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Article Title Page

The Impact of Degree Apprenticeships: Analysis, Insights and Policy Recommendations

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Structured Abstract:

Purpose

Degree apprenticeships in the UK have grown exponentially since they were introduced. While claims and speculations about their impact have been made by high-profile politicians, lobbyists and training providers, the evidence base for these claims has never been systematically scrutinised. The purpose of this paper is to analyse and present up-to-date peer-reviewed evidence on the impact of degree apprenticeships on social mobility and productivity and their influence on future policy.

Design/methodology/approach

The authors critically and systematically review over 4,000 data points from relevant sources and synthesise the results qualitatively and quantitatively with a combined method approach. Quantitative evidence has been aggregated where possible and tested for statistical significance. Qualitative evidence has been critically reviewed and comparatively analysed.

Findings

The analysis reveals that there is a shortage of depth and breadth of concrete and peer-reviewed evidence on the impact of degree apprenticeships. Nevertheless, existing data demonstrates that degree apprenticeships are meeting their intended purpose of contributing positively to the UK government's high-level goals for productivity and social mobility. They are an alternative route into higher education and serve as a vital talent pipeline providing opportunities for young people, existing employees, and learners from diverse backgrounds.

Originality

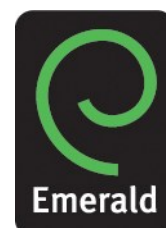
This article provides the first systematic and peer-reviewed synthesis of the impact of degree apprenticeships. It brings together existing evidence and statistically validates outcomes to inform researchers, educators, training providers, policymakers and other stakeholders in their recommendations moving forward.

Keywords: degree apprenticeships, impact, productivity, social mobility, apprenticeship policy

Article Classification: Literature Review

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Running Heads:



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Degree Apprenticeships (DAs) in the UK were launched in 2015 to bring together the world of work and higher education. Just as DAs were launched, the UK government published a report that stated that “a large productivity gap exists between the UK and leading advanced economies... this gap is too large and... narrowing it is a prize worth striving for” (HM Treasury, 2015). In the same year, another government report highlighted the problem of social mobility in the country, stating that, “ours is a country where the class and income of children when they grow up is more related to the class and income of their parents than elsewhere in the developed world... there is a class ceiling in British society and it inhibits the life chances of hundreds of thousands of children” (Social Mobility and Child Poverty Commission, 2015). Overcoming this dual challenge is the aim of UK DAs.

There is some evidence that DAs improve the effectiveness of partnerships between stakeholders (McKnight *et al.*, 2019), provide a professional highly-skilled workforce that meets some of the demands of the labour market (Crawford-Lee, 2020; Konstantinou and Miller, 2020), serve as an intervention for under-achieving groups (Mutlib, 2020; Senior *et al.*, 2020), and provide an environment for healthy competition between training providers to raise the status of apprenticeships and improved curriculum development (Bradley *et al.*, 2019). However, there is a lack of credible scholarship (in terms of scope and size) that addresses hyperbolic and hypothetical statements made on the impact of degree apprenticeships. Also, literature that brings together DA impact cases to create strong evidence that is evaluated against the government’s original intended purpose is rare.

This article aims to synthesise (qualitatively and quantitatively) existing outputs on the impact of DAs in terms of productivity and social mobility. Six published outputs - five reports and one journal article - on the impact of DAs have been carefully considered. Only six published outputs have been chosen because DA research is in its infancy and very limited research efforts have gone into its impact. Outputs on the impact of apprenticeships in general (not DA) have been excluded from this study. By focusing on DAs only, the authors believe that they are producing the first output that brings together the impact of DAs holistically and builds a picture of the broadest evaluation of DA impact to date.

Although most of the selected outputs use summative and descriptive methods, there are elements of quantitative patterns in them. It is important to assess both the qualitative and quantitative evidence from these outputs to comprehensively capture the landscape of DA impact. Qualitative evidence will be synthesised, compared, and recategorised under productivity and social mobility headings. Quantitative evidence will be aggregated where possible, compared and tested for statistical significance of arguments that

are derived from the re-categorisation and assessment of the selected outputs. Such a combined method approach allows the authors to critically re-assess the existing evidence of DA impact with the confidence of retaining the rigour of the original outputs.

The rest of the article is written as follows: Section 2 is a background chapter that reviews all the six outputs used in the study. Section 3 will draw out all the impact cases from these outputs. Sections 4 and 5 provide an evaluation and conclusion respectively.

Since the graduation of the first DA cohorts, some efforts have been made to evaluate the impact of DA programmes. However, not very much has been done between then and now. Combinations of several search terms like, “degree apprenticeship impact” and “‘degree apprenticeship’+impact” were entered into search engines (including Google, Google Scholar, and Scopus) in this review analysis. The top 50 to 80 of the search results were mostly relevant and were carefully scrutinised for the terms “degree apprenticeship” and “impact” in their titles and brief descriptions; they were limited to only DA programmes and filtered so that they focused solely on the impact of DAs. Six (6) outputs fit the selection process above: five are reports on DA impact and one is a journal article. These outputs, in order of the date of publication, are:

1. Degree Apprenticeships: Impacts, Challenges, and Future Opportunities (National Centre for Universities and Business, 2018) – henceforth known as **NATCUB**. In this output, the authoring institution was funded to “explore the emerging effects of the availability of degree apprenticeships, ..., on employers’ early talent strategies and the potential impact on social mobility” (National Centre for Universities and Business, 2018). Twelve large levy-paying employers and thirteen Higher Education Institutions (HEIs) in England were interviewed. After the interviews, a roundtable session was conducted with stakeholders to discuss the interview findings.
2. The Future of Degree Apprenticeships (Universities UK, 2019) – henceforth known as **UNIVUK**. This report is a product of “desk-based research and extensive engagement with a wide range of stakeholders, including 13 trailblazer leads, 49 employers, 60+ universities, 11 Schools, 747 students, 93 parents [and] an expert sounding board” (Universities UK, 2019).
3. Sustainable Degree Apprenticeships (Lester and Bravenboer, 2020) – henceforth known as **MIDSTA**. This project was led by Middlesex University with Staffordshire University, Sheffield Hallam University and University Vocational Awards Council (UVAC) as collaborators. In this study, a desk-based literature review, semi-structured interviews and questionnaire surveys were used on three key stakeholders in DAs: employers, providers and apprentices.

4. Move on up? Measuring the Social Mobility Impact of Apprenticeships (Middlesex University London, 2021) – henceforth known as **MIDUNI**. The MIDUNI researchers conducted a survey (200 apprentices responded) about their “social and economic backgrounds, using a set of tested socio-economic background measures.” In addition to the responses, the research team considered the “participation of local areas (POLAR), Index of Multiple Deprivation (IMD) and other qualitative data to evaluate the impact of DA at Middlesex University”.
5. Force for Change: The Impact of Degree Apprenticeships at Manchester Metropolitan University (Manchester Metropolitan University, 2021a) – henceforth known as **MANMET**. The Force for Change report provides a quantitative insight into the overall impact DAs are having by looking at the profiles of all Manchester Metropolitan University’s 2573 DA learners from the 2015/16 academic year to the 2020/21 academic year.
6. One journal article (Smith *et al.*, 2021) - henceforth referred to as **SMITAY** - is also considered. In the study, the researchers used mixed methods at six Scottish HEIs to uncover the social mobility potential of computing and IT-based DAs. This article is not specifically a DA impact output but it is considered because it contains some useful DA impact parameters that are beneficial in this study.

In summary, these outputs provide over 4000 data sources (including surveys, interviews and group discussions) that have been summarised in Table 1. Although MANMET provides the highest data points (61%) followed by UNIVUK (23%) and the remaining provide less than 10% of the data points each, all outputs are considered based on the overall themes emerging from their key findings and not the quantitative or qualitative “weight” (numerical strength of the number of participants).

Table 1: Number of respondents (qualitative/quantitative) from the six outputs.

| Study | Employers | Training Providers | Trailblazer Leads | Schools | Non-DA Students | Parents | DA Apprentices | Total |
|--------------|------------|--------------------|-------------------|-----------|-----------------|-----------|----------------|-------------|
| NUTCUB | 12 | 13 | 0 | 0 | 0 | 0 | 0 | 25 |
| UNIVUK | 49 | 60+ | 13 | 11 | 747 | 93 | 0 | 973+ |
| MIDSTA | 76 | 106 | 0 | 0 | 0 | 0 | 54 | 236 |
| MIDUNI | 0 | 0 | 0 | 0 | 0 | 0 | 200 | 200 |
| MANMET | 0 | 0 | 0 | 0 | 0 | 0 | 2573 | 2573 |
| SMITAY | 0 | 0 | 0 | 0 | 0 | 0 | 188 | 188 |
| Total | 137 | 179+ | 13 | 11 | 747 | 93 | 3015 | 4195 |

Table 1 represents one of the largest, most diverse and wide-ranging views of stakeholders gathered on the impact of DAs. Therefore, it is hoped that the analysis in this article will provide a comprehensive up-to-date

evidence-based resource on the policy impact of DAs for researchers and policymakers in a sector that is lacking sufficient extant literature.

There is no standard or benchmark established for measuring or evaluating the impact of DAs. A reasonable approach for measuring the impact of DAs is by assessing how they meet their original intended purpose. Since productivity and social mobility are the “twin aims” of the apprenticeship policy agenda (Quality Assurance Agency, 2019), they will be used to measure the impact of DA.

Productivity

In the UK, productivity “is a measure of the amount of output a business produces for a unit of input... higher productivity means that a business produces more output for each worker it employs.” (Office for National Statistics, 2018). It is practically complex to determine the exact quantum of the productivity contribution of DAs to the UK economy. Three major themes emerge from the selected outputs that fall under the productivity category.

A. High-Quality Contributions

Apprenticeships in general benefit employers by helping to address skills shortages and providing value for money (The St Martin’s Group, 2021). More specifically, DAs are making significant contributions to employer partners and the economy (Lester and Bravenboer, 2020).

In the MANMET report, 96% of the 2020/21 Digital and Technology Solutions Professional graduating cohort’s endpoint assessment results were at the Merit or Distinction level. This is a meaningful real-world business contribution. These apprentices have added to the output of their businesses, thereby improving their productivity. MIDSTA reports that over 80% of survey respondents see productivity as an extremely or very important aim of degree apprenticeships. For these measures of productivity to be met, the study’s authors argue that it is vital for HEIs and businesses to work together to build strong partnerships that ensure that apprentices are properly supported with sufficient off-the-job time, integrated strategic goals, and effective evaluation strategies (Lester and Bravenboer, 2020).

B. Career Advancement

Career advancements are strongly coupled with pay rises. The pay for DA graduates rises more rapidly than that of non-DA graduates (Webber, 2019). Due to the quality, quantity and scale of the impact DA graduates make, they are valued by their employers. Between 2015 and 2021, over 78% of all Manchester Metropolitan DA learners received a pay rise, with some 64% receiving a promotion during their apprenticeship

(Manchester Metropolitan University, 2021a). The first graduating cohorts were surveyed one year after their apprenticeship and the findings show that the graduates were earning on average approximately “46% (£18,000) higher than the average UK computing graduate and 5% (£2,000) higher than graduates from the top five computing courses in the UK” (Manchester Metropolitan University, 2021b). Aggregating the observations of the MANMET report, statistical testing of proportions also confirms that DA graduates have significantly higher income compared to a sample undergraduate group (z statistics = -39.21, p = 0.000 in Appendix 1).

C. Talent Development

Employers across all sectors are working hard to create a conducive environment for a diversified workforce that will be appealing to a wider pool of employees, including degree apprentices. Recently in a survey of over 600 English businesses, it emerged that the majority (89%) of employers who recruited apprentices agree that “apprentices enable their organisation to proactively build [their] future”, leading them to consider the recruitment of more apprentices in the future (Gaini, 2021; The Open University, 2021). The prospect of DAs serving as a pipeline for a diverse and robust talent pool is shared by many employers across the business spectrum (Lester and Bravenboer, 2020; Universities UK, 2019).

In the MANMET report, participating employers were asked to share their opinion on DAs as a catalyst for growing talent in their organisation. The results were overwhelming; 100% of the employers agreed that DAs were a medium for growing talent in their organisation, 88% agreed that DAs brought knowledge into their organizations and 81% agreed that DAs encouraged progression on the career ladder (Manchester Metropolitan University, 2021a). Similarly, 100% of the employers in the NATCUB report want to increase the number of their apprentices and some use DAs to directly replace graduate vacancies (National Centre for Universities and Business, 2018).

In MIDSTA, the authors note that DAs have a vital role to play in filling skills gaps in industries such as digital, engineering, public sector leadership and management, and nursing. However, the authors also note that there have been challenges to the use of DAs in developing talent, as progression routes from lower-level apprenticeships to DAs have been unclear. They recommend that for DAs to reach their goal of becoming a vehicle for social mobility, more needs to be done to promote DAs as a valid alternative route to higher education, recruit underrepresented groups, and improve progression opportunities (Lester and Bravenboer, 2020).

Social Mobility

In the UK, social mobility is “the link between a person’s occupation or income and the occupation or income of their parents” (Social Mobility Commission, 2018). In a recent UK survey, 79% of all adults (4693

participants) believe that a large gap exists between social classes in Britain; 34% would say that the gap is “very large” whilst 45% would describe it as “fairly large” (Social Mobility Commission, 2021). The selected outputs point to the fact that DAs are contributing to narrowing the social inequality gap in the following ways.

A. Opportunities for Young People

The UK government pledged over £60m in funds to support “apprenticeship take-up by young people and poorer families from disadvantaged areas...” (HM Government, 2018). The call to make DAs open to all was echoed in a recent report published by the Higher Education Policy Institute, when the chair of the Education Select Committee, Rt Hon. Robert Halfon encouraged HEIs to make the shift from full-time academic degrees, which set up some young people to fail, to DA alternatives that provide “a ladder of opportunity for all young people” (Robert Halfon, 2018). A recent national poll conducted in the UK (Social Mobility Commission, 2021) called for more opportunities for apprenticeships as a channel for supporting disadvantaged families. Although there is room for improvement (Lester, 2020), a lot of work is being done, including targeted approaches, to broaden DA recruitment of young people.

According to the MANMET report, DAs are making progress on Rt Hon. Halfon’s call; there is a good spread of age bands. As depicted in Figure 1, the national average for all 19 and under apprenticeship starts is about 30% over the past three years (Department for Education, 2022). In DA, in particular, nationally, in the 2020/21 academic year, 20% of degree apprentices were 20 years old or younger (Cullinane and Doherty, 2020). In the same period, MANMET reports that 25% of DA learners were under 20 years – beating the national average for the same period.

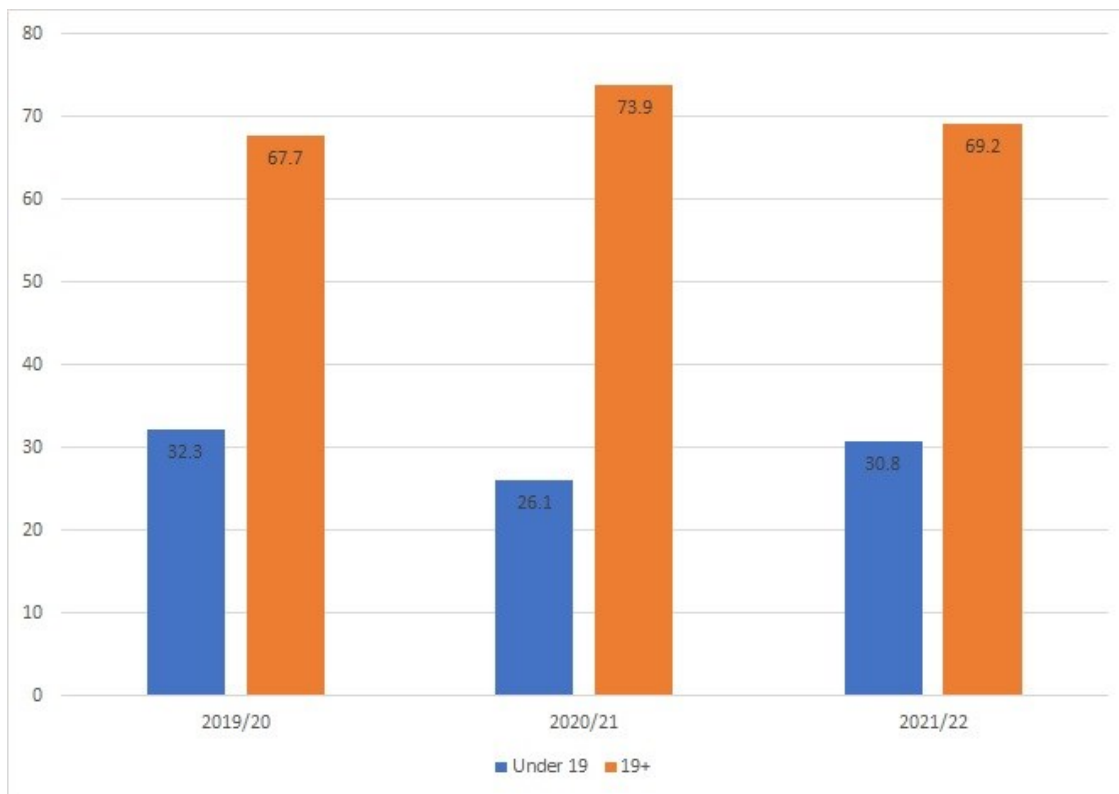


Figure 1: Apprenticeship starts from 2019 to 2022

According to McKnight *et al.* (2019), although degree apprenticeships were designed with young people in mind, there is strong evidence that they are not taking up the opportunity, although they are increasingly showing interest and parents are beginning to “warm-up” to DAs. SMITAY found that the proportion of apprentices who were under 25 was only slightly lower than “traditional” degree courses; 42% as opposed to 48%. Statistical testing of the age difference, in this case, suggests that there is no significant difference in terms of under 25 participation between DAs and other provisions (z statistics = -1.17, $p = 0.242$ in Appendix 2). The age patterns of DAs are still inconclusive given SMITAY’s observation. The study’s authors cautioned that, within their study, those recruited directly to a degree apprenticeship were more likely to be from an advantaged background (Smith *et al.*, 2021). By contrast, MIDUNI found that 72% of degree apprentices on their vocational course offerings (nursing, policing) were over 25, suggesting that the age spread of apprentices is directly linked to the type of DA programme that is being offered (Middlesex University London, 2021). This affirms some of the findings from NATCUB, where the majority of the early learners were existing workers who were upskilling (National Centre for Universities and Business, 2018).

B. Supporting Women in STEM

Nationally, there is a significant underrepresentation of women in Science, Technology, Engineering and Mathematics (STEM) education and in the workforce. From 2016 to 2019 in the UK, between 24% and 26%

of STEM graduates from higher education were women and women in the core STEM workforce were between 21% and 24% (STEM women, 2021; WISE, 2020). For the same period, 27% of women in the workforce in the UK were in STEM, compared to 52% of women in the wider workforce for the same year (British Science Association, 2020).

DAs have shown that they can be used as a vehicle for boosting the number of women in STEM education and the workforce. In the MANMET report, about 34% of STEM apprentices are women. Compared to 24% of female UG STEM graduates, MANMET's data indicates significant uptake of female participants in DA programmes (z statistics = -7.90, p = 0.000 in Appendix 3). This was achieved through initiatives that were targeted at making young women aware of the opportunities opened up by STEM DAs and working closely with employer partners to help them increase the diversity of their workforce (Manchester Metropolitan University, 2021a).

C. Alternative Routes to Higher Education (HE)

In a 2020 survey of young graduates, it emerged that 18% were the first to complete a university degree (Henderson *et al.*, 2020) in their families. According to MANMET, 16% of degree apprentices who enrolled in the 2020/2021 academic year were from low participating neighbourhoods, compared to 25% from the highest participating neighbourhoods. For the same period, 40% of the graduating cohort were the first in their families to attend university. In addition to providing young people fresh opportunities to gain useful professional skills, apprenticeships also provide people from the existing workforce opportunities to upskill or reskill to boost their career prospects and reduce the risk of redundancies (Manchester Metropolitan University, 2021a).

The MANMET outcome is echoed in the findings of MIDUNI, where 72% of respondents were over 25, and 66% of respondents were from low HE backgrounds, with parents who either had no formal qualifications or were educated below degree level. In addition, only 37% of the highest earners in their households were employed in professional roles, indicating that, for these apprentices, DAs are a powerful vehicle for allowing them to achieve higher qualifications. Several respondents cited economic and social barriers to higher education such as domestic violence, reliance on state benefits and housing, and lack of social capital, which the DA route allowed them to overcome once they had entered the workforce (Middlesex University London, 2021).

D. Opportunities for Students from Diverse Backgrounds

From MANMET, over 30% of apprentices were from the “most disadvantaged deciles (address at enrolment IMD1-4) for Education and Skills domain”; most of these learners (86%) completed or continued to study on their programme (Manchester Metropolitan University, 2021a). This figure is very encouraging when compared with the fact that 13% of some degree apprentices “come from neighbourhoods in the bottom fifth

of deprivation” (Cullinane and Doherty, 2020). The trend seems to be on an upward trajectory, moving from 25% in 2015-2016 to 37% in 2020-2021. However, a smaller number of degree apprentices (13%) are from the most advantaged backgrounds (IMD 10) – which is lower than the national average (27%) reported in the same year (Cullinane and Doherty, 2020). MIDUNI reports similar results – 66% of degree apprentice respondents are from low HE participating backgrounds with up to 63% from non-professional backgrounds. For the same MIDUNI cohort, 38% are from the most deprived areas according to IMD data with over 15% from IMD1-2 and over 20% from IMD3-4 (Middlesex University London, 2021). Combining the data from MANMET and MIDUNI, there is significant evidence that DA programmes recruit a higher percentage from deprived IMD groups compared to the most advantaged social groups (z statistics = 21.36, p = 0.000 in Appendix 4).

Regarding ethnic diversity, MANMET saw growth in Black, Asian and Minority Ethnic apprentices – rising from 10% in 2015-2016 to 19% in 2020-2021 (Manchester Metropolitan University, 2021a). In total, 49% of starters were female and 51% male. Respondents to the survey discussed in MIDUNI were 53% female and 47% BAME, which is significantly more diverse than the other studies discussed in this paper (Middlesex University London, 2021). With 47% BAME participation, DA programmes recruited significantly more minority ethnic individuals (z statistics = 4.06, p = 0.000 in Appendix 5) compared to the national undergraduate BAME participation (27.4%) (UK Government, 2022). Although it was a small sample size (200 respondents of 1030 apprentices surveyed), the study authors claim that this is representative of the Middlesex DA cohorts as a whole. The cohorts were predominantly recruited to public sector roles (policing and nursing), and this may have impacted the diversity recorded, as both MIDSTA and SMITAY note that, to see an increase in diversity in DA programmes, universities are reliant on the hiring practices of employers and their commitment to promoting diversity within their workforces (Lester and Bravenboer, 2020; Smith *et al.*, 2021).

Degree apprenticeships were created to narrow the social mobility and productivity gap in the UK. Seven years on, it is becoming clear that, in terms of contributions to the employers and the UK economy, most DA apprentices are contributing to or leading significant real-world projects that are benefiting their employers. The results from MANMET, MIDSTA and UNIVUK unanimously affirm the contribution of apprentices to their employers and the UK economy; this is supported by the rate and scale of remuneration increases apprentices are enjoying. From the NATCUM, MANMET and MIDSTA reports, apprenticeships are serving as a vital pipeline for growing talents across many sectors and covering all the spectra of DA provision.

When it comes to social mobility, the results are mixed. Although there are different findings, the majority of the evidence supports DA's contribution to a higher level of social mobility. While the combined MANMET and MIDUNI reports have strong and positive messages about the impact of DAs in some cases of social mobility, other reports have slightly contradictory narratives. Statistical tests run with aggregated observations of the MANMET and MIDUNI data support a significantly higher participation rate of both female and ethnic minority groups in DA programmes compared to national undergraduate programmes. For example, MIDUNI and MANMET found a good percentage of their learners were from disadvantaged backgrounds. There is however some other literature (e.g. McKnight *et al.*, 2019) that contradicts this, and others have characterised DAs as a “middle-class land grab” (Bravenboer, 2022). The same disparity could be said of SMITAY, MIDUNI and NATCUB concerning young learners; tests on participant age patterns are inconclusive. SMITAY found that younger learners were disproportionately represented but MIDUNI and NATCUB did not strongly share that view. Some research (Lester, 2020) has shown that DAs are not contributing significantly to the social mobility agenda but it is evident from the discussions in the previous section that DAs are making a notable positive impact on social mobility. As for the productivity contribution of DAs, both qualitative and quantitative evidence indicates overwhelmingly positive impacts on quality of learning, career development, and talent development. It is encouraging to find that a high percentage of DA participants obtain their degrees and achieve significantly higher incomes when they enter full-time employment.

Some of the contradictions about the impact of DAs on social mobility could be because, during the infancy of DAs, employers focussed on upskilling their current workforce, rather than recruiting direct school leavers. It could also be due to the field of study – attracting mature workers looking to upskill or reskill. A recent survey of legal DAs discovered that the disadvantaged are unable to access DA opportunities due to the “differential access to particular kinds of informal work experience”, therefore, DAs may not close the “gap in access to the solicitor's professions between individuals from different backgrounds” (Casey and Wakeling, 2022). According to UNIVUK, there is a need for pre-university learners to be well informed of the DA alternative as a career path and route to HE as some parents are concerned about what is interpreted as the limited or restricted social and cultural enrichment DA provision offers. Equal access to DAs in some sectors may remain a challenge for a while but there are strong calls for “increased signposting of apprenticeships in deprived areas...” (All-Party Parliamentary Groups, 2001). Recent reports (Lester and Bravenboer, 2020; Social Mobility Commission, 2020) have called for the promotion of apprenticeships and recruitment to reach diverse groups (including ethnicity, disability, and social deprivation), where individuals might not have typical university entry qualifications.

In 1999, Prime Minister Tony Blair set an ambitious target of “50 per cent of young adults going into higher education in the next century” (BBC, 1999). Twenty years later, with the target reached (Sean Coughlan, 2019), fresh policy calls have been made for “50% of students at university enrolled on degree apprenticeships” (University Alliance, 2018). With high-profile UK ministers re-enforcing such ambitious calls (Camden, 2021), there is the need to ensure that DAs are “fit for purpose” – by helping bridge the productivity and social mobility divide. Employers and training providers are inherently set up to enable DAs to achieve the former, but to achieve the latter, these stakeholders must set strategic goals, collaborate, and work together. These efforts must be driven by clearly set initiatives and frameworks provided by the Institute for Apprenticeships and Technical Education (IfATE) and supported by sector organisations. Social mobility must be on the strategic agenda for both employers and training providers and must not be “pushed somewhat to the sidelines” (Universities UK, 2019); these should include policies and guidelines for recruitment from under-represented backgrounds, stronger collaboration between employers and training providers in recruitment and enrolment and providing support for these stakeholders to ensure that it does not become an overhead that will prevent them from considering DAs.

In a recent survey by UCAS (2022a), it emerged that most university applicants rate non-DA university degrees as more prestigious than DA degrees; surprisingly, 92% of the participants don’t associate doing a DA with leading to a good job. Although the discussions in this article point to the fact that degree apprentices are excelling and making significant contributions, it seems there is a need for more efforts from the government, IfATE, UCAS, training providers, employers, colleges and other stakeholders to create awareness and promote DAs. UCAS has taken a giant step toward apprenticeships in its 2020-25 corporate strategy (UCAS, 2022b); such initiatives must be supported by policymakers and rolled out across DA stakeholders in a sustainable (Visvizi *et al.*, 2020; Visvizi and Daniela, 2019) and innovative (Aljohani *et al.*, 2022b; Nawaz *et al.*, 2022) way.

DAs have seen tremendous growth since their launch in 2015. With ambitions set to see DAs grow even further, it is expedient that concrete evidence is provided on the impact they are having. Anecdotal narratives and insufficient research lacking depth, breadth or both on DAs must be addressed. This article has brought together all available outputs on the impact of degree apprenticeships covering over 4000 data points from surveys, focus group discussions, and other research instruments. The outputs have been systematically reviewed and analysed using qualitative and statistical techniques. The results show there is strong evidence that degree apprenticeships are meeting the government’s intentions for the programmes: they are

contributing to improving social mobility and productivity – a key aim of the UK government’s Levelling Up policy. However, they also reveal the limitations of the current impact research into DA – with a lack of peer-reviewed, broad-based evidence. The outcomes of this research provide stakeholders and policy-makers with evidence they can use in moving forward with the degree apprenticeship agenda. A potential area for further research is a large-scale nationwide survey to explore the impact of degree apprenticeships in-depth to provide a better understanding and address the lack of broad-based evidence of impact (QAA, 2022).

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Appendices

Appendix 1: Two sample test of proportions: graduate income comparison

prtesti 2573 0.000 2573 0.46, level (95)

Two-sample test of proportions

x: Number of obs = 2573

y: Number of obs = 2573

| Variable | Mean | Std. Err. | z | P> z | [95% Conf. Interval] |
|----------|-----------|-----------|--------|-------|----------------------|
| x | 0 | 0 | | | 0 |
| y | .46 | .0098255 | | | .4407423 .4792577 |
| diff | -.46 | .0098255 | | | -.4792577 -.4407423 |
| | under Ho: | .0117329 | -39.21 | 0.000 | |

diff = prop(x) - prop(y)

z = -39.2061

Ho: diff = 0

Ha: diff < 0

Ha: diff != 0

Ha: diff > 0

Pr(Z < z) = 0.0000

Pr(|Z| < |z|) = 0.0000

Pr(Z > z) = 1.0000

Appendix 2: Two sample test of proportions: age of participants

prtesti 188 0.42 188 0.48, level (95)

Two-sample test of proportions

x: Number of obs = 188

y: Number of obs = 188

| Variable | Mean | Std. Err. | z | P> z | [95% Conf. Interval] |
|----------|-----------|-----------|-------|-------|----------------------|
| x | .42 | .0359965 | | | .3494482 .4905518 |
| y | .48 | .0364371 | | | .4085847 .5514153 |
| diff | -.06 | .0512192 | | | -.1603877 .0403877 |
| | under Ho: | .0513126 | -1.17 | 0.242 | |

diff = prop(x) - prop(y)

z = -1.1693

Ho: diff = 0

Ha: diff < 0

Ha: diff != 0

Ha: diff > 0

Pr(Z < z) = 0.1211

Pr(|Z| < |z|) = 0.2423

Pr(Z > z) = 0.8789

Appendix 3: Two sample test of proportions: female participation

prtesti 2573 0.24 2573 0.34, level (95)

Two-sample test of proportions

x: Number of obs = 2573

y: Number of obs = 2573

| Variable | Mean | Std. Err. | z | P> z | [95% Conf. Interval] |
|----------|-----------|-----------|-------|-------|----------------------|
| x | .24 | .0084196 | | | .2234978 .2565022 |
| y | .34 | .0093388 | | | .3216963 .3583037 |
| diff | -.1 | .0125739 | | | -.1246444 -.0753556 |
| | under Ho: | .012651 | -7.90 | 0.000 | |

diff = prop(x) - prop(y)

z = -7.9045

Ho: diff = 0

Ha: diff < 0

Ha: diff != 0

Ha: diff > 0

Pr(Z < z) = 0.0000

Pr(|Z| < |z|) = 0.0000

Pr(Z > z) = 1.0000

Appendix 4: Two sample test of proportions: IMD stratification (IMD 1-4 vs IMD 10, with MANMET and MIDUNI data)

prtesti 2773 0.38 2773 0.13, level (95)

Two-sample test of proportions

x: Number of obs = 2773

y: Number of obs = 2773

| Variable | Mean | Std. Err. | z | P> z | [95% Conf. Interval] |
|----------|-----------|-----------|-------|-------|----------------------|
| x | .38 | .0092175 | | | .3619341 .3980659 |
| y | .13 | .0063864 | | | .1174829 .1425171 |
| diff | .25 | .0112138 | | | .2280214 .2719786 |
| | under Ho: | .0117055 | 21.36 | 0.000 | |

diff = prop(x) - prop(y)

z = 21.3576

Ho: diff = 0

Ha: diff < 0

Ha: diff != 0

Ha: diff > 0

Pr(Z < z) = 1.0000

Pr(|Z| < |z|) = 0.0000

Pr(Z > z) = 0.0000

Appendix 5: Two sample test of proportions: BAME participation (MIDUNI)

prtesti 200 0.47 200 0.274, level (95)

Two-sample test of proportions

x: Number of obs = 200

y: Number of obs = 200

| Variable | Mean | Std. Err. | z | P> z | [95% Conf. Interval] |
|----------|-----------|-----------|------|-------|----------------------|
| x | .47 | .0352916 | | | .4008297 .5391703 |
| y | .274 | .0315376 | | | .2121874 .3358126 |
| diff | .196 | .0473299 | | | .1032351 .2887649 |
| | under Ho: | .0483338 | 4.06 | 0.000 | |

diff = prop(x) - prop(y)

z = 4.0551

Ho: diff = 0

Ha: diff < 0

Ha: diff != 0

Ha: diff > 0

Pr(Z < z) = 1.0000

Pr(|Z| < |z|) = 0.0001

Pr(Z > z) = 0.0000