

HOW ENGINEERING DEGREE APPRENTICESHIPS HAVE AN IMPACT ON EQUALITY, DIVERSITY AND INCLUSION (EDI): A LOCAL STUDY

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ABSTRACT

This paper explores the impact of Engineering Degree Apprenticeships on Equality, Diversity and Inclusion (EDI) through a focused case study within an HEI on the South Coast of the UK. It compares local enrolment and achievement data with national trends in both Degree Apprenticeships and Full-Time Engineering Degrees. Drawing on four years of data (2022–2025 starts), the study examines student demographics and outcomes across key EDI indicators, including; gender, ethnicity, socio-economic background (IMD), and learning difficulties.

Findings reveal that while the case studies engineering degree apprenticeship cohort remains predominantly male and White British, mirroring national patterns in Full-Time Engineering Degrees, there are notable differences. Female participation within the case study, though low, shows a gradual increase, aligning with national apprenticeship trends but still lagging behind Full-Time Degree benchmarks. However, apprentices with learning difficulties are proportionally better represented than in national full-time programmes, suggesting that the apprenticeship model may offer a more inclusive route for neurodiverse learners.

Socio-economic representation is mixed: while there is some engagement from students in more deprived IMD quintiles, the majority still come from mid-to-upper quintiles, echoing national concerns about the accessibility of degree apprenticeships for the most disadvantaged. However, achievement rates, within the case study, are consistently high across most demographics, indicating strong support structures once students are enrolled as apprentices.

This study contributes to the growing discourse on the role of Degree Apprenticeships in addressing systemic inequalities in engineering education and highlights the need for targeted outreach and inclusive recruitment strategies to broaden participation.

Keywords: Degree-Apprenticeships, EDI, neurodiverse-learners, widening-participation, engineering

1 INTRODUCTION

The UK's engineering skills pipeline must simultaneously meet employer demand for high-level technical skills and build a profession that better reflects society. Degree Apprenticeships (DAs) are frequently presented as a mechanism to achieve both aims. Universities UK [1] argues that DAs combine paid employment, an accredited degree, and structured progression into skilled roles, thereby reducing financial barriers and widening access for under-represented groups. Evidence from IFF Research [2] for the Department for Education shows employers use DAs primarily to upskill existing staff (61%) and support internal progression pathways (39%). Despite these advantages, persistent participation gaps remain. Bolton and Lewis [3] report that social mobility outcomes in DAs have in some cases “got worse... and were particularly acute among degree apprentices under 25,” highlighting continuing inequalities by gender, ethnicity, and socio-economic background. This paper provides an evidence-based analysis of local engineering DA enrolment and attainment by protected and widening-participation characteristics, benchmarked against national patterns in DAs and Full-Time Engineering Degrees, to assess where access and outcomes diverge and why.

2 METHODOLOGIES

This study draws on a focused case study conducted within a higher education institution (HEI) located on the South Coast of the United Kingdom, utilising four years of enrolment and achievement data from

cohorts beginning between 2022 and 2025. It investigates student demographics and outcomes across key EDI indicators, including: gender, ethnicity, socio-economic background, as measured by the Index of Multiple Deprivation (IMD), and declared learning difficulties. Descriptive statistical methods are employed to identify trends, patterns, and relationships within the institutional datasets. Chi-square tests were considered but not used due to the small sample sizes (n). These findings are then contextualised through comparison with national data sources, enabling alignment with broader sector trends across both DAs and Full-Time Engineering Degree programmes.

3 CASE STUDY

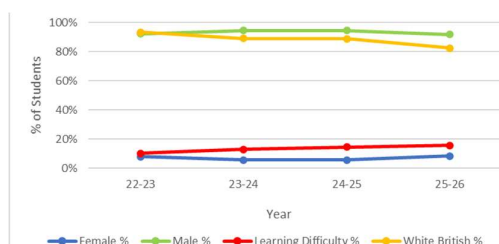


Figure 1. Enrolment: Key Characteristics

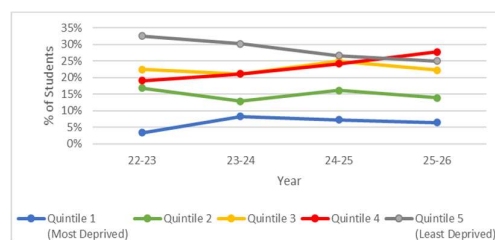


Figure 2. Enrolment: IMD Background

3.1 Participation Trends (Enrolment Data)

Gender. Female enrolments show a small but steady increase over the period (Figure 1, blue), rising from 7.9% in 2022/23 to 8.3% in 2025/26, while male participation remains consistently dominant at approximately 92–95% (Figure 1, green). Although the shift is modest, it indicates incremental progress in widening gender participation within the programme, albeit from a notably low baseline, n ranging from 6 to 9.

Ethnicity. The cohort remains predominantly White British across all observed years, comprising approximately 82–93% of enrolments, as seen in Figure 1, gold. Minor increases are observed within the “Other White” category, while representation from Asian and Black ethnic groups remains small (n=3 to 8) but stable. Importantly, the proportion of students selecting “Not provided” decreases over the period, suggesting improved confidence or willingness to disclose ethnicity data.

Declared learning difficulties. The proportion of learners reporting a learning difficulty increases markedly over time (Figure 1, red), rising from 10.1% (n=9) in 2022/23 to 15.7% (n=18) in 2025/26. This upward trend may reflect improved disclosure practices, enhanced institutional support structures, or greater accessibility for students with additional learning needs.

Socio-economic background (IMD). Learners are drawn from across the socio-economic spectrum, though with visible clustering in the mid-to-upper quintiles, as Figure 2 shows. Representation from the most deprived (Quintile 1) is low, averaging at 6.3% (n=4). In contrast, enrolments from the least deprived (Quintile 5) constitute the single largest group most years, averaging at 28.6% (n=15). The pattern indicates a mid-to-less-deprived skew, with some if limited reach into the most deprived quintile.

3.2 Analysis of Achievement

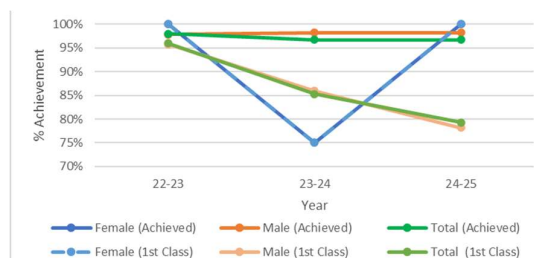


Figure 3. Achievement by Gender

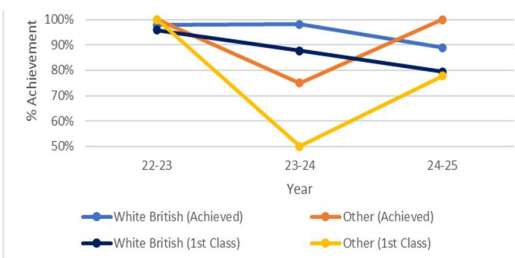


Figure 4. Achievement by Ethnicity

Overall patterns. Achievement rates, shown in green in Figure 3, remain consistently high across the period of study, with completion at approximately 98% (n=50) in 2022/23 and 96.7% (n=85) in 2023/24. First-class attainment is consistently lower than overall achievement, showing a steady decline.

Gender. Figure 3 also shows achievement by gender. Male learners, who represent the majority of leavers each year, demonstrate consistently strong achievement rates: around 98% each year, with those

achieving first-class grades dropping from 95.7% to 78.2%. Female outcomes display far greater volatility due to very small cohort sizes. In 2022/23, results for the three female leavers were uniformly positive, with 100% in both achievement and first-class attainment. In 2023/24, both achievement and first-class outcomes declined to 75% (n = 4), by 2024/25, both measures returned to 100% (n = 7). While these fluctuations preclude strong inference, the available data do not indicate systematic under-performance among female learners once enrolled.

Ethnicity. Figure 4 shows White British leavers, the majority group, consistently achieved $\geq 90\%$, with first-class attainment declining from 95.8% to 79.5%. Other ethnic groups appear in very small numbers (often n=1 to 4), and while recorded achievement is frequently 100%, the small sample sizes preclude meaningful interpretation or inference when attainment percentage falls.

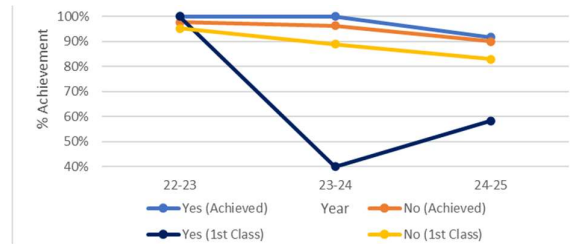


Figure 5. Achievement by Declared Learning Difficulty

Declared learning difficulties. Learners declaring a learning difficulty achieve highly overall but exhibit lower first-class degree outcomes relative to peers without such declarations, as can be seen in Figure 5. For example, in 2024/25, for 12 learners, their achievement rate stands at approximately 91.7%, with 58.3% attaining a first-class degree. This contrasts with achievement of 90% and first-class attainment of 82.9% among those 70 learners without a declared difficulty.

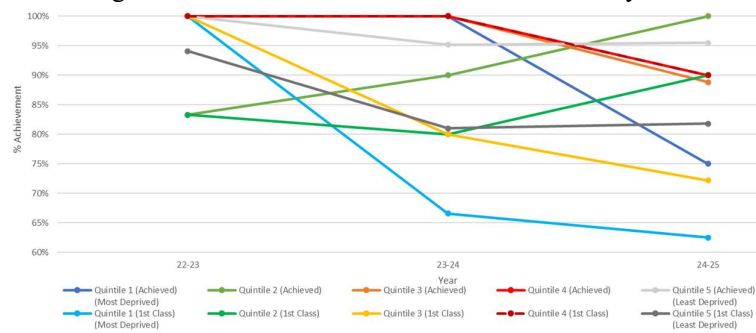


Figure 6. Achievement by IMD Background

Socio-economic background (IMD). Figure 6 shows achievement remains strong across IMD quintiles, though first-class attainment displays considerable variation. As with other subgroup analyses, many of these cells contain small numbers, limiting the reliability of comparisons. Nevertheless, there is no consistent evidence that learners from more deprived neighbourhoods experience lower achievement once on programme. However, the observed decline in first-class attainment for Quintile 1 and the corresponding rise for Quintile 2 merit closer examination, as this convergence appears to normalise the aggregate outcome profile.

4 NATIONAL CONTEXT AND COMPARISON

4.1 Degree Apprenticeships (National)

Gender. According to an EngineeringUK [4] report, “the proportion of female apprenticeship starts has been improving for engineering and technology-related subject areas, but remains below the average across all subject areas,” with female entrants accounting for only 17% of starts in 2023–2024 compared with 52% across all subjects. This disparity is largely driven by persistently low female participation in sectors such as Engineering and Manufacturing, where women constitute approximately 10% of apprenticeship starters. At the DA level, however, year-on-year growth has been more pronounced, with a 13% annual increase in female participation between 2022 and 2024. Complementing these findings,

an Aura [5] reports a 19% decline in female retention at this stage, signalling a significant challenge for achievement outcomes.

Ethnicity. The same EngineeringUK [4] report found that “14% of starts for engineering and technology-related apprenticeships in 2023/24 were by people from a UK minority ethnic background, up from 8% in 2017/18”, indicating a sustained long-term increase in participation.

Declared learning difficulties. Although not publicly available, dataset reports participation or achievement rates within engineering DAs, broader apprenticeship data, Aptem [6], show an increase in disclosure: rising from 11.9% in 2020/21 to 14.5% in 2022/23.

Socio-economic background (IMD). Evidence from the Sutton Trust [7] shows that recent apprenticeship reforms “have not delivered radical change in social mobility,” with only 29% of engineering DAs coming from the two lowest IMD quintiles, underscoring persistent socio-economic inequalities in access and progression. With a Department for Education [8] dataset highlighting that achievement rates from these two lowest IMD quintiles is around 50%; 48.2% and 51.1% respectively.

4.2 Full-Time Engineering Degrees (National)

Below are key benchmark figures for students in engineering and technology first-degree courses in the UK, primarily based on the EngineeringUK [9] 2023 report on Engineering in Higher Education, unless otherwise noted.

Gender. Across engineering, women remain significantly under-represented. EngineeringUK [9] reports that women constituted only 18.5% of first-degree undergraduate entrants, in stark contrast to the 56.5% female participation observed across all undergraduate subject areas. This pattern is reinforced by the most recent 2023/24 HESA [10] data, which indicates that men account for approximately 78% of students enrolled in engineering, confirming the field as one of the most persistently male-dominated academic domains. Longitudinal data further illustrates the slow pace of progress. According to SWE’s [11] analysis of HESA figures, the proportion of women enrolled in engineering undergraduate programmes has increased only modestly over the past decade; “from 14.5% in 2015 to 19.8% in 2024”. Parallel improvements are reflected in degree completions: the number of degrees awarded to women rose from 13.9% in 2015 to 19.3% in 2024. Although these trends signal incremental improvement, they also highlight the enduring gender disparity.

Ethnicity. According to EngineeringUK [9], courses recruit a higher proportion of minority ethnic entrants compared with the undergraduate sector overall, with Asian students particularly well represented. This diversity is reflected in the wider student population data for 2020/21, in which only 66.1% of undergraduates were white. Degree outcomes similarly display important differences across ethnic groups. Across all major ethnic categories, engineering and technology students were more likely to achieve first-class honours than qualifiers across all subjects generally, with White, Asian, and Mixed-Ethnicity students each surpassing the 40% threshold for first-class awards. However, a more varied pattern emerges for upper-second degree classifications: 33.5% of White qualifiers, compared with 43.0% of Black qualifiers, indicating meaningful variation in attainment profiles across groups. This data illustrates both the comparatively strong representation of minority ethnic groups within engineering programmes and the nuanced attainment differences that persist across ethnic categories.

Declared learning difficulties. However, the report focuses on disability rather than declared learning difficulties. Stating that only 10.5% of first-degree engineering and technology undergraduates have a known disability, compared with 15.1% across all subjects, indicating a persistent participation gap within the sector. Despite this lower level of participation, attainment patterns suggest that disabled students achieve at least as strongly as, their non-disabled peers, with 81% achieving a first-class or upper-second honours degree, compared with 80.3%.

Socio-economic background (IMD). The report also highlights that the lowest participation, only 11.2% of undergraduates come from the most deprived areas (Quintile 1) compared with 13.5% across all subjects. In contrast, 32.4% originate from the least deprived areas (Quintile 5), highlighting a substantial socio-economic skew in access. However, differences in attainment across socio-economic groups appear less pronounced within engineering and technology than in the wider undergraduate population. With the difference achieving a first-class honours between Quintile 1 and 5 being only 2.6% and notably this pattern reverses for upper-second, with the most disadvantaged students outperforming by 2.5%. These findings indicate that although socio-economic background continues to shape patterns of access to engineering and technology degrees, it has less influence on academic outcomes for those who progress into these programmes. They also suggest that once enrolled, students

from lower-participation areas demonstrate strong levels of academic achievement, underscoring the importance of widening participation initiatives aimed at improving access rather than capability.

5 DISCUSSIONS AND CONCLUSION

5.1 Limitations

The local dataset covers four entry cycles but includes small sample sizes for several demographic groups, particularly women and minority ethnic learners. As a result, apparent fluctuations in achievement or grade outcomes may reflect sampling variability rather than meaningful change. Additionally, national benchmarking draws on data from multiple external sources with diverging timeframes, definitions, and disaggregation levels (e.g., engineering and technology broadly versus engineering DAs specifically). These inconsistencies limit the precision of direct comparisons and require cautious interpretation.

5.2 Discussions

Access versus Outcome. The local evidence demonstrates that engineering DAs can offer a financially accessible and high completion pathway for those who secure a place. The removal of tuition fees and the integration of paid employment substantially reduce the financial barriers that typically restrict access to higher education. However, the data also indicate that limited entry, rather than performance once enrolled, remains the primary constraint on EDI. Patterns of under representation; particularly for women and minority ethnic groups, mirror national trends, suggesting that structural barriers to entry persist irrespective of institutional support or programme design. Consequently, while outcomes for those who enrol are generally strong, these successes do not yet translate into a representative intake.

Gender. Collectively, the local and national evidence illustrate a consistent pattern:

- Women perform strongly once enrolled, and there is no indication of gender-based performance gaps.
- Participation remains the binding constraint, with women significantly under represented in engineering DAs and engineering education more broadly.
- Retention at the DA stage requires attention, as national evidence suggests attrition among female apprentices even where recruitment is improving.
- Structural barriers, such as perceptions of engineering, school subject choices, workplace culture, and the visibility of role models, continue to shape entry patterns far more than academic capability.

In this context, the modest local increase from 7.9% to 8.3% female enrolment mirrors the incremental gains seen nationally but falls well short of addressing the underlying structural imbalance. The challenge, therefore, is not in female learners' capacity to succeed, but in ensuring that more women have the opportunity to enter engineering pathways in the first place, and that they encounter supportive environments that sustain retention and progression.

Ethnicity. Taken together, the local and national data illustrate several important themes:

- Access, not achievement, is the primary site of ethnic disparity. Minority ethnic learners are under-represented in the local programme, even though national participation in engineering-related apprenticeships is increasing.
- Once enrolled, minority ethnic apprentices perform strongly, and local achievement data provide no evidence of performance gaps.
- Variability in small cohort outcomes underscores the need for caution when analysing and interpreting local data for under-represented groups.
- National degree-level patterns highlight both progress and complexity: strong Asian representation, gradual increases in Black and Mixed-Ethnicity participation, and nuanced differences in attainment.
- The apprenticeship experience itself, particularly workplace culture, mentoring, and belonging, remains central to ensuring equitable progression and retention.

Overall, the evidence suggests that enhancing ethnic diversity in engineering DAs requires interventions focused primarily on recruitment and access, paired with ongoing cultural and academic support to maintain high levels of achievement once learners are enrolled.

Declared learning difficulties. Participation among learners with declared learning difficulties shows encouraging growth, accompanied by strong overall achievement. Nonetheless, the comparatively lower proportion achieving first-class degree outcomes points to the need for more consistently robust academic and workplace support. This includes refinement of reasonable adjustments, enhanced coaching, and more inclusive assessment design. Such measures could strengthen the alignment between

widening participation and high-level achievement, ensuring that increased access is matched by equitable academic progression.

Socio-economic background (IMD). The socio-economic profile of the intake, particularly the continued over representation of learners from the least deprived quintile, indicates that structural inequalities remain influential. While engineering DAs reduce cost barriers, they do not fully counterbalance entrenched disparities linked to geographic deprivation and prior educational opportunity. This local pattern aligns with national statistics, that DAs have not yet achieved their full potential as vehicles for social mobility. Strategic interventions; such as targeted community-based recruitment, pre-apprenticeship bridging provision, and partnerships with employers operating in high deprivation areas, could help shift the distribution towards a more socio economically diverse cohort.

Culture and Progression. EDI outcomes extend beyond recruitment. The transition from access to retention, high performance, and progression depends heavily on the cultural and developmental environment within employers and training providers. National evidence consistently emphasises the importance of inclusive workplace practices, high quality supervision, and clear progression pathways. Local observations similarly suggest that small cohorts of underrepresented learners can achieve highly when appropriately supported. Strengthening the cultural dimension of the apprenticeship experience is, therefore, central to converting diverse entry into long term success.

5.3 Conclusion

Local evidence indicates that Degree Apprenticeships in engineering deliver high completion and strong attainment once learners are on programme; the primary constraint remains entry rather than capability. Compared with national patterns, female participation is lower, ethnic diversity remains limited, and socio-economic representation is skewed away from the most deprived quintile, despite improvement for learners with a learning difficulty. In response, this study has informed changes to the interview and selection process to improve inclusivity. Outreach has also been expanded through school engagement and the use of current apprentices from more diverse backgrounds as visible role models. These actions, alongside inclusive employer recruitment and supportive workplace cultures, represent key levers for improving access. Future cohorts will be monitored to assess whether these targeted interventions lead to measurable improvements in participation and EDI outcomes.

REFERENCES

- [1] Universities UK. *THE FUTURE OF DEGREE APPRENTICESHIPS*, 2021 (Universities UK).
- [2] IFF Research. *Apprenticeship Evaluation 2023: Employer survey*, 2024 (Department for Education).
- [3] Bolton, P., and Lewis, J. *Degree apprenticeships*, 2024 (House of Commons Library).
- [4] EngineeringUK. *APPRENTICESHIP PATHWAYS INTO ENGINEERING: 2023/24 annual data update*, 2024 (EngineeringUK).
- [5] Aura. *Equality, Diversity and Inclusion in Engineering - A Roadmap Towards Positive Change*, 2020 (Supergen).
- [6] Aptem. *Apprentices with LLDD increase by 2.6% in two years*. Available: <https://www.aptem.co.uk/apprentice-training-providers/apprentices-with-lldd-increase-by-2-5-in-two-years/> [Accessed on 2025, 11 November], (2024) 9 October.
- [7] The Sutton Trust. *BRIDGING THE GAP: Socio-economic diversity in the engineering sector: access, pay and progression*, 2022 (The Sutton Trust).
- [8] Department for Education. *Achievement Rates Learner Characteristics - Volumes and Rates by Std-fwk flag, STEM, SSA T1, Detailed Level, Age, IMD*. Available: <https://explore-education-statistics.service.gov.uk/data-catalogue/data-set/35c9bae8-8753-4c4d-9cb4-56a52584231a> [Accessed on 2026, 19 February], (2026) 29 January.
- [9] EngineeringUK. *Engineering in Higher Education*, 2023 (EngineeringUK).
- [10] HESA. *Higher Education Student Statistics: UK, 2023/24 - Subjects studied*. Available: <https://www.hesa.ac.uk/news/20-03-2025/sb271-higher-education-student-statistics/subjects> [Accessed on 2025, 11 November], (2025) 20 March.
- [11] SWE. *United Kingdom Tertiary Education*. Available: <https://swe.org/research/2025/united-kingdom-tertiary-education/#:~:text=shown%20in%20figure-,According%20to%20the%20HESA%2C%20the%20number%20of%20women%20enrolled%20in,HE%20Student%20Data%2C%20Figure%2017> [Accessed on 2025, 11 November], (2025).