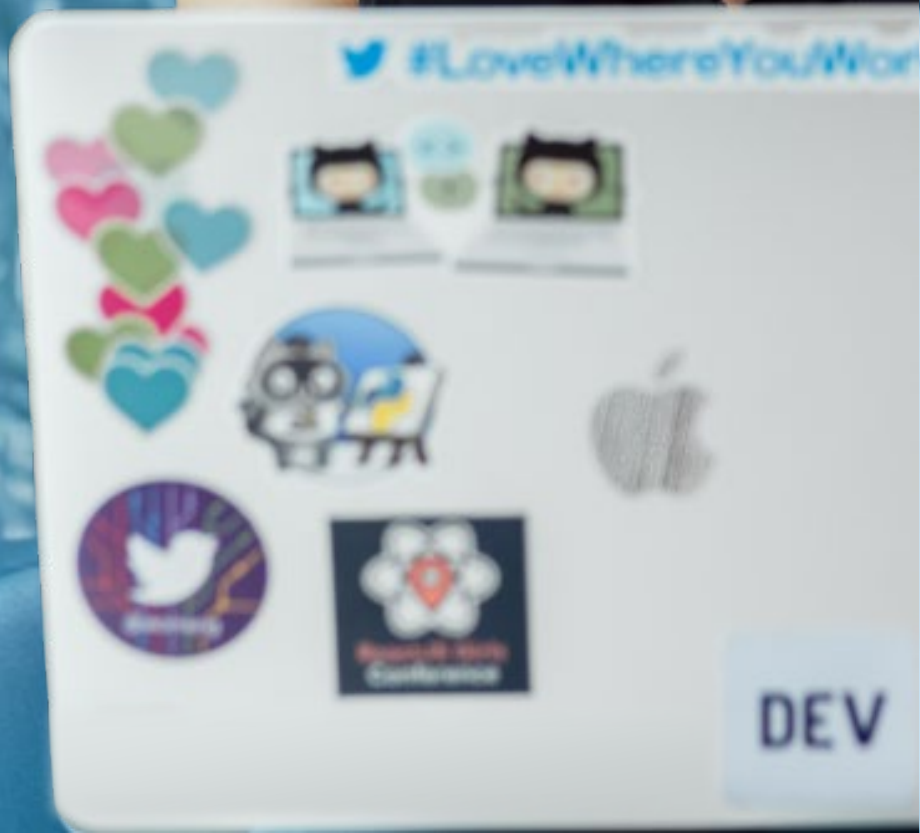


**ENGINEERING IN
HIGHER EDUCATION**



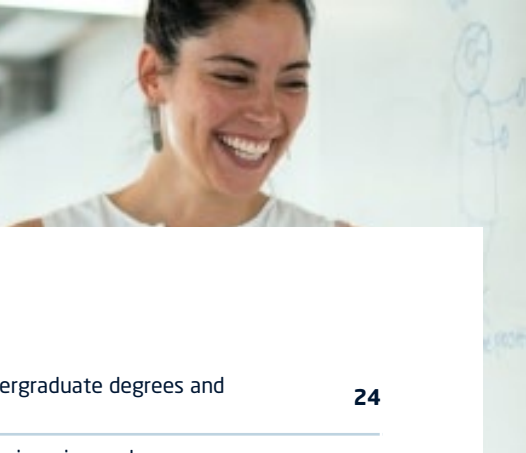
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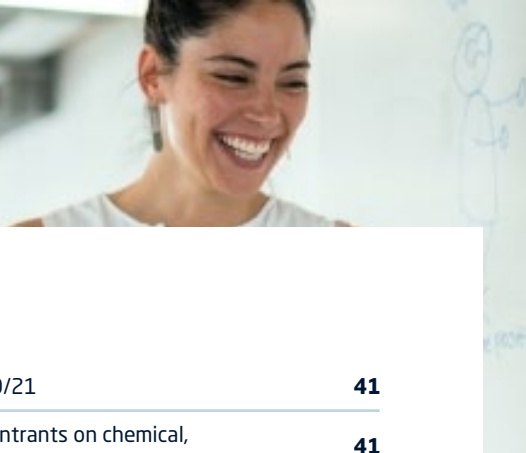
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Key findings

In this report, we look at engineering and technology students in higher education (HE) including their characteristics and subjects being studied and compare to students studying on HE courses overall. Unless otherwise stated, figures in the key findings here are for 2020/21 HE entrants.

Engineering overall

- Between 2009/10 and 2020/21, there has been a proportionately bigger increase in engineering and technology students than in all students, at 14.0% compared to 5.2%.
- Engineering and technology was the 5th most popular subject group when looking at all levels combined, and the most popular for postgraduate research students.
- 6.1% of first degree undergraduate entrants in HE in the UK were studying engineering and technology. Furthermore, 13.1% of postgraduate research entrants were studying engineering and technology which is high compared to 5.4% of postgraduate taught degrees.
- Engineering and technology students were more likely to obtain a first class honours degree than the average for all subjects - 44.8% in engineering and technology compared to 35.0% for all subjects.

Characteristics of engineering students

- Just 18.5% of engineering and technology first degree undergraduate entrants were women, which is low compared to 56.5% of students across all subjects. Representation was higher on engineering and technology postgraduate courses (25.8% of students on taught courses and 27.8% on research courses were women) but remained much lower than in the total student population.
- Engineering and technology degrees had a higher proportion of minority ethnic entrants than other subjects. Most notable were the higher percentages of Asian students studying engineering and technology at all levels compared to all subjects combined.
- Just 10.5% of engineering and technology first degree entrants had a known disability, compared to 15.1% for all subjects combined. For postgraduate study, percentages of entrants with a known disability were lower still at 4.2% and 7.3% for taught and research courses respectively.
- Engineering and technology students are much more likely to come from areas with the highest HE participation rates among young people - only 11.2% of first degree undergraduate entrants from the areas with the lowest participation (quintile 1) compared with 32.4% from the highest participation areas (quintile 5).
- For first degree undergraduate entrants, 21.0% studying engineering and technology came from the rest of the World (RoW) and 6.3% came from the European Union (EU) which is high compared to 11.3% and 5.7% respectively for all subjects combined.

Engineering subjects

- Mechanical engineering is the most popular subject of study within engineering and technology undergraduate first degrees with 22.5% of engineering and technology students choosing this specialism.
- For postgraduate study the most popular subject was electronic and electrical engineering for both taught (19.4%) and research (19.6%) of courses.
- The characteristics of students differed by subject. For example 29.1% of chemical, process and energy engineering undergraduate entrants were women, compared to 11.4% in production and manufacturing engineering.

Engineering graduates

- The percentage of graduates in employment 15 months after graduation has been negatively affected by the Covid-19 pandemic -71.8% of engineering and technology graduates from 2019/20 were in paid employment compared to 74.3% of those who graduated in 2017/18.
- Of those in paid employment, 60% of engineering and technology graduates were working in the engineering industry 15 months after employment.
- 8.2% of engineering and technology graduates from 2019/20 who were unemployed and looking for work, which is higher than the average for all subjects in the same period (7.3%) and higher than for those graduating from the same subjects in 2017/18 (5.8%).



Part 1: Engineering overall

1. Introduction

There are a number of pathways into engineering, with various academic and vocational routes available including apprenticeships and degree apprenticeships. However, by far the most popular and well-known route into an engineering and technology career is through higher education (HE). The wide range of both undergraduate and postgraduate degrees available in the UK allow students to study engineering in general or a more specific aspect of the subject in greater detail, which provides a variety of options for those with career aspirations in engineering. In fact, 3 of the top 20 universities in the world for studying engineering are based in the UK¹, which makes the UK an attractive and competitive option globally for studying the subject, as we see in the numbers of international students choosing to study here.

In this report, we look at the number of HE engineering and technology students, including trends over time, and make comparisons with the trends in the number of students studying on HE courses overall. We know that there have been increasing numbers of students overall, particularly in recent years, and engineering and technology has seen a larger proportional increase than the overall student population.

We also explore the characteristics of students such as gender, ethnicity and disability status. This is particularly important in relation to engineering, as diversity in the workforce is something that the

engineering community is working to increase. Currently women are severely underrepresented in the engineering workforce (16.5% compared with 47.7% in the total workforce²), and others such as minority ethnic groups, those with a disability and those from low socio-economic backgrounds are also underrepresented. In monitoring progress towards diversifying the engineering workforce, we need to include the number of students studying engineering and technology in HE institutions, as this forms a major pathway into engineering careers in the future.

Additionally, we look at the destination of students who graduated from engineering and technology degrees compared to all degrees. This has understandably been affected by the Covid-19 pandemic, which led to a drop in the numbers in paid employment and an increase in those choosing to take on further study. Unfortunately, there has also been a rise in graduates reporting that they are unemployed and looking for work 15 months after graduation in recent years for those who had studied other subjects as well as engineering and technology. More positively, 60% of engineering and technology graduates who were in paid employment 15 months after graduation, were working in engineering companies, showing that the HE pathway into engineering is successful for a large number of students.

In the second part of this report, we explore the 7 different subjects within engineering and technology, including trends in the different levels of study and latest student characteristics. These insights allow us to see which are the most popular subjects and also which are the most/least diverse at a glance.

¹ World University Rankings 2022 by subject: engineering, online, accessed January 2023

² Trends in the engineering workforce, EngineeringUK 2022, online, accessed January 2023

1.1 Context

The Covid-19 pandemic impacted on assessments taken at all levels of education. Alternative assessment methods were used instead of summer examinations in 2020 and 2021 for GCSE/Scottish National 5 qualifications as well as for A levels/Scottish Highers. Grades were awarded based on a combination of teacher judgement and provision of evidence to demonstrate students' performance. Consequently, a higher number of students obtained the necessary grades to further study in higher education.

Additionally, when the UK left the European Union (EU) in January 2020, there was little known about the impact this would have on foreign student numbers in UK HE institutions. As 7% of students from the EU study engineering and technology subjects, any loss of students from the EU could have an impact on numbers studying engineering.

2. Engineering and technology in higher education

2.1 Student numbers

In this first section, we look at all engineering and technology degrees combined, to get an overview of the total number of students in higher education. To begin, figure 1 looks at the trends in student numbers. Since 2009/10, there has been a proportionately bigger increase in engineering and technology students than in all students, at 14.0% compared to 5.2%. We see the numbers of students have been gradually increasing over this period and that until the most recent periods have fluctuated only up to 2.5% year-on-year in engineering and technology, similar to overall student numbers.

In recent years we have seen a greater increase in students studying engineering and technology with a 3.9% increase in numbers from 2018/19 to 2019/20 and a further 4.3% increase in 2020/21 - following a plateau seen in the preceding years. In comparison, total student numbers saw an increase of 1.6% overall between 2018/19 and 2019/20 followed by a large jump in 2020/21 where total student numbers were 8.3% bigger than in the previous year. This may be related to the impact of

the Covid-19 pandemic and restrictions imposed causing many exams to be replaced by other forms of assessment which increased the rates of young people achieving the necessary grades to go to university.

FIGURE 1:

Number of higher education students studying engineering and technology and all degrees in the UK, by year

Year	Engineering and technology students		All students	
	Number	Change over 1 year (%)	Number	Change over 1 year (%)
2009/10	156,985		2,493,420	
2010/11	160,885	2.5%	2,501,295	0.3%
2011/12	162,020	0.7%	2,496,645	-0.2%
2012/13	158,115	-2.4%	2,340,275	-6.3%
2013/14	159,010	0.6%	2,299,355	-1.7%
2014/15	161,445	1.5%	2,266,075	-1.4%
2015/16	163,255	1.1%	2,280,825	0.7%
2016/17	165,155	1.2%	2,317,880	1.6%
2017/18	164,975	-0.1%	2,343,095	1.1%
2018/19	165,180	0.1%	2,383,970	1.7%
2019/20*	171,620	3.9%	2,421,875	1.6%
2020/21*	179,000	4.3%	2,622,465	8.3%

Source: HESA student record 2020/21

*There has been a change to the coding system used to classify subjects in HE from 2019/20

To give some further context, figure 2 shows the numbers of entrants (first year students) studying each principal subject by level of study in 2020/21. By looking at entrants rather than the entire student population, we see the most up-to-date picture of the HE landscape, and any changes that may be occurring.

Overall, engineering and technology was the 5th most popular subject group when looking at all levels combined, behind business and management, subjects allied to medicine, social sciences and education and teaching. It was also the 5th most popular for first degree entrants, 6th most popular for other undergraduates and 7th most popular for taught postgraduate studies. Encouragingly, it was

FIGURE 2:

Number of entrants by principal subject and level of study, UK, 2020/21

Principal subject	Undergraduate		Postgraduate		Total
	First degree	Other	Taught	Research	
Business and management	112,235	11,735	97,660	2,215	223,850
Subjects allied to medicine	76,995	28,665	49,825	2,610	158,095
Social sciences	68,925	11,475	43,330	2,770	126,500
Education and teaching	17,280	6,755	54,760	1,600	80,395
Engineering and technology	38,615	3,850	22,720	4,725	69,915
Design, and creative and performing arts	50,010	2,990	14,785	1,095	68,880
Computing	36,545	2,265	25,685	1,900	66,400
Psychology	35,365	1,840	18,835	2,065	58,110
Law	31,915	3,580	14,145	740	50,385
Biological and sport sciences	32,265	2,060	7,885	3,210	45,415
Language and area studies	20,540	5,025	9,330	1,660	36,550
Historical, philosophical and religious studies	19,525	1,290	8,135	2,130	31,085
Medicine and dentistry	13,180	605	9,260	2,335	25,580
Combined and general studies	7,160	11,675	5,850	325	25,015
Architecture, building and planning	11,595	1,155	10,930	540	24,215
Physical sciences	16,080	955	3,170	3,120	23,325
Media, journalism and communications	11,790	265	9,385	395	21,835
Mathematical sciences	11,520	375	5,600	975	18,470
Geography, earth and environmental studies (natural sciences)	7,765	215	3,940	985	12,905
Agriculture, food and related studies	3,305	3,300	2,555	205	9,360
Geographical, earth and environmental studies (social sciences)	2,830	50	2,090	230	5,205
Veterinary sciences	2,295	180	950	100	3,525

Source: HESA student record 2020/21

the most popular subject studied on postgraduate research degrees with 4,725 students studying at this level in 2020/21.

Over the last decade, engineering and technology has held a 6%-7% share of first degree undergraduate entrants in HE in the UK. The latest figure for 2020/21

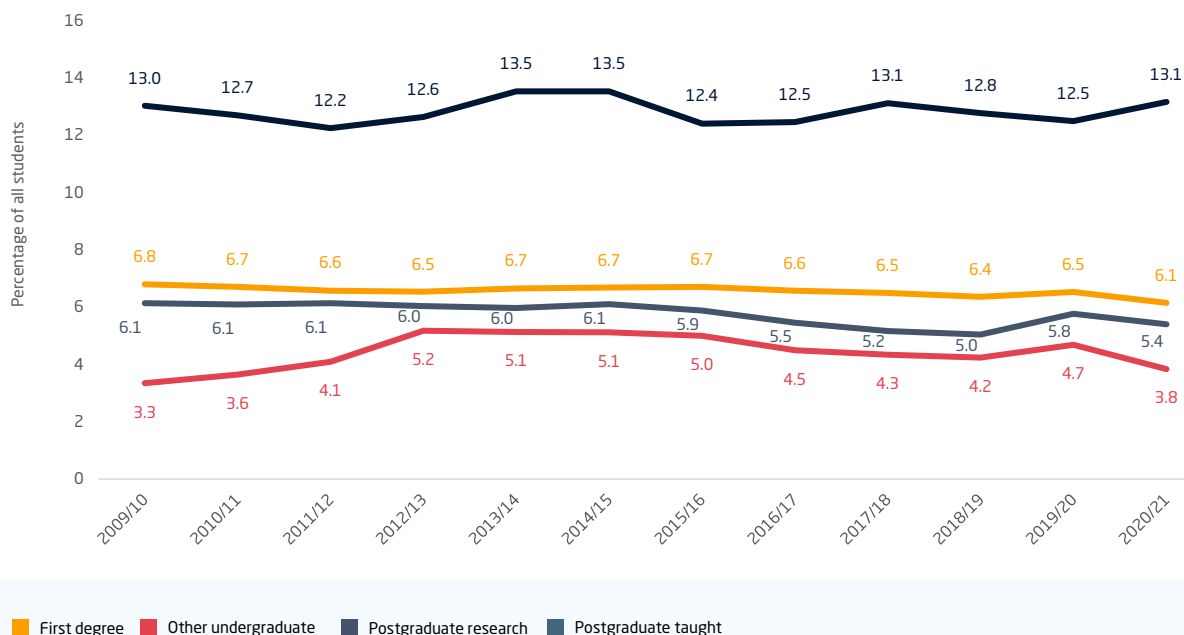
is 6.1% which is low in this range, but this is most likely to be a reflection of the large increase in overall student numbers following the pandemic, as discussed earlier. A similar dip in the percentage share of students has also been seen in the other undergraduate entrants which saw a 0.9% drop in the latest year-on-year figures.

Consistently engineering and technology has the highest share in postgraduate research degrees, holding at between 12% and 14% since 2009/10. In the most recent academic year, 13.1% of

entrants at this level were studying on engineering and technology degrees. This is high compared to 5.4% of postgraduate taught degrees.

FIGURE 3:

Engineering and technology first year students over time as a share of total first year students, by level of study, UK, 2020/21



Source: HESA student record 2020/21
 Note there has been a change to the coding system used to classify subjects in HE from 2019/20

2.2 Qualifiers

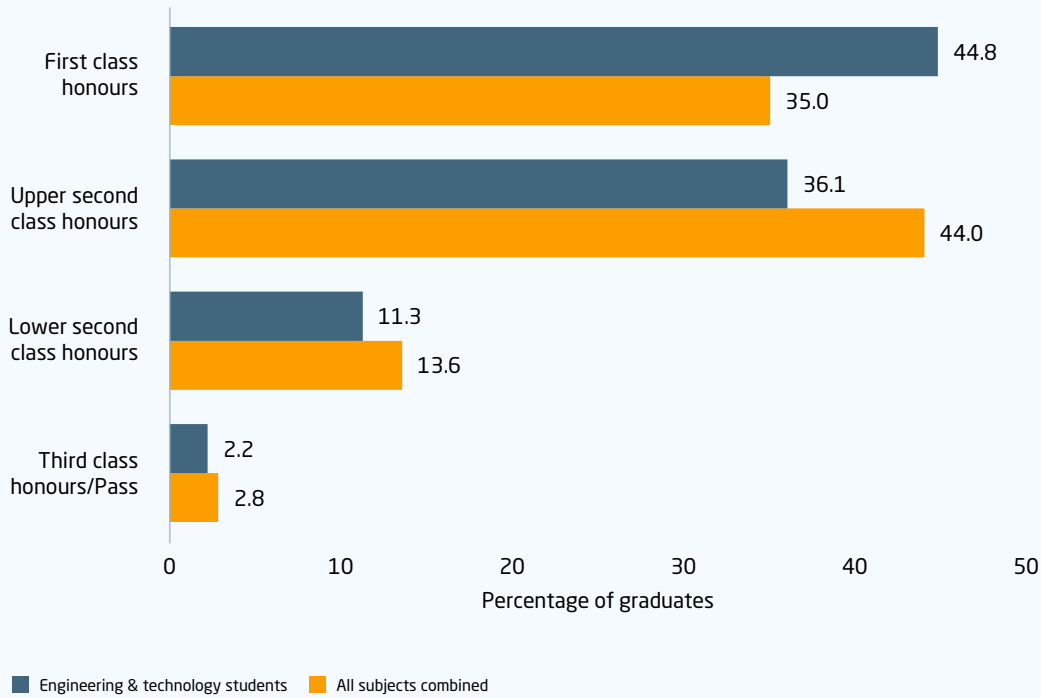
Next, we look at undergraduate students completing their course and obtaining a qualification. As not all students who enter on a degree will complete it, this gives a picture of those students most likely to go on into engineering as their completion at this stage of education indicates an increased likelihood of a future career in engineering.

Engineering and technology students are more likely to obtain a first class honours degree than students

of other subjects. This is shown in figure 4 where 44.8% of engineering and technology qualifiers obtained a first class honours degree compared to 35.0% for all subjects. This difference is offset by the percentages for upper second class degree, at 36.1% for engineering and technology and 44.0% for all subjects combined.

FIGURE 4:

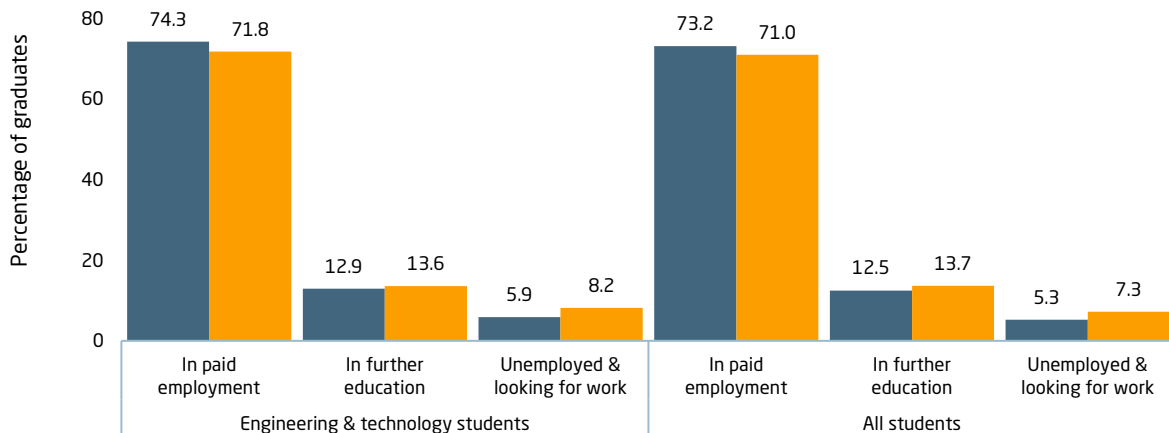
Class of degree for qualifiers in engineering and technology undergraduate degrees and all subjects, UK, 2020/21



Source: HESA student record 2020/21

FIGURE 5:

Graduate outcomes 15 months after graduation, UK, 2017/18 and 2019/20



Source: HESA graduate outcomes

Note that the percentages do not sum to 100% as there are some further options not displayed in the chart here, such as carrying out voluntary work, retired and creating a portfolio.

2.3 Graduates

The final piece of the picture comes from the graduate outcomes - that is, what engineering and technology graduates are doing 15 months after qualification. Figure 5 shows that the picture is similar for engineering and technology students compared to all students, with 71.8% of engineering and technology graduates from 2019/20 and 71.0% of all graduates in paid employment. We do however see that this is lower than in the 2017/18 cohort, where 73.2% of all graduates and 74.3% of engineering and technology graduates were in paid employment 15 months after graduation - likely an effect of the Covid-19 pandemic. Furthermore, of those in paid employment, 60.0% of engineering and technology graduates were working in the engineering industry at this point.

Additionally, 13.6% of engineering and technology graduates were in further study compared with 13.7% of all students. These figures are both higher than pre-pandemic levels. Of more concern are the 8.2% of engineering and technology graduates unemployed and looking for work, which is significantly higher than the 5.8% of those graduating in 2017/18. This does however follow a similar pattern as all subjects which have also seen an increase in the percentages unemployed and looking for work, from 5.3% to 7.3%.

3. Who is studying engineering and technology?

Previous reports by EUK and others³ have highlighted the under-representation of various groups in the engineering workforce, for example women, people from minority ethnic backgrounds and people with a disability. Engineering employers and employees have been working to promote engineering as inclusive in order to attract a more diverse future workforce. By looking at the characteristics of students and qualifiers from the HE data, we are able to explore the characteristics of people currently in an educational pathway into engineering, who are most likely to become

engineers of the future, and see if progress is being made at this stage. Here we will explore gender, ethnicity, disability, place of usual residence and students from low HE participation neighbourhoods.

3.1 Gender

Women are largely under-represented in the engineering workforce with the most recent data showing women represent just 16.5% of engineers in 2021 compared with 47.7% in the UK workforce as a whole⁴. It is worth noting that this is an increase from 10.5% in 2010, meaning there are now around 375,000 additional engineering roles filled by women than a decade prior, so improvements have been made, though at a slow pace.

However, there continue to be fewer girls than boys studying science, maths, engineering and technology (STEM) subjects from A level onwards⁵. With these being pre-requisite qualifications for study on engineering and technology degrees, the concern is that the workforce cannot reach more gender equality without increasing the number of girls and women studying the necessary subjects along the pathway. In this section we explore the latest data on student numbers and qualifiers by gender to identify if improvements have been made.

3.1.1 Undergraduate entrants by gender

Of all the engineering and technology undergraduate first degree entrants in 2020/21, 7,135 were women. This represents just 18.5% of engineering and technology students studying at this level, which is low compared to 56.5% of students across all subjects being women (figure 6). For other engineering and technology undergraduate degrees the percentage is lower still, at 14.6%, in contrast with the percentage of women being higher overall (66.6%).

³Trends in the engineering workforce, EngineeringUK 2022, accessed January 2023

⁴Women in engineering, EngineeringUK 2022, accessed January 2023

⁵Secondary pathways into engineering, EngineeringUK 2022, accessed January 2023

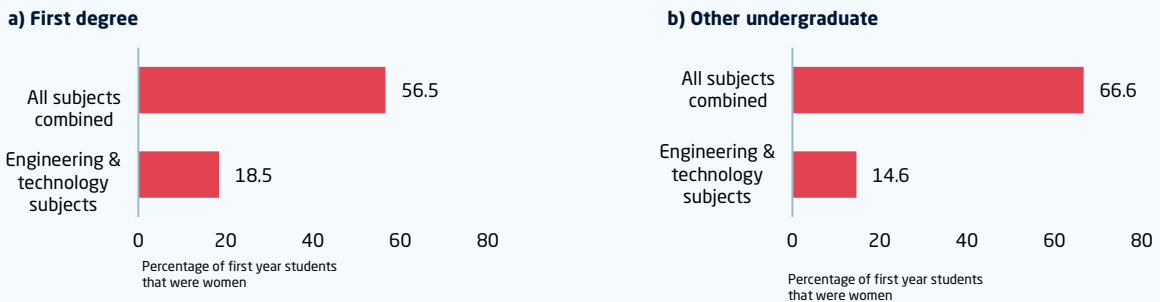
3.1.2 Undergraduate qualifiers by gender

Though the number of women studying engineering and technology degrees is lower than the number of men, for those who qualify the outcomes are positive. Almost half of the women who qualified on engineering and technology degrees did so with first class honours (48.6%). This is higher than both the percentage of men on engineering and

technology degrees, where 41.9% qualified with first class honours, and the percentage of women studying all subjects, where 35.1% achieved first class honours. This demonstrates that women have the skills and capability to do well in engineering and technology degrees should they chose it as a subject.

FIGURE 6:

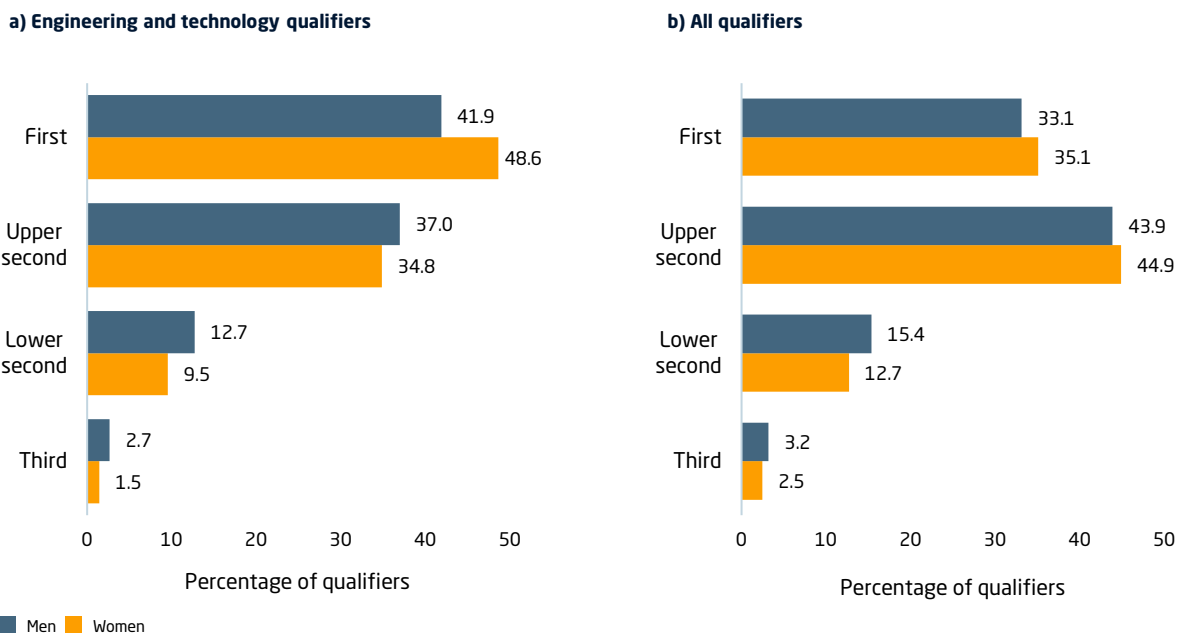
Engineering and technology first year students over time as a share of total first year students, by level of study, UK, 2020/21



Source: HESA student record 2020/21

FIGURE 7:

Class of degree for qualifiers in engineering and technology undergraduate degrees and all subjects, by gender, UK, 2020/21



Source: HESA student record 2020/21

3.1.3 Postgraduate entrants by gender

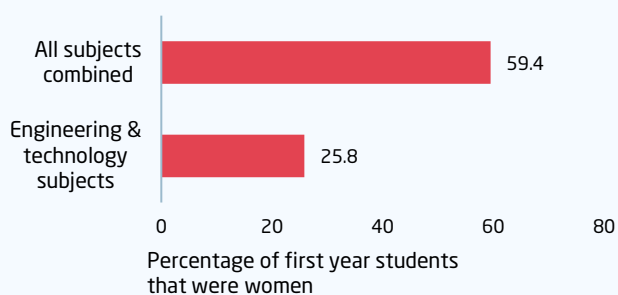
It is encouraging to see that a higher percentage of postgraduate entrants on engineering and technology degrees were women, with 25.8% of postgraduates on taught degrees and 27.8% of those on research degrees (figure 8). However,

the gap between engineering and technology entrants and those studying other subjects remains, with 59.4% of all taught postgraduate degrees being studied by women and 50.6% of all postgraduate research degrees.

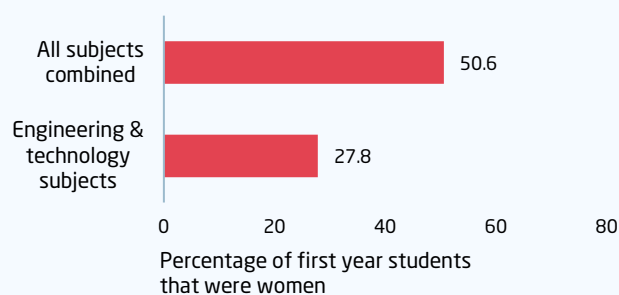
FIGURE 8:

Percentage of first year postgraduate entrants that were women, engineering and technology subjects compared with all subjects combined, 2020/21

a) Postgraduate taught



b) Postgraduate research



Source: HESA student record 2020/21

3.1.4 Graduate outcomes by gender

Looking at the outcomes of graduates 15 months after graduation, a similar percentage of men and women with an engineering and technology qualification were in paid employment (71.8% for men and 71.1% for women). There was a 1.5 percentage point (%p) difference by gender when looking at those in further education, with a higher percentage of women (15.1%) than men (13.6%). Furthermore, 8.2% of men with an engineering and technology degree were unemployed 15 months after graduation, which is 1%p higher than women with the same qualification (7.2%). If we compare engineering and technology graduates and all graduates, fewer women graduating from engineering and technology degrees were in paid employment than the average for all subjects (71.1% compared with 73.3%).

However, this may be explained by more female graduates from engineering and technology being in further education than the overall average (15.1% compared with 12.9%).

3.2 Ethnicity

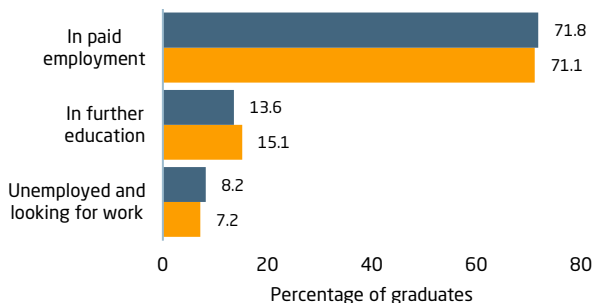
The representation of people from minority ethnic groups in engineering occupations is increasing, but their percentage share of employment remains lower than that for all jobs at 11.4% compared to 13.0% in 2021⁶. Much like with the gender disparity, the desire to create a more diverse workforce has led to the engineering community working to attract people from different ethnic backgrounds. Here we are able to explore if there is any evidence of change in the academic pathway into engineering, through looking at broad ethnic groups and their participation in engineering and technology HE studies.

⁶Trends in the engineering workforce, EngineeringUK 2022, online, accessed January 2023

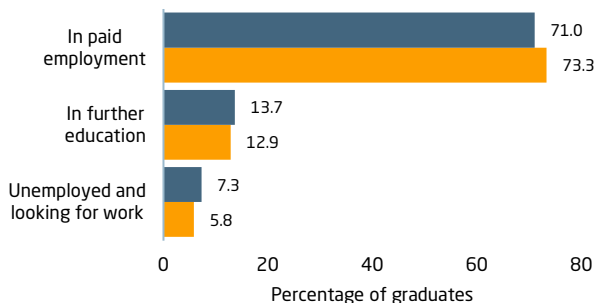
FIGURE 9:

Graduate outcomes, engineering and technology subjects compared with all subjects combined, by gender, 2019/20

a) engineering and technology graduates



b) all graduates



Source: HESA graduate outcomes
 Note that the percentages do not sum to 100% as there are some further options not displayed in the chart here, such as carrying out voluntary work, retired and creating a portfolio.

3.2.1 Undergraduate entrants by ethnicity

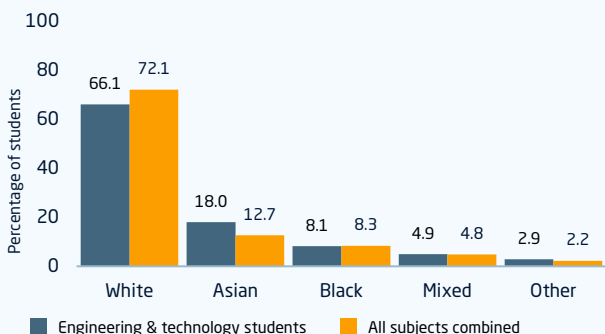
Overall, engineering and technology degrees had a higher proportion of minority ethnic entrants than other subjects. For undergraduate first degrees, engineering and technology saw a higher percentage of Asian entrants than what was seen in all subjects combined at 18.0% compared with 12.7%. This difference is mostly offset by a lower percentage of white students in engineering and technology.

For Black, mixed and other ethnic groups, there was a similar percentage of entrants in engineering and technology as there is in the student population as a whole.

This is not the same for other undergraduates, where around 9 in 10 engineering and technology students were white compared to 82.2% in all subjects combined. All other ethnic groups had a lower percentage share of the engineering and technology student population than what was seen in all subjects.

FIGURE 10:

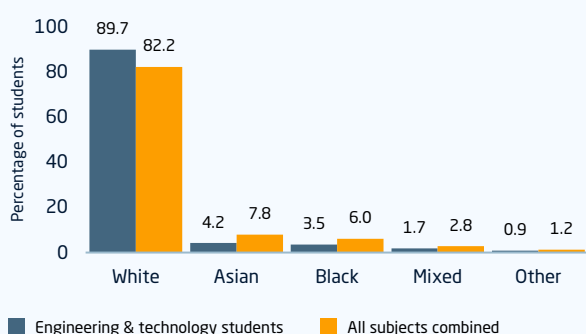
Percentage of undergraduate degree entrants by ethnic group, engineering and technology subjects compared with all subjects combined, 2020/21



Source: HESA student record 2020/21
 Note that only students from the UK have ethnicity recorded in the dataset and therefore others are not included in this analysis.

FIGURE 11:

Percentage of other undergraduate entrants by ethnic group, engineering and technology subjects compared with all subjects combined, 2020/21



Source: HESA student record 2020/21
 Note that only students from the UK have ethnicity recorded in the dataset and therefore others are not included in this analysis.

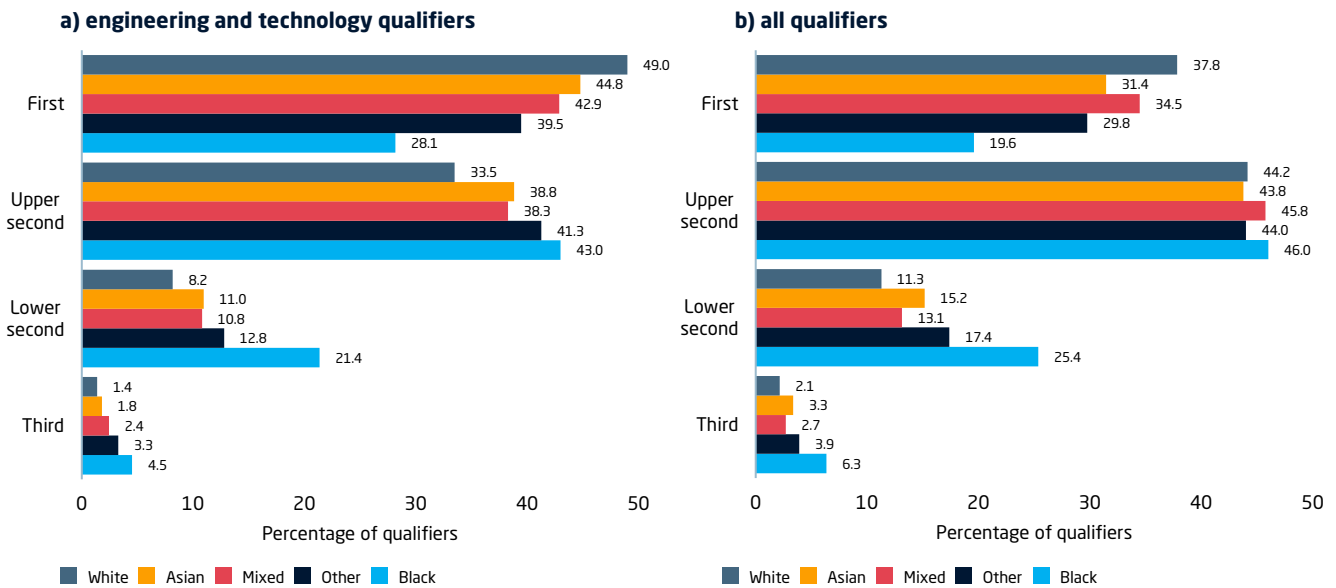
3.2.2 Undergraduate qualifiers by ethnicity

For all ethnic groups, engineering and technology students had a higher percentage of first class honours than all qualifiers. Of particular note are white and Asian qualifiers in with over 40% achieving first class honours but more than 10%p difference between engineering and technology and the overall

average. Looking at students obtaining upper second class honours, for all subjects combined there is little difference between ethnic groups, with a range of 44.0%-46.0%. For engineering and technology subjects there is more variation, ranging from 33.5% in white qualifiers to 43.0% in Black qualifiers.

FIGURE 12:

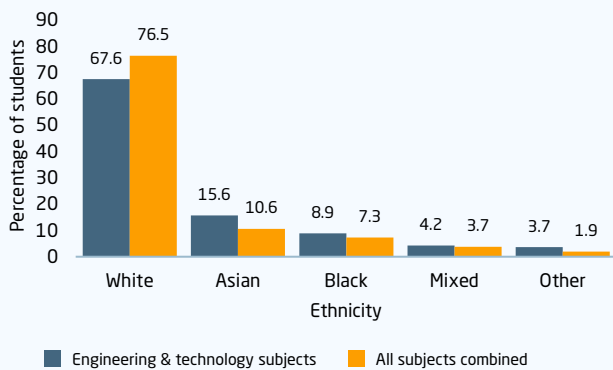
Class of degree for qualifiers in engineering and technology undergraduate degrees and all subjects, by ethnicity, UK, 2020/21



Source: HESA student record 2020/21
Note that only students from the UK have ethnicity recorded in the dataset and therefore others are not included in this analysis.

FIGURE 13:

Percentage of first year postgraduate taught entrants by ethnic group, engineering and technology subjects compared with all subjects combined, 2020/21



Source: HESA student record 2020/21
Note that only students from the UK have ethnicity recorded in the dataset and therefore others are not included in this analysis.

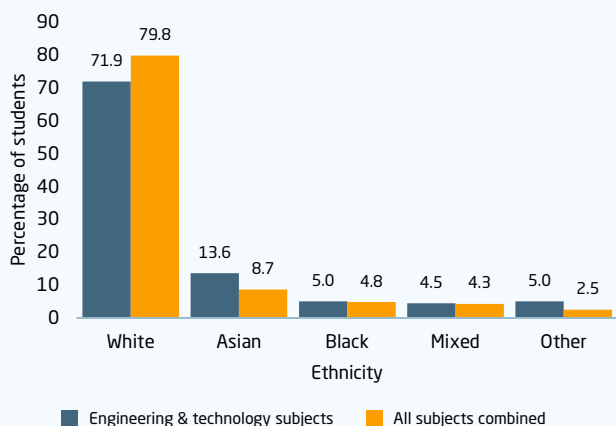
3.2.3 Postgraduate entrants by ethnicity

For postgraduate study, again there were higher percentages of entrants from minority ethnic groups than seen for all subjects combined. For postgraduate taught degrees, 67.7% of engineering and technology entrants were white compared with 76.5% in all subjects. This was higher still in postgraduate research courses, with 71.9% of engineering and technology entrants and 79.8% of all entrants being white.

It is encouraging to see that the percentage of Asian entrants studying postgraduate degrees in engineering and technology continues to be higher than for all subjects at 15.6% for taught courses and 13.6% for research courses compared to 10.6% and 8.7% respectively for all subjects. There are also higher percentages of engineering and technology entrants in all minority ethnic groups than the average for all subjects.

FIGURE 14:

Percentage of first year postgraduate research entrants by ethnic group, engineering and technology subjects compared with all subjects combined, 2020/21



Source: HESA student record 2020/21
 Note that only students from the UK have ethnicity recorded in the dataset and therefore others are not included in this analysis.

3.3 Gender and ethnicity

Next, we look at the variation between ethnic groups for men and women separately. It is important to look at this further detail, as a truly diverse workforce needs to not only increase inclusion in one aspect of diversity - for example if the percentage of females increased but very few of those women were from minority ethnic backgrounds, many of the benefits of a diverse workforce would still be missing. We can use the HE data again to look at how this may impact the future engineering workforce.

3.3.1 Undergraduate entrants by ethnicity and gender

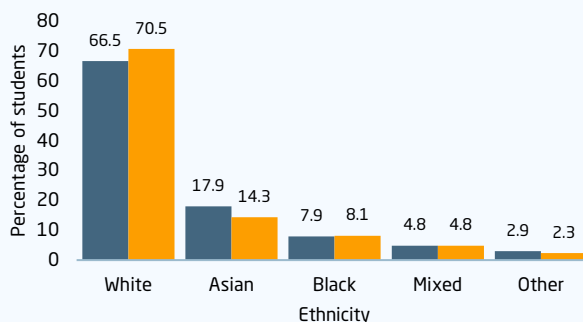
Figure 15 shows that while the percentage of undergraduate first degree entrants in each ethnic group followed the same pattern for men and women, there was more difference between subjects for women. Engineering and technology had a higher proportion of female entrants from minority ethnic backgrounds than all subjects combined (35.7% compared with 26.8%). For men, the corresponding percentage of minority ethnic

entrants was 33.5% for engineering and technology and 29.5% for all subjects. Of the minority ethnic groups, Asian entrants fill the highest percentage of places with 17.9% of men on engineering and technology courses and 18.2% of women. This is particularly notable as just 11.5% of all women on undergraduate degree courses are of Asian ethnicity. There is also a higher percentage of Black women studying on engineering and technology courses (9.2%) than on all courses (8.5%) which is different to men where 7.9% of engineering and technology entrants were Black, compared to 8.1% in all subjects.

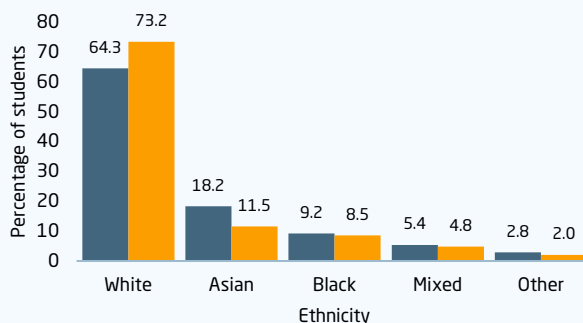
FIGURE 15:

Percentage of undergraduate degree entrants by ethnic group and gender, engineering and technology subjects compared with all subjects combined, 2020/21

a) men



b) women



Source: HESA student record 2020/21
 Note that only students from the UK have ethnicity recorded in the dataset and therefore others are not included in this analysis.

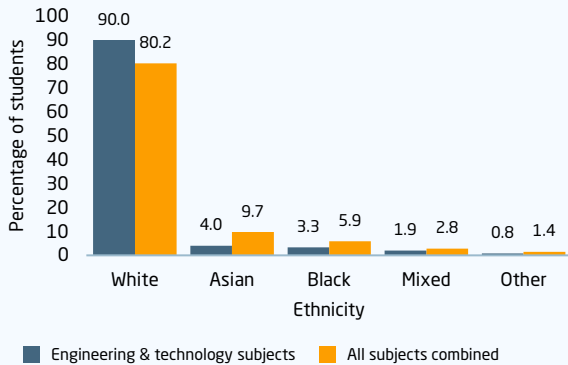
For other undergraduates the student population is mostly white at 90% or more of both men and

women in engineering and technology and over 80% in all subjects.

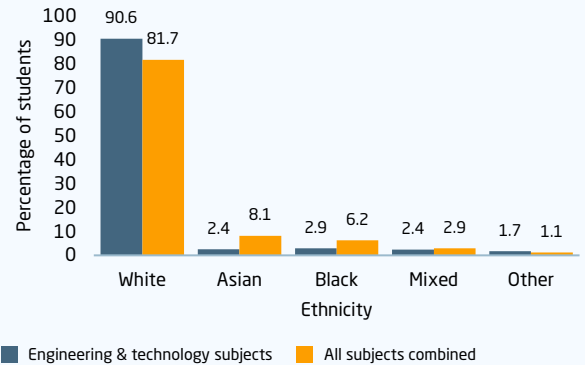
FIGURE 16:

Percentage of other undergraduate entrants by ethnic group and gender, engineering and technology subjects compared with all subjects combined, 2020/21

a) men



b) women



Source: HESA student record 2020/21
Note that only students from the UK have ethnicity recorded in the dataset and therefore others are not included in this analysis.

3.3.2 Undergraduate qualifiers by ethnicity and gender

Looking at undergraduate qualifiers, we see that women outperform men in almost all ethnic groups in terms of achieving first class honours and by a larger percentage point difference in engineering and technology than for all subjects.

We start by looking at the white ethnic group, who we know have the largest share of the student population and are denoted by the grey bars in figures 17 and 18. For all subjects combined, white males had the highest percentage of first class honours at 23.4%, and white females had the second highest (behind mixed ethnicity) at 23.2%. The corresponding percentage of white students achieving first class honours in engineering and technology was 32.7% for men and even higher for women at 35.7%. As is seen in the overall qualifiers data, this is somewhat offset by the differences seen in those achieving upper second class honours.

Students of Asian ethnicity (denoted by the yellow bar) have the highest percentage of men qualifying with first class honours in engineering and technology at 33.2%, which is 5% lower than the percentage of Asian women qualifiers obtaining first class honours (38.2%). The corresponding percentages for first class honours in all subjects are much lower at 21.9% in men and 20.6% in women. Asian men in engineering and technology also have a higher percentage of upper second class honours at 31% compared to 29.5% in all subjects.

Black students (denoted by the blue bar) have among the highest percentages of qualifiers achieving upper second class honours for men studying engineering and technology (30.2%) and all subjects (27.9%), and also for women studying engineering and technology (34.5%). Women of mixed ethnicity saw the highest percentage of first class honours for engineering and technology degrees (38.6%) which is in contrast to all subjects combined where they have the lowest percentage of qualifiers (13.3%).

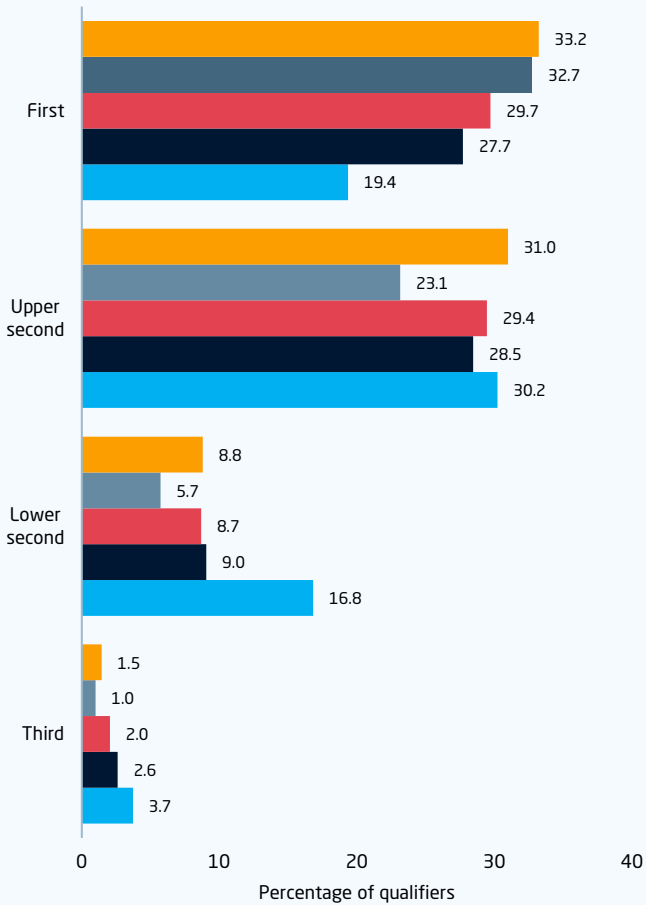
Overall, it is very positive to see such high achievement rates among ethnic minority engineering and technology students and

important to highlight this success to young people, for them to see engineering as an option, regardless of ethnicity or gender.

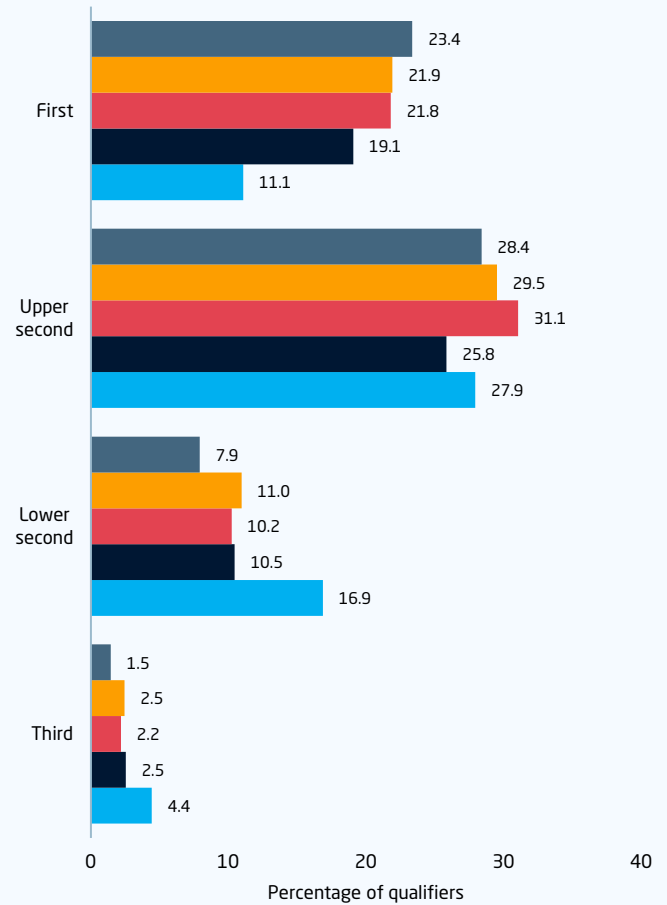
FIGURE 17:

Class of degree for male qualifiers in engineering and technology undergraduate degrees and all subjects, by ethnicity, UK, 2020/21

a) Engineering and technology qualifiers



b) All qualifiers



Asian White Mixed Other Black

White Asian Mixed Other Black

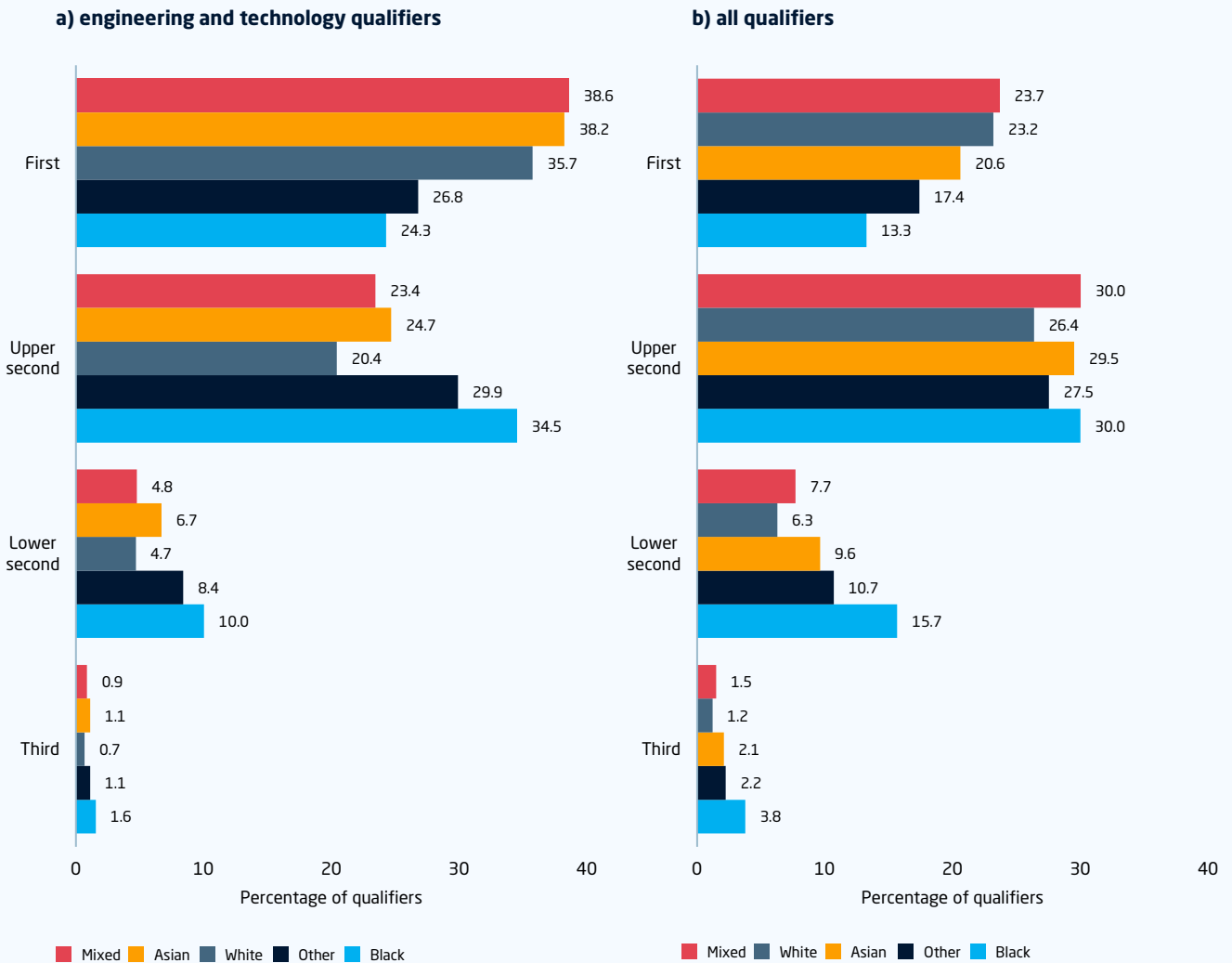
Source: HESA student record 2020/21

Note that only students from the UK have ethnicity recorded in the dataset and therefore others are not included in this analysis.



FIGURE 18:

Class of degree for female qualifiers in engineering and technology undergraduate degrees and all subjects, by ethnicity, UK, 2020/21



Source: HESA student record 2020/21
 Note that only students from the UK have ethnicity recorded in the dataset and therefore others are not included in this analysis.

3.3.3 Postgraduate entrants by ethnicity and gender

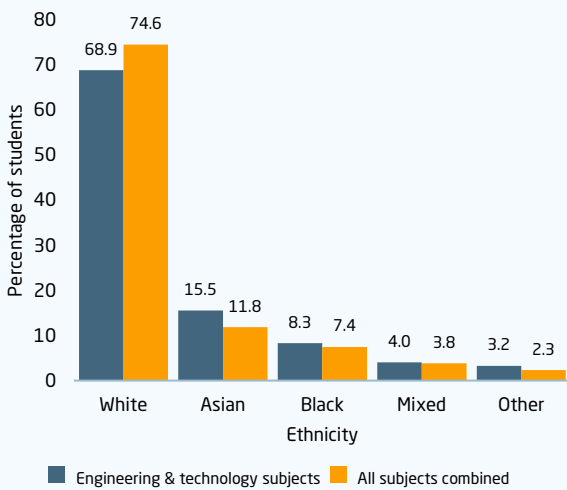
For postgraduate study, we see similar patterns by ethnicity and gender to that of undergraduate first degrees for both taught and research programmes with a lower percentage of white entrants studying engineering and technology than the average for all subjects combined. One

difference can be seen between men and women when looking at postgraduate research programmes, as there is more ethnic diversity in the women choosing to study engineering and technology at this level - a third of women are from minority ethnic groups compared to 26.9% of men. This is mainly due to a higher percentage of Asian women studying postgraduate engineering and technology research degrees (18.8%), which is also high compared to all subjects combined (9.8%).

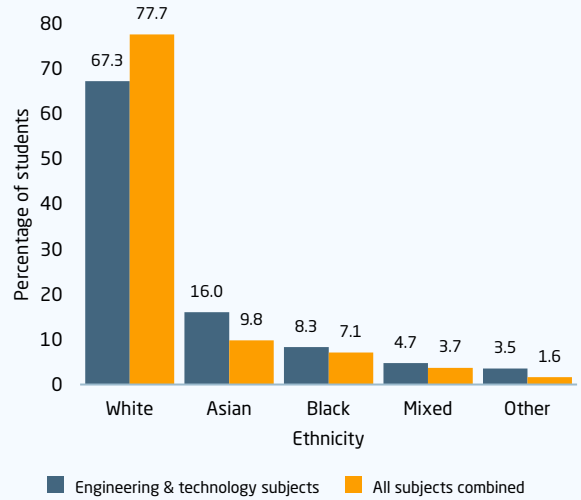
FIGURE 19:

Percentage of taught postgraduate degree entrants by ethnic group and gender, engineering and technology subjects compared with all subjects combined, 2020/21

a) men



b) women

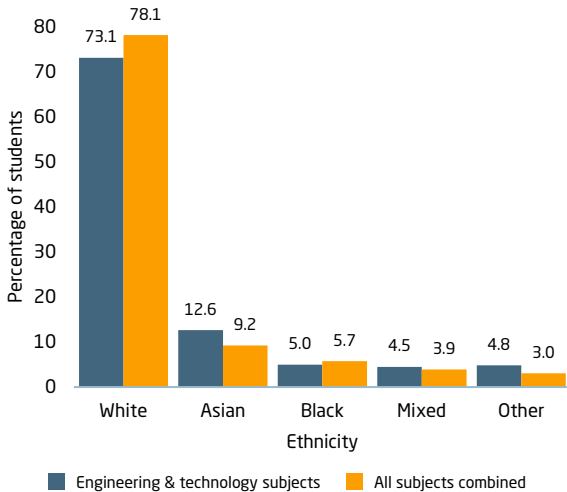


Source: HESA student record 2020/21
 Note that only students from the UK have ethnicity recorded in the dataset and therefore others are not included in this analysis.

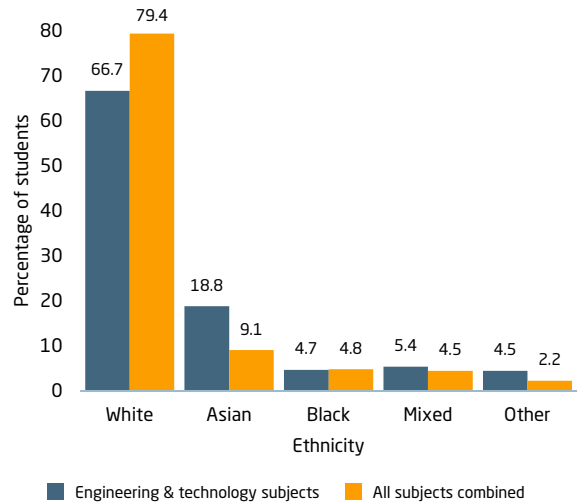
FIGURE 20:

Percentage of research postgraduate degree entrants by ethnic group and gender, engineering and technology subjects compared with all subjects combined, 2020/21

a) men



b) women



Source: HESA student record 2020/21
 Note that only students from the UK have ethnicity recorded in the dataset and therefore others are not included in this analysis.

3.4 Disability

Next we explore students with a known disability and their participation in HE courses, comparing engineering and technology with all subjects combined as in the previous sections. It is worth noting that the term 'disability' covers a wide range of conditions (see methods section for definitions) and that students are not obliged to disclose any disability should they not wish to do so. We therefore group the students here into those with a known disability and those with no known disability.

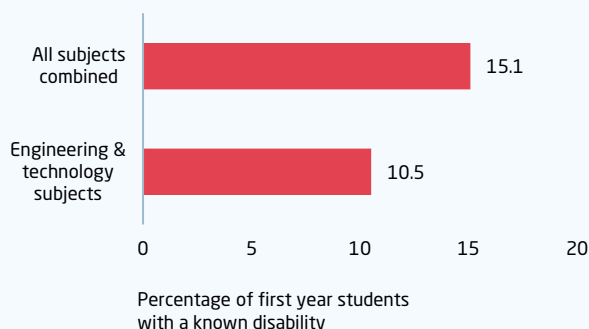
3.4.1 Undergraduate entrants by disability status

Engineering and technology subjects appear to be lagging behind other subjects in terms of recruiting disabled students to study in HE. In 2020/21, just 10.5% of engineering and technology first degree entrants had a known disability, compared to 15.1% for all subjects combined. For other undergraduates the percentages were lower still at 8.5% and 12.2% respectively.

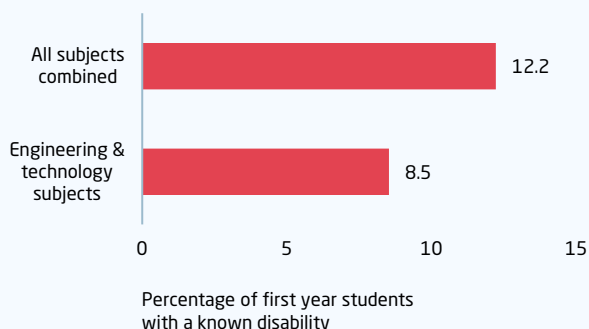
FIGURE 21:

Percentage of undergraduate first degree entrants with a known disability, engineering and technology subjects compared with all subjects combined, 2020/21

a) First degree



b) Other undergraduate

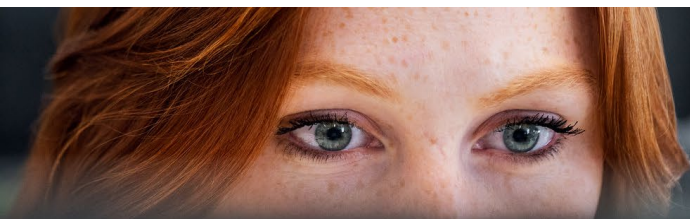


Source: HESA student record 2020/21

3.4.2 Undergraduate qualifiers by disability status

Despite the lower participation rates, students with a known disability still perform well in HE. In fact, 45.1% of engineering and technology qualifiers with a known disability did so with a first class honours and a further 35.9% gained upper second

class honours. This is higher than their counterparts with no known disability with 42.5% and 37.8% respectively, though do note that the number of students with a disability was comparatively low.



3.4.2 Undergraduate qualifiers by disability status

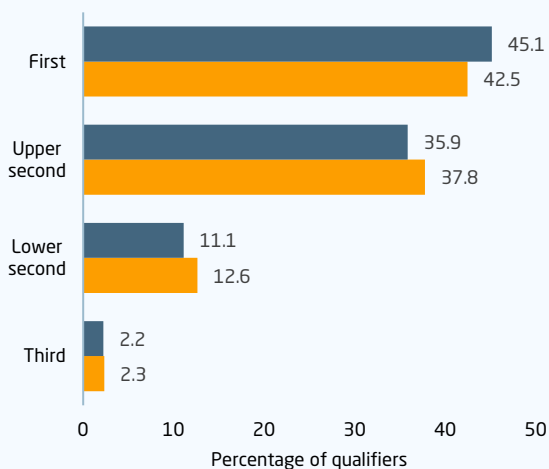
Despite the lower participation rates, students with a known disability still perform well in HE. In fact, 45.1% of engineering and technology qualifiers with a known disability did so with a first class honours and a further 35.9% gained upper second

class honours. This is higher than their counterparts with no known disability with 42.5% and 37.8% respectively, though do note that the number of students with a disability was comparatively low.

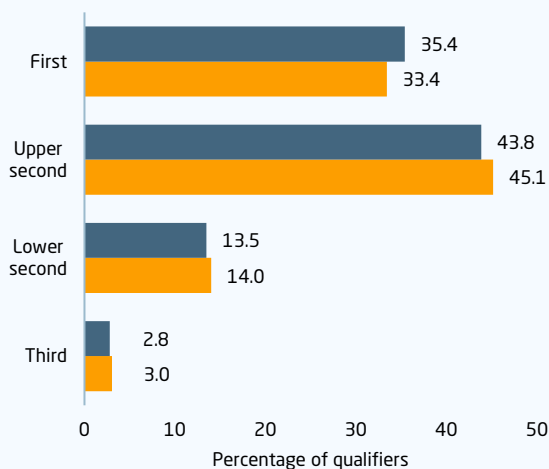
FIGURE 22:

Class of degree for qualifiers in engineering and technology undergraduate degrees and all subjects, by disability status, UK, 2020/21

a) Engineering and technology qualifiers



b) All qualifiers



■ Known disability ■ No Known disability

■ Known disability ■ No Known disability

Source: HESA student record 2020/21

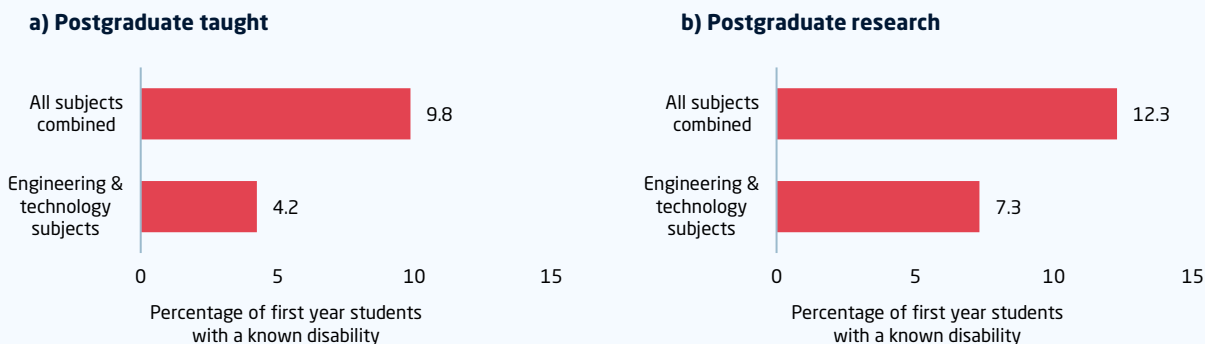
3.4.3 Postgraduate entrants by disability status

Percentages of entrants with a known disability are lower still when looking at postgraduate study for both all subjects and particularly in engineering and technology where just 4.2% of postgraduate taught and 7.3% of postgraduate research students had a known disability. This compares to 9.8% and 12.3% of students studying all subjects on taught and

research programmes respectively. It is important that the barriers to participation are explored related to postgraduate study and disability to ensure that engineering is accessible to a wider range of students moving forward that may then follow the pathway to an engineering career.

FIGURE 23:

Percentage of postgraduate entrants with a known disability, engineering and technology subjects compared with all subjects combined, 2020/21



Source: HESA student record 2020/21

3.5. Low HE participation neighbourhoods (POLAR4)

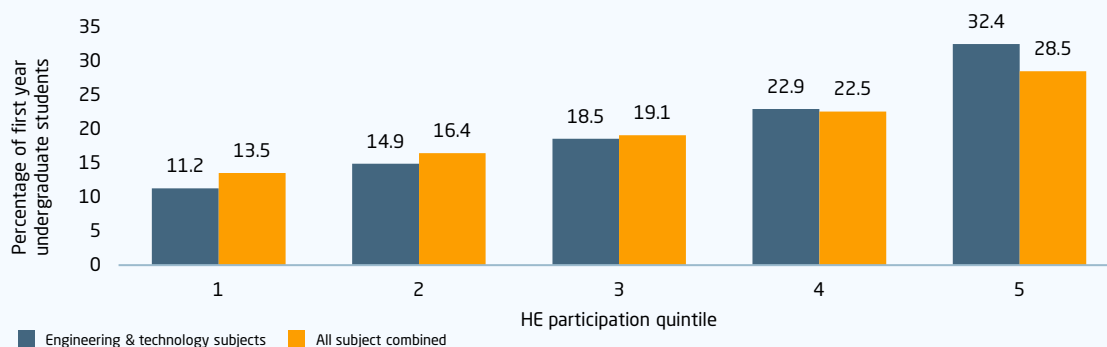
As a measure of deprivation, an index has been created by the Office for Students⁷ looking at how likely young people are to participate in higher education across the UK based on their area of residence (see methods section 1.3.4 in Part 3 for further details). If participation in HE were equal for all, then each quintile would contain 20% of the student population, however we see that this is not the case and that differences occur between engineering and technology and other subjects.

3.5.1 Undergraduate entrants from low HE participation neighbourhoods

Figure 24 shows the percentage of first degree entrants in each quintile on the POLAR4 HE participation index for engineering and technology subjects and all subjects combined. Although some disparity is seen across all subjects, it is clear that engineering and technology students are much more likely to come from the higher quintiles with 32.4% of students from areas with the highest participation rates among young people (quintile 5) and just 11.2% from the areas with the lowest participation (quintile 1).

FIGURE 24:

Percentage of first year undergraduate students in each HE participation (POLAR4) quintile, engineering and technology subjects compared with all subjects combined, 2020/21



Source: HESA student record 2020/21

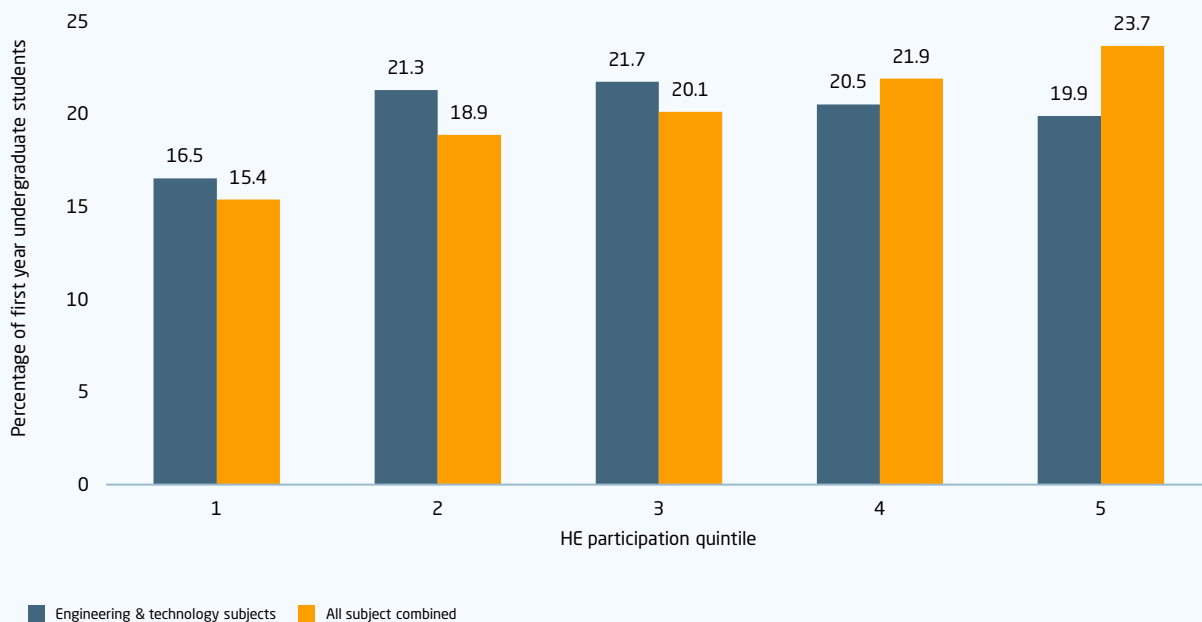
⁷[Young participation by area](#), Office for Students, online, accessed January 2023

It is encouraging to see that for other undergraduates (figure 25), there are fewer than 20% of students from the highest quintile, though there is still the lowest percentage of students from

the lowest quintile (16.5%). This indicates that perhaps this route into engineering is more accessible or attractive to those from more deprived areas.

FIGURE 25:

Percentage of other undergraduate students in each HE participation (POLAR4) quintile, engineering and technology subjects compared with all subjects combined, 2020/21



Source: HESA student record 2020/21

3.5.2 Undergraduate qualifiers from low HE participation neighbourhoods

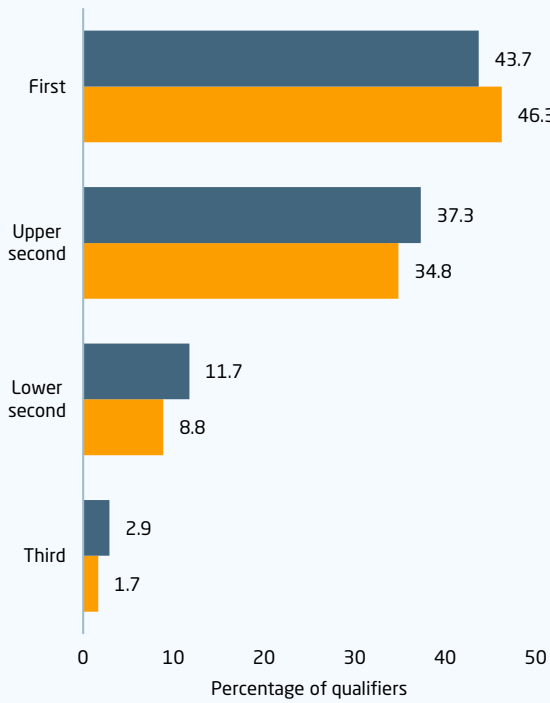
For those who do qualify with an undergraduate degree, there are positive results for students from areas of all levels of participation. In figure 26, you see a comparison of the results for students from the lowest HE participation quintile compared to the highest HE participation quintile. For all qualifiers (figure b) there is a distinct difference between the percentage of students qualifying with first class honours dependent upon whether they come from

an area of low or high HE participation (30.9% for quintile 1 compared to 38.2% for quintile 5). For engineering and technology, the difference is not as large at 43.7% for the lowest quintile compared to 46.3% for the highest. In fact, for upper second class honours in engineering and technology, the lowest quintile has a higher percentage of qualifiers at 37.3% compared to 34.8% in the highest quintile.

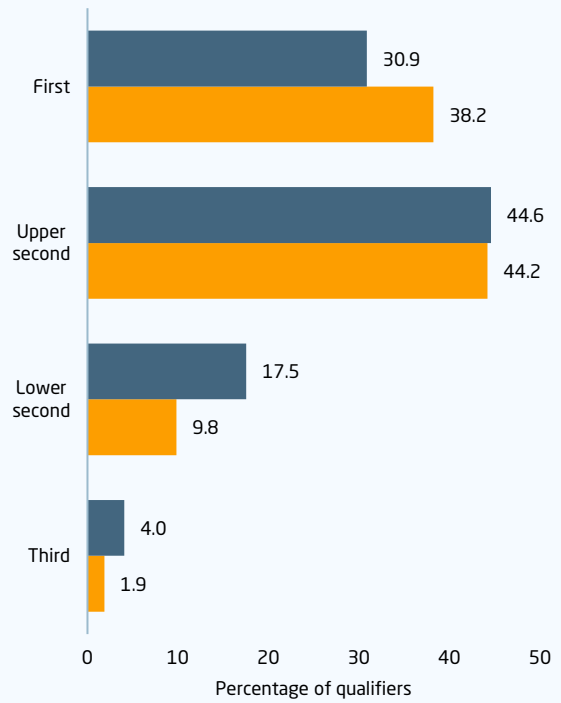
FIGURE 26:

Class of degree for qualifiers in engineering and technology undergraduate degrees and all subjects, by participation quintile, UK, 2020/21

a) Engineering and technology qualifiers



b) All qualifiers



■ Lowest quintile ■ Highest quintile

■ Lowest quintile ■ Highest quintile

Source: HESA student record 2020/21

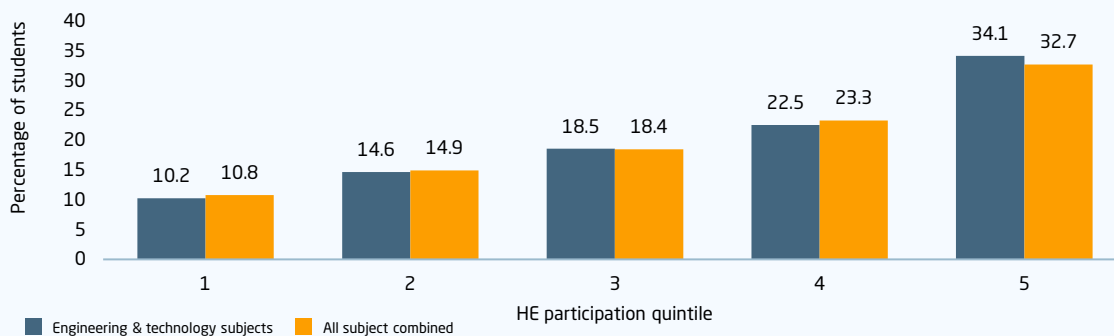
3.5.3 Postgraduate entrants from low HE participation neighbourhoods

For postgraduate study, the distinction by area is clear. Very few students studying either taught or research postgraduate programmes were from the low HE participation quintiles. For engineering and technology, just 10.2% of taught students and 8.2% of research students were from the lowest HE participation quintile. Instead, much higher percentages were in fact from the highest HE

participation quintile, with 34.1% of taught and 38.3% of research students. We can, of course, not be certain if students from the lower HE participation areas would be interested in this higher level of study or if there are further barriers such as cost or accessibility that are stopping them from continuing along the academic pathway, which is something that warrants further investigation.

FIGURE 27:

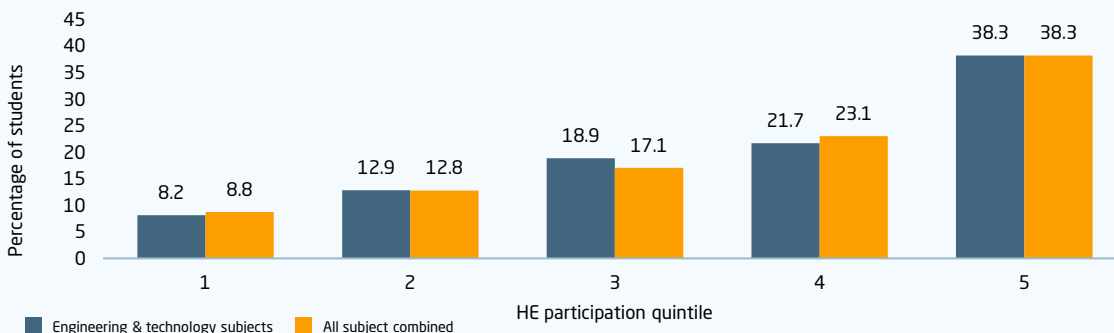
Percentage of taught postgraduate students in each HE participation (POLAR4) quintile, engineering and technology subjects compared with all subjects combined, 2020/21



Source: HESA student record 2020/21

FIGURE 28:

Percentage of research postgraduate students in each HE participation (POLAR4) quintile, engineering and technology subjects compared with all subjects combined, 2020/21



Source: HESA student record 2020/21

3.6 Place of usual residence

There are many HE options in the UK for students from across the world, with many high ranking universities, leading to high numbers of international students choosing to study here. In this section we split students into three groups:

those who usually reside in the UK (before having started their HE course), those who would usually reside in a country in the European Union (EU) and those from the rest of the world (RoW).

3.6.1 Undergraduate entrants by place of usual residence

Looking at undergraduates, 7% of entrants from the EU and 9% of those from the RoW are choosing to study engineering and technology courses, compared to 3% of UK students. It is therefore important to understand the effect that this has on student numbers, particularly in light of any changes that may take place following political events such as Brexit.

Figure 29a shows that engineering and technology has a higher percentage of first degree undergraduate entrants from the RoW than the average for all subjects, with 21.0% of all students

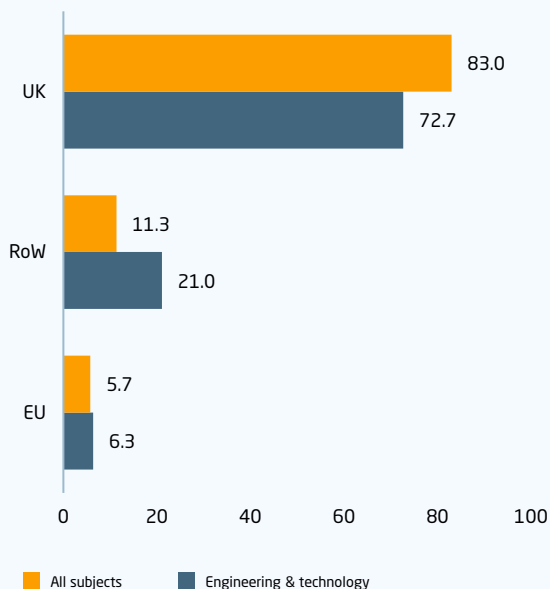
compared to 11.3% overall. Also there is a higher percentage of students from the EU studying engineering and technology (6.3%) compared to all subjects (5.7%). This is mostly offset by a lower percentage of UK students, with 72.7% of engineering and technology students from the UK compared to 83.0% overall.

We do not see such a large distinction on other undergraduates where there are 86.9% of students from the UK, 10.3% from the RoW and 2.7% from the EU in engineering and technology compared to 86.3%, 11.8% and 1.9% respectively for all subjects.

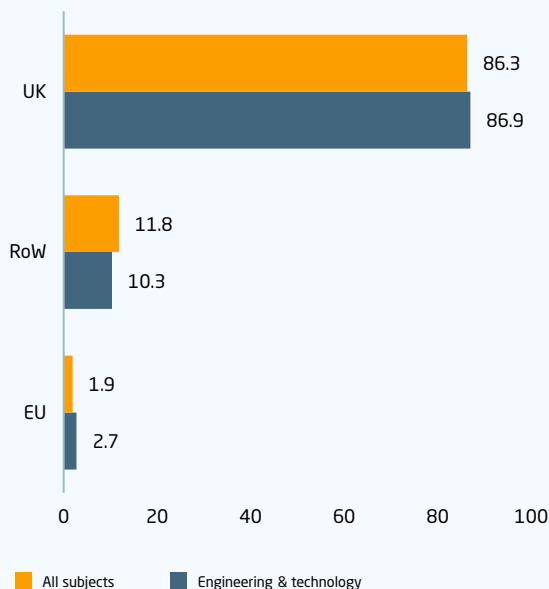
FIGURE 29:

Percentage of first year undergraduate students domiciled in the UK, European Union (EU) and the rest of the world (RoW), engineering and technology subjects compared with all subjects combined, 2020/21

a) Undergraduate first degree



b) Other undergraduate



Source: HESA student record 2020/21

3.6.2 Undergraduate student qualifiers by place of usual residence

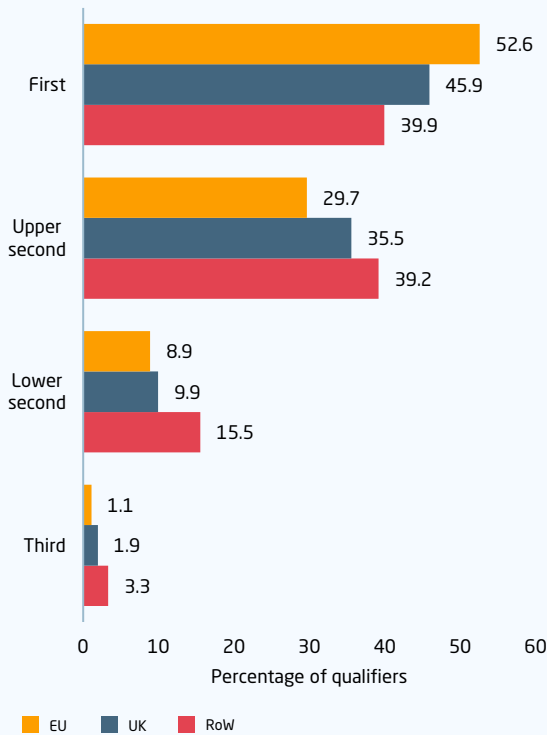
For those qualifying in engineering and technology, more than half of EU students achieved first class honours in 2020/21, along with 45.9% of UK

students and 39.9% of those from the RoW. This is approximately 10% higher than their counterparts when looking at all subjects combined.

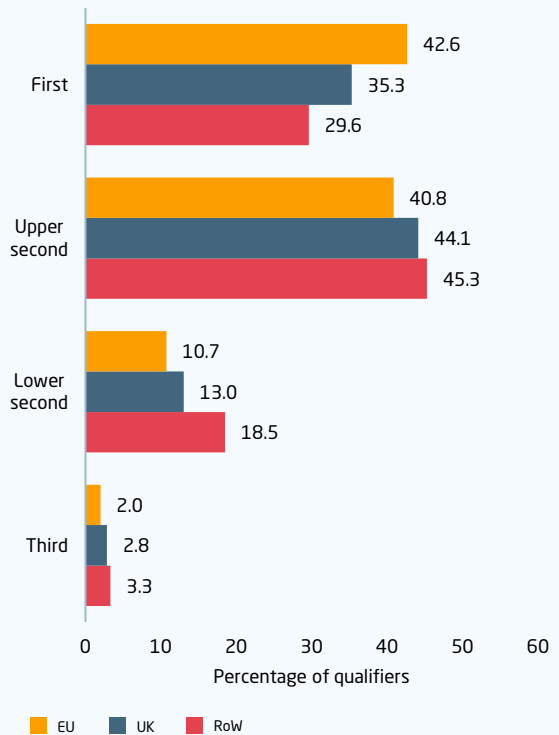
FIGURE 30:

Class of degree for qualifiers in engineering and technology undergraduate degrees and all subjects, by place of usual residence, UK, 2020/21

a) Engineering and technology qualifiers



b) All qualifiers



Source: HESA student record 2020/21

3.6.3 Postgraduate entrants by place of usual residence

For international students studying postgraduate degrees in the UK, engineering and technology is a popular choice. In fact, we saw that in 2020/21, 14.5% of students from the EU starting postgraduate taught degrees were studying engineering and technology as were 19.2% of

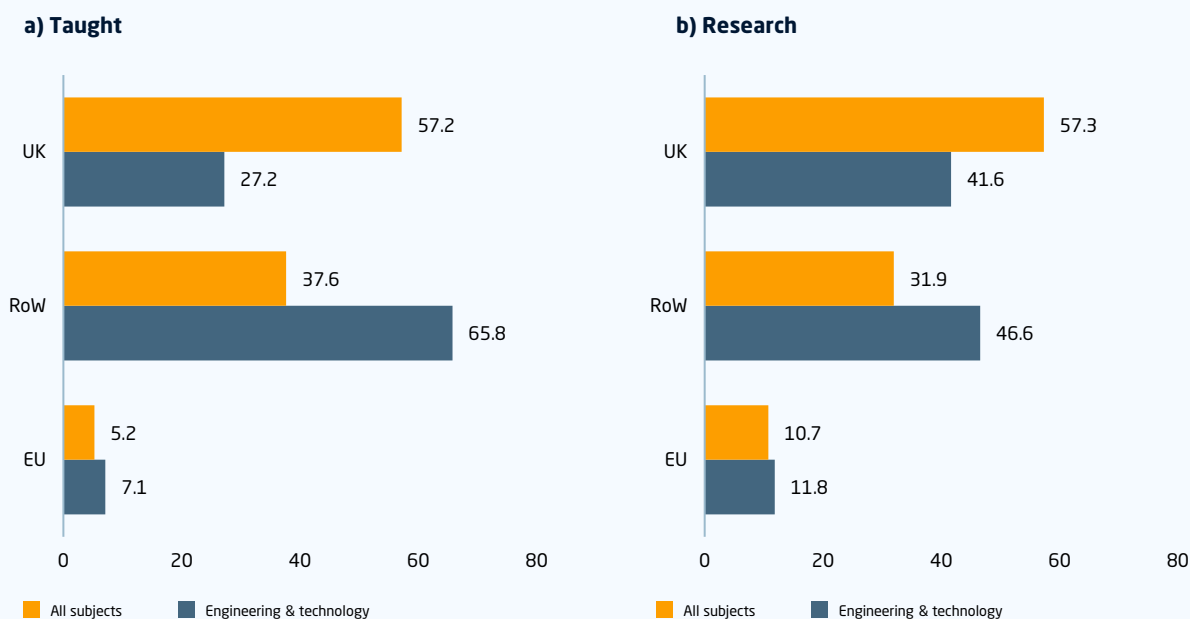
students from the RoW studying at this level. For postgraduate research entrants from the EU, 7.3% were studying engineering and technology and 9.4% of all students from the RoW. This shows that the UK is considered a popular choice for studying engineering and technology at this higher level.

Figure 31 shows that the majority of students studying taught postgraduate degrees in engineering were from the RoW (65.8%) which is high compared to all subjects (37.6%). Postgraduate

research programmes also attract a large number of international students with 46.6% of all students from the RoW and 11.8% from the EU. Again, this is high compared to all subjects.

FIGURE 31:

Percentage of first year postgraduate students domiciled in the UK, European Union (EU) and the rest of the world (RoW), engineering and technology subjects compared with all subjects combined, 2020/21



Source: HESA student record 2020/21

4. Discussion

Overall, the HE pathway into engineering has seen positive increases in total numbers and increased diversity in recent years, albeit at a relatively slow pace. However, we know that there is currently a big skills shortage⁸ in the STEM and engineering workforce in the UK and there are still not enough students to meet the future need for engineers. This is particularly of concern as EngineeringUK found in the Engineering Brand Monitor survey⁹ that the academic pathway into engineering is the most well-known of routes.

The government's levelling up agenda and drive to 'build back better' through infrastructure, innovation and green technologies is going to require an increase in the number of engineers in all regions of the UK to succeed. It is therefore imperative that young people from all backgrounds, including those in low HE participation areas, understand the opportunities that are available to them both in HE and vocational routes into engineering such as T levels and degree apprenticeships.

⁸[Addressing the STEM skills shortage challenge](#), The Institution of Engineering and Technology, online, accessed January 2023

⁹[Engineering Brand Monitor 2021, EngineeringUK 2022](#), online, accessed January 2023

In order to facilitate this, the engineering community need to work with schools and further education institutions to provide the right careers resources and support to increase young people's knowledge of engineering and the vast skills and applications associated with it. We need to ensure that all young people, irrespective of their gender,

ethnicity, socio-economic background or disability status, have the opportunity to succeed should they aspire to become an engineer of the future.

The next part of the report looks at each principal subject individually and explore the characteristics of the students studying and results obtained.



Part 2: Engineering subjects at a glance

Engineering and technology can be split into a number of principal subjects, as described in Part 3 of the report. In this section we look at the 7 most

popular principal subjects within the HE data to explore which are the most popular at each level of study.

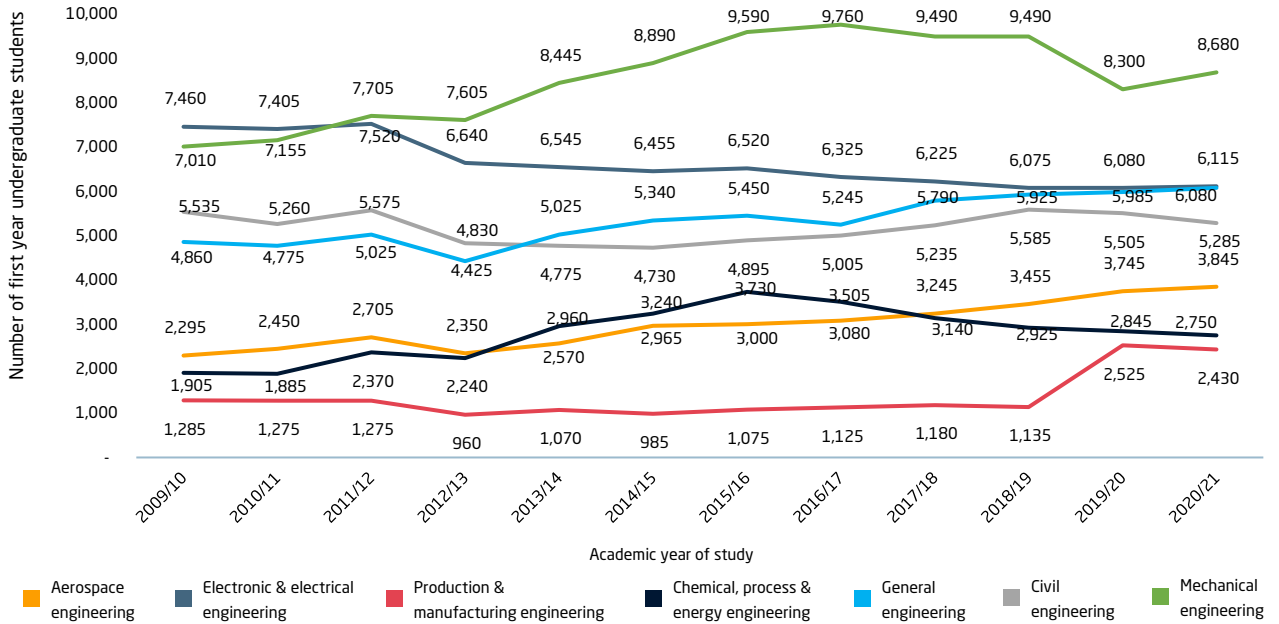
1. Undergraduate first degree entrants

Figure 32 shows the trend in the number of entrants studying each subject at undergraduate first degree level. From around 2011/12, mechanical engineering has consistently been the most popular subject in engineering and technology at this level, with a peak of 9,760 entrants in 2016/17 and some decline since then to 8,680 in the latest period, 2020/21. The numbers of students studying electronic and electrical engineering has been in decline since the start of this period, with the latest figures at 6,115 which is around 1,350 fewer than in 2009/10. General

engineering numbers have increased by more than 1,200 over the same period and are now very similar to those for electrical engineering, which suggests that students are looking to keep their options open by being more general in their approach to study, with specialism to come later. Production and manufacturing engineering appears to have seen a large increase in recent years from 2018/19, however this period coincides with the change in coding and we therefore should interpret this trend with caution.

FIGURE 32:

Trends in the number of first degree undergraduate entrants studying engineering and technology, by principal subject, UK



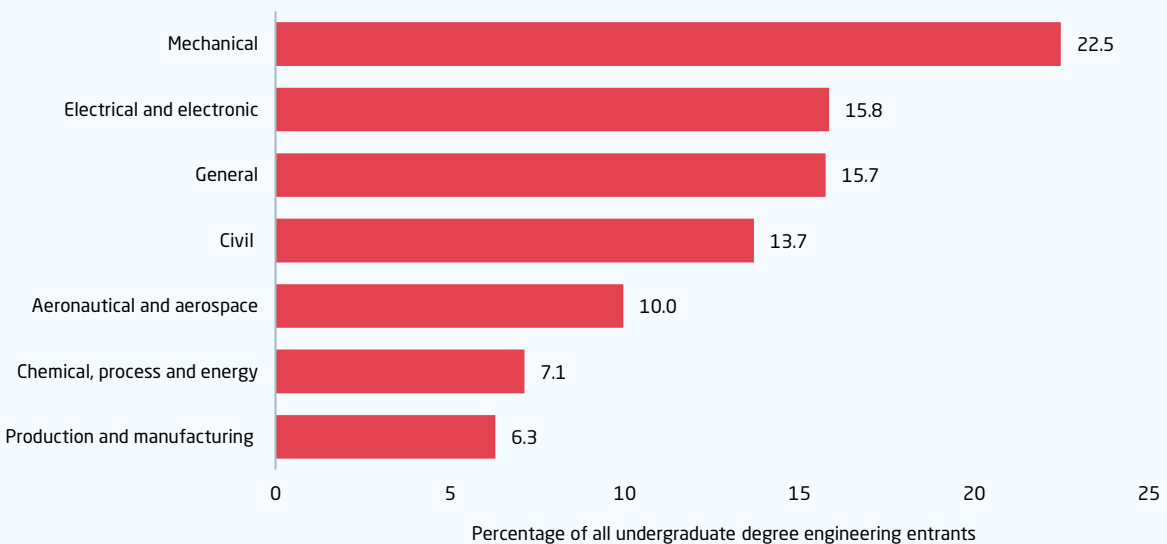
Source: HESA student record 2020/21
 Note there has been a change to the coding system used to classify subjects in HE from 2019/20

Now if we look at the percentage share each of these subjects has of the overall engineering and technology cohort, we see that mechanical engineering is the most popular for first

undergraduate degrees with 22.5% of students studying this, followed by electronic and electrical engineering (15.8%) and general engineering (15.7%).

FIGURE 33:

Percentage share of engineering and technology first degree entrants by principal subject (2020/21)



Source: HESA student record 2020/21

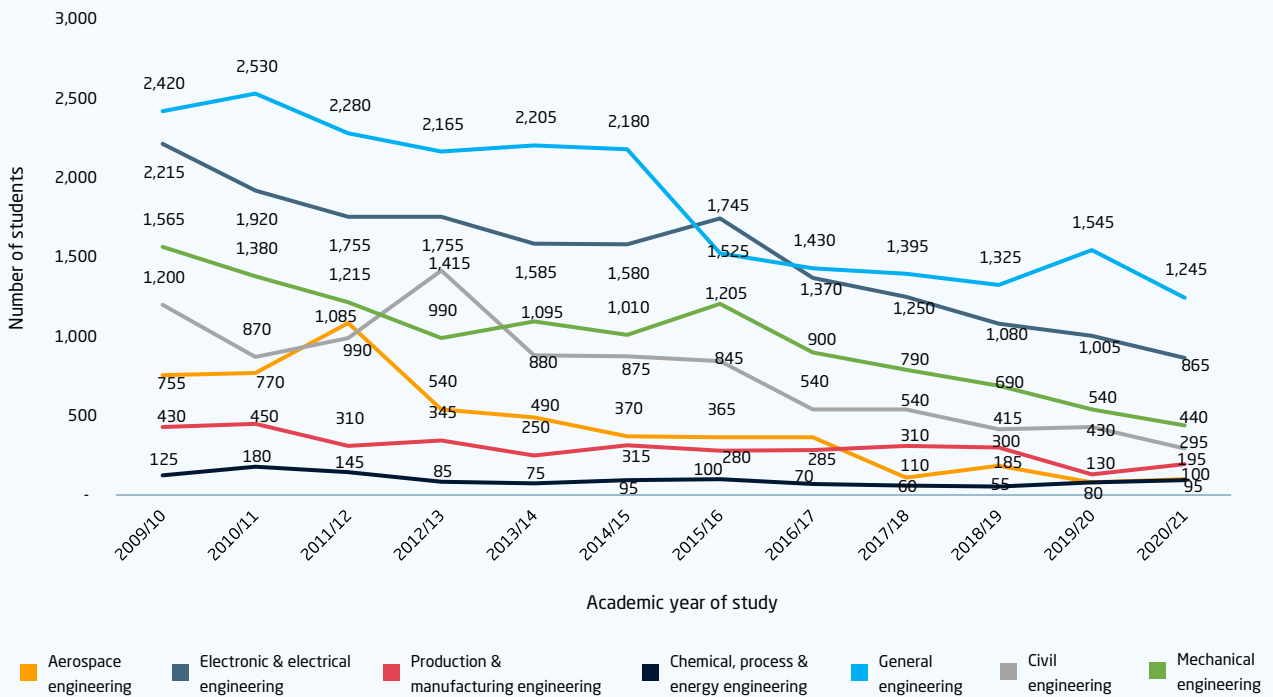
2. Undergraduate other entrants

For other types of undergraduate study, general engineering was the most popular with almost a third of engineering and technology entrants at this level studying the general subject. Figure 34 looks at the trend in the number of students studying other undergraduates and shows the decline in all

subjects over the period 2009/10 to 2020/21. Particularly noticeable are aerospace engineering, civil engineering, and mechanical engineering which each saw a reduction of more than 70% over the period. This, however, may be due to the courses on offer rather than interest in studying them.

FIGURE 34:

Trends in the number of other undergraduate entrants studying engineering and technology, by principal subject, UK



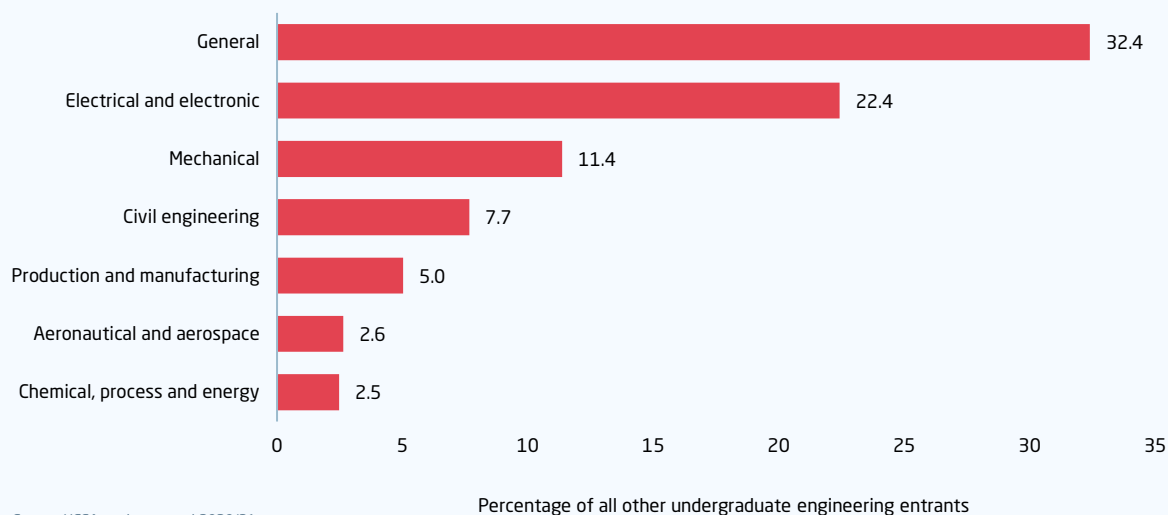
Source: HESA student record 2020/21
 Note there has been a change to the coding system used to classify subjects in HE from 2019/20

In figure 35 we see that in 2020/21 32.4% of other undergraduate entrants studying engineering and technology were studying general engineering, followed by 22.4% studying electrical and electronic

engineering and 11.4% studying mechanical engineering. All other subjects had less than a 10% share of students at this level, showing the breadth of subjects available.

FIGURE 35:

Percentage share of engineering and technology other undergraduate entrants by principal subject (2020/21)



Source: HESA student record 2020/21

3. Postgraduate taught degree entrants

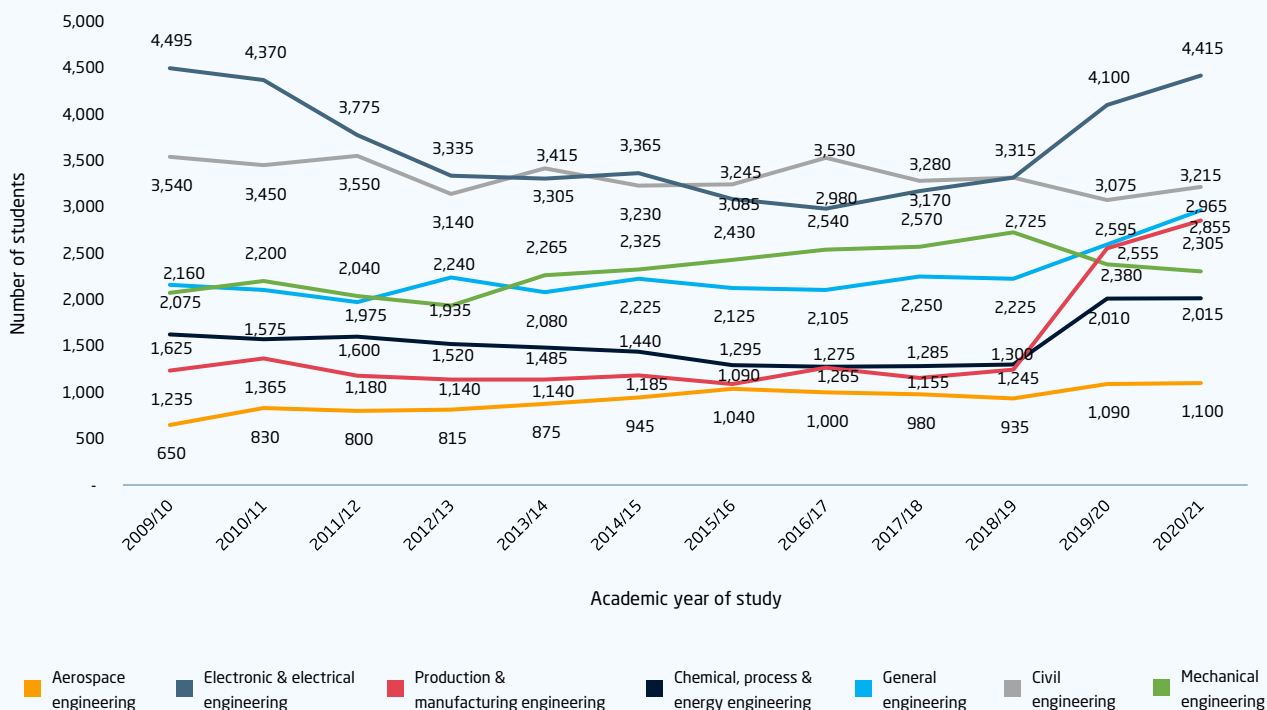
Figure 36 shows the trends in subjects for taught postgraduate degrees. We see that electronic and electrical engineering was the most popular subject for engineering and technology students at the start of the period and at the end of the period, but that between 2012/13 and 2018/19 student numbers in electronic and electronic engineering dropped to the level of civil engineering before picking up again. Mechanical engineering saw an

increase in numbers of students on postgraduate taught degrees up to 2018/19 before dropping again in recent years. Much like what we saw in undergraduate degree entrants, production and manufacturing engineering saw a sharp increase from 2018/19, as did chemical, process and energy engineering, but this may be related to the change of coding in the dataset.



FIGURE 36:

Trends in the number of postgraduate taught entrants studying engineering and technology, by principal subject, UK



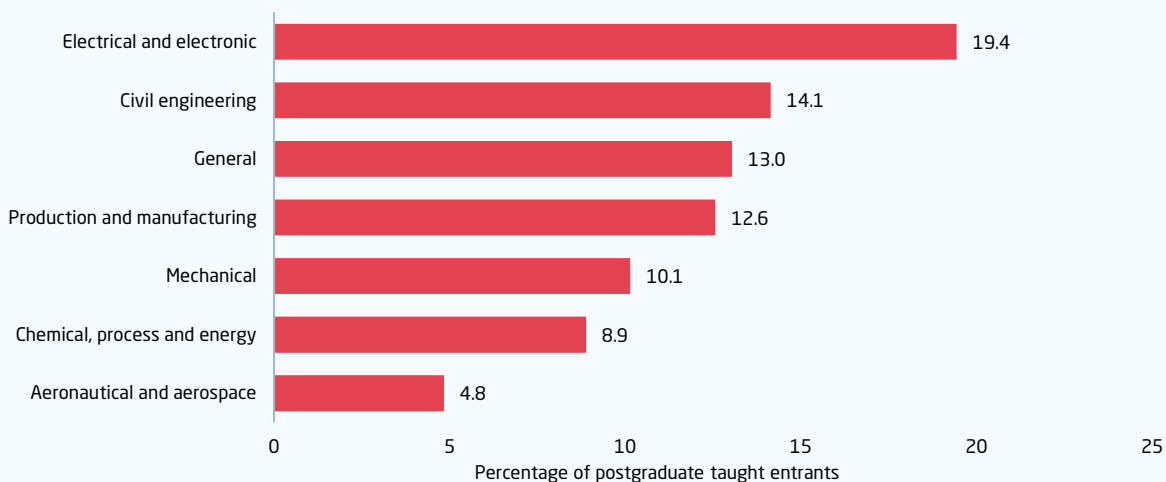
Source: HESA student record 2020/21
 Note there has been a change to the coding system used to classify subjects in HE from 2019/20

Looking at the share of all postgraduate taught entrants studying engineering and technology in 2020/21, electrical and electronic engineering

represented around 1 in 5 students (19.4%), followed by civil engineering (14.1%) and general engineering (13%).

FIGURE 37:

Percentage share of engineering and technology postgraduate taught degree entrants by principal subject (2020/21)



Source: HESA student record 2020/21

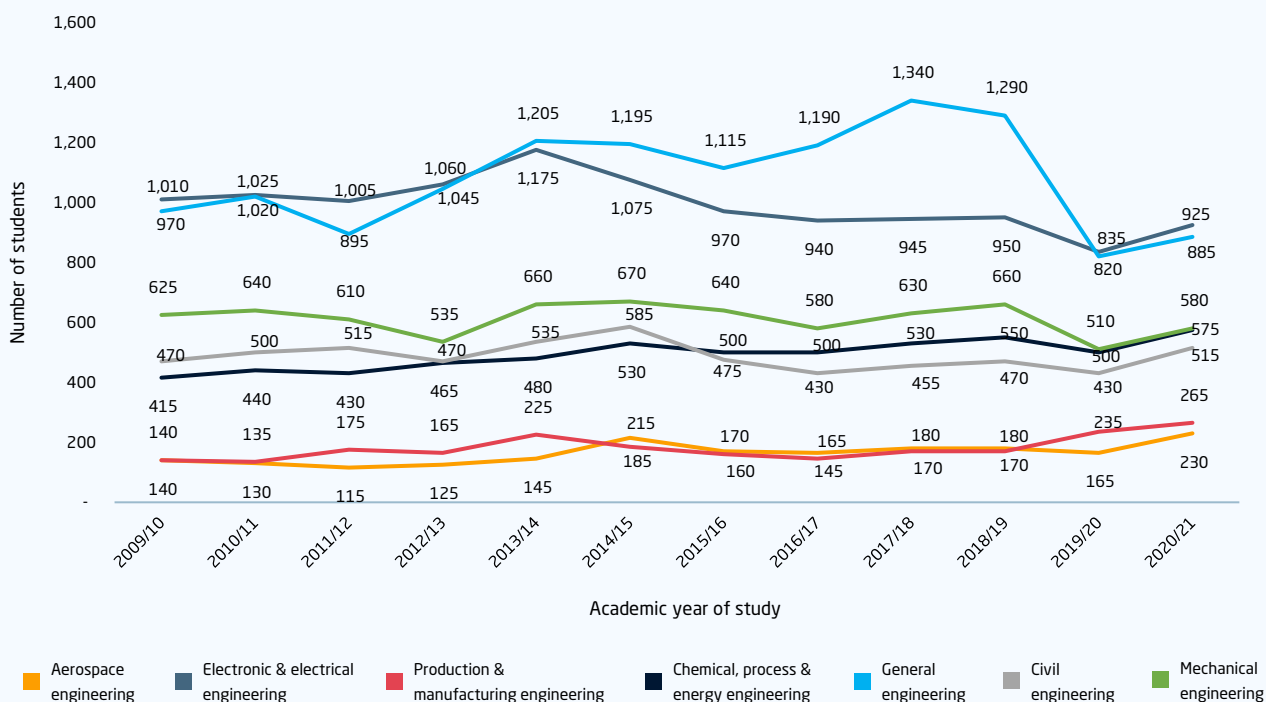
4. Postgraduate research degree entrants

Much like taught postgraduate degrees, electronic and electrical engineering was consistently one of the most popular subjects for postgraduate research engineering and technology students across the period, though between 2013/14 and 2019/20, general engineering had the highest share of

students at this level. The numbers of postgraduate research students studying the other subjects within engineering and technology have seen slow and steady increases over the period. There was a dip in numbers for 2019/20 but these appear to have picked up again in 2020/21.

FIGURE 38:

Trends in the number of postgraduate research entrants studying engineering and technology, by principal subject, UK



Source: HESA student record 2020/21

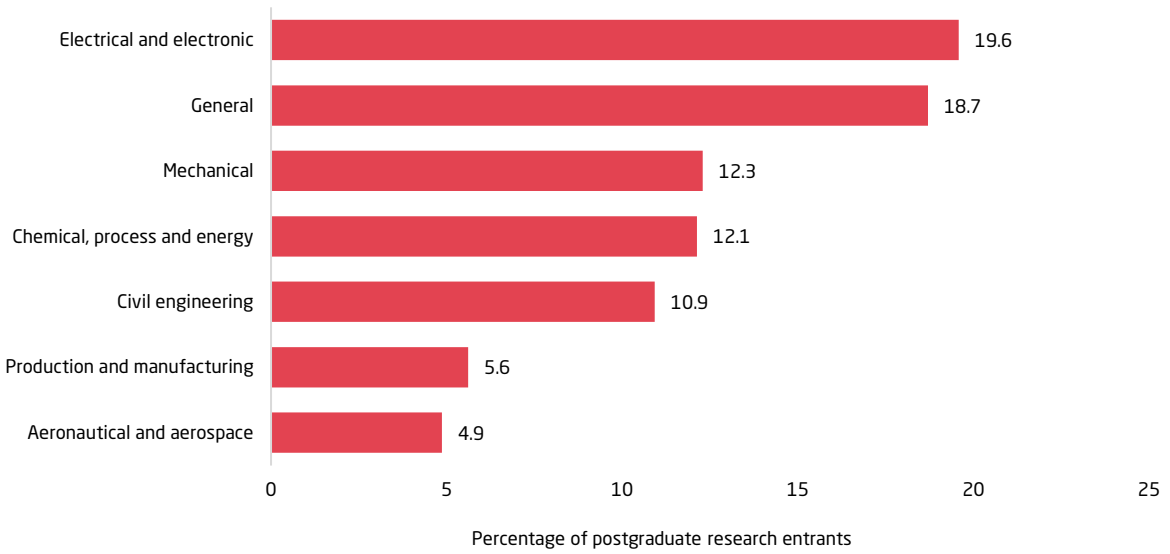
Note there has been a change to the coding system used to classify subjects in HE from 2019/20

For 2020/21, 19.6% of postgraduate research students in engineering and technology were studying electrical and electronic engineering, followed by general engineering research degrees (18.7%). The next group of subjects, with around 1

in 8 students studying, includes mechanical engineering, chemical process and energy engineering and civil engineering.

FIGURE 39:

Percentage share of engineering and technology postgraduate research degree entrants by principal subject (2020/21)



Source: HESA student record 2020/21



1. Aeronautical and aerospace engineering

In 2020/21 there were 5,275 entrants studying aeronautical and aerospace engineering in higher education, comprised of 3,945 undergraduate students (first degree and other undergraduate) along with 1,330 postgraduate students.

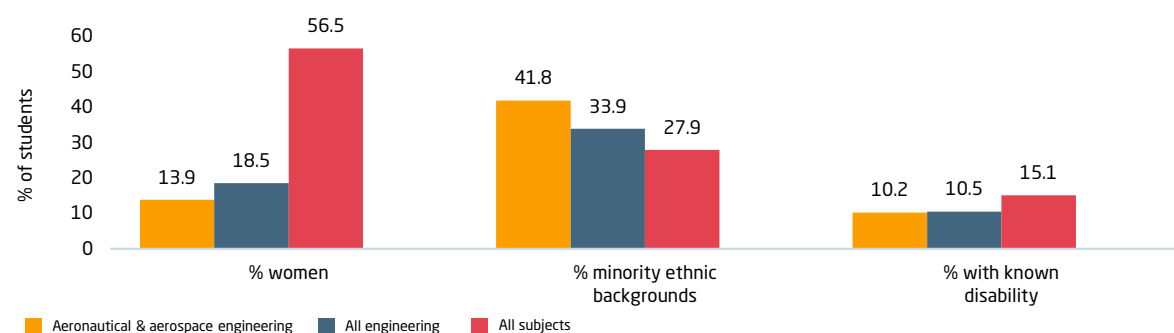
Undergraduate first degree entrants

Aeronautical and aerospace engineering courses were the 5th most popular choice for undergraduate degrees in engineering and technology in 2020/21, representing 10.0% of all engineering and technology entrants at this level. Of these:

- 13.9% were women
- 41.8% were from minority ethnic groups
- 10.2% had a known disability
- 11.5% were from low HE participation areas (POLAR 4 quintile 1)
- 75.9% were UK domiciled, 7.5% from EU countries and 16.5% from the rest of the world

FIGURE 40:

Characteristics of first year undergraduate degree entrants, 2020/21

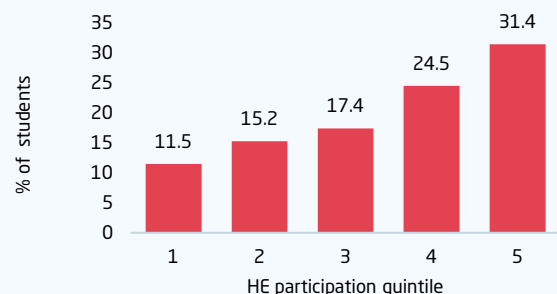


Source: HESA student record 2020/21
Note ethnicity is only recorded for UK students, others are excluded from the analysis

FIGURE 41:

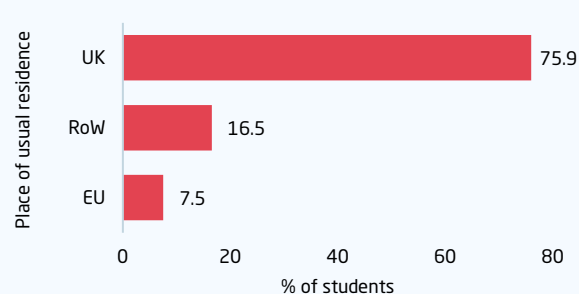
Background characteristics of first year undergraduate degree entrants on aeronautical and aerospace engineering courses, 2020/21

a) By HE participation quintile (POLAR4)



Source: HESA student record 2020/21

b) By place of usual residence



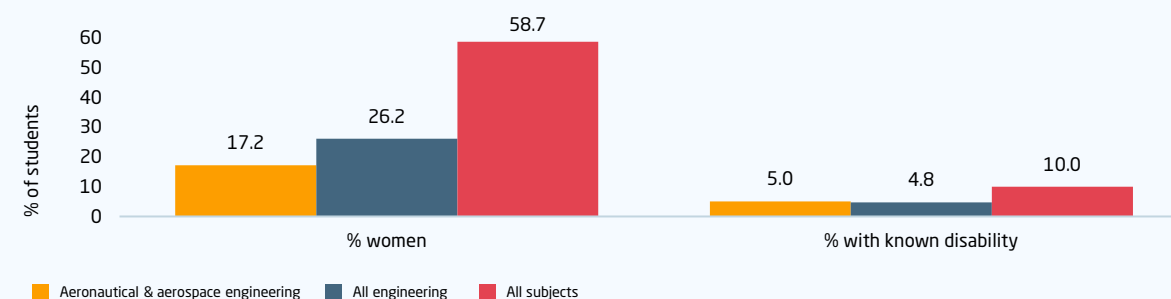
Postgraduate degree entrants

Of the aeronautical and aerospace engineering postgraduate entrants, 17.2% were women. This is low compared to 26.2% of all engineering and technology entrants and 58.7% of postgraduate entrants studying any subject. 5% of aeronautical

and aerospace engineering postgraduate entrants were known to have a disability which is similar to all engineering and technology entrants but remains lower than the overall average of 10.0%.

FIGURE 42:

Characteristics of first year postgraduate degree students, 2020/21



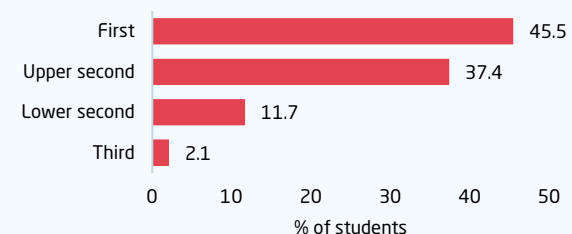
Source: HESA student record 2020/21
Note ethnicity is only recorded for UK students, others are excluded from the analysis

Undergraduate first degree qualifiers

45.5% of students qualifying with a first degree in aeronautical and aerospace engineering did so with first class honours. Additionally, more than a third (37.4%) obtained upper second class honours. This is average compared to other subjects in engineering and technology.

FIGURE 43:

Aeronautical and aerospace engineering results, 2020/21



Source: HESA student record 2020/21

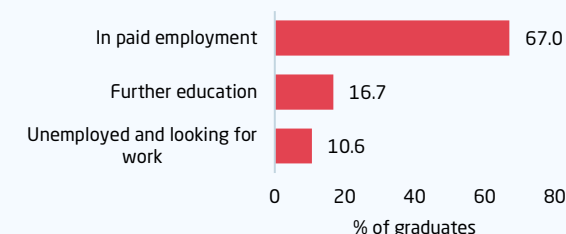
Graduate destinations

Two thirds of students who graduated aeronautical and aerospace engineering degrees in 2019/20 were in paid employment 15 months after graduation (67.0%). Of these, 57.3% were working in engineering companies.

Furthermore, 16.5% of graduates from these courses had gone on to further education, and 10.6% were unemployed and looking for work.

FIGURE 44:

Aeronautical and aerospace engineering graduate outcomes, 2020/21



Source: HESA student record 2020/21

2. Chemical, process and energy engineering

In 2020/21 there were 5,435 entrants studying chemical, process and energy engineering in higher education, comprised of 2,845 undergraduate students (first degree and other undergraduate) along with 2,590 postgraduate students.

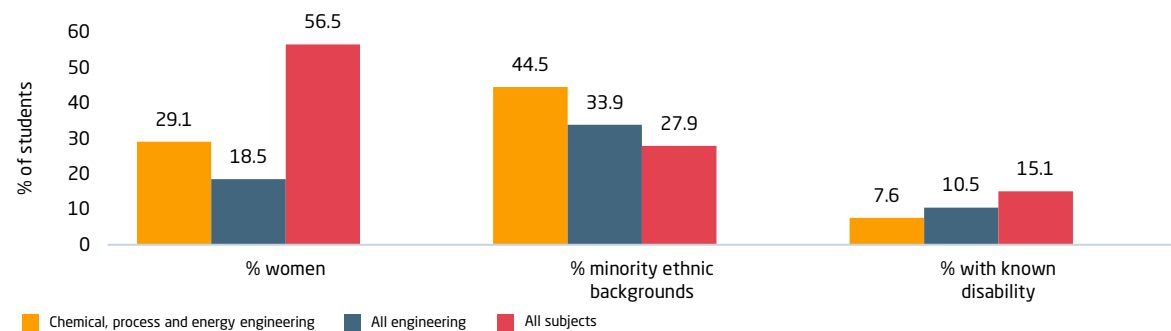
Undergraduate first degree entrants

Chemical, process and energy engineering courses were the 6th most popular choice for undergraduate degrees in engineering and technology in 2020/21, representing 7.1% of all engineering and technology entrants at this level. Of these:

- 29.1% were women
- 44.5% were from minority ethnic groups
- 7.6% had a known disability
- 10.7% were from low HE participation areas (POLAR 4 quintile 1)
- 69.0% were UK domiciled, 6.1% from EU countries and 25.0% from the rest of the world

FIGURE 45:

Characteristics of first year undergraduate degree entrants, 2020/21

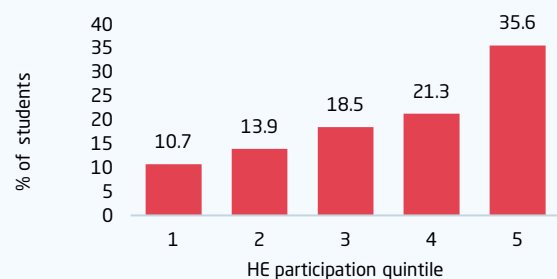


Source: HESA student record 2020/21
Note ethnicity is only recorded for UK students, others are excluded from the analysis

FIGURE 46:

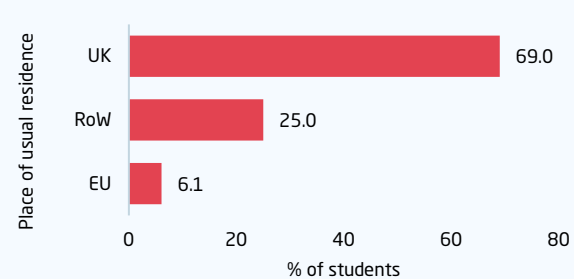
Background characteristics of first year undergraduate degree entrants on chemical, process and energy engineering courses, 2020/21

a) By HE participation quintile (POLAR4)



Source: HESA student record 2020/21

b) By place of usual residence



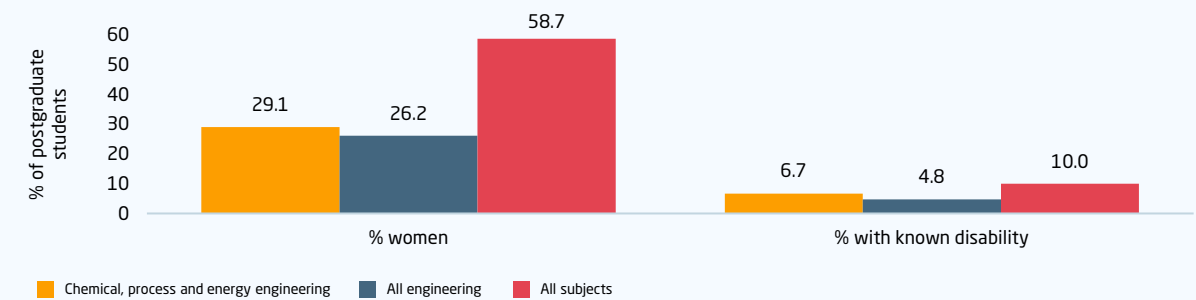
Postgraduate degree entrants

Of the chemical, process and energy engineering postgraduate entrants, 29.1% were women, compared to 26.2% of all engineering and technology entrants and 58.7% of postgraduate entrants studying any subject. 6.7% of chemical,

process and energy engineering postgraduate entrants were known to have a disability which is higher than all engineering and technology entrants but remains lower than the overall average of 10.0%.

FIGURE 47:

Characteristics of first year postgraduate degree students, 2020/21



Source: HESA student record 2020/21
Note ethnicity is only recorded for UK students, others are excluded from the analysis

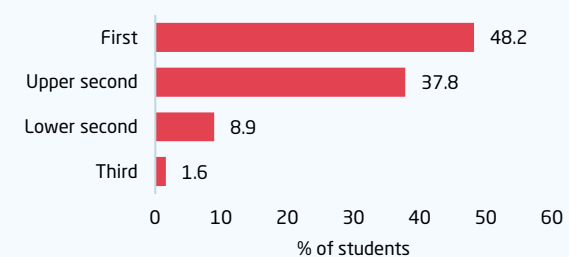
Undergraduate first degree qualifiers

48.2% of students qualifying with a first degree in chemical, process and energy engineering did so with first class honours, one of the highest among engineering subjects.

Additionally, more than a third (37.8%) obtained upper second class honours.

FIGURE 48:

Chemical, process and energy engineering results, 2020/21



Source: HESA student record 2020/21

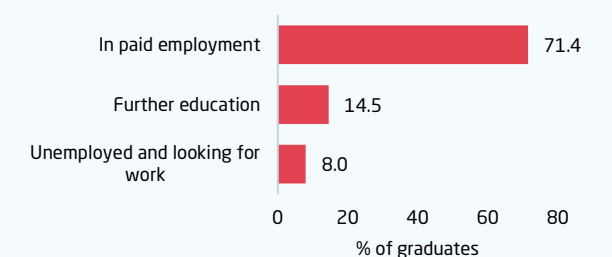
Graduate destinations

71.4% of students who graduated chemical, process and energy engineering degrees in 2019/20 were in paid employment 15 months after graduation. Of these, 58.9% were working for engineering companies.

14.5% of graduates from these courses had gone on to further education, and around 8.0% were unemployed and looking for work.

FIGURE 49:

Chemical, process and energy engineering graduate outcomes



Source: HESA student record 2020/21

3. Civil engineering

In 2020/21 there were 9,310 students studying civil engineering in higher education, comprised of 5,580 undergraduate students (first degree and other undergraduate) along with 3,730 postgraduate students.

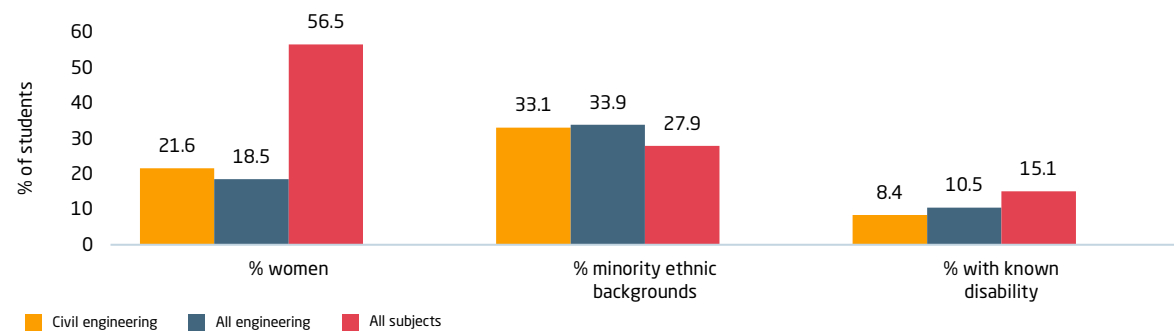
Undergraduate first degree entrants

Civil engineering courses were the 4th most popular choice for undergraduate degrees in engineering and technology in 2020/21, representing 13.7% of all engineering and technology entrants at this level. Of these:

- 21.6% were women
- 33.1% were from minority ethnic groups
- 8.4% had a known disability
- 10.7% were from low HE participation areas (POLAR 4 quintile 1)
- 78.0% were UK domiciled, 3.5% from EU countries and 18.4% from the rest of the world

FIGURE 50:

Characteristics of first year undergraduate degree entrants, 2020/21

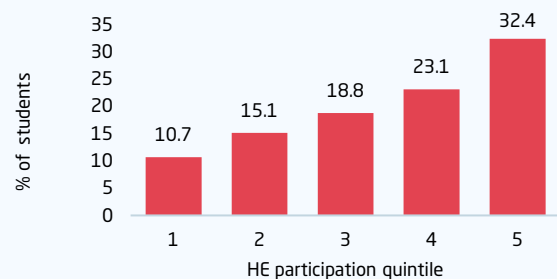


Source: HESA student record 2020/21
Note ethnicity is only recorded for UK students, others are excluded from the analysis

FIGURE 51:

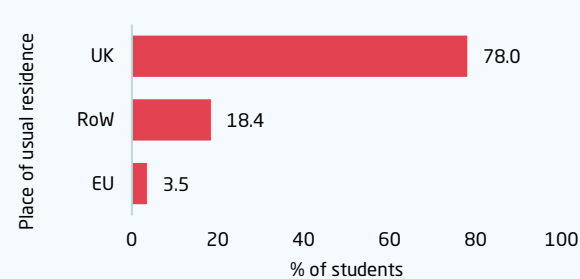
Background characteristics of first year undergraduate degree entrants on civil engineering courses, 2020/21

a) By HE participation quintile (POLAR4)



Source: HESA student record 2020/21

b) By place of usual residence



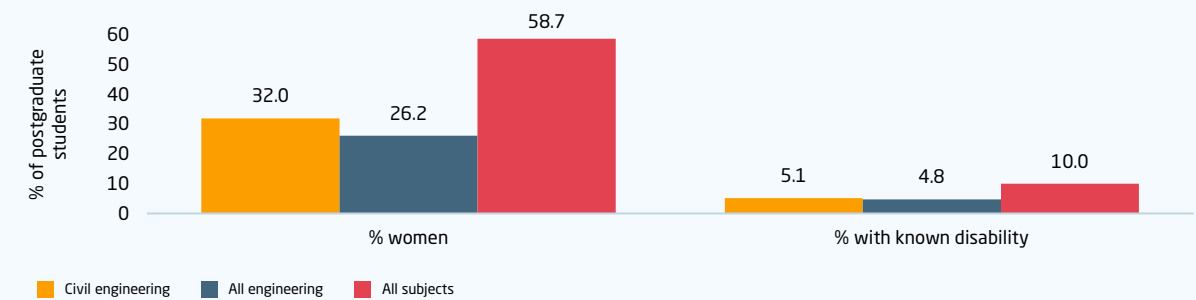
Postgraduate degree entrants

Of the civil engineering postgraduate entrants, 32.0% were women, compared to 26.2% of all engineering and technology entrants and 58.7% of postgraduate entrants studying any subject. 5.1% of civil postgraduate entrants were known to have a

disability which is similar to all engineering and technology students but remains lower than the overall average of 10.0%.

FIGURE 52:

Characteristics of first year postgraduate degree students, 2020/21



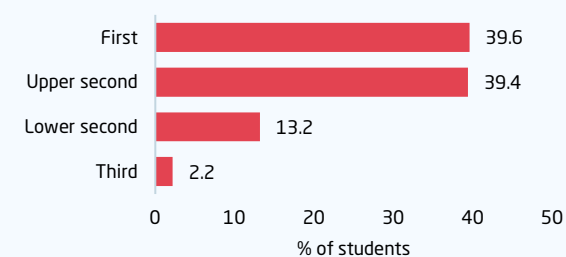
Source: HESA student record 2020/21
Note ethnicity is only recorded for UK students, others are excluded from the analysis

Undergraduate first degree qualifiers

39.6% of students qualifying with a first degree in civil engineering did so with first class honours and a similar percentage (39.4%) obtained upper second class honours. This is average compared to other subjects in engineering and technology.

FIGURE 53:

Civil engineering results, 2020/21



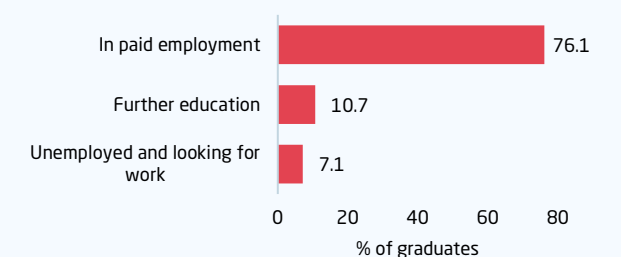
Source: HESA student record 2020/21

Graduate destinations

Three quarters of students (76.1%) who graduated from civil engineering degrees in 2019/20 were in paid employment 15 months after graduation. Of those, 67.7% were working for engineering companies, which is the highest of all subjects. 10.7% of graduates from these courses had gone on to further education, and around 7.1% were unemployed and looking for work.

FIGURE 54:

Civil engineering graduate outcomes



Source: HESA student record 2020/21

4. Electronic and electrical engineering

In 2020/21 there were 12,320 students studying electronic and electrical engineering in higher education, comprised of 6,980 undergraduate students (first degree and other undergraduate) along with 5,340 postgraduate students.

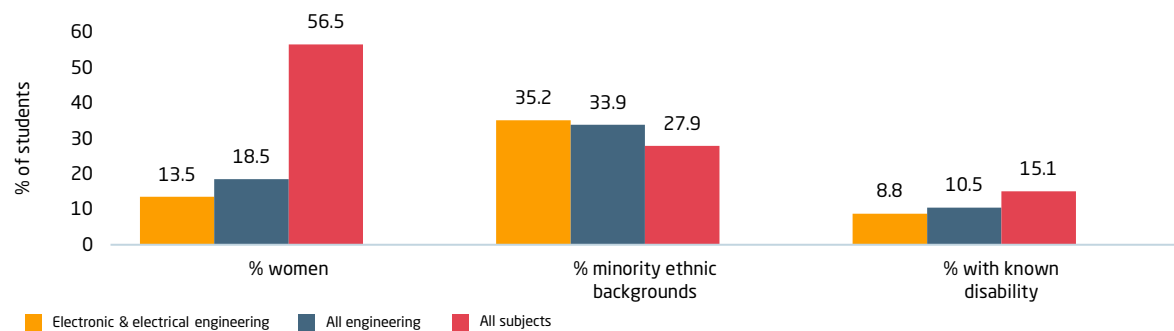
Undergraduate first degree entrants

Electronic and electrical engineering courses were the 2nd most popular choice for undergraduate degrees in engineering and technology in 2020/21, representing 15.8% of all engineering and technology entrants at this level. Of these:

- 13.5% were women
- 35.2% were from minority ethnic groups
- 8.8% had a known disability
- 13.0% were from low HE participation areas (POLAR 4 quintile 1)
- 56.2% were UK domiciled, 6.8% from EU countries and 37.1% from the rest of the World

FIGURE 55:

Characteristics of first year undergraduate degree entrants, 2020/21

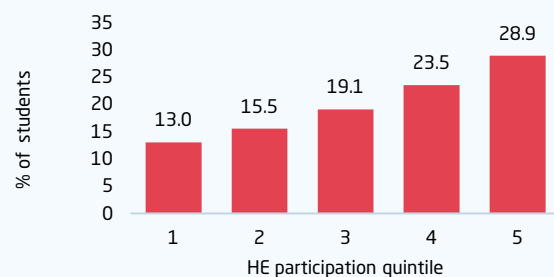


Source: HESA student record 2020/21
Note ethnicity is only recorded for UK students, others are excluded from the analysis

FIGURE 56:

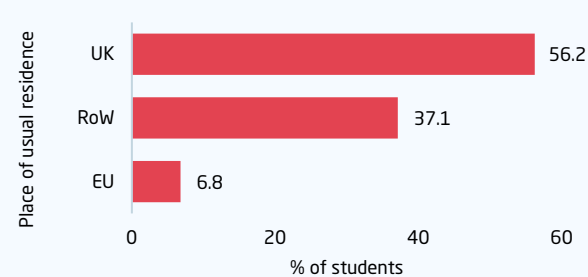
Background characteristics of first year undergraduate degree entrants on electronic and electrical engineering courses, 2020/21

a) By HE participation quintile (POLAR4)



Source: HESA student record 2020/21

b) By place of usual residence



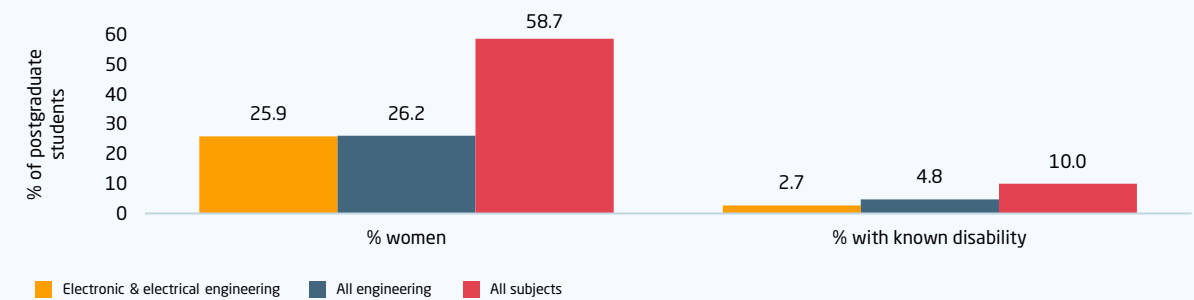
Postgraduate degree entrants

Of the electronic and electrical engineering postgraduate entrants, 25.9% were women, compared to 26.2% of all engineering and technology entrants and 58.7% of postgraduate entrants studying any subject. 2.7% of electronic

and electrical engineering postgraduate entrants were known to have a disability which is lower than all engineering and technology entrants and the overall average of 10.0%.

FIGURE 57:

Characteristics of first year postgraduate degree students, 2020/21



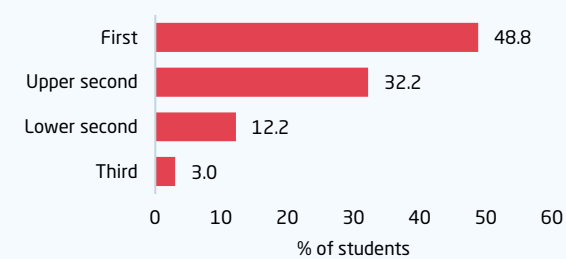
Source: HESA student record 2020/21
Note ethnicity is only recorded for UK students, others are excluded from the analysis

Undergraduate first degree qualifiers

Almost half (48.8%) of students qualifying with a first degree in electronic and electrical engineering did so with first class honours, one of the highest of all engineering subjects. Additionally more than a third (32.2%) obtained upper second class honours.

FIGURE 58:

Electronic & electrical engineering results, 2020/21



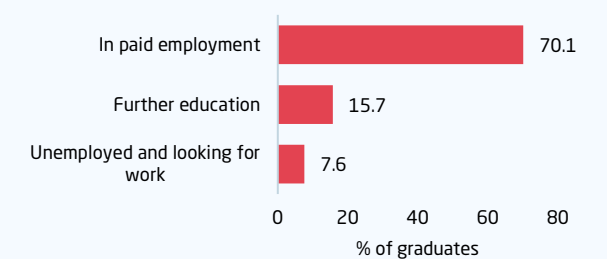
Source: HESA student record 2020/21

Graduate destinations

70.1% of students who graduated electronic and electrical engineering degrees in 2019/20 were in paid employment 15 months after graduation. Of those, 62.8% were working in engineering companies. 15.7% of graduates from these courses had gone on to further education, and around 7.6% were unemployed and looking for work.

FIGURE 59:

Electronic & electrical engineering graduate outcomes



Source: HESA student record 2020/21

5. General engineering

In 2020/21 there were 9,925 entrants studying general engineering in higher education, comprised of 6,080 undergraduate students (first degree and other undergraduate) along with 3,845 postgraduate students.

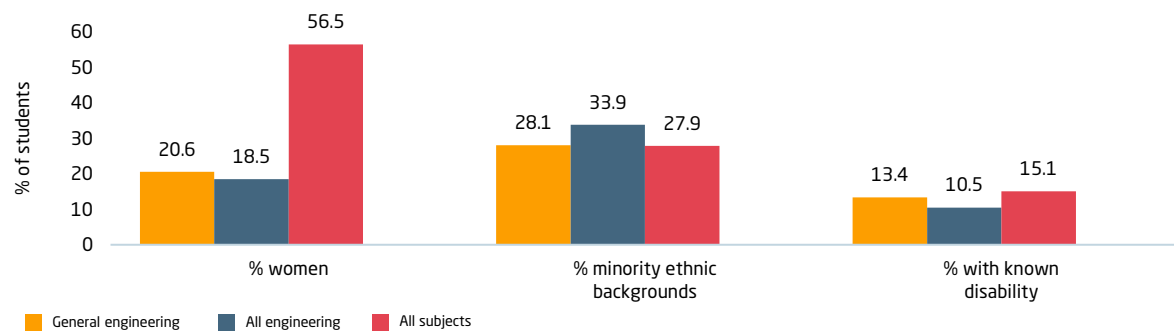
Undergraduate first degree entrants

General engineering courses were the 3rd most popular choice for undergraduate degrees in engineering and technology in 2020/21, representing 15.7% of all engineering and technology entrants at this level. Of these:

- 20.6% were women
- 28.1% were from minority ethnic groups
- 13.4% had a known disability
- 12.0% were from low HE participation areas (POLAR 4 quintile 1)
- 83.7% were UK domiciled, 5.5% from EU countries and 10.8% from the rest of the world

FIGURE 60:

Characteristics of first year undergraduate degree entrants, 2020/21

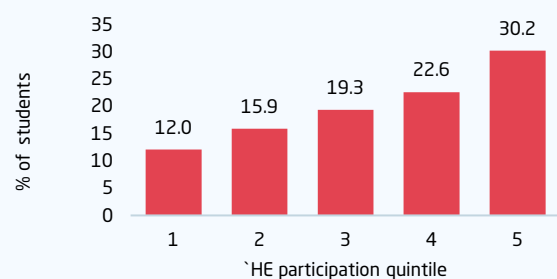


Source: HESA student record 2020/21
Note ethnicity is only recorded for UK students, others are excluded from the analysis

FIGURE 61:

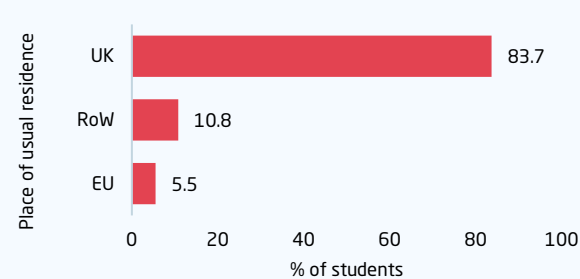
Background characteristics of first year undergraduate degree entrants on general engineering courses, 2020/21

a) By HE participation quintile (POLAR4)



Source: HESA student record 2020/21

b) By place of usual residence



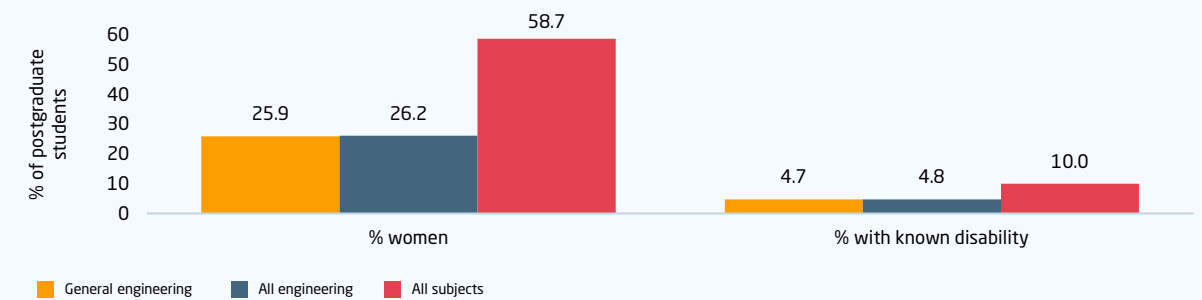
Postgraduate degree entrants

Of the general engineering postgraduate entrants, 25.9% were women, compared to 26.2% of all engineering and technology entrants and 58.7% of postgraduate entrants studying any subject. 4.7% of general engineering postgraduate entrants were

known to have a disability which is similar to all engineering and technology entrants but remains lower than the overall average of 10.0%.

FIGURE 62:

Characteristics of first year postgraduate degree students, 2020/21



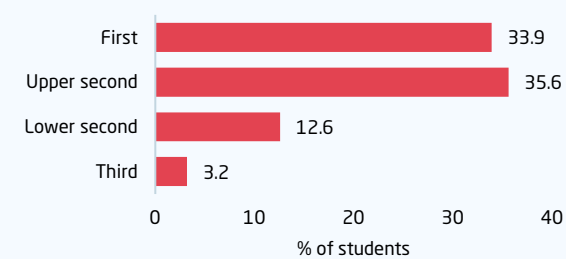
Source: HESA student record 2020/21
Note ethnicity is only recorded for UK students, others are excluded from the analysis

Undergraduate first degree qualifiers

A third (33.9%) of students qualifying with a first degree in general engineering did so with first class honours. Additionally, 35.6% obtained upper second class honours. This is one of the lowest of all the subjects in engineering and technology, but possibly reflective of the more general aspects of the degree.

FIGURE 63:

General engineering results, 2020/21



Source: HESA student record 2020/21

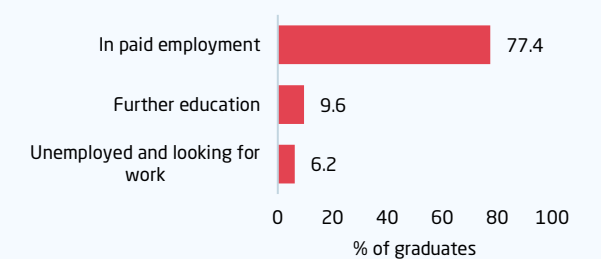
Graduate destinations

77.4% of students who graduated from general engineering degrees in 2019/20 were in paid employment 15 months after graduation. Of those, 54.8% were working in engineering companies.

9.6% of graduates from these courses had gone on to further education, and around 6.2% were unemployed and looking for work.

FIGURE 64:

General engineering graduate outcomes



Source: HESA student record 2020/21

6. Mechanical engineering

In 2020/21 there were 12,005 entrants studying mechanical engineering in higher education, comprised of 9,120 undergraduate students (first degree and other undergraduate) along with 2,885 postgraduate students.

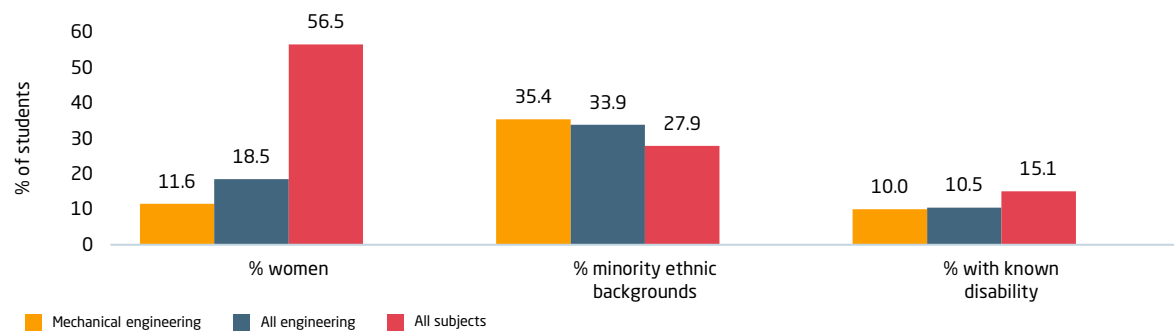
Undergraduate first degree entrants

Mechanical engineering courses were the most popular choice for undergraduate degrees in engineering and technology in 2020/21, representing 22.5% of all engineering and technology entrants at this level. Of these:

- 11.6% were women
- 35.4% were from minority ethnic groups
- 10.0% had a known disability
- 9.9% were from low HE participation areas (POLAR 4 quintile 1)
- 73.7% were UK domiciled, 6.1% from EU countries and 20.2% from the rest of the World

FIGURE 65:

Characteristics of first year undergraduate degree entrants, 2020/21

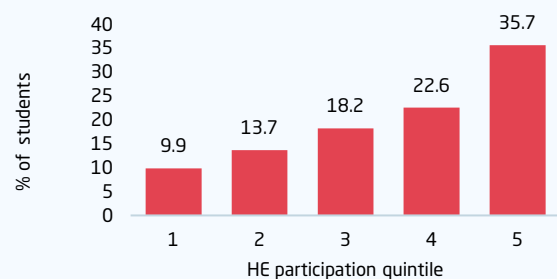


Source: HESA student record 2020/21
Note ethnicity is only recorded for UK students, others are excluded from the analysis

FIGURE 66:

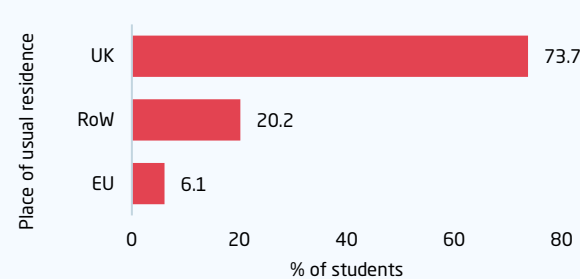
Background characteristics of first year undergraduate degree entrants on mechanical engineering courses, 2020/21

a) By HE participation quintile (POLAR4)



Source: HESA student record 2020/21

b) By place of usual residence



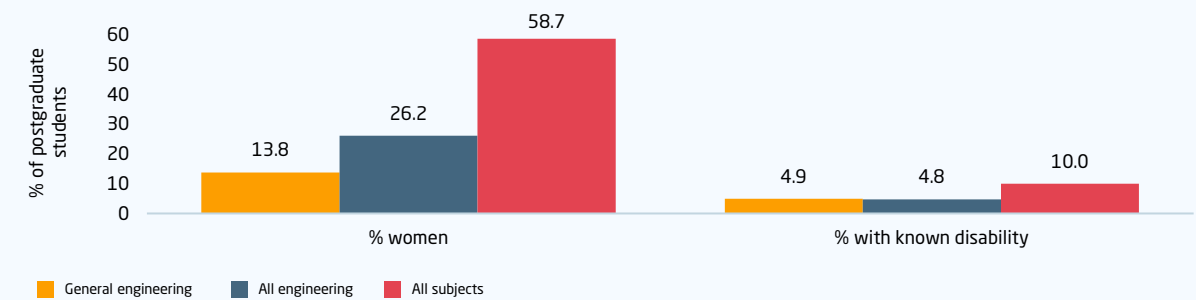
Postgraduate degree entrants

Of the mechanical engineering postgraduate entrants, just 13.8% were women, compared to 26.2% of all engineering and technology entrants and 58.7% of postgraduate entrants studying any subject. 4.9% of mechanical engineering

postgraduate entrants were known to have a disability which is similar to all engineering and technology entrants but remains lower than the overall average of 10%.

FIGURE 67:

Characteristics of first year postgraduate degree students, 2020/21



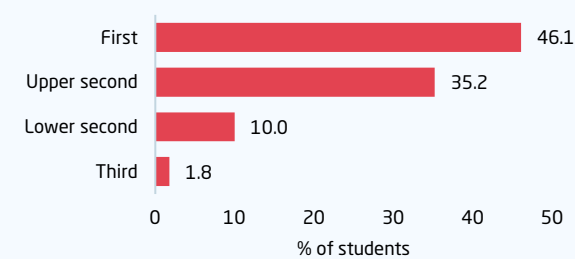
Source: HESA student record 2020/21
Note ethnicity is only recorded for UK students, others are excluded from the analysis

Undergraduate first degree qualifiers

46.1% of students qualifying with a first degree in mechanical engineering did so with first class honours. Additionally more than a third (35.2%) obtained upper second class honours. This is average compared to other subjects in engineering and technology.

FIGURE 68:

Mechanical engineering results, 2020/21



Source: HESA student record 2020/21

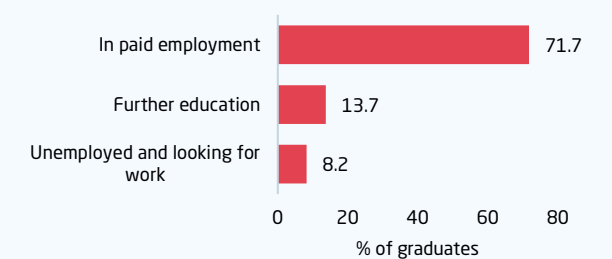
Graduate destinations

71.7% of students who graduated from mechanical engineering degrees in 2019/20 were in paid employment 15 months after graduation. Of these, 63.3% were working in engineering companies.

13.7% of graduates from these courses had gone on to further education, and around 8.2% were unemployed and looking for work.

FIGURE 69:

Mechanical engineering graduate outcomes



Source: HESA student record 2020/21

7. Production and manufacturing engineering

In 2020/21 there were 5,245 entrants studying production and manufacturing engineering in higher education, comprised of 2,625 undergraduate students (first degree and other undergraduate) along with 3,120 postgraduate students.

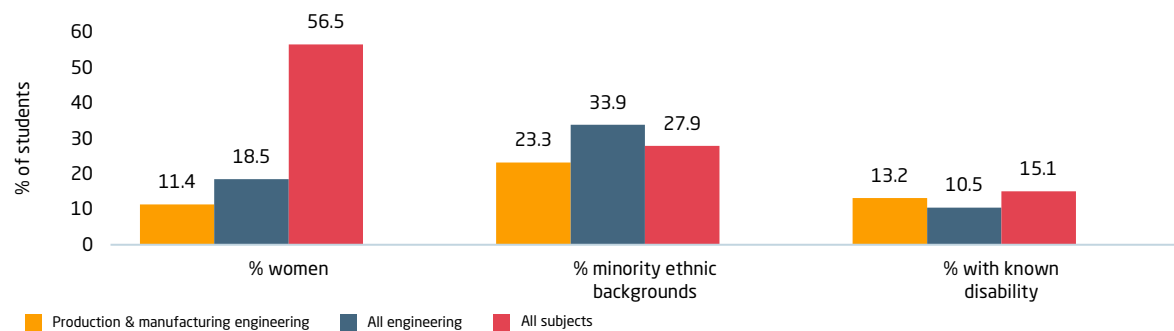
Undergraduate first degree entrants

Production and manufacturing engineering courses were the 7th most popular choice for undergraduate degrees in engineering and technology in 2020/21, representing 6.3% of all engineering and technology entrants at this level. Of these:

- 11.4% were women
- 23.3% were from minority ethnic groups
- 13.2% had a known disability
- 12.0% were from low HE participation areas (POLAR 4 quintile 1)
- 74.9% were UK domiciled, 7.6% from EU countries and 17.5% from the rest of the world

FIGURE 70:

Characteristics of first year undergraduate degree entrants, 2020/21

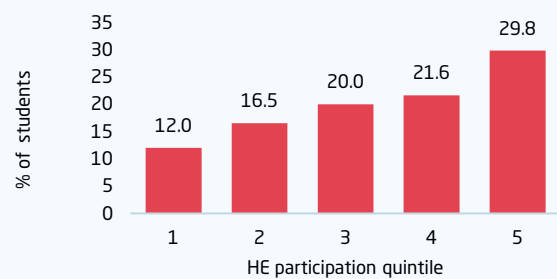


Source: HESA student record 2020/21
Note ethnicity is only recorded for UK students, others are excluded from the analysis

FIGURE 71:

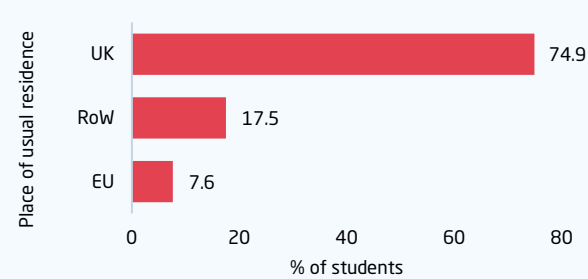
Background characteristics of first year undergraduate degree entrants on production and manufacturing engineering courses, 2020/21

a) By HE participation quintile (POLAR4)



Source: HESA student record 2020/21

b) By place of usual residence



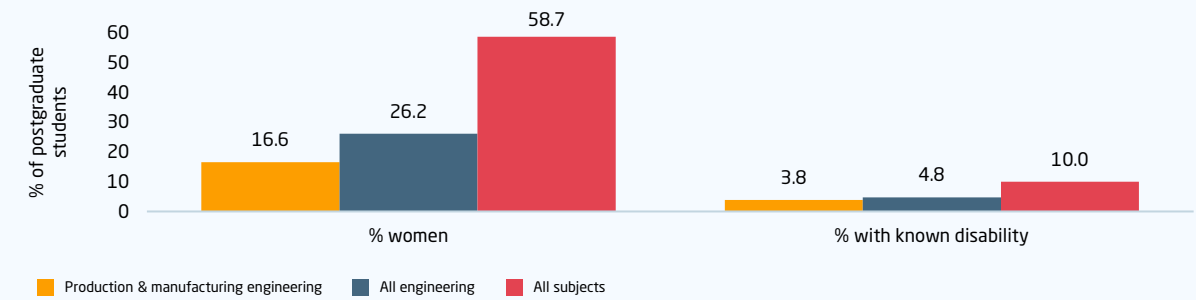
Postgraduate degree entrants

Of the production and manufacturing engineering postgraduate entrants, 16.6% were women, compared to 26.2% of all engineering and technology entrants and 58.7% of postgraduate entrants studying any subject. 3.8% of production

and manufacturing engineering postgraduate entrants were known to have a disability which is lower than all engineering and technology entrants and the overall average of 10%.

FIGURE 72:

Characteristics of first year postgraduate degree students, 2020/21



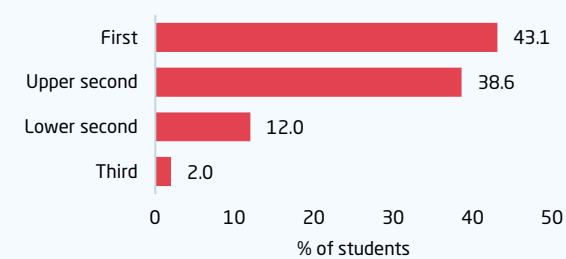
Source: HESA student record 2020/21
Note ethnicity is only recorded for UK students, others are excluded from the analysis

Undergraduate first degree qualifiers

43.1% of students qualifying with a first degree in production and manufacturing engineering did so with first class honours. Additionally, 38.6% obtained upper second class honours. This is average compared to other subjects in engineering and technology.

FIGURE 73:

Production & manufacturing engineering results, 2020/21



Source: HESA student record 2020/21

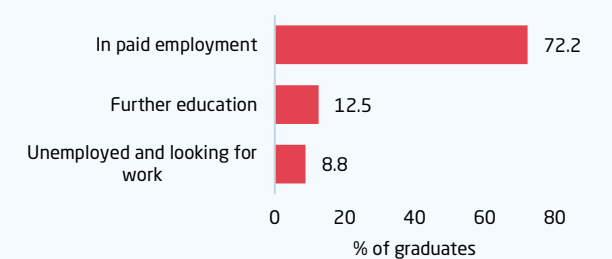
Graduate destinations

72.2% of students who graduated from production and manufacturing engineering degrees in 2019/20 were in paid employment 15 months after graduation. Of those, 61.7% were working in engineering companies.

12.5% of graduates from these courses had gone on to further education, and around 8.8% were unemployed and looking for work.

FIGURE 74:

Production & manufacturing engineering graduate outcomes



Source: HESA student record 2020/21



Part 3: Methodology

1. Introduction

The data used in this report is from the Higher Education Statistics Agency (HESA). In the UK HE system, engineering degrees form part of the broad subject group of 'engineering and technology'.

There have been some changes to coding for subjects in the higher education dataset in recent years and HESA have developed a Common Aggregation Hierarchy (CAH) to bridge the gap

Engineering:

- (CAH10-01-01) engineering (non-specific)
- (CAH10-01-02) mechanical engineering
- (CAH10-01-03) production and manufacturing engineering
- (CAH10-01-04) aeronautical and aerospace engineering
- (CAH10-01-05) naval architecture
- (CAH10-01-06) bioengineering, medical and biomedical engineering
- (CAH10-01-07) civil engineering
- (CAH10-01-08) electrical and electronic engineering
- (CAH10-01-09) chemical, process and energy engineering
- (CAH10-01-10) others in engineering

between the previously used Joint Academic Coding System (JACS) coding system and the newly developed Higher Education Classification of Subjects (HECoS)¹⁰.

In this report we use the CAH10 codes to identify 'engineering and technology' degrees within which there are 10 separate engineering subjects and 7 technology subjects.

Technology:

- (CAH10-03-01) minerals technology
- (CAH10-03-02) materials technology
- (CAH10-03-03) polymers and textiles
- (CAH10-03-04) maritime technology
- (CAH10-03-05) biotechnology
- (CAH10-03-06) others in technology
- (CAH10-03-07) materials science

¹⁰See HESA website The Higher Education Classification of Subjects (HECoS) for further details

1.1 Student data

For undergraduate and postgraduate students, the student record fixed database from August 2022 was used, with the most recent cohort of students from 2020/21 (for the academic year 1 August 2020 to 31 July 2021).

There are different cohorts of students in the HESA data.

- **Entrants:** those students who commenced their programme within the reporting period, based on the HESA standard registration population.
- **Students:** all students regardless of their commencement date, based on the HESA standard registration population.
- **Qualifiers:** students awarded a higher education qualification during the HESA reporting period, including qualifications awarded from dormant, writing-up and sabbatical status.

In this report we mainly focus on entrants, which gives the most up-to-date view of the HE landscape and allows comparisons between the overall population of students and engineering and technology entrants. We also look at qualifiers as not all students who enter HE will complete their degree. Drop-out rates vary between groups, so the composition of qualifiers differs from that of entrants.

Additionally, we explore levels of study. Students were classified as studying at one of four levels.

- **First degree undergraduate:** students participating in their first programmes of study in a subject leading to qualifications at first or foundation degree level.
- **Other undergraduate:** includes qualification aims equivalent to and below first degree level, including, but not limited to, foundation degrees, diplomas in higher education, Higher National Diploma (HND),

Higher National Certificate (HNC), and foundation courses at higher education level.

- **Postgraduate (taught):** doctorate and masters degrees, postgraduate bachelors degrees and postgraduate diplomas or certificates not studied primarily through research.
- **Postgraduate (research):** includes doctorate (incorporating New Route PhD), masters degrees and postgraduate diplomas or certificates (not Postgraduate Certificate in Education (PGCE) at level M) studied primarily through research.

1.2 Graduate destination data

For graduates, we use the HESA Graduate Outcomes Survey, from the fixed database in January 2023. The survey contacts all graduates from higher education reported to HESA with qualifications obtained during the reporting period (1 August to 31 July), 15 months after they finish their studies.

In this report we look at the employment status of the graduates, reporting on three groups:

- **In paid employment:** includes paid work for an employer, self employed and running their own business.
- **In further education:** engaged in a course of study, training or research.
- **Unemployed and looking for work**

Note that the percentages displayed in the report do not sum to 100% as other options can also be chosen in the survey, such as developing a portfolio, taking time out to travel, retired or carer.

1.3 Demographic data

In the report, we explore various demographics of students and graduates, comparing the composition of the engineering and technology student population with the overall student population, as well as comparing levels of qualifiers between groups. Below each demographic is briefly explained to assist with understanding of the results throughout the report.

1.3.1 Gender

The data collected by HESA records the sex of the student, as opposed to the gender with which they identify. There are three categories in the dataset: male, female and other (for students whose sex aligns with terms such as intersex, androgyne, intergender, ambigender, gender fluid, polygender and gender queer). However, due to small numbers, in this report we are only able to display results for male and female students and graduates.

1.3.2 Ethnicity

HESA record the ethnicity of students whose permanent address is in England, Wales, Scotland, Northern Ireland, Guernsey, Jersey and the Isle of Man. It is therefore necessary to restrict our analysis to these students when looking at ethnicity.

The data are aligned to the categories used in the Census as recommended by the Office for National Statistics (ONS). Due to small numbers when looking at each of the individual ethnic groups, for the purpose of this report, ethnicity is grouped as follows:

- **Asian** includes Asian or Asian British - Indian, Asian or Asian British - Pakistani, Asian or Asian British - Bangladeshi, Chinese, and other Asian background.
- **Black** includes Black or Black British - Caribbean, Black or Black British - African, and other Black background.

- **Mixed** includes mixed - white and Black Caribbean, mixed - white and Black African, mixed - white and Asian, other mixed background.
- **White** includes white, white - Scottish, Irish Traveller, Gypsy or Traveller, plus other white background.
- **Other** includes Arab and other ethnic background.

Those recorded as 'unknown/not applicable' are not included in our analysis. This is used not only to denote those who do not have a permanent address in the UK, but also for those whose permanent address is unknown (2014/15 onwards), those who have refused to give ethnic information or whose ethnicity is unknown.

1.3.3 Disability

Students are not required to report a disability should they not wish to do so, and therefore in the report we categorise disability into 'known disability' and 'no known disability'. HESA specifies disabilities to include: a specific learning difficulty, blind or a serious visual impairment, deaf or a serious hearing impairment, a physical impairment or mobility issues, personal care support, mental health condition, social communication/autistic spectrum disorder or a long-standing illness or health condition.

1.3.4 Low participation neighbourhoods (POLAR4)

To help assess UK students attending HE courses from disadvantaged areas, the POLAR4 classification was formed to identify where participation in HE is usually low. Areas were ranked based on the combined participation rates of those who entered HE between the academic years 2009-10 and 2013-14, if they entered aged 18, or between 2010-11 and 2014-15 if they entered aged 19.

Five groups were then formed, each representing 20% of the UK young cohort, with quintile 1 having the lowest young participation (most disadvantaged), up to quintile 5 which are the areas with the highest participation (most advantaged). Students were allocated to the neighbourhoods on the basis of their postcode and those whose postcode falls within middle layer super output areas with the lowest participation (quintile 1) are denoted as being from a low participation neighbourhood.

1.3.5 Place of usual residence

A student's place of usual residence is based on their permanent home address - where they normally lived for non-educational purposes before starting their course. This is sometimes also referred to as their domicile. It is important to look at this as international students pay different fees for HE courses in the UK depending on their usual place of residence.

In our report, students are grouped into one of the following:

- **United Kingdom (UK):** England, Northern Ireland, Scotland, Wales and also includes Guernsey, Jersey and the Isle of Man.
- **European Union (EU):** includes all countries in the EU on 1 December of the reporting period.
- **Rest of the World (RoW):** includes any other country not in the UK or the EU.

1.4 Analysis

Results displayed are for full-time equivalent (FTE) students, which takes into account that some students are studying part-time. For example, a student on a full-time, full year course would be counted as 1.0 FTE, whereas a student on a part-time course that is 50% of a full-time course would be counted as 0.5.

Counts displayed throughout the report are rounded to the nearest 5, as required by HESA, to avoid any potential disclosure issues. However, percentages are calculated based on unrounded data.



Who we are

Established in 2001, EngineeringUK is a not-for-profit organisation, funded predominantly via the professional registration fees of individual engineers, as well as the support of a range of businesses, trusts and foundations, and a corporate membership scheme. Our ambition is to enable more young people from all backgrounds to be informed, inspired and progress into engineering and technology.

Working in partnership to inspire more young people from a greater range of backgrounds to pursue the exciting career opportunities in modern engineering and technology is at the heart of EngineeringUK's purpose. Collaboration is essential to reach our long-term vision: that the UK has the workforce needed for engineering and technology to thrive, to improve sustainability and to achieve net zero.

www.engineeringuk.com

Driven by data

Our work is rooted in our understanding of the current and future needs of the engineering and technology workforce. We complement that understanding by establishing which activities help increase the number and diversity of young people choosing engineering, technology and technician careers, especially those in sustainability and net zero.

We base everything we do on evidence and we share our analysis and insight widely. We publish comprehensive data on all aspects of engineering and technology in the UK - providing a detailed examination of the economic contribution, the workforce composition, as well as the extent to which workforce supply through education and training is likely to meet future demand for engineering and technology skills.

We evaluate all our activity to help ensure our engagements with young people are as effective as possible. It is through evaluation that we can identify the extent to which our programmes are winning the hearts and minds of young people, increasing their understanding of engineering and technology, and changing their perceptions of a career in it as something they'd consider for themselves, regardless of background and gender.