment as an engineer/technologist or undertake further study in engineering/technology.

Table 44: Whether 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 and gender

Engineering/ technology employment or further study	1st year		2nd Year		3rd Year		4th Year		Overall
	Male	Female	Male	Female	Male	Female	Male	Female	
Yes	77.1%	72.5%	80.3%	76.4%	74.8%	72.4%	79.5%	76.4%	76.8%
No	5.1%	7.7%	6.6%	6.8%	6.9%	13.0%	7.3%	8.3%	6.8%
Don't know	17.8%	19.8%	13.1%	16.7%	18.4%	14.6%	13.2%	15.3%	16.4%
Total	**1241**	**349**	**823**	**263**	**729**	**239**	**371**	**144**	**4159**

Examining the data by whether or not respondents were in their final year, see Table 45, shows that those respondents in their final year are less likely to state that they intend to seek employment as an engineer/technologist or undertake further study in engineering/technology than those not in their final year. The differences between the responses of males and females are not statistically significant. 74% of males and 69% of females in their final year state that they intend to seek employment as an engineer/technologist or undertake further study in engineering/technology compared to 79% of males and 75% of females not yet in their final year.

Table 45: Whether 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 whether respondents' are in their final year of study and gender

Engineering/ technology employment or further study	Final year		Other years		Overall
	Male	Female	Male	Female	
Yes	74.2%	69.2%	78.6%	75.4%	77.0%
No	9.3%	14.5%	5.5%	7.6%	6.8%
Don't know	16.5%	16.4%	15.9%	17.0%	16.2%
Total	**547**	**214**	**2697**	**806**	**4264**

Table 46 shows the same data broken down by whether respondents are in their final year, whether they have undertaken a work placement, and gender. It is noticeable that particularly in the final year there is a statistically significant difference between the overall responses of those in their final year who have and have not undertaken an industrial placement. There is also a statistically significant difference between the responses of men and women in their final year who have not undertaken a work placement or internship while the responses in those in their final year who have undertaken an industrial placement are not statistically significantly different.

Table 46: Whether 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 once they have taken any time off that they intend to by whether it is respondents' final year of study, whether they have undertaken a work placement and gender.

Engineering/ technology employment or further study	Final Year				Other years			
	Industrial Placement		No industrial Placement		Industrial Placement		No industrial Placement	
	Male	Female	Male	Female	Male	Female	Male	Female
Yes	81.6%	76.7%	67.3%	59.6%	82.1%	82.2%	77.8%	73.5%
No	7.1%	8.3%	11.4%	22.3%	4.7%	5.0%	5.7%	8.3%
Don't know	11.3%	15.0%	21.4%	18.1%	13.2%	12.8%	16.5%	18.2%
Total	**266**	**120**	**281**	**94**	**514**	**180**	**2183**	**626**

Undertaking an industrial placement is a significant factor in reinforcing respondents' intentions to seek employment as an engineer/technologist or undertake further study in engineering/technology. Although the evidence is not strong, undertaking an industrial placement appears to affect women's intentions more than men's. However, it is also possible that where work placements are optional, respondents more inclined towards careers as an engineer/technologist or towards undertaking further study in engineering/technology are more likely to opt for a placement thus amplifying the differences between those who have and who have not undertaken work placements. The number of female respondents, in particular, is too small to investigate this further.

Table 47 presents data whether respondents intend to seek employment as an engineer/technologist or undertake further study in engineering/technology on completion of their studies broken down by subject group or subject and gender. Even though the proportion of students who are female does vary from subject to subject, see Table 5, there does not seem to be any relationship between the proportion of students who are female studying a particular subject group or subject, and the likelihood of female respondents to indicate that they intend to seek employment as an engineer/technologist or undertake further study in engineering/technology on completion of their course.

Table 47: Whether 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, and having taken any time off that they intend to by subject group/subject and gender

Subject group/Subject	Male				Female			
	Engineering/ technology employment or further study							
	Yes	No	Don't know	Total	Yes	No	Don't know	Total
Engineering	**79%**	**6%**	**15%**	**2335**	**77%**	**8%**	**15%**	**683**
Aeronautical/Aerospace Engineering	73%	11%	16%	314	75%	9%	16%	69
Chemical/Process Engineering	78%	5%	17%	161	75%	11%	14%	107
Electrical/Electronic Engineering	82%	4%	14%	397	79%	3%	18%	61
Mechanical Engineering	80%	5%	15%	622	83%	5%	12%	105
Technology	**72%**	**12%**	**17%**	**78**	**62%**	**8%**	**30%**	**50**
Materials Science/Metallurgy	73%	5%	22%	77	60%	21%	19%	48
Computer Science	**78%**	**5%**	**17%**	**631**	**69%**	**12%**	**19%**	**202**

Table 48: Whether respondents who had not already accepted a job offer and do not know if they intend to, or do not intend to, seek employment as an engineer/technologist or undertake further study in engineering/technology on completion of their studies, intend to seek employment in role which requires and/or makes use of engineering or technology background by gender

Employment in role which requires and/or makes use of engineering or technology background	Respondents' intention to seek employment as an engineer/technologist or undertake further study in engineering/technology					
	Do not know			No		
	Male	Female	Overall	Male	Female	Overall
Yes	59.5%	66.3%	60.8%	59.8%	48.9%	56.8%
No	2.3%	2.3%	2.4%	26.1%	21.7%	24.3%
Don't know	38.2%	31.4%	36.8%	14.1%	29.3%	18.9%
Total	**519**	**172**	**702**	**199**	**92**	**296**

Of the 296 respondents who stated that they did not intend to seek employment as an engineer/technologist or undertake further study in engineering/technology on completion of their courses, 57% intend to seek employment in role which requires and/or makes use of their engineering or technology background (see Table 48). Similarly, 61% of the 702 respondents who did not know whether they would seek employment as an engineer/technologist or undertake further study in engineering/technology intend to seek employment in role which requires and/or makes use of their engineering or technology background. Overall, of the 4303 respondents who have not already accepted a job offer only 89, 2.1% (2.0% of men and 2.3% of women) state that they do not intend to seek a role which requires and/or makes use of their engineering or technology background.

Respondents who had not accepted a job offer and who indicated that they intended to seek employment as an engineer/technologist or undertake further study in engineering/technology were asked to indicate which of a number of options described they were most likely to do on completion of their courses after having taken any time off. The results broken down by year of study and gender are shown in Table 49 and broken down by whether it is the respondent's final year of study, whether they have undertaken a work placement, and gender are shown in Table 50. In general the intention to undertake further study falls as the year of study increases. Further analysis also shows that those registered for bachelor degree courses are significantly more likely to intend to undertake further study, in particular masters courses, than those registered for enhanced first degrees. 22.6% of respondents registered for bachelor degrees courses intend to undertake a masters course, compared to 5.7% of those registered for enhanced first degree courses.

Table 49: What respondents who had not already accepted a job offer and who indicated that they intended to seek employment as an engineer/technologist, or, undertake further study in engineering/technology were most likely to do on completion of their course by year of study and gender

Type of engineering/ technology employment or further study	1st year		2nd Year		3rd Year		4th Year		Overall
	Male	Female	Male	Female	Male	Female	Male	Female	
Further Study: engineering/technology -related doctorate	10.1%	9.9%	8.9%	6.5%	9.7%	8.1%	8.5%	7.3%	9.2%
Further Study: engineering/technology -related masters	15.5%	15.0%	12.4%	13.4%	16.0%	15.0%	3.4%	10.9%	13.1%
Work as an engineer/technologist in Industry/Commerce	53.1%	44.7%	60.5%	52.2%	55.8%	47.4%	71.9%	60.0%	56.8%
Work as an engineer/technologist in the Public Sector	3.0%	10.7%	3.3%	6.0%	3.1%	8.7%	3.1%	5.5%	4.2%
Work as an IT Professional or Technician	6.2%	6.3%	7.9%	7.5%	6.2%	8.7%	6.4%	7.3%	6.7%
Don't know	8.5%	11.1%	4.8%	10.9%	5.9%	9.2%	5.4%	6.4%	7.2%
Other	3.7%	2.4%	2.1%	3.5%	3.3%	2.9%	1.4%	2.7%	2.8%
Total	**957**	**253**	**661**	**201**	**545**	**173**	**295**	**110**	**3305**

The data in both Table 49 above and Table 50 below shows that women are less likely than men to express an intention to work as an engineer or technologist in industry or commerce. The numbers of women in their final year are too small to draw firm conclusions, however, the group with the highest proportion of respondents intending to work as an engineer or technologist in industry or commerce are men in their final year who have undertaken at least one period of work placement. In contrast the group with the lowest proportion of respondents intending to work as an engineer or technologist in industry or commerce are women not yet their final year who have not undertaken a period of work placement.

It is also noticeable that in general women are more likely than men to express an intention to work as an engineer or technologist in the public sector. Lower proportions of respondents who have had at least one period of work placement express the intention to work as an engineer or technologist in the public sector than those who have not undertaken a period of work placement.

Table 50: What respondents who had not already accepted a job offer and who indicated that they intended to seek employment as an engineer/technologist or undertake further study in engineering/technology were most likely to do on completion of their course by whether it is respondent's final year of study, whether they have undertaken a work placement, and gender

Type of engineering/ technology employment or further study	Final Year				Other years			
	Industrial Placement		No industrial Placement		Industrial Placement		No industrial Placement	
	Male	Female	Male	Female	Male	Female	Male	Female
Further Study: engineering/technology -related doctorate	9.7%	10.9%	4.8%	5.4%	11.4%	6.8%	9.3%	8.7%
Further Study: engineering/technology -related masters	10.1%	13.0%	15.9%	16.1%	8.3%	12.8%	14.2%	13.7%
Work as an engineer/technologist in Industry/Commerce	68.2%	51.1%	57.1%	50.0%	61.6%	57.4%	56.9%	47.8%
Work as an engineer/technologist in the Public Sector	1.8%	7.6%	4.2%	10.7%	2.4%	5.4%	3.3%	8.9%
Work as an IT Professional or Technician	6.5%	7.6%	6.9%	8.9%	7.1%	6.8%	6.4%	7.0%
Don't know	3.2%	6.5%	8.5%	5.4%	6.4%	8.8%	6.7%	11.1%
Other	0.5%	3.3%	2.6%	3.6%	2.8%	2.0%	3.1%	2.8%
Total	**217**	**92**	**189**	**56**	**422**	**148**	**1698**	**460**

Respondents were asked to name the top three companies for which they would like to work. The most popular choices are shown in Table 65 in Appendix C. The choices expressed by men and women are different but this is on part related to the different subject make up of the two sets of respondents: men are more likely than women to be reading mechanical engineering or electrical/electronic engineering.

3.7 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. Respondents were asked to rate the factors as very important, important, somewhat important, or not important. The results broken down by gender are shown in Table 51.

Table 51: Distribution of respondents' ratings of the importance of different aspects in their career by gender

Factor	Male (N=3486)				Female (N=1096)			
	V. Imp.	Imp	S. Imp	N. Imp	V. Imp.	Imp	S. Imp	N. Imp
A workplace culture where all staff are treated well	56.9%	37.2%	5.0%	0.8%	65.9%	31.6%	2.4%	0.2%
Being creative and intellectually stimulated	52.4%	39.7%	7.0%	0.9%	52.1%	38.8%	8.1%	1.0%
Good professional development opportunities	51.5%	39.9%	7.8%	0.8%	56.1%	38.0%	5.2%	0.6%
Job security	48.3%	40.5%	9.9%	1.3%	52.6%	40.8%	6.2%	0.5%
Having the potential for promotions	46.6%	40.6%	10.9%	1.9%	42.9%	44.2%	11.9%	1.1%
Making a positive difference to the company	38.6%	46.2%	12.6%	2.5%	38.2%	46.1%	13.0%	2.6%
Lots of variety in the work	36.6%	48.3%	13.5%	1.7%	42.2%	45.0%	11.6%	1.2%
Prospects for receiving a high salary	38.4%	44.0%	14.5%	3.0%	32.6%	46.7%	18.6%	2.1%
Holding a respected position	34.2%	46.1%	15.9%	3.8%	36.7%	45.5%	15.6%	2.2%
A variety of roles available	27.8%	52.0%	18.0%	2.2%	32.2%	49.1%	17.2%	1.5%
Making a positive contribution to society	35.1%	39.5%	20.3%	5.1%	39.6%	39.5%	17.6%	3.3%
Living in a pleasant area	30.0%	46.6%	19.5%	3.9%	29.3%	48.6%	19.3%	2.7%
Prospects for a leadership role	33.4%	40.7%	19.7%	6.2%	31.2%	40.7%	21.5%	6.6%
Having independence and personal autonomy	22.4%	52.2%	23.1%	2.2%	23.5%	54.7%	20.1%	1.6%
Access to state-of-the-art equipment/resources	26.4%	45.5%	23.4%	4.6%	17.7%	45.7%	30.6%	6.0%
Having opportunities to socialise outside of work	27.8%	42.3%	23.4%	6.5%	29.6%	42.0%	22.6%	5.8%
Having a reasonable commute to work	22.1%	48.2%	22.9%	6.8%	25.5%	52.0%	18.8%	3.7%
A strong health and safe culture	27.7%	38.8%	24.2%	9.3%	34.5%	42.4%	19.8%	3.3%
Opportunities to travel	24.9%	34.2%	27.7%	13.2%	27.4%	33.9%	26.1%	12.6%
A strong equality and diversity culture	22.7%	36.2%	27.5%	13.5%	33.3%	40.0%	21.8%	4.9%
Autonomy at work	12.2%	44.8%	36.0%	7.1%	11.2%	44.7%	37.6%	6.5%
Extensive benefits packages and/or bonuses	16.7%	36.7%	35.9%	10.7%	13.8%	39.1%	37.6%	9.5%
Flexible working hours	15.8%	35.9%	37.3%	11.0%	19.2%	38.0%	34.8%	8.1%
The amount of holiday	13.1%	38.5%	38.8%	9.6%	13.7%	41.2%	38.1%	6.9%
Working at a fast pace	9.7%	32.3%	41.3%	16.8%	7.5%	34.3%	43.7%	14.5%
Working at a relaxed pace	10.6%	29.5%	40.0%	19.9%	10.0%	29.6%	44.1%	16.3%

Table 52: Ranking of respondents' ratings of the importance of different aspects in their career by gender

Quality	Male (N=3486)		Female (N=1096)	
	Rank	Score*	Rank	Score*
A workplace culture where all staff are treated well	1	350.3	1	363.1
Being creative and intellectually stimulated	2	343.6	4	342.0
Good professional development opportunities	3	342.2	2	349.6
Job security	4	335.7	3	345.4
Having the potential for promotions	5	331.9	5	328.8
Making a positive difference to the company	6	321.0	7	319.9
Lots of variety in the work	7	319.9	6	328.3
Prospects for receiving a high salary	8	317.8	11	309.8
Holding a respected position	9	310.7	8	316.7
A variety of roles available	10	305.4	10	312.0
Making a positive contribution to society	11	304.6	9	315.4
Living in a pleasant area	12	302.6	13	304.5
Prospects for a leadership role	13	301.3	17	296.5
Having independence and personal autonomy	14	294.8	15	300.2
Access to state-of-the-art equipment/resources	15	293.7	20	275.1
Having opportunities to socialise outside of work	16	291.4	18	295.3
Having a reasonable commute to work	17	285.5	16	299.2
A strong health and safe culture	18	284.8	12	308.1
Opportunities to travel	19	270.8	19	276.1
A strong equality and diversity culture	20	268.2	14	301.6
Autonomy at work	21	262.1	23	260.7
Extensive benefits packages and/or bonuses	22	259.4	24	257.2
Flexible working hours	23	256.5	21	268.2
The amount of holiday	24	255.1	22	261.7
Working at a fast pace	25	235.0	25	234.8
Working at a relaxed pace	26	230.9	26	233.3

* 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 52 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 men and women are very similar: in fact although the order varies slightly, the top 11 and the bottom 6 factors for men and women are the same. Both men and women rank "A workplace culture where all staff are treated well" as the most important factor.

The two factors for which the rankings of men and women differ the most are "A strong health and safe culture", ranked 18th by men and 12th by women, and "A strong equality and diversity culture" ranked 20th by men and 14th by women.

Rankings were also generated for respondents in their final year and for those not yet in their final year and these were very similar to the ranking shown for all respondents. This suggests that students' ideas of the factors which are important to them change little during the course of their studies and that the, albeit small, differences between the rankings expressed by men and women are maintained throughout the course of students' studies.

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 gender are shown in Table 53. 70% of male respondents and 73% of female respondents report having received some careers support during their undergraduate studies.

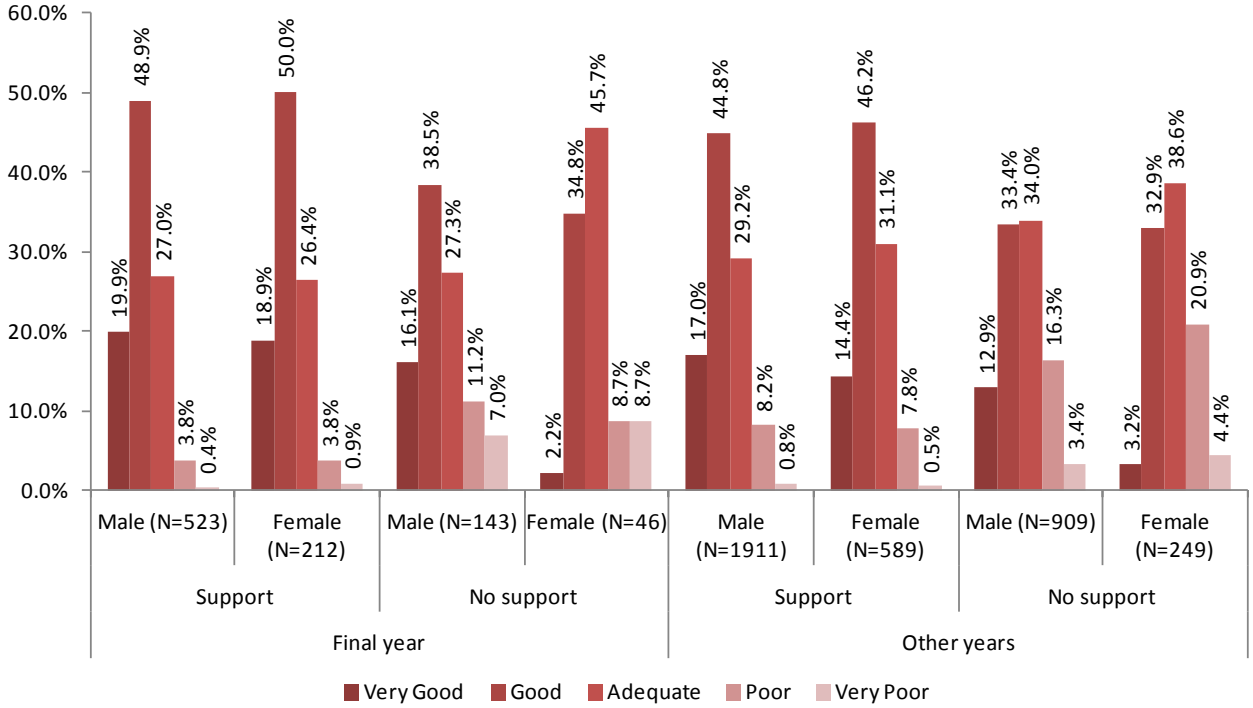
Table 53: Respondents' reported awareness of career options within academia by whether they are in their final year, whether they have received careers support and gender

Awareness of career options as an engineering/ technology graduate	Final year				Other years				Overall
	Received support		Not received support		Received support		Not received advice		
	Male	Female	Male	Female	Male	Female	Male	Female	
Very Good	19.9%	18.9%	16.1%	2.2%	17.0%	14.4%	12.9%	3.2%	15.3%
Good	48.9%	50.0%	38.5%	34.8%	44.8%	46.2%	33.4%	32.9%	42.5%
Adequate	27.0%	26.4%	27.3%	45.7%	29.2%	31.1%	34.0%	38.6%	30.6%
Poor	3.8%	3.8%	11.2%	8.7%	8.2%	7.8%	16.3%	20.9%	9.8%
Very Poor	0.4%	0.9%	7.0%	8.7%	0.8%	0.5%	3.4%	4.4%	1.7%
Total	**523**	**212**	**143**	**46**	**1911**	**589**	**909**	**249**	**4582**

Overall 89% of 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 respondents who had received support rated their awareness of career options as adequate or better, compared to 82% of respondents who had not received support. There were no significant differences between the responses of men and women 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 female respondents. Of those in other years of study, 91% of respondents who had received support rated their awareness as adequate or better, compared to 79% of respondents who had not received support. There were significant differences between the responses of men and women who had not received careers support: women reported that they were less aware of career options than men.

Figure 8 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.

Figure 8: Respondents' reported awareness of career options by whether they are in their final year, whether they have received careers support and gender



Those respondents who had received careers support were asked to specify its source. The results are shown in Table 54. The most common sources of careers support are university careers services, 77%, and careers/recruitment fairs, 60%. There were similar patterns for males and females: women were more likely to have received support through careers /recruitment fairs and academic staff, and men were more likely to have received support from friends.

Table 54: Sources of careers support used by respondents who reported having received careers support during their undergraduate studies by gender

Type of careers support received	Male	Female	Overall
University careers service	77.2%	77.0%	77.1%
Industrial placement supervisor	24.2%	25.8%	24.7%
Careers/recruitment fairs	58.8%	64.0%	60.0%
Academic staff in your department	41.7%	45.8%	42.7%
Family	47.3%	48.7%	47.6%
Friends	47.1%	41.6%	45.9%
Other	3.1%	3.6%	3.2%
Total	**2434**	**801**	**3264**

The types of careers support received by respondents are shown in Table 55. 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 men and women are similar.

Table 55: Types of careers support received by respondents who reported having received careers support during their undergraduate studies by gender

Type of careers support received	Male	Female	Overall
Types of jobs available	64.9%	61.8%	64.0%
Where to look for jobs	59.7%	56.2%	58.8%
Filling out application forms	32.7%	32.6%	32.8%
Writing a CV	64.7%	67.4%	65.3%
Insights into working in particular jobs e.g. pay, conditions	40.4%	34.7%	39.0%
Interview techniques	41.6%	42.9%	42.0%
Other	1.6%	2.1%	1.8%
Total	**2434**	**801**	**3264**

Respondents were asked whether the careers advice was sought or whether it was offered unsolicited. The responses are shown in Table 56. 66% of respondents, 65% of men and 69% of women, had sought advice, and 71% had received unsolicited advice, 72% of men and 70% of women.

Table 56: Whether careers advice was sought or offered unsolicited by gender

Was advice sought or offered unsolicited?	Male	Female	Overall
Advice sought	23.2%	24.7%	23.6%
Advice offered unsolicited	29.4%	25.3%	28.3%
Both sought and offered unsolicited	42.2%	44.3%	42.7%
Don't know/can't remember	5.2%	5.7%	5.4%
Total	**2435**	**802**	**3266**

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 57. 80% of respondents report having had the chance to practise presentation skills, 55% 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 57: Whether or not respondents have been given the chance to learn about or practise specific skills

Was advice sought or offered unsolicited?	Male (%)	Female (%)	Overall (%)
Presentation skills	79.1%	82.1%	79.9%
Leadership skills	55.3%	52.1%	54.5%
Team working	86.0%	89.9%	86.9%
Total	**2435**	**802**	**3266**

3.9 Respondents' opinions

Respondents were asked how strongly they agreed or disagreed with a number of statements. The results are presented in the tables below.

Table 58: Whether female respondents feel that they have been treated as an equal by their fellow male students

I have been treated as an equal by my fellow male students	Percentage
Strongly agree	36.6%
Agree	45.3%
Neither agree not disagree	12.7%
Disagree	5.0%
Strongly disagree	0.5%
Total	**1096**

Only female respondents were asked whether they felt that they had been treated as an equal by their fellow male students. 82% of respondents strongly agreed or agreed that they had been treated as equals, and 6% disagreed or strongly disagreed.

The responses to statements with which both males and female respondents were asked how much they agreed are shown in Table 59 and are plotted Figure 9. There are some differences between the responses of men and women. For example, men do not agree as strongly as women that, "Women students get as much out of the course as men," or that "Women students integrate as well as men into the course." There is better agreement between men and women in disagreeing that, "The women students on my course lose out," although women disagree more strongly than men. There is also closer matching between the responses of men and women to the statements, "Academic staff give male and female students the same opportunities and support," and, "I feel that the academic staff treat male and female students equally," although men agreed slightly more strongly than women. However it should also be noted that only around 3% of respondents disagreed with either of these latter statements.

Overall these responses suggest men feel more strongly than women that women do not integrate as well as men into engineering and technology courses and therefore lose out.

Interestingly, 69% of men and 60% of women neither agreed nor disagreed that there should be more female lecturers. The responses of men and women to the statement, "My experiences of studying at university have provided me with good role models to encourage me to pursue a career in engineering/technology," were very similar. However the strength of agreement was not as great as for many of the responses: 47% of men and 46% of women agreed with the statement, and 20% of men and 22% of women strongly agreed.

Men were more confident than women that they would make a good engineer or technologist. 50% of men and 47% of women agreed and 37% of men and 28% of women strongly agreed with the statement, "I feel confident that I will make a good engineer/technologist." Again this is an example where overall women appear less confident than men in respect of their ability to undertake a career as an engineer or a technologist.

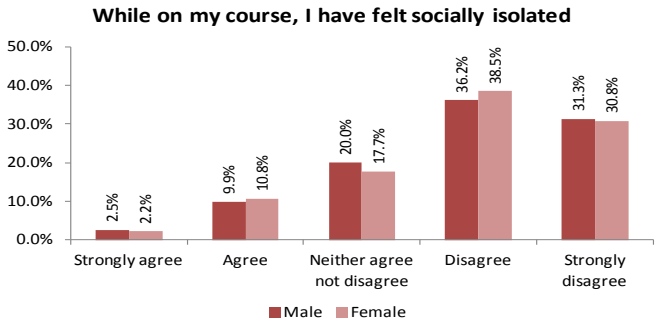
Table 59: How strongly respondents agree or disagree with a number of statements about their experiences on their courses by gender

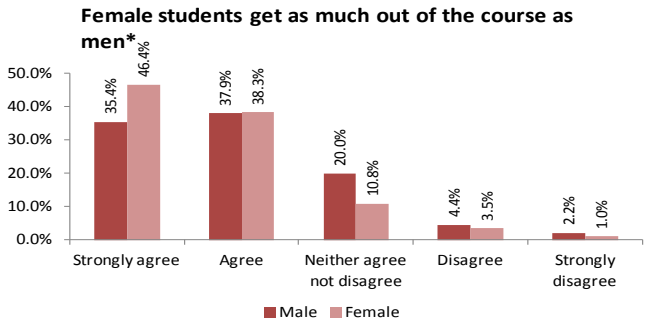
Statement	Gender	Strongly agreed	Agree	Neither agree nor disagree	Disagree	Strongly disagree
While on my course, I have felt socially isolated	Male	2.5%	9.9%	20.0%	36.2%	31.3%
	Female	2.2%	10.8%	17.7%	38.5%	30.8%
	Overall	2.5%	10.1%	19.5%	36.7%	31.1%
Women students get as much out of the course as men*	Male	35.4%	37.9%	20.0%	4.4%	2.2%
	Female	46.4%	38.3%	10.8%	3.5%	1.0%
	Overall	37.9%	37.9%	18.0%	4.3%	1.9%
Women students integrate as well as men into the course**	Male	31.4%	43.6%	17.9%	5.9%	1.2%
	Female	39.9%	42.6%	10.9%	6.1%	0.5%
	Overall	33.3%	43.2%	16.5%	6.0%	1.1%
The women students on my course lose out	Male	0.9%	2.9%	18.2%	37.4%	40.5%
	Female	0.5%	3.2%	16.4%	42.0%	37.9%
	Overall	0.9%	3.0%	17.9%	38.5%	39.7%
Academic staff give male and female students the same opportunities and support	Male	57.9%	31.6%	7.2%	2.4%	0.9%
	Female	52.0%	38.4%	6.8%	2.2%	0.5%
	Overall	56.3%	33.3%	7.2%	2.4%	0.9%
I feel that the academic staff treat male and female students equally	Male	54.7%	36.1%	6.2%	2.3%	0.7%
	Female	49.7%	40.5%	6.4%	3.1%	0.3%
	Overall	53.3%	37.2%	6.5%	2.5%	0.6%
I feel that there should be more female lecturers*	Male	6.5%	12.1%	69.2%	8.5%	3.7%
	Female	12.3%	18.7%	60.3%	7.6%	1.1%
	Overall	8.0%	13.7%	66.9%	8.3%	3.1%
My experiences of studying at university have provided me with good role models to encourage me to pursue a career in engineering/technology	Male	20.0%	46.5%	26.1%	5.7%	1.7%
	Female	21.7%	46.4%	25.7%	4.5%	1.7%
	Overall	20.4%	46.3%	26.1%	5.4%	1.8%
I feel confident that I will make a good engineer/technologist*	Male	36.7%	49.6%	11.4%	1.8%	0.5%
	Female	28.2%	47.4%	19.6%	3.3%	1.5%
	Overall	34.6%	49.0%	13.5%	2.2%	0.8%

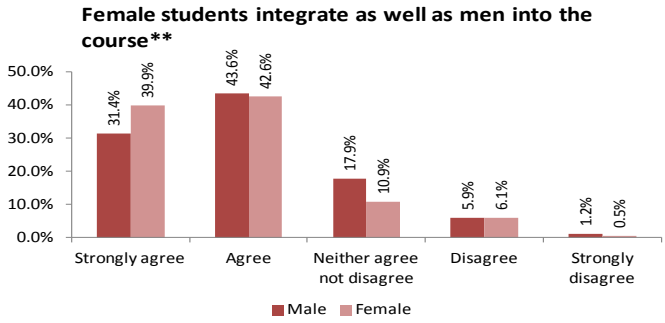
* The distribution of responses by males and females are statistically significantly different ($p<0.05$)

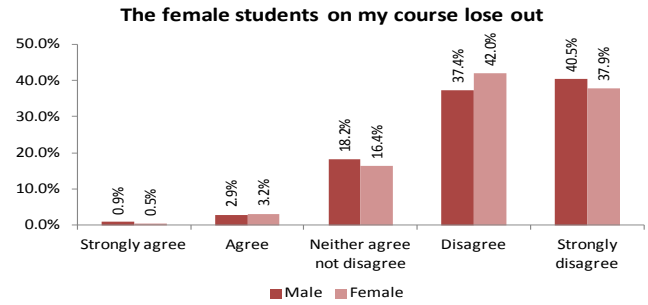
** The distribution of responses by males and females grouped as strongly agree and agree, neither agree nor disagree, and disagree and strongly disagree are statistically significantly different ($p<0.05$)

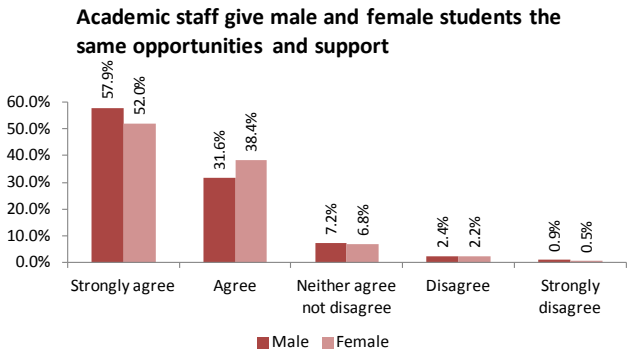
Figure 9: How strongly respondents agree or disagree with a number of statements about their experiences on their courses by gender

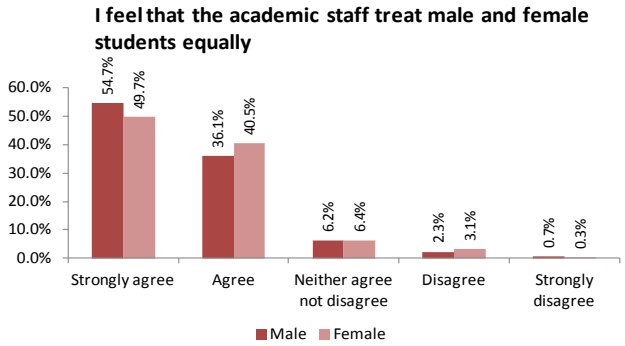


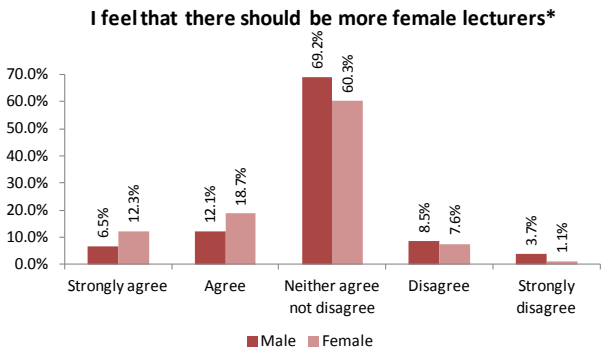


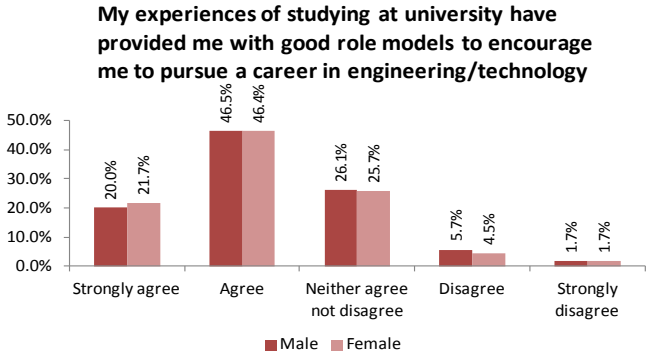


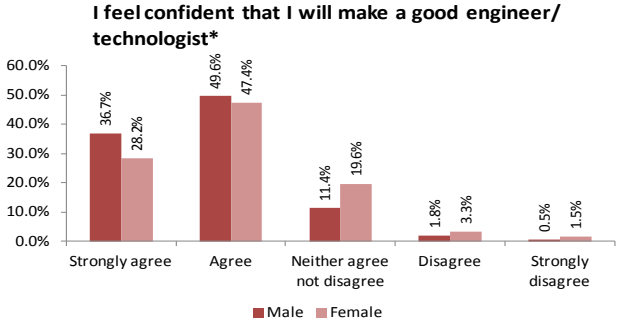












* The distribution of responses by males and females are statistically significantly different ($p<0.05$)

** The distribution of responses by males and females grouped as strongly agree and agree, neither agree nor disagree, and disagree and strongly disagree are statistically significantly different ($p<0.05$)

4. Conclusions and discussion

The main purpose of this study was to:

- investigate any differences between the destinations of men and women six months after completing first degrees in engineering and technology subjects, and
- examine differences between the career ambitions of men and women.

4.1 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 2009/10. At subject group level 15% of engineering subject graduates, 24% of computer science subject graduates and 36% of technology subject graduates were female in 2009/10. Slightly higher proportions of men than women graduate from enhanced first degree courses in engineering and technology. In 2009/10 22% of males and 20% of females graduated from enhanced first degree courses in engineering and technology.

4.1.1 Attainment differences

At the subject group level women are more likely than men to gain first and upper second class degrees. In engineering subjects 64% of women and 58% of men, in computer sciences subjects 55% of women and 50% of men and in technology subjects 68% of women and 56% of men gained first class or upper second class degrees in 2009/10.

4.1.2 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 make up 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.

4.1.3 Socioeconomic status

Although there is variation in the socio economic make up of the student populations graduating in different subjects, and there are variations in the socio economic make up 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 make up of the populations of men and women is similar.

4.1.4 Employment differences

In general, male graduates from engineering first degree courses are more likely to be in work six months after graduation than female graduates, and female graduates were more likely than male graduates to be undertaking some form of further study. When the patterns are examined in terms of graduates from enhanced first degrees and bachelor degrees it is found higher proportions of male and female graduates from enhanced first degree courses are in work than graduates from bachelor degree courses. Correspondingly smaller proportions of men and women are undertaking further study. It is also notable that patterns of activity six months after graduation of male and female graduates are much more similar among enhanced first degree graduates than bachelor degree graduates. It is to be expected that enhanced degree graduates are more likely to be in work as the qualification is at a higher level than the bachelor degree, and enhanced degree graduates are more likely to have graduated with a first class or upper second class degree. In contrast bachelor degree graduates are more likely to undertake some form of further study in order to enhance their qualifications and increase their likelihood of gaining a better job.

4.1.5 Technology versus engineering graduates

For technology graduates the patterns of the activities of men and women six months after graduation are reversed compared to engineering graduates. Female graduates are more likely to be in work than male graduates although similar proportions of male and female graduates are undertaking some form of further study. Very similar proportions of male and female graduates from computer sciences subjects were in work than were undertaking further study.

So there are no clear gender patterns of activity six months after graduation across the different engineering and technology subject groups, although overall women are more likely to be undertaking further study than men. It is important to note that among engineering enhanced first degree graduates the patterns of activity of men and women is much more similar than the patterns of male and female bachelor degree course graduates. This suggests that women with enhanced first degrees are more confident to enter the job market than those with bachelor degrees. Men graduating from enhanced first degree courses are more confident than men graduating from bachelor degree courses, but there is not as big a difference between the proportions of male graduates from enhanced first degree courses and bachelor degree courses in work as there are between the proportions of female graduates from enhanced first degree courses and bachelor degree courses. Women engineering graduates are more likely to undertake further study than men, presumably because a significant proportion of this group of graduates wish to improve their qualifications to give them a better chance in the job market.

It is not clear why the patterns of activity six months after graduation for male and female graduates from technology, computer sciences subjects degree courses differ from those of engineering graduates.

One of the most interesting and significant findings is that for those graduates who studied full or part time and were working six months after graduation but excluding those graduates who were studying and working, men were more likely than women to be in engineering and technology occupations. In engineering subjects 63% of male bachelor degree graduates were in engineering and technology occupations compared to 44% of females. Once again there is less difference between male and female engineering graduates from enhanced first degree courses with almost 80% of men and about 70% of women in engineering and technology occupations. Similar patterns are found for bachelor graduates from technology subjects; 54% of men and 41% of women were in engineering and technology occupations. There was less difference between male and female graduates from computer sciences subjects' bachelor degree courses: 34% of men and 30% of women were in engineering and technology occupations.

Computer sciences subjects' bachelor degree graduates were much more likely to be in non-STEM occupations than in engineering and technology occupations.

4.1.6 Employment type

When considering whether graduates have entered graduate-level roles, it is noticeable that 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. In engineering and technology subjects women are more likely than men to enter non-graduate level jobs. It is possible that a significant proportion of those graduates in non-graduate level occupations have taken temporary jobs while they consider what they will do long term. Nonetheless the gender differences are significant.

Among graduates from each subject group entering full or part time work men are more likely than women to enter professional occupations and women are more likely than men to enter associate professional and technical occupations. While it is not possible to say for sure how men and women ended up in these different roles it is possible that men were more ambitious than women in respect of the roles that they applied for. This correlates with the general observation that women, especially those graduating from engineering bachelor degree courses, appear to be less confident about entering the job market than men, even though women are more likely than men to graduate with first class or upper second class degrees. Of course, it may also be the case that women are less likely to be offered professional occupations than men.

Overall, patterns of graduates' activities six months after completing their courses do vary by subject group and by subject and whether graduates are from enhanced first or a bachelor degree courses. Women are more likely than men to qualify with first class or upper second class degrees, but are less likely to be working six months after graduation and more likely to be undertaking further study. Among those who were working full or part time six months after graduating, men were significantly more likely to be working in engineering and technology occupations than women, although there were large variations between subjects. Furthermore women were also less likely than men to be in graduate level roles, and were less likely than men to be employed in professional occupations.

The patterns observed in the DLHE data suggest that women are less confident than similarly qualified men to enter the job market and may be less likely than men to apply for engineering and technology and/or professional occupation level roles.

4.2 Survey of engineering and technology graduates

The survey findings also suggest that women are less confident than men about undertaking careers in engineering and technology. Unfortunately, although the number of survey responses analysed was reasonably large, 4624, and the proportion of responses from women was 23.9%, once the sample was divided into individual years of study and subjects the number of women in each category was too small for firm conclusions to be drawn. Consequently the majority of conclusions drawn from the data are at the subject group level, or are drawn for the whole sample.

4.2.1 Reasons for course choice

There were gender differences in the reasons selected by respondents for why they decided to undertake their course. Although the most popular reason selected by both respondents who selected one and two

reasons was, "Out of interest and enthusiasm for engineering," women were less likely to have selected this reason than men. Women were also less likely than men to have selected, "I have an aptitude for engineering", and more likely to have selected, "I 'wandered' into this course after my A-levels". Although the question asked why respondents decided to undertake their course it is likely that respondents' experiences during their course will colour their views and this appears to be particularly true for women given that the proportion selecting "Out of interest and enthusiasm for engineering" falls as their year of study increases. The data suggest that women undertaking engineering and technology courses are less enthusiastic than men about engineering and technology and have less confidence in their ability.

Only around 3% of respondents reported that they regretted undertaking their courses and there were no significant differences between the responses of men and women.

4.2.2 Influence of work experience

The survey data suggest that work experience has a key role to play in reinforcing respondents' commitment to careers in engineering and technology. Overall 69% of men and 67% of women who had undertaken at least one work placement or internship during their course were more intent on pursuing a career in engineering/technology. There was also a clear pattern that the more positive a respondent's experiences during their work placement or internship the more intent they were on pursuing a career in engineering/technology. Conversely, the less satisfactory a work placement the less intent respondents were on pursuing a career in engineering/technology. It should be noted that the majority of respondents reported broadly positive work placement or internship experiences. There were no significant gender differences between the work placement or internship experiences of men and women.

One other possibility needs to be considered. It is possible that a number of respondents who are more committed to a career as an engineer or technologist are also more likely to undertake work placements and internships. Nonetheless the quality of the work placement does affect respondents' likelihood to state that their work experience has made them more or less intent on pursuing a career in engineering or technology.

Overall 89% of respondents believed they possessed the majority of general skills that employers look for. The proportion of respondents who believed they possessed the majority of general skills rose the longer time they spent on their course. There were no significant gender differences. In contrast a significantly higher proportion of men than women believed they have the majority of technical skills that employers often look for. Correspondingly a higher proportion of women than men believe that they will possess those skills by the time they complete their course although the total proportion of men who believe they have or believe they will have those skills is higher than the total proportion of women. These results do not suggest that a higher proportion of men than women actually have the technical skills that employers look for, but they do suggest that men are more confident than women that they have the technical skills required for employment.

4.2.3 Undergraduate course experiences

About 68% of respondents reported that their experiences as an engineering/technology student had made them more intent on pursuing a career in engineering/technology. This proportion varied little with year of study and there was little difference between men and women. The proportions of men and women with doubts about pursuing a career in engineering or technology, or definitely not wanting to pursue a career in engineering or technology, did rise from the first year of study onwards but again there were no significant

differences between men and women. There are significant differences between the overall responses of those who have and those have not undertaken work placements with those respondents who have undertaken a work placement being more intent on pursuing a career in engineering/technology, and although the sample sizes are low, the effect appears to be greater for women than men.

Respondents who had not already accepted a job offer were asked whether they intended to seek employment as an engineer/technologist or undertake further study in engineering/technology on completion of their studies. Particularly for respondents in their final year, there were significant differences in the responses of those who had and had not undertaken at least one period of work placement or an internship. Those who had under taken a work placement being more intent on seeking employment in, or studying further, engineering/technology.

It is noticeable that particularly in the final year there is a statistically significant difference between the overall responses of those who have and have not undertaken an industrial placement. There is also a statistically significant difference between the responses of men and women in their final year who have not undertaken a work placement or internship, with men being more likely than women to state that they intend to seek employment as an engineer or technologist or undertake further study in engineering/technology. It is worth noting that 22% of women in their final year who have not undertaken a period of work placement or an internship state that they do not intend to seek employment as an engineer/technologist or undertake further study in engineering/technology, compared to 8% of women in their final year who have had a period of work placement or an internship. The evidence is that work placements have a greater effect on reinforcing the career intentions of women than men to pursue a career as an engineer/technologist.

It is interesting to note that of the respondents who had not yet accepted a job offer only 2.0% of men and 2.3% of women stated that they did not intend to seek a role which required and/or makes use of their engineering or technology background. This is in line with the finding that only 3.4% of men and 3.6% of women regret undertaking their courses.

In general the intention to undertake further study falls as the year of study increases. Further analysis also shows that those registered for bachelor degree courses are significantly more likely to intend to undertake further study, in particular masters courses, than those registered for enhanced first degrees.

4.2.4 Employment intent and career awareness

Respondents who had not already accepted a job were asked what they were most likely to do once they had completed their course. Females were less likely than men to express an intention to work as an engineer or technologist in industry or commerce. Although the numbers of females in their final year are too small to draw any firm conclusions females were less likely than men to express an intention to work as an engineer or technologist in industry or commerce; whether or not they had under taken a work placement. Among the group that had undertaken a work placement or an internship and were in their final year, 68% of men and 51% of women responded that they were most likely to work as an engineer or technologist in industry or commerce.

There is relatively little difference in the ranking of factors which are important to men and women in their careers. Both men and women ranked, "A workplace culture where all staff are treated well" the most highly and, " Working at a relaxed pace," the lowest. This suggests that in judging whether or not a job is good, male and female respondents apply essentially the same criteria excepting that women are less likely than men to want a job in industry or commerce.

Overall 89% of respondents rate their awareness of career options as adequate or better. In the final year 93% of respondents rated their awareness as adequate or better compared to 87% in other years. Comparing those respondents who had received careers support with those that had not, 96% of final year respondents who had received support rated their awareness as adequate or better, compared to 82% of those who had not received support. There were no significant differences between the responses of men and women 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 female respondents. Of those in other years, 91% of respondents who had received support rated their awareness as adequate or better compared to 79% of those who had not received support. There were significant differences between the responses of men and women who had not received careers advice with a higher proportion of men than women rating their awareness of career options as adequate or better.

Among respondents in their final year the reported awareness of career options was very similar for men and women who had received some form of careers support, but was markedly different among those that had not received advice, albeit that the sample sizes were too small for the difference to be statistically significant. Although these data may not represent a real difference in awareness of career options the data do suggest that **women are less confident than men in respect of career options available to them and that women require more careers support than men to build up their confidence.**

The picture painted by the respondents' survey responses is that women are less confident about their technical abilities than men and that overall women are less likely than men to intend to seek employment as an engineer or technologist; although relatively small proportions of both men and women state that they regret undertaking their course or that they do not intend to seek a role that requires or makes use of their engineering or technology background. It is also clear that **undertaking a work placement or internship generally reinforces respondents' intentions to seek employment as an engineer or technologist but this effect appears to be greater for women than men.** Work experience in all likelihood demonstrates to respondents that they really do enjoy working as an engineer or technologist whereas the academic environment does not necessarily give respondents insight into working. It is also possible that respondents realise that they do have the ability to work as an engineer or technologist whereas studying the subject at university may not build that confidence. **Given that women have less confidence than men in their technical abilities it is likely that work experience will build the confidence of women more than men, and this is what is observed.**

The evidence is that careers advice and support also has a greater effect on building the confidence of women than men in respect of the career options open to them. However although men and women essentially rank the importance of various factors in their career similarly, women in their final year are less likely than men to say that they are most likely to be working as an engineer or technologist in industry or commerce on completion of their course.

The evidence from the survey that women are less confident in their technical abilities than men and that they are less likely to seek a role in industry or commerce, does correlate with the analysis of HESA data on the destination of leavers from higher education which shows that men are more likely to be in engineering and technology roles than women six months after completing their courses. What is not so clear though is **why men are more likely than women to be in professional occupations and women are more likely than men to be in associate professional roles.** It is possible that women are less likely than men to apply for professional occupations. It should be noted however that reasonably large proportions of men and women, albeit higher promotions of women than men, completing bachelor degree courses are in non-graduate roles. A reasonable number of these individuals are probably in temporary roles while they

consider what they will do in the long term. The recent BIS report[17] considers the sometimes complex career paths of STEM graduates in non-STEM roles and suggests that those choosing to take time out or to enter temporary work were amongst the least 'decided' and potentially the most likely to drift away from STEM. The report also concluded that graduates' eventual job destinations often did not correlate simply with their career thinking before graduation; significant numbers who had applied only for STEM jobs when finishing at university ended up outside STEM. The reverse was also the case with some who had only applied for non-related jobs at that time ending up in STEM jobs.

Irrespective of the initial destinations of engineering and technology graduates six months after graduation, it is likely to be two or three years before graduates have settled into a clear career, excluding, of course, those graduates who went on to further study.

4.2.5 Course experiences and influences

Finally, the survey examined the opinions of respondents about some aspects of their course and experiences.

- A large majority of female respondents agreed or strongly agreed that that they had been treated as an equal by their fellow male students
- Both male and female responses agree to the same extent that academic staff give male and female students the same opportunities and support, and that they treat male and female students equally.

Interestingly though men do not agree as strongly as women that women integrate as well as men in their courses or that they get as much out of their courses as men.

Neither men nor women had strong feelings about whether or not there should be greater numbers of female academics, and around 67% of men and 68% of women agreed or strongly agreed that their experiences of studying at university had provided them with good role models to encourage them to pursue a career in engineering or technology.

The impression is that the majority of male and female students feel that they are treated equally by staff and fellow students and women feel they get as much out of their courses as men. **Men however do not feel as strongly as women that women get as much out of their courses as men**.

Finally, to underline the theme from the survey that women are less confident of their technical abilities than men, men were more confident than women that they would make a good engineer or technologist. 87% of men and 75% of women agreed or strongly agreed that they felt confident that they would make a good engineer or technologist.

4.3 Comparison of survey respondents' career intentions with DLHE data

Table 60 and Table 61 present comparisons for engineering subject group graduates of the career intentions of survey respondents with the destinations of graduates six months after completion of their courses. The comparison is for engineering students only as the numbers of final year, see Table 61, female respondents for the other subjects groups were too small.

[17] STEM Graduates in Non STEM Jobs, Department for Business, Innovation and Skills, 2011

In order to carry out the comparison, the data on the nature of the jobs or further study accepted by survey respondents were combined with the data on what respondents who had not yet accepted a job offer or an offer to undertake further study thought they were most likely to be doing on completion of their courses. Respondents who did not know what they were likely to be doing were excluded from the analysis. DLHE data on the main activities of engineering graduates were analysed but those graduates unemployed or who explicitly refused to answer the DHLE questionnaire were excluded from the analysis.

Table 60: A comparison by gender between the most likely initial destinations of all home registered survey respondents on engineering courses and the main activities of UK domiciled students six months after completing first degree courses in engineering and technology subjects in 2008/09 and 2009/10 combined*

Main activity		Most likely initial destinations of all survey respondents on engineering courses**			Main activities of students six months after completing first degrees in engineering subjects in 2008/09 and 2009/10***		
		Male	Female	Overall	Male	Female	Overall
Work	E&T Role	1191	341	1501	7715	865	8580
		73.8%	75.6%	75.5%	49.5%	39.2%	48.3%
	Non-E&T Role	109	27	114	3525	605	4130
		6.8%	6.0%	5.7%	22.6%	27.4%	23.2%
Further study only		276	74	326	2430	410	2845
		17.1%	16.4%	16.4%	15.6%	18.6%	15.9%
Work and further study					2000	200	1300
					7.0%	9.1%	7.3%
Not available for employment		38	9	47	615	95	705
		2.4%	2.0%	2.4%	3.9%	4.3%	4.0%
Other					200	30	230
					1.3%	1.4%	1.3%
Total		1614	451	1988	15625	2210	17835

* The numbers of students completing enhanced degree courses in technology and computer science were too few to present data. Counts of students are rounded to the nearest 5.

** Results were calculated by combining the data on the nature of the roles or further study accepted by respondents who had already accepted a job or a place for further study with the most likely initial activities of the respondents who had not yet accepted a job or place for further study. The responses of those respondents who did not know what they were likely to be doing on completion of their course were not included in the calculation.

*** The proportions of graduates in each category of "Main Activity" are calculated ignoring those who were assumed to be unemployed or who explicitly refused to answer the DHLE questionnaire. The proportions undertaking Engineering and Technology roles are calculated for those graduates whose Main Activities were "Full time paid work only (including self-employed)", "Part time paid work only" or "Voluntary/unpaid work only". "E&T roles" are taken as Engineering and Technology, and, Science and Mathematics occupations combined and "Non-E&T roles" are taken as Non-STEM occupations. (Source: HESA Student Data)

Table 61: A comparison by gender between the most likely initial destinations of home registered survey respondents in the final year of engineering courses and the main activities of UK domiciled students six months after completing first degree courses in engineering and technology subjects in 2008/09 and 2009/10 combined*

Main activity		Most likely initial destinations of survey respondents in the final year of engineering courses**			Main activities of students six months after completing first degrees in engineering subjects in 2008/09 and 2009/10***		
		Male	Female	Overall	Male	Female	Overall
Work	E&T Role	233	81	314	7715	865	8580
		74%	72%	73%	49.5%	39.2%	48.3%
	Non-E&T Role	33	9	42	3525	605	4130
		10%	8%	10%	22.6%	27.4%	23.2%
Further study only		39	18	57	2430	410	2845
		12%	16%	13%	15.6%	18.6%	15.9%
Work and further study					2000	200	1300
					7.0%	9.1%	7.3%
Not available for employment		12	5	17	615	95	705
		4%	4%	4%	3.9%	4.3%	4.0%
Other					200	30	230
					1.3%	1.4%	1.3%
Total		317	113	430	15625	2210	17835

* The numbers of students completing enhanced degree courses in technology and computer science were too few to present data. Counts of students are rounded to the nearest 5.

** Results were calculated by combining the data on the nature of the roles or further study accepted by respondents who had already accepted a job or a place for further study with the most likely initial activities of the respondents who had not yet accepted a job or place for further study. The responses of those respondents who did not know what they were likely to be doing on completion of their course were not included in the calculation.

*** The proportions of graduates in each category of "Main Activity" are calculated ignoring those who were assumed to be unemployed or who explicitly refused to answer the DHLE questionnaire. The proportions undertaking Engineering and Technology roles are calculated for those graduates whose Main Activities were "Full time paid work only (including self-employed)", "Part time paid work only" or "Voluntary/unpaid work only". "E&T roles" are taken as Engineering and Technology, and, Science and Mathematics occupations combined and "Non-E&T roles" are taken as Non-STEM occupations. (Source: HESA Student Data)

It was not possible to compare directly all the main activities indentified in the DLHE data with the survey data however the data in Table 61 do allow some interesting comparisons:

- 74% of male and 72% of final year female respondents thought that they were likely to be working in engineering and technology roles when completing their studies while the DLHE data shows that 50% of male and 39% of female graduates in 2008/09 and 2009/10 were working in engineering and technology roles six months after completing their courses
- While only 10% of male and 8% of female respondents expected to be working in non-engineering and technology roles, DLHE data shows that 23% of male and 27% of female graduates are in such roles

As commented upon earlier in the report, it is likely that a significant proportion of those graduates in the non- engineering and technology roles are in what they regard as temporary roles. This is under lined by the data presented in Table 62 which shows that 54% of male and 56% of female graduates in non-STEM occupations are in non-graduate roles, compared to 7% of male and 6% of female graduates in STEM occupations.

The most notable issue arising from the comparisons is that while similar proportions of male and female final year respondents expect to be working in engineering roles after completing their courses, about 75%, in reality a significantly smaller proportion of female than male graduates are working in engineering roles six months after completing their courses.

Table 62: Proportions of UK domiciled students in graduate and non-graduate level occupations undertaking engineering and technology and non-engineering and technology roles six months after completing first degree courses in engineering and technology subjects and whose main activities were "Full time paid work only (including self-employed)", "Part time paid work only" or "Voluntary/unpaid work only" in 2008/09 and 2009/10 combined

Occupations	Graduate occupations	Male	Female	Overall
Engineering and technology occupations	Graduate	92.8%	93.9%	92.9%
	Non-Graduate	7.2%	6.1%	7.1%
Non-Engineering and technology occupations	Graduate	46.2%	44.0%	45.9%
	Non-Graduate	53.8%	56.0%	54.1%

This observation may be linked to the gender-related issues identified from the survey which suggested that women had less confidence in their technical abilities and in their knowledge of the job market than men. The lower confidence of women might make them less likely than men to apply for engineering and technology roles, but the data available in this study do not allow this issue to be investigated. Similarly although it is not possible to know for sure whether or not the men and women who apply for such roles are equally likely to secure and accept offers some data are available from a survey of companies' recruitment practices run as part of the SET to Lead project.

Of 11 companies surveyed, seven report routinely monitoring the proportions of men and women who apply for jobs and the proportions of men and women that progress through the recruitment process. Three companies supplied recruitment data and in all three cases the proportion of women who accepted job offers was in line with the proportion of women who applied. However, companies could not provide a breakdown of whether roles were technical or not. One company did state that women disproportionately applied for corporate roles. It is likely that corporate roles do not require technical backgrounds and so the proportion of females in the pool of candidates for corporate roles will be larger than that for technical roles.

Six of the seven companies that reported they monitor data stated that they compare the data with that from earlier years. It is not known, however, whether companies make any attempt to monitor whether applications match the gender make up of the candidate pool. It is likely however that companies do not do this.

Although the evidence is sketchy and more work is needed the company survey data provides some circumstantial evidence that women who do apply for roles are as likely as men who apply for similar roles to be offered and accept roles. As referenced earlier, the recent study for BIS on STEM graduates in non-STEM jobs makes it clear that the paths followed by graduates into employment are complex. However, the survey data in this study does suggest that women are less confident in their technical abilities than men, and consequently the suspicion must be that women are less likely than men to apply for engineering

and technology roles during their course or shortly afterwards. These findings are in line with those in the report published by CRAC in 2007.[18]

Work by Caroll Seron[19] from the University of California, Irvine confirms that women's lack of *professional role confidence* (an individual's confidence in their ability to successfully fulfil the roles, competencies and identity features of a profession) compared to men's reduces their likelihood of remaining in engineering majors (courses) and careers. Soron's research found that professional role confidence predicts behavioural and intentional persistence and that women's relative lack of this confidence contributes to their attrition.

It is not known what proportion of those graduates in non-engineering and technology roles six months after completing their courses eventually take employment in engineering and technology roles but again, as the BIS report makes clear, those who initially do not enter STEM roles are more likely than not to stay in non-STEM roles.

In conclusion this research confirms previous work that women are less likely than men to be working in engineering and technology roles six months after graduating from undergraduate engineering and technology courses even though, for example, women in the final year of undergraduate engineering courses are as likely as men to express the intention to work in engineering and technology roles. The reasons for these differences appear to be related to the relatively lower confidence of women in their technical abilities and in the career options open to them. The data also suggests that undertaking good quality industrial placements and receiving good careers advice does increase women's confidence and hence it must be assumed their likelihood of applying successfully for engineering and technical roles.

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[18] The career thinking of UK engineering undergraduates, CRAC, 2007

[19] E. Cech, B. Rubineau, S. Sulbey and C. Seron, Professional Role Confidence and Gendered Persistence in Engineering, American Sociological Review, 76(5), 641-666.

5. Recommendations

The recommendations flowing from the study findings are presented alongside the stakeholder(s) considered to be the most appropriate to take them forward.

The relatively lower confidence of women than men in their technical abilities and in the career opportunities open to them is of paramount importance. While the anecdotal evidence from employers is that women perform as well as men during the interview and assessment process, the data show that women are less likely than men to end up on a technical career path. Improving the career confidence of women to support their technical competence is a key priority and the following recommendation will help realise this:

9. Undertaking work placements and internships are shown in the study to correlate with increased confidence and likelihood of realising a STEM job. These placements must be of a high quality and offer a positive experience. A "code of practice" for employers to sign up to should be developed setting out the key elements of positive work placements. In addition a related checklist setting out the key elements of positive work placements could support students in researching suitable work placements.

   ► *HEIs, Engineering and technology employers, Engineering and technology trade bodies, Student groups*

10. Good quality careers advice provided through careers services is vital and in addition opportunities for careers support should be brought closer to engineering and technology students. Women-only or women-targeted careers sessions should be held in engineering and technology departments, and the possibility of incorporating careers modules into courses in order to build the career confidence of women in particular should be considered seriously.

    ► *HEIs*

11. Where work placements are a voluntary element of a course HEIs should encourage students to undertaken these, stressing the positive impact that undertaking workplacements has on employability.

    ► *HEIs*

12. Internship programmes enable students to gain experience of working in technical roles and opportunities for these should be increased. Given that good quality internships are likely to have a positive effect on students' attitudes towards careers in engineering and technology roles, some funding should be provided through central government for these programmes. Internships provided should be paid, but perhaps government funding could be used to top up students' salaries so that employers can employ a larger number of interns.

    ► *HEIs, Engineering and technology employers, BIS*

13. Staff in HEI engineering and technology departments should be made aware that women are likely to have lower "career confidence" than men in that they are likely to be less confident in their technical abilities and in the career opportunities open to them and that this translates into women being less likely than men to end up in technical jobs.

    ► *HEIs, Engineering and technology departments, Professional bodies*

14. Engineering and technology employers and learned societies should find opportunities to engage with female engineering and technology undergraduates. For example, employers should consider holding women's career days/open days, the purpose of which should be to tackle head-on women's relative lack of confidence.

    ► *Engineering and technology employers, Engineering and technology learned societies*

15. The visibility of women in senior technical roles needs to be increased so the women undergraduates see that women do have successful careers as engineers and technologists.

    ► *Engineering and technology employers, HEIs*

16. To gain greater insight into the undergraduate experience, a diary study, as in recent work by Seron, would deepen the appreciation of the career paths of male and female engineering undergraduates.

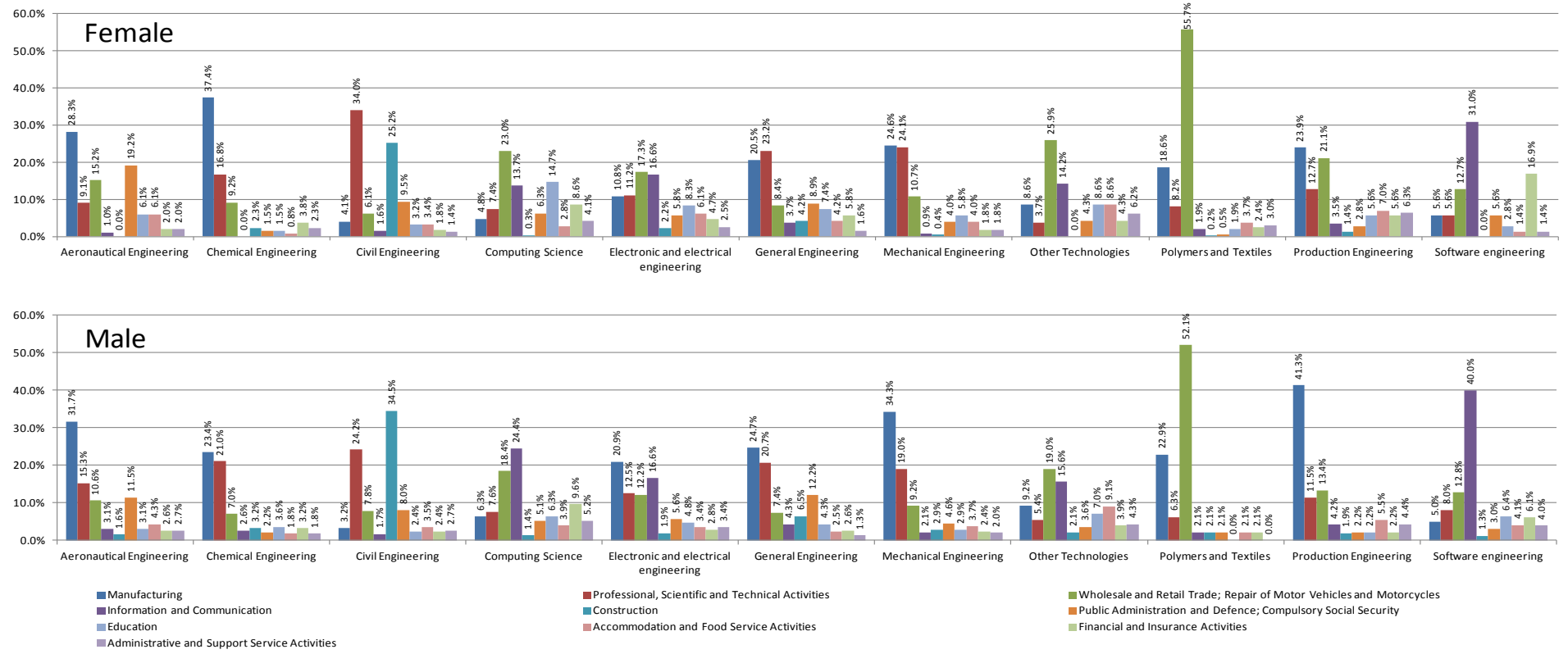
    ► *BIS, Royal Academy of Engineering*

6. Appendices

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

Table 63: The occupations of full and part time UK domiciled students completing first degree courses in engineering and technology subjects who entered full or part work paid work only by gender 2008/09 and 2009/10 combined (Source: HESA DLHE Data)

Standard Occupational Classification	Engineering Subjects		Technology Subjects		Computer Sciences Subjects	
	Female	Male	Female	Male	Female	Male
Managers and Senior Officials	**9.1%**	**8.2%**	**11.6%**	**8.0%**	**8.8%**	**9.1%**
Corporate managers	6.9%	5.9%	8.2%	6.1%	6.5%	6.9%
Managers and proprietors in agriculture and services	2.2%	2.2%	3.5%	1.9%	2.3%	2.2%
Professional Occupations	**56.3%**	**48.7%**	**20.2%**	**9.4%**	**41.3%**	**56.3%**
Business and public service professionals	2.6%	3.7%	0.8%	1.0%	2.9%	2.6%
Health professionals	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%
Science and technology professionals	52.4%	42.5%	16.7%	6.4%	35.4%	52.4%
Teaching and research professionals	1.3%	2.4%	2.8%	1.9%	3.0%	1.3%
Associate Professional and Technical Occupations	**14.6%**	**16.9%**	**30.2%**	**43.6%**	**22.8%**	**14.6%**
Business and public service associate professionals	5.4%	8.3%	8.0%	21.7%	7.8%	5.4%
Culture, media and sports occupations	4.0%	4.8%	16.6%	18.1%	4.7%	4.0%
Health and social welfare associate professionals	0.1%	0.4%	0.1%	0.3%	0.2%	0.1%
Protective service occupations	0.2%	0.3%	0.7%	0.5%	0.4%	0.2%
Science and technology associate professionals	4.8%	3.1%	4.8%	2.9%	9.7%	4.8%
Administrative and Secretarial Occupations	**3.0%**	**7.2%**	**6.0%**	**9.7%**	**5.9%**	**3.0%**
Administrative occupations	2.8%	5.6%	5.6%	8.1%	5.7%	2.8%
Secretarial and related occupations	0.2%	1.6%	0.4%	1.7%	0.2%	0.2%
Skilled Trades Occupations	**2.4%**	**0.7%**	**4.2%**	**2.0%**	**1.5%**	**2.4%**
Skilled agricultural trades	0.2%	0.1%	0.3%	0.1%	0.1%	0.2%
Skilled construction and building trades	0.3%	0.0%	0.5%	0.0%	0.0%	0.3%
Skilled metal and electrical trades	1.3%	0.5%	1.2%	0.0%	0.9%	1.3%
Textiles, printing and other skilled trades	0.5%	0.2%	2.3%	1.9%	0.5%	0.5%
Personal Service Occupations	**0.9%**	**2.4%**	**1.9%**	**2.0%**	**1.6%**	**0.9%**
Caring personal service occupations	0.4%	1.8%	0.8%	1.1%	0.9%	0.4%
Leisure and other personal service occupations	0.6%	0.6%	1.1%	0.8%	0.7%	0.6%
Sales and Customer Service Occupations	**7.5%**	**10.3%**	**13.7%**	**19.2%**	**12.8%**	**7.5%**
Customer service occupations	1.5%	1.6%	2.6%	2.5%	2.7%	1.5%
Sales occupations	6.0%	8.6%	11.1%	16.7%	10.0%	6.0%
Process, Plant and Machine Operatives	**1.3%**	**0.5%**	**1.5%**	**0.6%**	**0.7%**	**1.3%**
Process, plant and machine operatives	0.7%	0.5%	0.9%	0.5%	0.3%	0.7%
Transport and mobile machine drivers and operatives	0.5%	0.0%	0.6%	0.1%	0.4%	0.5%
Elementary Occupations	**4.9%**	**5.1%**	**10.7%**	**5.6%**	**4.7%**	**4.9%**
Elementary administration and service occupations	3.9%	5.1%	8.4%	5.5%	4.0%	3.9%
Elementary trades, plant and storage related occupations	1.0%	0.1%	2.3%	0.1%	0.7%	1.0%
Grand Total	**11610**	**1515**	**1590**	**965**	**2770**	**11610**



	Aeronautical Engineering	Chemical Engineering	Civil Engineering	Computing Science	Electronic and electrical engineering	General Engineering	Mechanical Engineering	Other Technologies	Polymers and Textiles	Production Engineering	Software engineering
Female	100	130	445	605	275	190	225	160	575	140	70
Male	940	500	2580	1535	2560	1265	3100	1050	50	685	705

Figure 10: Proportion of full and part time UK domiciled students completing first degree courses in engineering and technology subjects who entered full time or part paid work only by employers type (SIC sector), subject and gender 2008/09 and 2009/10 combined

6.2 Appendix B: Subjects studied by respondents to the survey of engineering and technology graduates

Table 64: Subject(s) and gender of respondents to the survey of engineering and technology graduates

Subject Group/Subject	Male	Female	Do not wish to say	Total
Engineering				
Acoustic Engineering	8			8
Aeronautical/Aerospace Engineering	332	73	2	407
Aeronautical/Aerospace Engineering & Civil/Structural Engineering	1			1
Aeronautical/Aerospace Engineering & Electrical/Electronic Engineering	6	1		7
Aeronautical/Aerospace Engineering & Engineering/Industry Design	1			1
Aeronautical/Aerospace Engineering & General Engineering	2			2
Aeronautical/Aerospace Engineering & Maritime Technology	2			2
Aeronautical/Aerospace Engineering & Mechanical Engineering	42	7		49
Aeronautical/Aerospace Engineering & Production/Manufacturing Engineering	3			3
Architecture/Architectural Environment Engineering/Built Environment	16	17	2	35
Architecture/Architectural Environment Engineering/Built Environment & Civil/Structural Engineering	3			3
Automotive Engineering	58	4		62
Automotive Engineering & Engineering/Industry Design	1	1		2
Automotive Engineering & Mechanical Engineering	3			3
Chemical/Process Engineering	173	115	2	290
Chemical/Process Engineering & Engineering/Industry Design	1	1		2
Chemical/Process Engineering & General Engineering		1		1
Chemical/Process Engineering & Mechanical Engineering	2			2
Civil/Structural Engineering	455	202	3	660
Civil/Structural Engineering & Engineering/Industry Design	9	3		12
Civil/Structural Engineering & General Engineering	4	2		6
Civil/Structural Engineering & Mechanical Engineering	2	1		3
Civil/Structural Engineering & Production/Manufacturing Engineering	1			1
Electrical/Electronic Engineering	421	71	2	494
Electrical/Electronic Engineering & Engineering/Industry Design	6		1	7
Electrical/Electronic Engineering & Materials Science/Metallurgy	3			3
Electrical/Electronic Engineering & Mechanical Engineering	59	4	1	64
Engineering/Industry Design	94	59	3	156
Engineering/Industry Design & Mechanical Engineering	32	10		42
Engineering/Industry Design & Production/Manufacturing	5	5	1	11

Engineering				
General Engineering	55	19	3	77
General Engineering & Automotive Engineering	1			1
General Engineering & Mechanical Engineering	9	4		13
Mechanical Engineering	679	120	8	807
Mechanical Engineering & Production/Manufacturing Engineering	16	4		20
Production/Manufacturing Engineering	16	19		35
Technology				
Biomedical Engineering	7	22	1	30
Biotechnology	19	11	1	31
Biotechnology & Materials Science/Metallurgy	2	5		7
Environmental Technology	6	7		13
General Engineering & Production/Manufacturing Engineering	3	1		4
Maritime Technology	43	8		51
Maritime Technology & Mechanical Engineering	3			3
Materials Science/Metallurgy & Minerals Technology	1			1
Minerals Technology	2			2
Computer Science				
Computing Science/Artificial intelligence/Software engineering/Information Technology (IT)	657	210	8	875
Computing Science/Artificial intelligence/Software engineering/Information Technology (IT) & Mathematics	5	1	1	7
Engineering and Technology				
Aeronautical/Aerospace Engineering & Biotechnology	1			1
Aeronautical/Aerospace Engineering & Materials Science/Metallurgy	2			2
Biotechnology & Chemical/Process Engineering	1	7	1	9
Biotechnology & Civil/Structural Engineering	1			1
Biotechnology & Engineering/Industry Design		1		1
Biotechnology & General Engineering	2	2		4
Biotechnology & Maritime Technology	1	1		2
Biotechnology & Mechanical Engineering	3	1		4
Biotechnology & Minerals Technology		1		1
Chemical/Process Engineering & Materials Science/Metallurgy	1	2		3
Chemical/Process Engineering & Minerals Technology		1		1
Civil/Structural Engineering & Environmental Technology		1		1
Civil/Structural Engineering & Maritime Technology	1			1
Civil/Structural Engineering & Materials Science/Metallurgy	1			1
Civil/Structural Engineering & Minerals Technology	1			1
Electrical/Electronic Engineering & General Engineering	10			10
Engineering/Industry Design & General Engineering	8	1		9
Engineering/Industry Design & Maritime Technology	2	1		3
Engineering/Industry Design & Materials Science/Metallurgy	5			5
Engineering/Industry Design & Minerals Technology	1			1

Environmental Technology & Materials Science/Metallurgy	1			1
General Engineering & Maritime Technology	2			2
General Engineering & Materials Science/Metallurgy		2		2
Maritime Technology & Materials Science/Metallurgy	3			3
Materials Science/Metallurgy	81	50	2	133
Materials Science/Metallurgy & Mechanical Engineering	2			2
Materials Science/Metallurgy & Production/Manufacturing Engineering		1		1
Engineering and Computer Sciences				
Aeronautical/Aerospace Engineering & Computing Science/Artificial intelligence/Software engineering/Information Technology (IT)	3			3
Chemical/Process Engineering & Computing Science/Artificial intelligence/Software engineering/Information Technology (IT)	3			3
Computing Science/Artificial intelligence/Software engineering/Information Technology (IT) & Electrical/Electronic Engineering	66	10		76
Computing Science/Artificial intelligence/Software engineering/Information Technology (IT) & Engineering/Industry Design	5	4		9
Computing Science/Artificial intelligence/Software engineering/Information Technology (IT) & General Engineering	5	2		7
Computing Science/Artificial intelligence/Software engineering/Information Technology (IT) & Mechanical Engineering	3			3
Computing Science/Artificial intelligence/Software engineering/Information Technology (IT) & Production/Manufacturing Engineering	1			1
Computer Science and Technology				
Computing Science/Artificial intelligence/Software engineering/Information Technology (IT) & Maritime Technology	1			1
Grand Total	**3486**	**1096**	**42**	**4624**

6.3 Appendix C: Most popular potential employers of respondents

Respondents were asked to name the top three companies for which they would like to work. The most popular choices of those respondents who answered the question are shown in Table 65. The choices expressed by men and women are different but this is related to the different subject make up of the two sets of respondents: men are more likely than women to be reading mechanical engineering or electrical/electronic engineering.

Table 65: The most popular companies for which respondents expressed an interest in working

Rank	Male (N=2669)		Female (N=734)	
1	Rolls Royce	15.0%	Arup	9.5%
2	BAE Systems	9.9%	Google	7.5%
3	Google	8.8%	Microsoft	7.5%
4	Microsoft	8.1%	Rolls Royce	7.2%
5	BP	6.7%	Atkins	5.6%
6	Jaguar Land Rover	6.1%	BP	5.2%
7	Apple	5.8%	Apple	4.5%
8	Arup	5.5%	Balfour Beatty	4.2%
9	IBM	5.1%	IBM	4.2%
10	Airbus	4.4%	Airbus	4.1%

To illustrate this point Table 66 presents data on the companies named by respondents reading mechanical engineering. Although the number of women answering the question is low relative to the number of men, the company lists for men and women are very similar, with Rolls Royce toping both lists. Seven companies are common to the top ten choices of both men and women.

Table 66: The most popular companies for which respondents reading mechanical engineering expressed an interest in working

Rank	Male (N=521)		Female (N=74)	
1	Rolls Royce	31.5%	Rolls Royce	20.3%
2	Jaguar Land Rover	16.9%	BP	10.8%
3	BAE System	16.5%	Jaguar Land Rover	10.8%
4	McLaren	12.3%	McLaren	10.8%
5	BP	9.0%	Shell	10.8%
6	Aston Martin	6.7%	Airbus	8.1%
7	Shell	6.5%	BAE Systems	8.1%
8	Airbus	6.3%	ARUP	4.1%
9	BMW	3.8%	Caterpillar	4.1%
10	Audi	2.7%	EDF Energy	4.1%

Table 67 presents the data on the companies named by respondents reading civil/structural engineering. The top five companies named by both men and women are the same and eight companies are common to the lists of ten most popular companies named by men and women.

Table 67: The most popular companies for which respondents reading civil/structural engineering expressed an interest in working

Rank	Male (N=328)		Female (N=130)	
1	Arup	37.5%	Arup	43.1%
2	Balfour Beatty	24.4%	Balfour Beatty	23.8%
3	Atkins	19.8%	Atkins	21.5%
4	Mott MacDonald	14.3%	Mott MacDonald	13.1%
5	Laing O'Rourke	8.2%	Laing O'Rourke	9.2%
6	Buro Happold	5.8%	BAM Nuttall	6.2%
7	BP	5.2%	Aecom	5.4%
8	BAM Nutall	4.9%	Network Rail	4.6%
9	Aecom	4.3%	Buro Happold	3.8%
10	Kier	3.4%	Costain	3.1%

The data for the companies named by respondents reading chemical/process engineering are presented in Table 68. Oil companies fill the top three places in the lists for men and women, although the most popular company named by men and women is different. Seven companies are common the lists of ten most popular companies named by men and women.

Table 68: The most popular companies for which respondents reading chemical/process engineering expressed an interest in working

Rank	Male (N=134)		Female (N=74)	
1	BP	46.3%	Exxon Mobil	29.7%
2	Exxon Mobil	44.9%	Shell	29.7%
3	Shell	32.4%	BP	27.0%
4	GSK	16.9%	Unilever	16.2%
5	Procter and Gamble	5.9%	GSK	13.5%
6	Astra Zeneca	5.1%	Procter and Gamble	10.8%
7	Unilever	5.1%	Air Products	5.4%
8	EDF	4.4%	Johnson Matthey	5.4%
9	ConocoPhilips	2.9%	Kraft	5.4%
10	Johnson Matthey	2.2%	Nestle	5.4%

Data are for the companies named by respondents reading electrical/electronic engineering are presented in Table 69. The number of women is very low which make comparisons between the companies named by men and women difficult.

Table 69: The most popular companies for which respondents reading electrical/electronic engineering expressed an interest in working

Rank	Male (N=323)		Female (N=43)	
1	BAE Systems	14.2%	Siemens	16.3%
2	Apple	12.4%	BBC	9.3%
3	Rolls Royce	11.1%	Dolby Digital	9.3%
4	National Grid	9.3%	IBM	9.3%
5	Siemens	9.3%	Atkins	7.0%
6	Intel	8.7%	BT	7.0%
7	Google	7.1%	Sony	7.0%
8	Microsoft	6.8%		
9	Arm	6.5%		
10	IBM	5.9%		

Finally, data for the companies named by respondents reading computing science/artificial intelligence/software engineering/information technology are presented in Table 70. The top four choices are the same in for men and women although Google is the most popular company named by men and Microsoft is the most popular company named by women. Six companies are common to the lists of ten most popular companies named by men and women.

Table 70: The most popular companies for which respondents reading computing science/artificial intelligence/software engineering/information technology expressed an interest in working

Rank	Male (N=509)		Female (N=155)	
1	Google	35.2%	Microsoft	32.9%
2	Microsoft	34.4%	Google	30.3%
3	IBM	16.9%	IBM	14.8%
4	Apple	12.4%	Apple	12.9%
5	Cisco Systems	6.3%	Liberty IT	7.1%
6	Intel	5.9%	GCHQ/Military Intelligence	7.1%
7	GCHQ/Military Intelligence	4.7%	BT	6.5%
8	Facebook	4.1%	Kainos	6.5%
9	British Telecom	3.1%	CITI	5.2%
10	Blizzard	2.9%	Intel	5.2%

The data presented for individual subjects strongly suggests that men and women reading a particular engineering and technology subject aspire to work for the same companies. Data presented in the main report suggest that similar proportions of men and women aspire to work in engineering and technology roles, and the data presented here suggest that in addition men and women aspire to work for the same companies as each other.

6.4 Appendix D: Survey of engineering and technology undergraduates

Section 1: Introduction

This questionnaire is designed to find out about the career intentions and experiences of engineering and technology undergraduate students.

Once you have completed the questionnaire you will be given the chance to enter a prize draw. Simply fill in your contact details at the end of the questionnaire and you will be entered into the prize draw to have a chance of winning one of the 12 following prizes:

- § First Prize: £100 Amazon token
- § Second Prize: £50 Amazon token
- § Third Prizes: 10 x £10 Amazon tokens

The closing date for the prize draw is 15 January 2012.

The questionnaire should take you between 10 and 20 minutes to complete.

The questionnaire is for students studying a variety of subjects. For simplicity we use the terms "engineer", "technologist", "engineering" and "technology" throughout the questionnaire.

Questions marked with an asterisk (*) require an answer.

If you'd like more information about the survey please select the box below, otherwise you can go straight to the survey:

Continue straight to the survey (**Go to section 3**)
Learn more about the survey (**Go to section 2**)

Section 2: Survey background

The project is funded by the National HE STEM Programme and is being delivered by University College London with Katalytik, an independent consultancy. The questionnaire has been developed and is being run by Oxford Research and Policy.

The National HE STEM Programme supports Higher Education Institutions in the exploration of new approaches to recruiting students and delivering programmes of study within the Science, Technology, Engineering and Mathematics (STEM) disciplines.

For enquiries about this survey please contact Sean McWhinnie.

Section 3: Your Degree Course

***1. At which institution are you registered as an undergraduate student?**

***2. Please indicate the broad subject area(s) of your degree course by choosing one or two close match(es) from the list below.**

Please do try to find matches from the list rather than using the "Other" field.

Aeronautical/Aerospace Engineering
Biotechnology
Chemical/Process Engineering
Civil/Structural Engineering
Computing Science/Artificial intelligence/Software engineering/Information Technology (IT)
Electrical/Electronic Engineering
Engineering/Industry Design
General Engineering
Maritime Technology
Materials Science/Metallurgy
Mechanical Engineering
Minerals Technology
Production/Manufacturing Engineering
Other (please specify)

***3. Are you studying full-time or part-time?**

Full-time
Part-time

***4. How long do you expect to spend on your course, including any placements?**

2 years
3 years
4 years
5 years
More than 5 years

***5. What year of your course are you on?**

1st year
2nd Year
3rd Year
4th Year
5th Year
5+ Year

***6. What final qualification do you expect to obtain?**

BSc
MA
BEng
MEng
BA
Other (please specify)

***7. Are you a member of a professional institute (e.g. Institution of Civil Engineers, Royal Aeronautical Society, etc.)?**

Yes (**Go to section 4**)
No (**Go to section 5**)

Section 4: Professional Institutes

*1. Please select or list all institutes that you a member of:

- British Computer Society
- British Institute of Non-Destructive Testing
- Chartered Institution of Building Services Engineers
- Chartered Institution of Highways &amp? Transportation
- Chartered Institute of Plumbing and Heating Engineering
- Chartered Institution of Water and Environmental Management
- Energy Institute
- Institution of Agricultural Engineers
- Institution of Civil Engineers
- Institution of Chemical Engineers
- Institute of Cast Metals Engineers
- The Institution of Diesel and Gas Turbine Engineers
- Institution of Engineering Designers
- Institution of Engineering and Technology
- Institution of Fire Engineers
- Institution of Gas Engineers and Managers
- Institute of Highway Engineers
- Institute of Healthcare Engineering &amp? Estate Management
- Institution of Lighting Professionals
- Institute of Marine Engineering, Science and Technology
- Institution of Mechanical Engineers
- Institute of Measurement and Control
- Institution of Royal Engineers
- Institute of Acoustics
- Institute of Materials, Minerals and Mining
- Institute of Physics
- Institute of Physics & Engineering in Medicine
- Institution of Railway Signal Engineers
- Institution of Structural Engineers
- Institute of Water
- Nuclear Institute
- Royal Aeronautical Society
- Royal Institution of Naval Architects
- Society of Environmental Engineers
- Society of Operations Engineers
- The Welding Institute
- Other(s) - please specify

Section 5: Your Course

***1. Which of the following statements bests describe the MAIN reason(s) you decided to undertake your course?**

Please mark no more than TWO choices

- I realised that others I knew were applying for similar courses
- I was inspired/encouraged by a family member/family friend
- I was influenced by other role models
- Recognition that studying engineering could increase my chances of getting into a good university
- I have an aptitude for engineering
- Out of interest and enthusiasm for engineering
- I was inspired/encouraged by a teacher
- The course qualification is a pre-requisite for the career I want
- I "wandered" into this course after my A-levels (or equivalent)
- To enhance my earning potential
- Don't know
- Other (please specify)

***2. Are you pleased you decided to do your course?**

- Yes **(Go to section 6)**
- No **(Go to section 7)**
- Don't Know **(Go to section 8)**

Section 6: Your Course (continued)

***1. Which of the following statements best describes the MAIN reason why you are PLEASED with your decision to undertake your course?**

- Don't know
- The course enables me to get a better idea about my career plans
- The course gives me a better understanding of an engineer's/technologist's work
- The course will give me the qualification I need for the career I want
- The course provides me with the skill set I need for the career I want
- The course gives me the experience I need for the career I want
- Engineering/technology comes naturally to me
- I've made great friends
- I enjoy my subject
- Other (please specify)

Go to section 8

Section7: Your Course (continued)

***1. Which of the following statements best describe the MAIN reason why you somewhat REGRET deciding to undertake your course?**

- I don't believe there are any jobs available in engineering/technology
- The course is not providing me with the skills I need for the career I want
- It's hard academically
- Financial worries
- The course is not what I expected
- I've felt socially isolated
- I no longer want to work in engineering
- Don't know
- Other (please specify)

Section 8: Work/Industrial Placements

***1. Does your course include an industrial placement as part of the course?**

Yes, compulsory
Yes, optional

***2. Did you spend any time working in an area related to your course BEFORE you began your course?**

No
Yes: a full-time job
Yes: a temporary placement
Yes, other (please specify)

***3. AFTER you began your course, have you spent any time on placement or undertaking relevant work experience either as part of your course or not?**

Yes: (a) work placement(s) as part of my course (**Go to section 9**)
Yes: (an) internship(s) which was(were) not part of my course(**Go to section 9**)
Yes: both a work placement as part of my course and an internship(**Go to section 9**)
No(**Go to section 11**)

Section 9: Your Placements and Work Experience

***1. How many periods on placement have you had since beginning your course?**

1
2
More than 2

***2. What kinds of placement or work experience have you undertaken since you began your course?**

Please select all that apply:

A work placement of at least 6 months as part of my course
A work placement of between 3-6 months as part of my course
A placement of up to 3 months linked/integrated with my course
Work experience or an internship related to my course that I organised myself
Other (please specify)

***3. How many months in total have you spent on industrial placement/undertaking work experience?**

1-3 months
4-6 months
7-9 months
10-12 months
More than 12 months

Section 10: Your placement

If you have undertaken a placement as part of your course please answers the following questions about that, otherwise please answer for your most recent internship.

***1. Which of the following were true about your industrial placement?**

I worked in the field
I worked in a laboratory/workshop
I was given formal safety training
I learnt about the commercial objectives of the company
I was given a formal induction course
I did essentially the same thing for the whole of my placement
I was given adequate supervision
I was invited to work social events
I had a mentor
I did a variety of things during my placement
There was a special programme of training for placement students
I attended training courses

***2. Please select the statement that best describes the effect of your (most recent) industrial placement on your career intentions:**

My placement made me more intent on pursuing a career in engineering/technology
My placement made me less intent on pursuing a career in engineering/technology
My placement had no effect on my career intentions

***3. During my most recent placement, I met role models who inspired me to pursue a career in engineering/technology**

Strongly agree Agree Disagree Strongly disagree

***4. Was your placement/internship paid?**

Yes No

***5. How readily would you accept a job offer to work in your placement company permanently?**

Yes definitely without hesitation
Probably, but I would need to think about it
I might, but I would apply to other companies as well
I'm not sure one way or the other
Definitely not

6. Please could you specify the firm and location where you spent your work placement (optional).

11. Your Next Steps

***1. Would you say you possess the majority of general skills that employers often look for?**

Note: 'General skills' refers to non-technical or transferable skills e.g. communication, team-working and problem-solving skills

Yes No Don't know

***2. Would you say you possess the majority of technical skills that employers often look for?**

Yes
No
No, but I expect to by the time I complete my course
Don't know

***3. How much have you planned your next (i.e. once you've completed your course) career steps?**

Fully
A little
Not at all

***4. My experience as an engineering/technology student has…**

Please mark the most appropriate statement.

…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

***5. Have you already accepted a job offer or already been accepted on a programme of further study or training, due to start after completion of your course?**

Yes **(Go to section 12)** No **(Go to section 15)**

Section 12: Your Next Steps (continued)

***1. Which of the following best describes the job or study/training offer you have accepted?**

Please mark one choice.

Further Study: engineering/technology-related doctorate
Further Study: engineering/technology-related masters
Further Study: non-engineering/technology related
Teacher Training
Industry/commerce: engineering/technology role
Industry/commerce: non-engineering/technology role
Government/Civil service/Public sector: engineering/technology role
Government/Civil service/Public sector: non-engineering/technology role
Other (please specify)

***2. Does your job/course require an engineering/technology qualification?**

Yes **(Go to section 23)** No **(Go to section 13)**

Section 13: Your Next Steps (continued)

***1. Did you begin your undergraduate studies thinking you would have a career which required an engineering/technology qualification?**

Yes **(Go to section 14)** No **(Go to section 23)** Don't know **(Go to section 23)**

Section 14: Your Next Steps (continued)

***1. What has made you change your mind about pursuing a career which requires an engineering/technology qualification?**

Please select the main reason

- I intend to return to engineering/technology in the future
- I was put off by knowledge from a relative doing that kind of work
- I have tried and failed to get jobs directly related to my degree
- My course did not prepare me well enough to get a degree-related job
- I was put off by talking to people I know doing that kind of work
- I was put off by my work experience
- I don't believe jobs related to my degree will give me the work-life balance I want
- There are too few jobs related to my degree in my preferred location
- I will find it easier to get a job in another field
- There are too few career opportunities in my field
- I believe that I will be socially isolated in jobs related to my degree
- I believe I will have better long-term career prospects
- I have not enjoyed my degree course
- I will be better paid in another field
- I have become more interested in another field
- Other reason (please specify)

Section: 15. Your Next Steps (continued)

***1. On (or shortly after) completing your course, what do you intend to do?**

- Seek, or take up, paid work
- Seek, or take up, voluntary work
- Undertake further study
- Take some time off (e.g. a gap year)
- Don't know
- Other (please specify)

***2. Ultimately where do you intend to seek employment or undertake further study?**

In the UK

- In my home country (if not the UK)
- In another country
- Would consider all options
- Undecided

***3. On completion of your studies, and having taken any time off that you intend to, do you intend to seek employment as an engineer/technologist, or, undertake further study in engineering/ technology?**

Yes (**Go to section 21**) No (**Go to section 16**) Don't know (**Go to section 16**)

Section 16: Your Next Steps (continued)

***1. Although not intending to seek employment in/study further engineering/technology, or not sure whether you will, do you intend to seek employment in role which requires and/or makes use of your engineering/technology background (e.g. technical publishing, scientific civil service, etc.)?**

Yes (**Go to section 19**) No (**Go to section 17**) Don't know (**Go to section 20**)

Section 17: Your Next Steps (continued)

***1. Did you begin your studies thinking you would have a career in engineering/technology?**

Yes (**Go to section 18**) No (**Go to section 19**) Don't know (**Go to section 19**)

Section 18: Your Next Steps (continued)

***1. What has made you change your mind about pursuing a career in engineering/technology?**

Please select the main reason

My course did not prepare me well enough to get a degree-related job
There are too few career opportunities in my field
I will find it easier to get a job in another field
I have been put off by my work experience
I don't believe jobs related to my degree will give me the work-life balance I want
I will be better paid in another field
I intend to return to engineering/technology in the future
There are too few jobs related to my degree in my preferred location
I have been put off by talking to people I know doing that kind of work
I believe I will have better long-term career prospects
I have not enjoyed my degree course
I have tried and failed to get jobs directly related to my degree
I believe that I will be socially isolated in jobs related to my degree
I have been put off by knowledge from a relative doing that kind of work
I have become more interested in another field
Other reason (please specify)

Section 19: Your Next Steps (continued)

***1. Which of the following best describes what you intend to do on completion of your course?**

Please mark one choice.

Further Study: non-engineering/technology related
Teacher Training
Work in Publishing
Work in a non-engineering role in industry/commerce
Work a non-engineering role in government/public sector/civil service
Work as an IT Professional or Technician
Work in Sales (inc. technical sales)
Work in Management Consultancy
Work in as a Financial Professional (in banking, accountancy, etc.)
Travel or take time out
Don't know
Other (please specify)

Go to section 22

Section 20: Your Next Steps (continued)

***1. Which of the following describes what you are most likely to do on completion of your course (after you have taken any time off if that is your intention)?**

Please mark one choice.

- Further Study: engineering/technology-related doctorate
- Further Study: engineering/technology-related masters
- Further Study: non-engineering/technology related
- Teacher Training
- Industry/Commerce: engineering/technology role
- Industry/Commerce: non-engineering/technology role
- Government/Public Sector/Civil Service: engineering/technology role
- Government/Public Sector/Civil Service: non-engineering/technology role
- Work as an IT Professional or Technician
- Don't know
- Other (please specify)

Go to section 22

Section 21: Your Next Steps (continued)

***1. Which of the following describes what you are most likely to do on completion of your course (after you have taken any time off if that is your intention)?**

Please mark one choice.

- Further Study: engineering/technology-related doctorate
- Further Study: engineering/technology-related masters
- Work as an engineer/technologist in Industry/Commerce
- Work as an engineer/technologist in the Public Sector
- Work as an IT Professional or Technician
- Don't know
- Other (please specify)

Section 22: Your Next Steps (continued)

1. As you think about where you would like to work, what companies would feature in your top 3 list?

Please rank in order of importance with number 1 being your first choice

- Number 1
- Number 2
- Number 3

Section 23: Career Elements

***1. How important to you is it to have a career which involves the following?**

Please mark one choice in each row.

	Very Important	Important	Somewhat important	Not important
A strong equality and diversity culture	☐	☐	☐	☐
Having a reasonable commute to work	☐	☐	☐	☐
Making a positive contribution to society	☐	☐	☐	☐
Opportunities to travel	☐	☐	☐	☐
A workplace culture where all staff are treated well	☐	☐	☐	☐
Good professional development opportunities	☐	☐	☐	☐
Having opportunities to socialise outside of work	☐	☐	☐	☐
Holding a respected position	☐	☐	☐	☐
Having the potential for promotions	☐	☐	☐	☐
Working at a fast pace	☐	☐	☐	☐
Working at a relaxed pace	☐	☐	☐	☐
The amount of holiday	☐	☐	☐	☐
Autonomy at work	☐	☐	☐	☐
Living in a pleasant area	☐	☐	☐	☐
Extensive benefits packages and/or bonuses	☐	☐	☐	☐
Having independence and personal autonomy	☐	☐	☐	☐
Job security	☐	☐	☐	☐
A variety of roles available	☐	☐	☐	☐
Being creative and intellectually stimulated	☐	☐	☐	☐
A strong health and safe culture	☐	☐	☐	☐
Flexible working hours	☐	☐	☐	☐
Prospects for a leadership role	☐	☐	☐	☐
Making a positive difference to the company	☐	☐	☐	☐
Access to state-of-the-art equipment/resources	☐	☐	☐	☐
Prospects for receiving a high salary	☐	☐	☐	☐
Lots of variety in the work	☐	☐	☐	☐

Section 24: Careers Guidance

***1. How would you rate your awareness of career options open to you as an engineering/technology graduate?**

Very Good Good Adequate Poor Very Poor

***2. During your undergraduate studies have you received any careers support from any source (e.g. friends, careers service, etc.)?**

Yes (**Go to section 25**) No (**Go to section 26**)

Section 25: Careers Guidance (continued)

***1. During your undergraduate studies from which of the following sources have you received careers support?**

Please mark all that apply.

- University careers service
- Industrial placement supervisor
- Careers/recruitment fairs
- Academic staff in your department
- Family
- Friends
- Another source (please specify)

***2. What was the topic of the careers support you've received (during your undergraduate studies)?**

Please mark all that apply.

- Interview techniques
- Where to look for jobs
- Filling out application forms
- Types of jobs available
- Insights into working in particular jobs e.g. pay, conditions
- Writing a CV
- Other (please specify)

***3. On the whole, did you seek out this careers advice or was it offered to you unsolicited?**

Please mark only one choice.

- I sought the advice
- The advice was offered to me unsolicited
- Both
- Don't know/can't remember

4. During your course have you been given the chance to learn about or practice any of the following?

	Yes	No
Presentation skills	☐	☐
Leadership skills	☐	☐
Team working	☐	☐

Section 26: Careers Guidance (continued)

1. What is the best piece of advice you have been given as you think about your career and from whom?

Section 27: About You

***1. What is your nationality?**

- British (**Go to section 28**)
- Chinese (**Go to section 29**)
- German (**Go to section 29**)
- Indian (**Go to section 29**)
- French (**Go to section 29**)
- Pakistani (**Go to section 29**)
- Greek (**Go to section 29**)
- Malaysian (**Go to section 29**)
- Other European Union (**Go to section 29**)
- Saudi Arabian (**Go to section 29**)
- American (USA) (**Go to section 29**)
- Nigerian (**Go to section 29**)
- Other (please specify) (**Go to section 29**)

Section 28: About you (continued)

***1. How would you describe your ethnic origin?**

White British	Black or Black British
White Irish	Chinese
White Other	Mixed/Dual Heritage
Asian or Asian British	Other

Section 29: About you (continued)

***1. How old are you?**

17	21	25
18	22	26-30
19	23	31-35
20	24	36-40

***2. Are you registered as a Home student, EU student or Overseas students?**

Home student
EU student
Overseas student

***3. What is your sex?**

Male (**Go to section 31**)
Female (**Go to section 30**)
Do not wish to say (**Go to section 31**)

Section 30: My experiences

How much do you agree with the following statement?

***1. I have been treated as an equal by my fellow male students**

Strongly agree
Agree
Neither agree not disagree
Disagree
Strongly disagree

Section 31: My experiences

How much do you agree with the following statements?

***1. While on my course, I have felt socially isolated.**

Strongly agree
Agree
Neither agree not disagree
Disagree
Strongly disagree

***2. Women students get as much out of the course as men.**

Strongly agree
Agree
Neither agree not disagree
Disagree
Strongly disagree

***3. Women students integrate as well as men into the course.**

Strongly agree
Agree
Neither agree not disagree
Disagree
Strongly disagree

***4. The women students on my course lose out.**

Strongly agree
Agree
Neither agree not disagree
Disagree
Strongly disagree

***5. Academic staff give male and female students the same opportunities and support.**

Strongly agree
Agree
Neither agree not disagree
Disagree
Strongly disagree

***6. My experiences of studying at university have provided me with good role models to encourage me to pursue a career in engineering/technology.**

Strongly agree
Agree
Neither agree not disagree
Disagree
Strongly disagree

***7. I feel that the academic staff treat male and female students equally.**

Strongly agree
Agree
Neither agree not disagree
Disagree
Strongly disagree

***8. I feel that there should be more female lecturers.**

Strongly agree
Agree
Neither agree not disagree
Disagree
Strongly disagree

***9. I feel confident that I will make a good engineer/technologist.**

Strongly agree
Agree
Neither agree not disagree
Disagree
Strongly disagree

Section 32: Your Comments and Prize Draw Entry

In the space below we would be grateful for your comments on your career intentions, and in particular how your experiences at university have affected your career intentions:

1. Please leave any comments

2. May we contact you?

All responses to this questionnaire will remain anonymous.

If you wish to provide your contact details to participate in any follow-up work, please provide your preferred contact details below. This information will be stored separately from the questionnaire and will only be used for the purpose of contacting you about future or follow-up work related to this study.

Name
Email Address
Mobile Phone No.

3. If you wish to be included in the prize draw then please enter your details below.

These details will be stored separately to the main questionnaire and will only be used in connection with the prize draw. They will not be used for any other purpose, nor passed on to any other third party.

Name
Email Address
Mobile Phone No.

Thank you very much for your time in completing this questionnaire.

Should you wish to review your responses, you may do so by using the navigation buttons below. To submit your responses, please click the 'Done' button.

This survey is part of an HE STEM funded project led from UCL in association with Katalytik.

Set to Lead is an innovative project connecting employers and universities to develop a rich contemporary resource for academics delivering leadership and team building courses in engineering and technology. Part of the project is to understand career intentions and to investigate the recruitment process for engineering and technology graduates.

The survey results will be published on 27 March 2012 along with a good practice guide on assessment centres.

Sean McWhinnie

6.5 Appendix E: List of Tables

Table 1: Engineering and technology subjects used in this report (Source: HESA Student Data)* 17

Table 2: All full time students completing first degree courses in engineering and technology subjects in 2008/09 and 2009/10 (Source: HESA Student Data)* 19

Table 3: All full time students completing first degree courses in engineering and technology subjects by domicile and gender in 2008/09 and 2009/10 combined(Source: HESA Student Data)* 20

Table 4: All full time students completing enhanced first degree and bachelor degree courses in engineering and technology subjects by gender in 2008/09 and 2009/10 (Source: HESA Student Data)* 20

Table 5: All full time students completing first degree courses in engineering and technology subjects by gender 2008/09 and 2009/10 (Source: HESA Student Data)* 21

Table 6: All full time students completing first degree courses in engineering and technology subjects by gender and domicile in 2008/09 and 2009/10 combined(Source: HESA Student Data)* 22

Table 7: Degree classification of all full time students completing first degree courses in engineering and technology subjects by gender 2008/09 and 2009/10 combined (Source: HESA Student Data)* 23

Table 8: Degree classification of full time students completing first degree courses in the engineering subject group by whether they qualify with an enhanced or bachelor first degree and gender 2008/09 and 2009/10 combined (Source: HESA Student Data)* 24

Table 9: Percentage breakdown by gender of all full time UK domiciled students completing first degree courses in engineering and technology subjects by ethnicity 2008/09 and 2009/10 combined (Source: HESA Student Data)* 26

Table 10: Percentage breakdown of all full time UK domiciled students completing first degree courses in engineering and technology subjects by gender and category of parental occupation 2008/09 and 2009/10 combined (Source: HESA Student Data)* 27

Table 11: Main activities of full time and part time UK domiciled students completing bachelor degree courses in engineering and technology subjects by gender in 2008/09 and 2009/10 combined (Source: HESA Student Data)* 29

Table 12: 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 2008/09 and 2009/10 combined (Source: HESA DLHE Data)* 31

Table 13: 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 2008/09 and 2009/10 combined (Source: HESA DLHE Data)* 32

Table 14: The nature of further study of full and part time UK domiciled students completing first degree courses in engineering and technology subjects and going on to further study only

or work and further study by gender 2008/09 and 2009/10 combined (Source: HESA DLHE Data) 33

Table 15: Proportions of full time and part time UK domiciled students completing first degree courses in engineering and technology subjects and registered as a research student six months after completion by gender 2008/09 and 2009/10 combined (Source: HESA DLHE Data) 33

Table 16: 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 2008/09 to 2009/10 combined (Source: HESA DLHE Data)* 34

Table 17: 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 gender 2008/09 and 2009/10 combined (Source: HESA DLHE Data)* 35

Table 18: Gender and domicile of respondents 38

Table 19: The subject group and gender of respondents 38

Table 20: The most popular subjects of respondents by gender 39

Table 21: The age of respondents by gender 39

Table 22: Respondents' year of course by gender 40

Table 23: Respondents' main reason for undertaking their courses by gender where respondents indicated a single reason 41

Table 24: Respondents' main reasons for undertaking their courses by gender where respondents indicated two reasons 42

Table 25: Whether or not respondents regret undertaking their courses by gender 42

Table 26: Respondents' reasons for not regretting undertaking their courses by gender* 43

Table 27: Whether respondents' courses included an industrial placement by gender 44

Table 28: Whether respondents' courses included an industrial placement by subject 44

Table 29: Whether respondents spent any time working in an area related to their course before beginning their courses by gender 44

Table 30: Whether respondents have spent time undertaking work experience as part of their course by year of study and gender 45

Table 31: Respondents' number of periods of work placement and/or internship since beginning their course by gender 46

Table 32: Length of time respondents have spent on work placement since beginning their course by gender 46

Table 33: Proportions of male and female respondents that agreed with statements about their most recent work placement or internship by gender 46

Table 34: Proportions of male and female respondents that agreed with positive statements about their most recent work placement or internship 47

Table 35: How readily respondents would accept a job offer to work in their placement company permanently by gender and by the number of positive statements about their most recent work placement or internship with which respondents agreed 48

Table 36: Effect of respondents' most recent industrial placement on their career intentions by gender and by the number of positive statements about their most recent work placement or internship with which respondents agreed 49

Table 37: Whether respondents met inspiring role models during their most recent placements by gender 49

Table 38: Whether or not respondents' most recent work placements or internship were by gender 49

Table 39: Whether respondents believe they possess the majority of general skills that employers often look for by year of study and gender 50

Table 40: Whether respondents believe they possess the majority of technical skills that employers often look for by year of study and gender. 51

Table 41: 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. 51

Table 42: The effect of respondents' experiences as an engineering/technology student on their intentions to pursue a career in engineering/technology by year of study and gender 53

Table 43: Intentions of respondents who had not already accepted a job offer on, or shortly after, completing their courses by year of study and gender 55

Table 44: Whether 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 and gender 56

Table 45: Whether 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 whether respondents' are in their final year of study and gender 56

Table 46: Whether 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 once they have taken any time off that they intend to by whether it is respondents' final year of study, whether they have undertaken a work placement and gender. 57

Table 47: Whether 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, and having taken any time off that they intend to by subject group/subject and gender 58

Table 48: Whether respondents who had not already accepted a job offer and do not know if they intend to, or do not intend to, seek employment as an engineer/technologist or undertake further study in engineering/technology on completion of their studies, intend to

seek employment in role which requires and/or makes use of engineering or technology background by gender 58

Table 49: What respondents who had not already accepted a job offer and who indicated that they intended to seek employment as an engineer/technologist, or, undertake further study in engineering/technology were most likely to do on completion of their course by year of study and gender 59

Table 50: What respondents who had not already accepted a job offer and who indicated that they intended to seek employment as an engineer/technologist or undertake further study in engineering/technology were most likely to do on completion of their course by whether it is respondent's final year of study, whether they have undertaken a work placement, and gender 60

Table 51: Distribution of respondents' ratings of the importance of different aspects in their career by gender 61

Table 52: Ranking of respondents' ratings of the importance of different aspects in their career by gender 62

Table 53: Respondents' reported awareness of career options within academia by whether they are in their final year, whether they have received careers support and gender 64

Table 54: Sources of careers support used by respondents who reported having received careers support during their undergraduate studies by gender 65

Table 55: Types of careers support received by respondents who reported having received careers support during their undergraduate studies by gender 66

Table 56: Whether careers advice was sought or offered unsolicited by gender 66

Table 57: Whether or not respondents have been given the chance to learn about or practise specific skills 66

Table 58: Whether female respondents feel that they have been treated as an equal by their fellow male students 67

Table 59: How strongly respondents agree or disagree with a number of statements about their experiences on their courses by gender 68

Table 60: A comparison by gender between the most likely initial destinations of all home registered survey respondents on engineering courses and the main activities of UK domiciled students six months after completing first degree courses in engineering and technology subjects in 2008/09 and 2009/10 combined* 77

Table 61: A comparison by gender between the most likely initial destinations of home registered survey respondents in the final year of engineering courses and the main activities of UK domiciled students six months after completing first degree courses in engineering and technology subjects in 2008/09 and 2009/10 combined* 78

Table 62: Proportions of UK domiciled students in graduate and non-graduate level occupations undertaking engineering and technology and non-engineering and technology roles six months after completing first degree courses in engineering and technology subjects and whose main activities were "Full time paid work only (including self-employed)", "Part time paid work only" or "Voluntary/unpaid work only" in 2008/09 and 2009/10 combined 79

Table 63: The occupations of full and part time UK domiciled students completing first degree courses in engineering and technology subjects who entered full or part work paid work only by gender 2008/09 and 2009/10 combined (Source: HESA DLHE Data) 83

Table 64: Subject(s) and gender of respondents to the survey of engineering and technology graduates 85

Table 65: The most popular companies for which respondents expressed an interest in working 88

Table 66: The most popular companies for which respondents reading mechanical engineering expressed an interest in working 88

Table 67: The most popular companies for which respondents reading civil/structural engineering expressed an interest in working 89

Table 68: The most popular companies for which respondents reading chemical/process engineering expressed an interest in working 89

Table 69: The most popular companies for which respondents reading electrical/electronic engineering expressed an interest in working 90

Table 70: The most popular companies for which respondents reading computing science/artificial intelligence/software engineering/information technology expressed an interest in working 90

6.6 Appendix F: List of Figures

Figure 1: Proportions of male full time students completing first degree courses in engineering and technology subjects by domicile in 2008/09 and 2009/10 combined (Source: HESA Student Data) 22

Figure 2: Tariff points of accepted applicants to engineering courses in 2007 by gender (Source: UCAS) 24

Figure 3: Main activity six months after graduation of UK domiciled students completing bachelor and enhanced first degree courses in engineering subjects 2008/09 and 2009/10 combined (Source: HESA DLHE Data) 29

Figure 4: Main activity six months after graduation of UK domiciled students completing bachelor degree courses in technology subjects 2008/09 and 2009/10 combined (Source: HESA DLHE Data) 30

Figure 5: Main activity six months after graduation of UK domiciled students completing bachelor degree courses in computer sciences 2008/09 and 2009/10 combined (Source: HESA DLHE Data) 30

Figure 6: The effect of respondents' experiences as an engineering/technology student on the intentions to pursue a career in engineering/technology by year of study and gender 54

Figure 7: The effect of respondents' experiences as an engineering/technology student on their intention to pursue a career in engineering/technology by year of whether or not respondents undertaken a work placement, year of study and gender 54

Figure 8: Respondents' reported awareness of career options by whether they are in their final year, whether they have received careers support and gender 65

Figure 9: How strongly respondents agree or disagree with a number of statements about their experiences on their courses by gender 69

Figure 10: Proportion of full and part time UK domiciled students completing first degree courses in engineering and technology subjects who entered full time or part paid work only by employers type (SIC sector), subject and gender 2008/09 and 2009/10 combined 84