WHAT IS AN APPRENTICESHIP?

COMPARING THE OCCUPATIONAL COVERAGE OF APPRENTICESHIPS IN ENGLAND, THE NETHERLANDS, SWITZERLAND, GERMANY AND DENMARK

A REPORT TO THE GATSBY FOUNDATION

ANDREW NORMAN

May 2022

GATSBY

GATSBY IS A FOUNDATION SET UP
BY DAVID SAINSBURY
TO REALISE HIS CHARITABLE OBJECTIVES.
WE FOCUS OUR SUPPORT ON A LIMITED
NUMBER OF AREAS:

PLANT SCIENCE RESEARCH

NEUROSCIENCE RESEARCH

SCIENCE AND ENGINEERING EDUCATION

ECONOMIC DEVELOPMENT IN AFRICA

PUBLIC POLICY RESEARCH AND ADVICE

THE ARTS

WE ARE PROACTIVE IN DEVISING PROJECTS
TO ACHIEVE OUR AIMS. WE ARE ENTHUSIASTIC
ABOUT SUPPORTING INNOVATION. WE ARE
ANALYTICAL AS WE BELIEVE IT IS IMPORTANT
TO UNDERSTAND THE OPPORTUNITIES
AND PROBLEMS WE TACKLE. WE TAKE A
LONG-TERM VIEW AS WE DO NOT THINK MUCH
CAN BE ACHIEVED BY SHORT, ONE-OFF
PROJECTS. WE ARE ALWAYS EAGER TO FORM
PARTNERSHIPS WITH ORGANISATIONS WHO
SHARE OUR GOALS.

The Gatsby Charitable Foundation
The Peak, 5 Wilton Road, London SW1V 1AP
T +44 (0)20 7410 0330 F +44 (0)20 7410 0332
www.gatsby.org.uk

CONTENTS

ACKNOWLEDGEMENTS IV

COMPARING THE OCCUPATIONAL COVERAGE OF APPRENTICESHIPS IN ENGLAND, THE NETHERLANDS, SWITZERLAND, GERMANY AND DENMARK 1
Executive summary 1
Introduction 3
Overview of Vocational Education and Training (VET) systems 3
Mapping methodology 8
Results of labour market comparison 9
Key policy insights 18
Conclusion 19

THE NETHERLANDS: ANALYSIS OF COUNTRY SPECIFIC DATA 20
Introduction 20
Context 20
Results of labour market comparison 24
Key policy insights 33
Conclusion 34
ISCO-08 analysis for the UK and the Netherlands 35

SWITZERLAND: ANALYSIS OF COUNTRY SPECIFIC DATA 38
Introduction 38
Context 38
Results of labour market comparison 41
Key policy insights 50
Conclusion 51
ISCO-08 analysis for the UK and Switzerland 52

GERMANY: ANALYSIS OF COUNTRY SPECIFIC DATA 55
Introduction 55
Context 55
Results of labour market comparison 58
Key policy insights 65
Conclusion 66
ISCO-08 analysis for the UK and Germany 67

DENMARK: ANALYSIS OF COUNTRY SPECIFIC DATA 71
Introduction 71
Context 71
Results of labour market comparison 74
Key policy insights 82
Conclusion 83
ISCO-08 analysis for the UK and Denmark 84

APPENDIX: OCCUPATIONS WITH THE MOST APPRENTICESHIPS MAPPED 87
England 87
The Netherlands 89
Switzerland 90
Germany 91
Denmark 94

ACKNOWLEDGEMENTS

The author is grateful to Daniel Sandford Smith of the Gatsby Charitable Foundation for his helpful and constructive guidance and advice. Helpful input was also received from Simon Broek, Emanuel Andreas Wüthrich, Prof. Dr. Samuel Muehlemann, Dr. Nicola Düll, Prof. Dr. Stefan C. Wolter, Anneke Westerhuis, and Adam Cotgrave.

DISCLAIMER

The views and opinions expressed in this report are those of the author and do not necessarily state or reflect those of the Gatsby Charitable Foundation.

COMPARING THE OCCUPATIONAL COVERAGE OF APPRENTICESHIPS IN ENGLAND, THE NETHERLANDS, SWITZERLAND, GERMANY AND DENMARK

EXECUTIVE SUMMARY

Traditionally apprenticeships have been seen as an effective way of enabling young people to enter and thrive in the labour market, and in many European countries this is still the case. The value of a high-quality apprenticeship is that it contextualises the learning that takes place away from the workplace and combines it with the learning that happens in the workplace – this brings real benefits to both the employer and apprentice.

The UK is unusual in that recent reforms to the labour market have meant the range of apprenticeships is much more varied than in other countries. The first part of this report explores the differences in the types of occupations covered by apprenticeships in England and four European countries: Germany, the Netherlands, Switzerland and Denmark. The rest of this report provides further analysis which compares each country to England in more detail.

Apprenticeships are a fundamental part of the education systems in each of the countries looked at. Participation is highest in Switzerland, where 2.3% of the population is an apprentice. Swiss apprentices – along with their German peers – tend to be younger, with many starting straight from school, whereas adult apprentices are more common in England, the Netherlands and – to a lesser extent – Denmark.

This report examines which parts of the labour market are covered by each country's apprenticeship system and highlights similarities and differences. The report only covers apprenticeships, meaning classroom-based vocational courses are not included in the analysis. Any conclusions cannot, therefore, be scaled to the level of the vocational education system.

Policy in England has led to the development of apprenticeships so that they provide a route into work and also a route for those already in work to change their occupation. This policy sets England apart from its European neighbours. In continental European countries, including Denmark, Germany, the Netherlands and Switzerland, apprenticeships are valued more as an entry route into skilled work – particularly for young people – than as retraining for skilled adults.

For each country, the analysis maps apprenticeships to four-digit Standard Occupation Classification (SOC) codes and compares coverage with the equivalent English apprenticeship standards mapped by the Institute for Apprenticeships and Technical Education (IFATE).

The key findings of the analysis of coverage are:

– **A high number of apprenticeship standards means broader coverage.** England has the broadest occupational coverage of the countries studied, with 68% of occupations linked to at least one apprenticeship. England has the highest coverage for each major occupation group, apart from elementary roles, partly because the English system has far higher numbers of individual apprenticeship standards.

– **Traditional compared with professional apprenticeships.** There is a marked split in the types of occupations covered by the English system on the one hand, and the Dutch, German, Swiss and Danish systems on the other. The latter focus on the skilled trades major SOC group – arguably the traditional domain of apprenticeships – while the former covers the whole labour market. What particularly stands out is that the English system covers professional and managerial roles to a much greater extent than any of the other countries looked at. However, these countries have other forms of work-based learning which cover professional and managerial roles. Further analysis including non-apprenticeship vocational training may show these whole vocational systems are similar in coverage to the English apprenticeship system.

– **England the outlier.** When it comes to coverage of occupations, England is the clear outlier. The four continental European apprenticeship systems are far more like each other than they are like the English system.

In addition to looking at the coverage of the labour market by apprenticeship standards this report includes data on participation. The share of the English population that are apprentices (1.3%) is similar to the Netherlands (0.7%), Germany (1.6%), Denmark (1.7%) and Switzerland (2.3%). Including participation data in the analysis decreases the differences in the labour market coverage within systems, meaning the share of apprenticeships mapped to each occupation group is more evenly distributed within each country.

However, there are some significant differences in the age of apprentices. For example, over 60% of apprentices in Switzerland are under 19, compared to just 21% in England.

We hope that the analysis presented in this report provokes discussion about the goals of the apprenticeship system. There may be nothing wrong with the English apprenticeship system having wider labour market coverage, but there is value in considering the potential benefits and disadvantages of having such a broad focus. For example, the narrower coverage in other countries may serve young people better, but it may be that progression routes beyond apprenticeship are harder to identify.

INTRODUCTION

More than any other form of vocational training, apprenticeships are rooted in the labour market. Apprenticeships have a good reputation in Europe and are credited with keeping youth unemployment low. This report assesses the types of occupations covered by different apprenticeship systems in Europe. It summarises the kinds of jobs covered by apprenticeship systems in Germany, the Netherlands, Switzerland and Denmark, and compares them to those covered in England.

Related to the occupational coverage of apprenticeship standards is the question of who apprenticeships should be for. Should apprenticeships act as a route into skilled labour markets for recent school-leavers or should they provide ongoing training for adults? The answer to this question has a significant bearing on the types of occupations the system covers. In England, for some time, the policy direction has been for apprenticeships to do both – provide ongoing training for adults and be a route into skilled work for young people. As the analysis shows, in this sense, England is an outlier in Europe.

The first part of this report provides context to the apprenticeship systems in each country, before going on to review the mapping methodology used for the four countries. It then summarises the findings of the analysis.

The remainder of the report comprises individual country reports providing further data and analysis which compares each country to England in more detail.

OVERVIEW OF VOCATIONAL EDUCATION AND TRAINING (VET) SYSTEMS

Brief overview of the VET systems in Germany, the Netherlands, Switzerland and Denmark

What the vocational systems of Germany, the Netherlands, Switzerland and Denmark have in common is that the apprenticeship component is largely restricted to the upper secondary level. None of these countries offer apprenticeship provision above European Qualifications Framework (EQF) Level 5, which is the equivalent of a Regulated Qualifications Framework (RQF) Level 4/5 in England.

VET provision beyond the upper secondary level is available in these countries, but not in the form of apprenticeships. Germany has recently rebranded many tertiary vocational courses as professional bachelor's and professional master's degrees. In the Netherlands, learners who already have an EQF Level 4 VET qualification can study at the tertiary level, either for an associate degree at EQF Level 5 or a higher professional bachelor's degree at EQF Level 6. Similarly, in Denmark, vocational students can also go onto professional bachelor's programmes, which consist of both theoretical and practical teaching and usually last three and a half years. There are two options within the VET system in Switzerland. The first option is bachelor's and master's degree programmes in universities of applied sciences. The second is professional education, which enables employees to specialise in a given field and deepen their technical expertise. In addition, professional education provides the knowledge, skills and know-how needed to manage a company. [1]

1 State Secretariat for Education, Research and Innovation (2021) *Vocational and professional education and training in Switzerland: Facts and figures 2021*. Available at: https://www.sbfi.admin.ch/sbfi/en/home/services/publications/data-base-publications/vocational-and-professional-education-and-training-in-switzerland.html

Participation

The Netherlands has the lowest apprenticeship participation of the countries looked at, with apprentices making up 0.7% of the population. However, this may at least be partially explained by the fact a further 380,000 Dutch learners follow the school-based vocational track, which requires between 20% and 60% of a learner's time to be spent in the workplace. These courses, therefore, like apprenticeships, involve a systematic and substantial element of work-based learning. Apprentices in England make up around 1.3% of the population, below the 1.6% seen in Germany and the 1.7% in Denmark. Switzerland has the highest level of participation, with apprentices making up 2.3% of the population.

Table 1: Number of apprentices in England, the Netherlands, Switzerland, Germany and Denmark[2]

Country	Number of apprentices	Share of the population
England	719,000	1.3%
The Netherlands	127,000	0.7%
Switzerland	198,000	2.3%
Germany	1,330,000	1.6%
Denmark	98,000	1.7%

Age

In terms of age distribution, there are clear differences between the five countries, with apprentices in England and the Netherlands being older than in Switzerland and Germany, and Denmark sitting somewhere in the middle. In England, 50% of apprentices are over 25 and in the Netherlands 48% are 23 or older. This contrasts heavily with Switzerland and Germany, where only 7% and 13% of apprentices respectively are 25 or older. In fact, 62% of apprentices in Switzerland are under 19, compared to just 21% in England.

2 The figure for Switzerland is for 2020 and was obtained through author correspondence with the State Secretariat for Education, Research and Innovation. The figure for England is for 2019/20 (latest full year). Source: Foley, N. (2021) *Briefing paper number 06113: Apprenticeship statistics*. London: House of Commons Library. Available at: https://researchbriefings.files.parliament.uk/documents/SN06113/SN06113.pdf. The German data is for 2018 and comes from Bundesinstitut für Berufsbildung (Federal Institute for Vocational Training) (2020a) *Datenreport zum Berufsbildungsbericht 2020: Informationen und Analysen zur Entwicklung der beruflichen Bildung*. Available at: https://www.bibb.de/dokumente/pdf/bibb_datenreport_2020.pdf. Data for the Netherlands is for 2020/21 and comes from the Foundation for Cooperation on Vocational Education, Training and Labour Market (SBB) *Facts and numbers*. Available at: https://www.s-bb.nl/feiten-en-cijfers. The figure for Denmark comes from *UDDAKT35: Educational activity at upper secondary vocational educations by education, age, ancestry, national origin, sex, status and enrolment type*. Available at: https://www.statbank.dk/statbank5a/SelectTable/Omrade0.asp?SubjectCode=5&ShowNews=OFF&PLanguage=1

Table 2: Age distribution of apprentices in England, the Netherlands, Switzerland, Germany and Denmark[3]

Country	Under 19	19-24	25+[4]
England	21%	30%	50%
The Netherlands	23%	29%	48%
Switzerland	62%	32%	7%
Germany	41%	46%	13%
Denmark	23%	40%	37%

Apprentice wages

Apprentices in England, the Netherlands and Germany are all entitled to a minimum wage, which is dependent on factors such as age, experience and weekly hours worked. In Germany, salaries are generally set through collective bargaining agreements, but any firms not part of these agreements can pay wages that are 20% lower.

There is no minimum wage for apprentices in Switzerland, but sector-based trade associations recommend salary brackets.[5] Similarly, there is no national minimum apprentice wage agreement in Denmark. Instead, minimum rates are set through collective bargaining agreements in each sector. In Germany and Switzerland apprentice wages typically start at a low level in the first year of the apprenticeship, then rise substantially during a 3- to 4-year programme.

Table 3: Minimum apprentice wage ranges in England, the Netherlands, Switzerland, Germany and Denmark[6]

Country	Minimum hourly wage range
England	£4.30 - £8.91
The Netherlands	£2.44 - £9.00
Switzerland	N/A
Germany	£3.18
Denmark	£7.50 - £10.00

3 Figures are rounded to the nearest per cent, so may not sum to 100%. Swiss figures are for 2020 and were obtained by the author through email correspondence with the Swiss Office fédéral de la statistique (Federal Statistical Office). English data is participation for 2020/21 academic year. Available at: https://explore-education-statistics.service.gov.uk/find-statistics/apprenticeships-and-traineeships/2020-21. The data for the Netherlands is analysis by the author of data from the Dutch Ministry of Education, Culture and Science for 2020. Available at: https://duo.nl/open_onderwijsdata/databestanden/mbo/studenten/. The German data is from Bundesinstitut für Berufsbildung (2020a) *op cit*. The figure for Denmark comes from *UDDAKT35: Educational activity at upper secondary vocational educations by education, age, ancestry, national origin, sex, status and enrolment type*. Available at: https://www.statbank.dk/statbank5a/SelectTable/Omrade0.asp?SubjectCode=5&ShowNews=OFF&PLanguage=1

4 23+ for the Netherlands.

5 International Labour Organization (ILO) *Tools: Formulating apprenticeship agreements*. Available at: https://www.ilo.org/global/topics/apprenticeships/publications/toolkit/programme-and-project-level/preparing-training-places/formulating-apprenticeship-agreements/tools/lang--en/index.htm

6 Germany figure based on monthly minimum apprentice wage of €515. See L&E Global (2019) *Germany: Wide minimum wage for apprentices will come into force by 2020*. Available at: https://knowledge.leglobal.org/germany-wide-minimum-wage-for-apprentices-will-come-into-force-by-2020/, assuming four weeks of the average Germany working week (34.3 hours as per https://www.statista.com/statistics/419570/main-job-average-weekly-working-hours-germany-y-on-y/).
Data for the Netherlands comes from Rijkoverheid (2020) *Bedragen minimumloon bbl 2020*. Available at: https://www.rijksoverheid.nl/onderwerpen/minimumloon/bedragen-minimumloon-bbl-opleiding/bedragen-minimumloon-bbl-2020. Euro conversion rate used was 1.18 euros to the pound, accurate as of 13/10/21. Data for Denmark comes from Apprenticeship Toolbox (2019b) *Company costs and benefits in Denmark*. Available at: https://www.apprenticeship-toolbox.eu/financing/company-costs-benefits/54-company-costs-and-benefits-in-denmark

Who pays for the system?

In England, large employers (those with a payroll over £3m per year) pay an apprenticeship levy, equivalent to 0.5% of the annual pay bill. This amount – plus a 10% top up from central government – can be used to pay for training carried out off-site by a training provider. Small employers pay 5% of these training costs, with the rest covered by central government. All employers are responsible for covering the wage costs and on-the-job training of their apprentices.

In Switzerland, individual businesses pay the salaries and training costs of apprentices, and business groups help finance training centres and specific courses in local areas. In the Netherlands, the costs of employing an apprentice and on-site training are paid by the employer. However, the government subsidises these costs through the Practical Learning Subsidy Scheme, up to a maximum of €2,700 per apprentice.[7] The costs associated with the off-the-job training of apprentices in vocational schools are borne by the Dutch state.

The apprenticeship system in Germany is financed jointly by the public and private sectors.[8] The majority of off-the-job training is financed by the *Länder* (federal states), with all workplace costs borne by the employers. In Denmark, vocational schools are funded by the state. Employers are responsible for paying the wages of apprentices while in the workplace. A levy, on all but the smallest businesses, compensates employers for the wages they pay to apprentices during their off-the-job training periods.[9]

Apprenticeship levels[10]

Apprenticeships in England are available at higher levels than in the Netherlands, Switzerland, Germany and Denmark, but the majority of participation is at RQF Levels 2 and 3. In Germany, almost all (94%) participation is at the equivalent of a RQF Level 3. In Denmark the equivalent of RQF Level 3 accounts for 73% of participation, whereas the majority of apprentices (42%) in the Netherlands study at RQF Level 2. Unfortunately, Switzerland does not publish participation data by level. However, Swiss apprenticeships go up to the RQF equivalent of Level 4/5.[11] Federal certificates, which are generally Level 2, take two years to complete, while federal diplomas, equivalent to RQF Level 3, take three to four years to complete (see Table 5 for length of apprenticeship comparison data).

7 Rijksdienst voor Ondernemend Nederland (2021) *Subsidieregeling Praktijkleren*. Available at: https://www.rvo.nl/subsidies-regelingen/subsidieregeling-praktijkleren

8 For a more in-depth explanation of apprenticeship funding in Germany see Voss, E. & Schöneberg, K. (2018) *Germany: Policy developments on apprenticeship*. Available at: https://euagenda.eu/upload/publications/untitled-185267-ea.pdf

9 See European Centre for the Development of Vocational Training (Cedefop) *European database on apprenticeship schemes for Denmark*, available at: https://www.cedefop.europa.eu/en/tools/apprenticeship-schemes/scheme-fiches/apprenticeship#group-remuneration-2016

10 Data for England is enrolments for 2020/21, available at: https://explore-education-statistics.service.gov.uk/find-statistics/apprenticeships-and-traineeships/2020-21. Figures for the Netherlands are for the 2020/21 academic year, available at: https://www.s-bb.nl/feiten-en-cijfers. Data for Germany is based on analysis of data from Bundesinstitut für Berufsbildung (2020b) *Verzeichnis der anerkannten Ausbildungsberufe 2020*. Available at: https://www.bibb.de/dienst/veroeffentlichungen/de/publication/show/16754

11 Note, EQF Level 5 spans RQF Levels 4 and 5.

Table 4: Share of apprenticeship participation by RQF equivalent level in England, the Netherlands, Switzerland Germany and Denmark

Country	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7
England	0%	26%	45%	9%	8%	6%	6%
The Netherlands[12]	23%	42%	32%	0%	0%	0%	0%
Switzerland	N/A						
Germany	0%	6%	94%	0%	0%	0%	0%
Denmark	0%	20%	73%	7%	0%	0%	0%

Table 5: Expected length of apprenticeships at different RQF equivalent level in England, the Netherlands, Switzerland Germany and Denmark (in years)

Country	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7
England	-	1-3	1-4	1-4	1.5-3	1-5	1-5
The Netherlands	2	3	3-4	-	-	-	-
Switzerland	N/A						
Germany	-	2	3-3.5	-	-	-	-
Denmark	-	1.5	3	5	5	-	-

None of this is to say that vocational provision in the Netherlands, Switzerland, Germany and Denmark does not exist above the equivalent of a RQF Level 4 or 5. There is a range of higher-level vocational options in these countries. However, as they are not classed as apprenticeships, they are excluded from this analysis.

12 The figure for the Netherlands does not sum to 100% and there is some participation at entry level in the Netherlands.

MAPPING METHODOLOGY

Mapping apprenticeships to occupations

To compare labour market coverage of the English, Swiss, Dutch, Danish and German apprenticeship systems, it is necessary to map an apprenticeship standard to an occupation. The list of occupations used is the Office for National Statistics' 2010 Standard Occupation Classification (SOC). For the English system, the analysis uses mappings previously carried out by IFATE of apprenticeship standards to four-digit SOC codes.[13] This consists of 731 apprenticeship standards mapped to occupations, with an additional nine standards not linked to any SOC code.[14]

For the Swiss, Dutch, German and Danish apprenticeship systems, mappings use the Warwick Institute for Employment Research's Computer Assisted Structured Coding Tool (CASCOT), which can match text to the UK's standard occupational and industrial classifications.[15] CASCOT is used to match apprenticeship titles in each system to four-digit SOC code occupations, with each match given a 'confidence score' of between 0 and 100%. Each CASCOT match with a confidence score below 50% is rematched by a manual comparison of apprenticeship and occupation descriptions. Those matches with a confidence score above 50% are briefly checked and clear mismatches are corrected.

A note on comparability of the different national systems

There are several challenges when comparing apprenticeship systems across countries. Differences including, but not limited to, data accessibility, definitions and specialisations within apprenticeship titles make like-for-like comparisons difficult. For example, in the Netherlands, vocational education is split into two routes: the work-based vocational training track and the school-based vocational training track. The work-based track requires at least 60% of learners' time to be spent in the workplace, and so is included in the data presented in this report and the Dutch section. However, the school-based track also requires between 20% and 60% of learners' time to be spent in the workplace, meaning it is closer to being an apprenticeship than many vocational programmes in England.[16] In addition, practically all vocational courses can be taken through either the work-based or school-based track, and both tracks lead to the same qualification and the same end-point assessment. While the school-based track was not included in these reports, it demonstrates that the lines between what is and is not an apprenticeship can be blurred.

The definition of what counts as a full apprenticeship (which can then be mapped to occupations) and what is a specialisation within an apprenticeship is also open to interpretation. For example, in some instances, government documents suggest there are 325 apprenticeships in Germany, yet others present data for 482, with some of the original 325 split into more specific topics. (Note, the full list of 482 is used for these reports.)

13 The mappings are publicly available on the IFATE website: https://www.instituteforapprenticeships.org/about/occupational-maps/

14 Note, there are 39 standards for which there are two versions (usually listed by IFATE as version 1 and version 1.1). Given that some standards with two versions are mapped by IFATE to different occupations, this report treats them as different standards. If two versions were treated as one standard there would be 701 in total.

15 CASCOT can be downloaded here: https://warwick.ac.uk/fac/soc/ier/software/cascot/

16 Having said this, it is unusual for school-based students to spend close to 60% of their time in the workplace. Typically it is around 30% (see Fazekas, M. and Litjens, I. (2014) *A Skills beyond School Review of the Netherlands*. Paris: OECD. Available at: https://www.oecd.org/education/skills-beyond-school/A-Skills-Beyond-School-Review-of-the-Netherlands.pdf). The upper bound exists for specific occupations and to allow for flexibility of student aspiration.

Looking at individual titles of Dutch apprenticeships, there are many that would translate into English as 'all-round'. For example, titles include All-Round Public Space Management Employee and All-Round Construction Worker. These are Level 3 qualifications that are broad in nature, with greater specialisation introduced at Level 4. It is also the case that there are options to specialise within English apprenticeship standards, but there is no obvious way to include them in the data. Similarly, some of the 244 Swiss apprenticeships contain multiple specialisms that students can follow. Participation data supplied by the Swiss government lists around 500 of these specialisms. Additional analysis of Denmark and Switzerland suggests that the headline findings remain the same when looking at core programmes and specialisms.

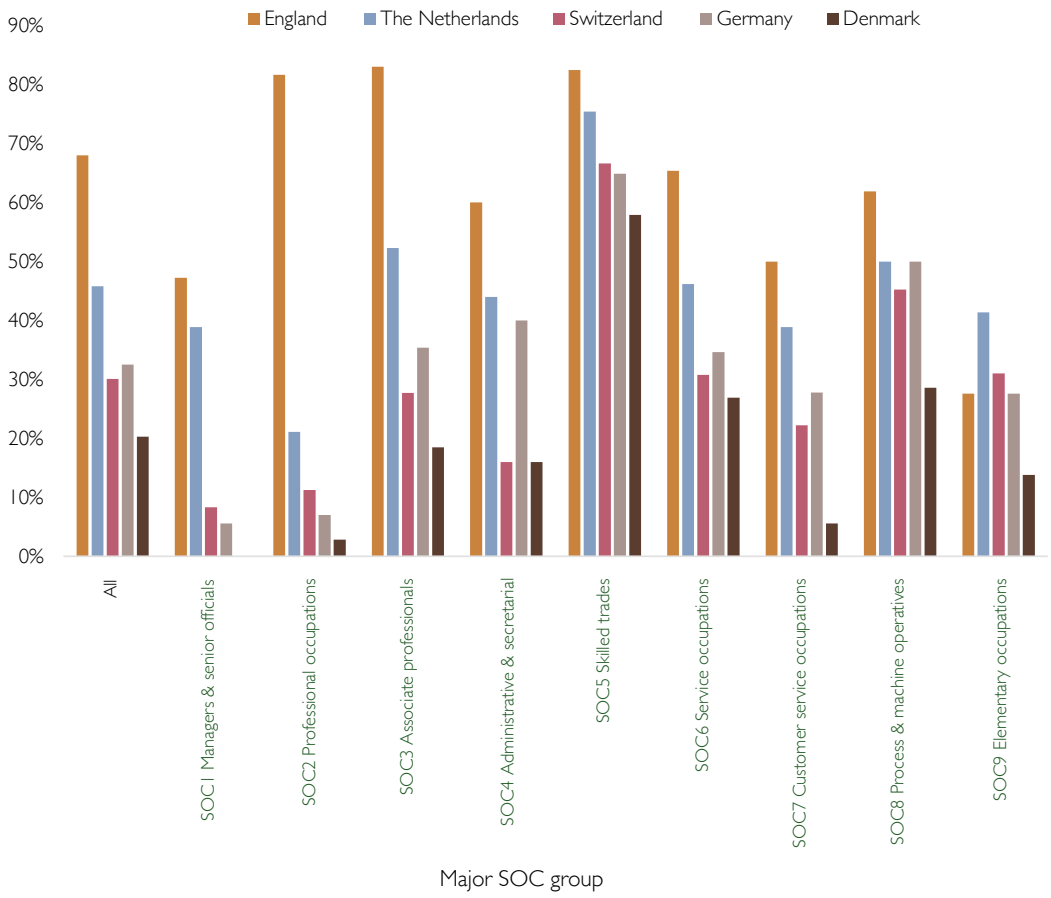
Finally, the concept of what apprenticeships are and who they are for differs across the countries. In some, they are strictly entry points into skilled work for recent school-leavers. In others, their use spans adult retraining. These differences muddy the waters and make like-for-like comparisons across countries challenging.

RESULTS OF LABOUR MARKET COMPARISON

The results below summarise the findings of the analysis into the occupational coverage of English, Swiss, Dutch, German and Danish apprenticeships, as proxied by four-digit SOC codes. Note that where additional labour market information is included – size of workforce, number of skills shortage vacancies (SSVs) – this is based on the English data. In this sense, it is a measure of how coverage would theoretically change if England adopted the Swiss, Dutch, German or Danish system overnight.

Headline coverage

Chart 1: Percentage of four-digit SOC code occupations covered by apprenticeships for each major SOC group in England, the Netherlands, Switzerland, Germany and Denmark



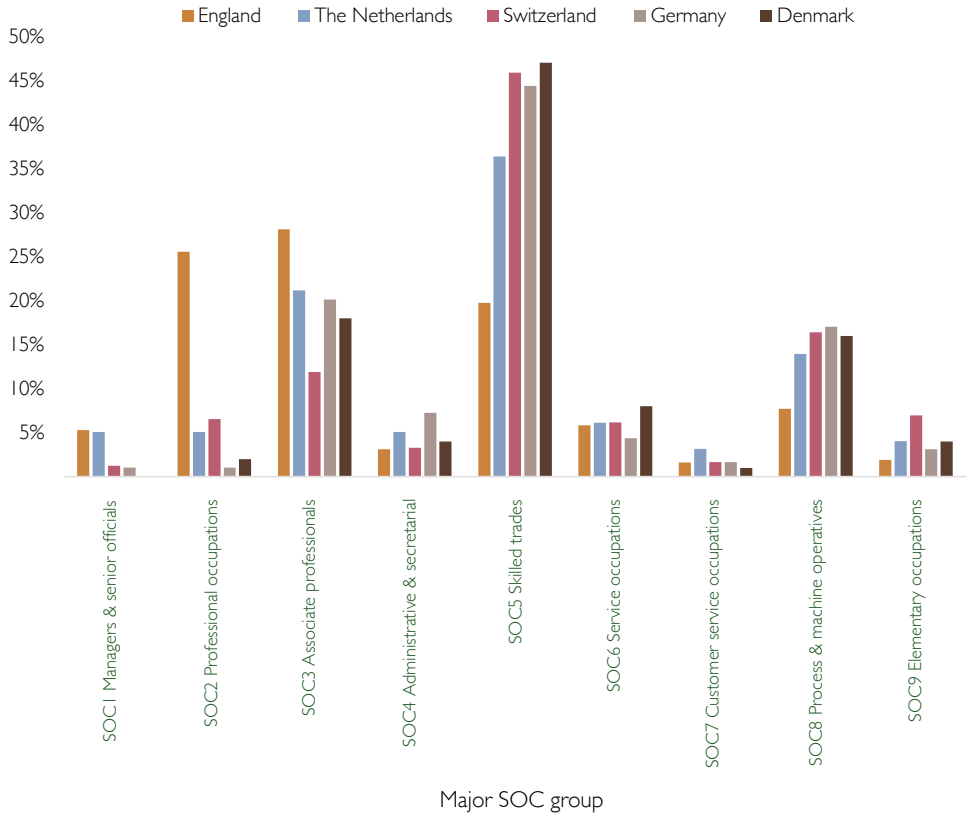
In terms of overall occupational coverage, England stands out. As shown in Chart 1, the English system covers more than two-thirds (68%) of four-digit SOC occupations, compared to less than half (46%) for the Netherlands, less than a third for Germany (33%) and Switzerland (30%) and just a fifth for Denmark (20%).[17] England has the highest coverage for each major occupation group, apart from elementary roles. This is mostly due to the fact there are far more apprenticeship standards in England. 731 English apprenticeship standards were mapped to occupations, compared to 482 from Germany, 473 from the Netherlands, 244 from Switzerland and 100 from Denmark.[18]

The English system also stands out in terms of where it concentrates its resources, as shown in Chart 2. This is particularly evident for professional (SOC group 2) occupations. More than one in four apprenticeships in England are mapped to professional occupations, whereas in the four other countries it is less than one in 15 – and in Germany it is just 1%. Conversely, less than 20% of apprenticeships in England are mapped to skilled trades roles, compared to 36% in the Netherlands, 44% in Germany, 46% in Switzerland and 47% in Denmark.

17 This figure rises to 29% if apprenticeship specialisms in Denmark are included.

18 The number of apprenticeship standards in Denmark rises to 234 if specialisms are included.

Chart 2: Share of apprenticeship standards in each major SOC group in England, the Netherlands, Switzerland, Germany and Denmark



In addition to covering more occupations, in the English system each occupation has more apprenticeships on average than Switzerland and Denmark, as shown in Table 6. The English system has an average of 2.9 apprenticeships per occupation, compared to 2.2 for the Swiss system and 1.3 for the Danish system.[19] The figure in the Netherlands is similar to England, at 2.8. In Germany, however, for each occupation covered there is an average of 4 apprenticeships mapped, suggesting that the German system has a tighter focus on certain occupations.

Table 6: Ratio of apprenticeships to occupations covered in England, the Netherlands, Switzerland, Germany and Denmark

Country	Number of apprenticeships	Number of occupations covered	Ratio of apprenticeships to occupations covered
England	731	251	2.9
The Netherlands	473	169	2.8
Switzerland	244	111	2.2
Germany	482	120	4.0
Denmark	100	75	1.3

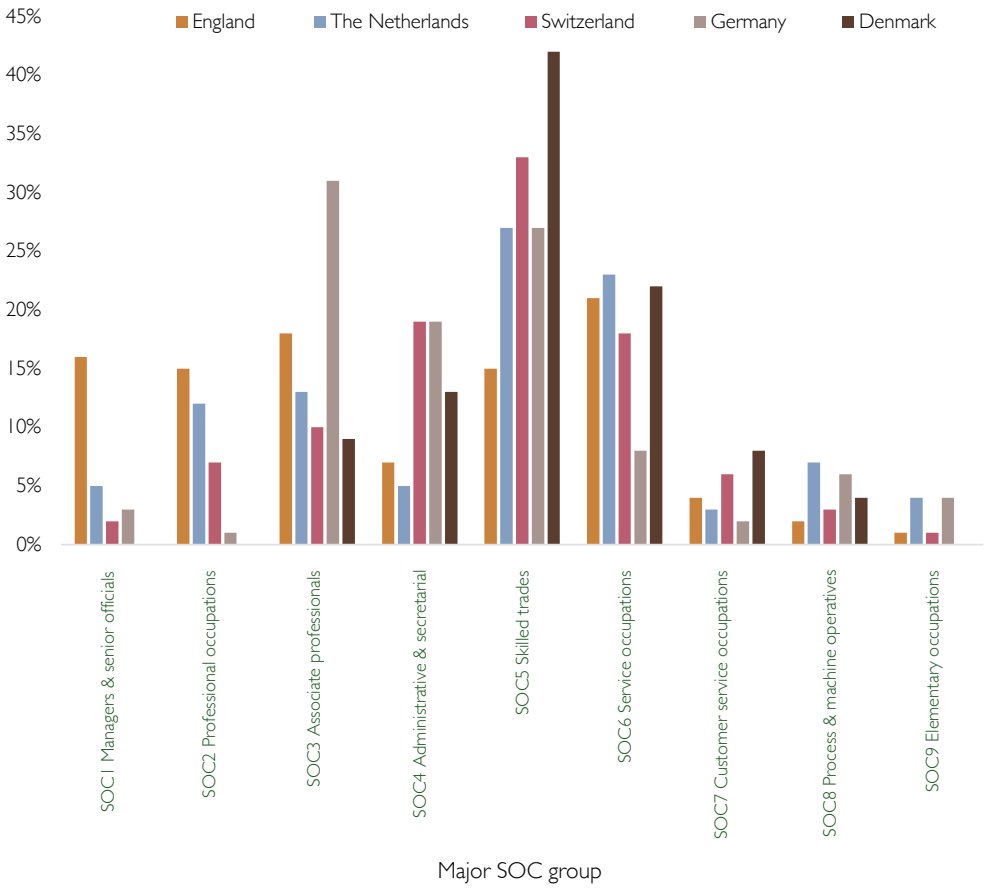
19 Including specialisms, the figure for Denmark rises to 2.2, the same as Switzerland but lower than England.

All this means that England is an outlier. Chart 4 shows that coverage in the Dutch, German, Swiss and Danish systems is much more similar than between any one of them and the coverage in England. However, it must be remembered that this analysis only covers apprenticeships. Charts 1 and 2, therefore, do not imply that the vocational systems in the Netherlands, Switzerland, Germany and Denmark exclude managerial and professional occupations altogether. There are many tertiary level vocational courses covering these types of roles. It can only be said that apprenticeships in these countries do not cover managerial and professional occupations.

Coverage weighted by participation

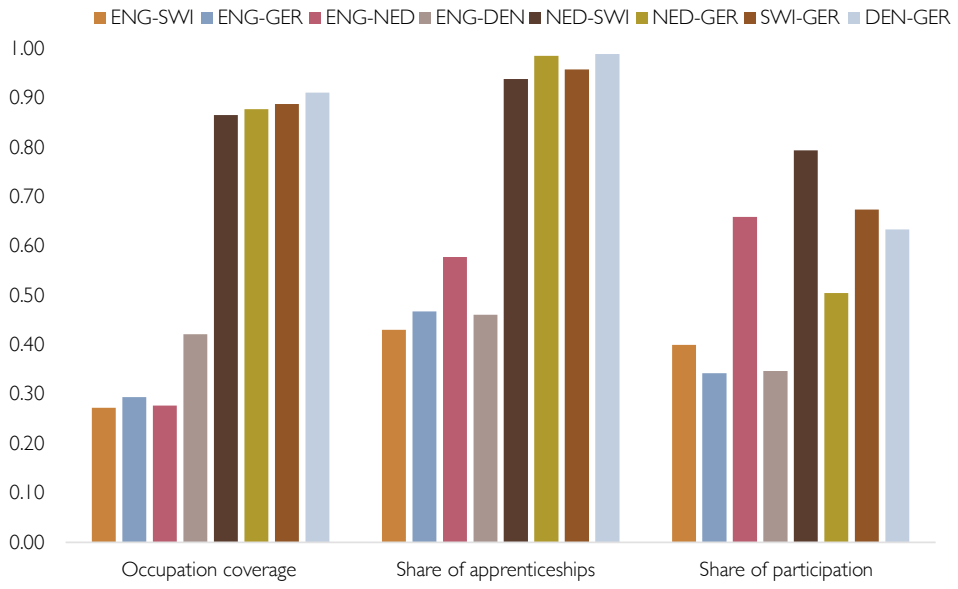
This section introduces apprenticeship participation metrics in relation to labour market demand for different occupation groups (Charts 4 and 5). Including participation moderates the differences in occupational coverage within systems, meaning the share of apprenticeships mapped to each occupation group is more evenly distributed within each country. For example, Chart 3 shows that participation in apprenticeships in England is more evenly spread across the occupational groups – five of the nine occupational groups have between 15% and 21% of apprentices – than the share of apprenticeship standards shown in Chart 2.

Chart 3: Share of apprenticeship participation in standards mapped to each major SOC group in England, the Netherlands, Switzerland, Germany and Denmark



Comparing participation in apprenticeships (Chart 3) instead of comparing how the apprenticeships are shared between occupational groups (Chart 2) shows similarities between England and the Netherlands. However, every other country combination (eg England and Switzerland, Switzerland and Germany, etc), shows a decrease in similarity after weighting by participation (Chart 4). Decreased similarity between each system when we take participation into account means that England is no longer such a strong outlier (compare Charts 2 and 3). Some differences that exist result from high participation rates in certain English standards. For example, the Team Leader and Supervisor apprenticeship accounted for 6% of all enrolments in 2020/21. IFATE linked this standard to an occupation in the managers, directors and senior officials group (SOC group 1). Removing this one apprenticeship standard from the data drops the share of apprenticeship starts mapped to SOC group 1 from 16% to 10%. Similarly, two Care Worker apprenticeships account for 7% of starts. Removing these from the caring, leisure and other services group (SOC group 6) reduces its share of participation from 21% to 14%.

Chart 4: Correlation coefficients for occupation coverage, share of apprenticeships and share of participation for England, Switzerland, Germany, the Netherlands and Denmark



Charts 5 and 6 show apprenticeship participation in relation to the share of employment and the share of SSVs – vacancies that employers struggle to fill because of a lack of adequately skilled candidates – in England.[20]

20 Employment data is for 2020 and is sourced from the Annual Population Survey via Nomis. SSV data is from the England dataset of the Employer Skills Survey 2019. Participation in apprenticeships in England is given by the number of enrolments in the first three-quarters of the 2020/21 academic year. Participation in the Netherlands is taken from SBB trend reports for each sector and covers the 2020/21 academic year. Participation in the German system is given by the number of learners in 2018, indicated in the BIBB's *List of recognised vocational training occupations 2020*. Participation data for Switzerland was obtained via correspondence with the State Secretariat for Education, Research and Innovation and covers total enrolments in 2020. Participation data for Danish apprenticeships was obtained through correspondence with Statistics Denmark and refers to the number of apprentices enrolled as of October 2020.

It is important to remember when comparing apprenticeship participation to these figures that apprenticeships are not the only source of education or training. Also, they represent only a flow of skills, rather than the stock of skills in the economy. Nonetheless, insights can be gained from comparing the different countries' apprenticeship systems with the pattern of employment and skills shortages in England.

Several points stand out in the analysis. Firstly, the share of apprenticeship participation in the Netherlands, Switzerland, Germany and Denmark for skilled trades roles is far higher than either the share of employment or the SSVs in England. As things stand for English apprenticeships, participation, employment and SSVs are more closely aligned. As such, a shift towards one of the continental systems could see skilled trades apprenticeship participation exceed the labour market demand in England.

Similarly, apprenticeship participation in professional roles in England is closer to its share of employment and SSVs, while Swiss, German, Dutch and Danish participation is lower.

Whether the English or continental model is preferable depends on what you want apprenticeships to achieve in relation to the other parts of the education system. For example, if you believe training for professional and managerial roles should be fulfilled by higher academic education and classroom-based vocational courses then you might favour the Swiss, German, Dutch and Danish apprenticeship systems. If you want apprenticeships to serve a wider share of the labour market, then the English system may be preferable.

Note, this is not to say that apprenticeships make no contribution to filling professional and managerial roles in Switzerland, Germany, the Netherlands and Denmark. Apprenticeships in these countries doubtless often build the foundational knowledge and skills necessary for these roles upon which higher education can build.

However, that the share of managerial roles in apprenticeship participation in England is higher even than its share of employment (Chart 5) suggests an imbalance, especially given that this has traditionally been the domain of higher education through MBAs. In addition, managerial positions accounted for just 3% of SSVs in England (Chart 6), which shows the vast majority of skills shortages are in other occupation groups.

Chart 5: Share of apprenticeship participation in England, the Netherlands, Switzerland, Germany and Denmark and share of employment in England for each major SOC group

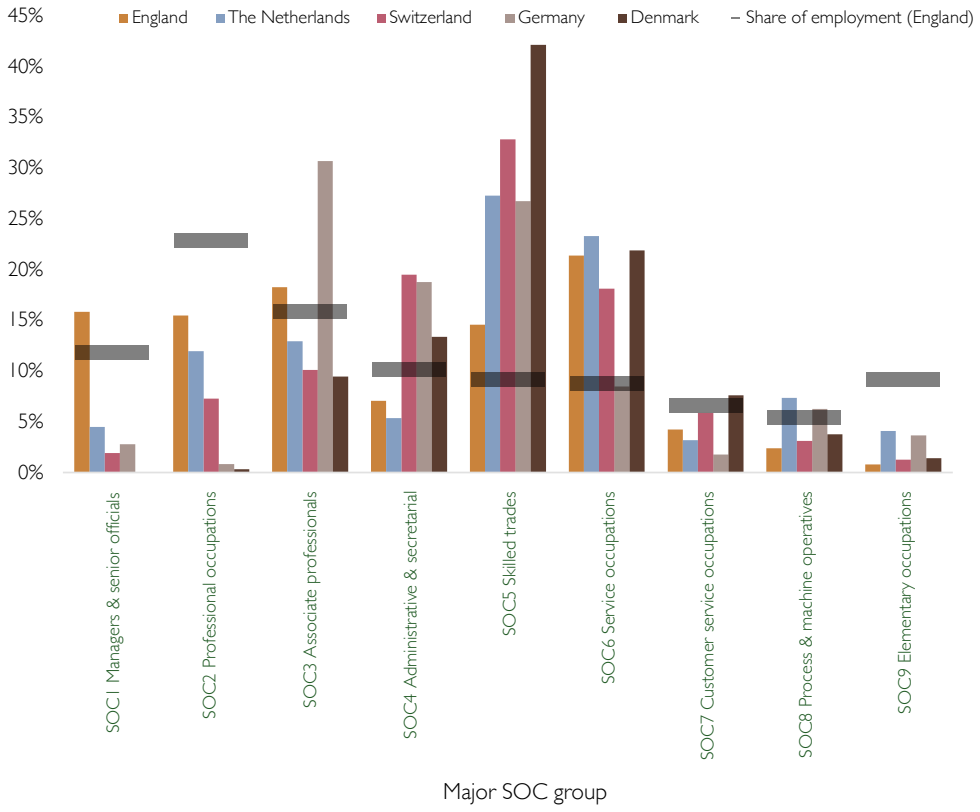
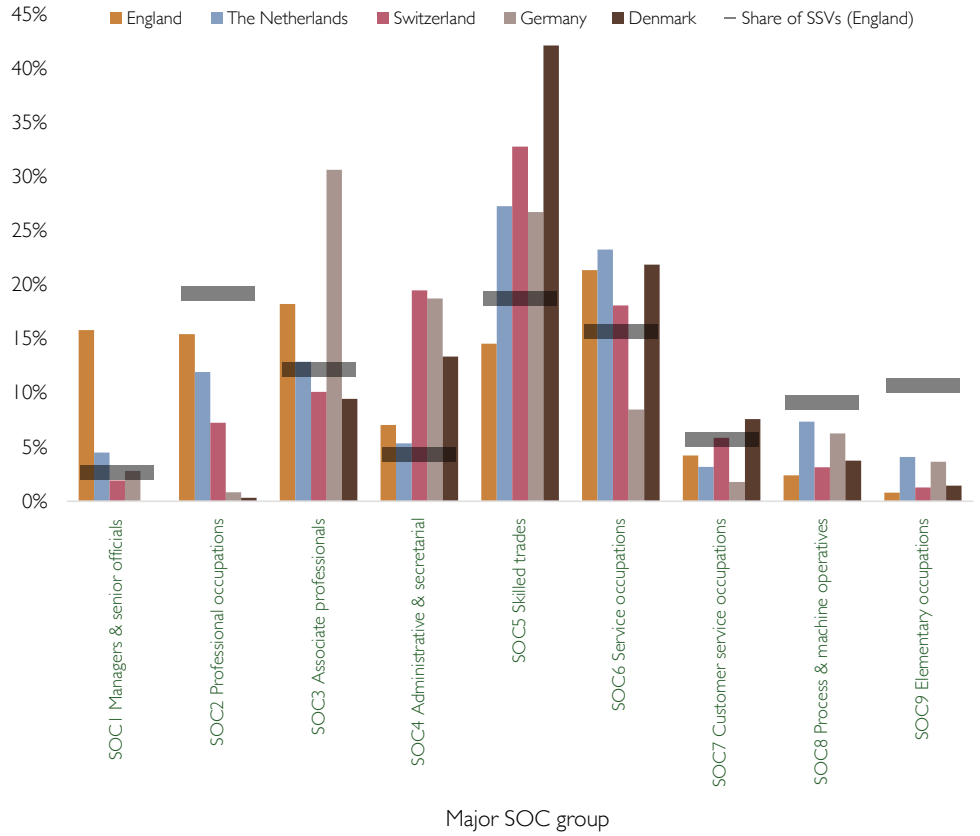


Chart 6: Share of apprenticeship participation in England, the Netherlands, Switzerland, Germany and Denmark and the share of total SSVs in England for each major SOC group

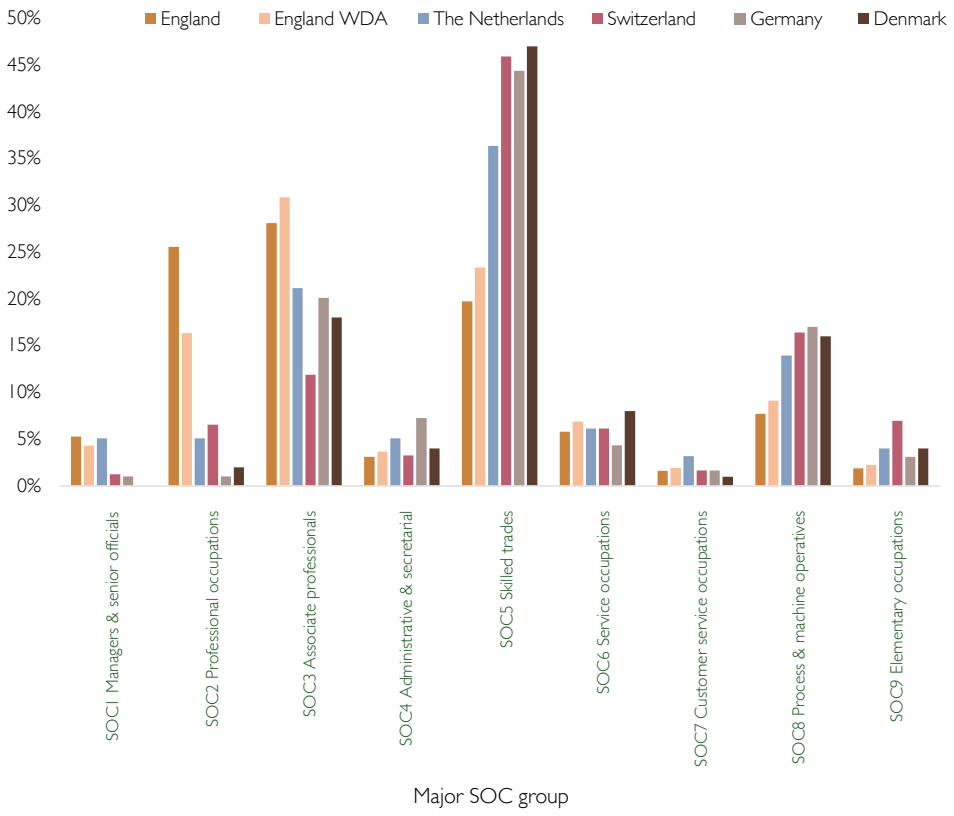


The impact of degree apprenticeships

The findings presented so far suggest – with only a few exceptions – that the English system focuses more on managerial and professional roles and less on skilled trades than the Dutch, Swiss, Danish and German systems. This indicates that English apprenticeships cover occupations that have traditionally been the domain of higher education – and that largely still are in the Netherlands, Switzerland, Germany and Denmark.

Could this be due to the presence of degree apprenticeships in England? These apprenticeships, at Levels 6 and 7, were described by the English government at their launch in 2015 as "an innovative new model bringing together the best of higher and vocational education".[21] After a slow beginning, the share of apprenticeships at Levels 6 and 7 has grown over the last few years to 13.5% of apprenticeship starts.[22] Charts 7 and 8 show the impact of removing these degree apprenticeships from the analysis.[23] Overall, it has the effect of dampening – but not eliminating – the key differences between England and the other countries. More specifically, it reduces the share of apprenticeships mapped to professional roles from 26% to 16%, bringing England closer to the Netherlands (5%) and Switzerland (7%), but still far above Germany (1%) and Denmark (2%). It also reduces the gap in the share of apprenticeships mapped to skilled trades roles, but not significantly so (Chart 7).

Chart 7: Share of apprenticeships in each major SOC group in the Netherlands, Switzerland, Germany, Denmark and England with and without English degree apprenticeships (England WDA)

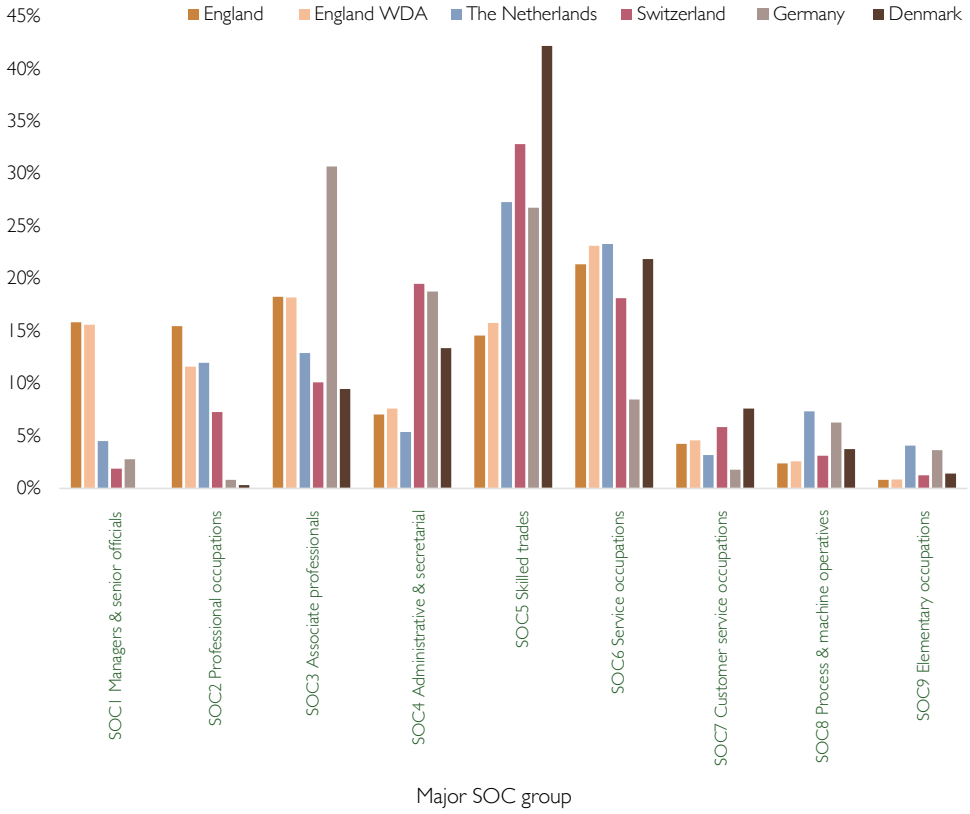


21 Department for Business, Innovation and Skills (2015) *Government rolls-out flagship degree apprenticeships*. Available at: https://www.gov.uk/government/news/government-rolls-out-flagship-degree-apprenticeships

22 Data source: Department for Education (DFE).

23 The analysis includes both integrated degree apprenticeships and non-integrated degree apprentices in the category England WDA in Charts 7 and 8. Note, however, that there are some apprenticeships at Level 6 and 7 which are nonetheless classed by IFATE as 'non-degree qualifications' and so are included in the England WDA figures. There are 50 of these non-degree qualifications.

Chart 8: Share of apprenticeship participation in each major SOC group in the Netherlands, Switzerland, Germany, Denmark and England with and without English degree apprenticeships (England WDA)



The impact on participation of removing degree apprenticeships is smaller, as shown in Chart 8. The biggest impact is the reduction in the share of participation in apprenticeships mapped to professional roles from 15% to 12%, bringing England in line with the Netherlands, but above Germany, Switzerland and Denmark.

However, removing degree apprenticeships from the data has little effect on the participation in managerial apprenticeships, with England still far above the other countries. This is because the Team Leader and Supervisor standard, which is responsible for around half of participation in apprenticeships linked to managerial roles in England, is a Level 3 qualification and thus not a degree apprenticeship.

KEY POLICY INSIGHTS

What are the central implications of the summary analysis presented above? Though there are some similarities in the types of occupations covered by English apprenticeships and the four continental European systems, there are many important differences that can inform policymaking.

The key findings of the analysis of coverage are:

- **A high number of apprenticeship standards means broader coverage**. England has the broadest occupational coverage of the countries studied, with 68% of occupations linked to at least one apprenticeship. England has the highest coverage for each major occupation group, apart from elementary roles, partly because the English system has far higher numbers of individual apprenticeship standards.
- **Traditional compared with professional apprenticeships**. There is a marked split in the types of occupations covered by the English system on the one hand, and the Dutch, German, Swiss and Danish systems on the other. The latter focus on the skilled trades major SOC group – arguably the traditional domain of apprenticeships – while the former covers the whole labour market. What particularly stands out is that the English system covers professional and managerial roles to a much greater extent than any of the other countries looked at. However, these countries have other forms of work-based learning which cover professional and managerial roles. Further analysis including non-apprenticeship vocational training may show these whole vocational systems are similar in coverage to the English apprenticeship system.
- **England the outlier.** When it comes to coverage of occupations, England is the clear outlier. The four continental European apprenticeship systems are far more like each other than they are like the English system.

In addition to looking at the coverage of the labour market by apprenticeship standards, this report includes data on participation. The share of the English population that are apprentices (1.3%) is similar to the Netherlands (0.7%), Germany (1.6%), Denmark (1.7%) and Switzerland (2.3%). Including participation data in the analysis also reduces the differences in the labour market coverage within systems, meaning the share of apprenticeships mapped to each occupation group is more evenly distributed within each country.

However, there are some significant differences in the age of apprentices. For example, over 60% of apprentices in Switzerland are under 19, compared to just 21% in England.

CONCLUSION

A consensus has been building in English policymaking that an effective apprenticeship system is vital for driving broad-based economic prosperity and delivering on the levelling up agenda. This report analyses how English apprenticeships compare to the Dutch, Swiss, German and Danish systems in terms of the kinds of occupations included.

Compared to these four countries, the English system is an outlier. It covers a significantly larger share of the English labour market than the Dutch, Swiss, German or Danish systems. In particular, it covers a high share of managerial and professional occupations, which the other countries mostly leave to other parts of the education system. In the Netherlands, Switzerland, Germany and Denmark, apprenticeships focus on skilled trades roles, keeping largely within the bounds of traditionally vocational occupations.

As emphasised throughout this report, we cannot scale the findings up to the level of the entire vocational system. The types of occupations excluded from the apprenticeship system in Germany, Switzerland, the Netherlands and Denmark may be covered by predominantly classroom-based vocational and professional courses at the tertiary level. However, it is noteworthy that apprenticeships are used more broadly in England, covering not only the first steps into skilled work for school-leavers but also for retraining already highly skilled adults.

It is also important to note that apprenticeships are only one aspect of what are complex vocational education systems. But policymakers in England should understand how their apprenticeship system differs from their continental neighbours. The Netherlands, Switzerland, Germany and Denmark offer alternative models in which apprenticeships focus predominantly on specific, often trade- and craft-related vocational occupations, acting as a pathway to skilled work.

THE NETHERLANDS: ANALYSIS OF COUNTRY SPECIFIC DATA

INTRODUCTION

The Netherlands has a large and well-established apprenticeship sector. In 2020/21 there were 127,000 apprentices in the Netherlands, and a further 380,000 on the school-based vocational track, which requires 20-60% of students' time to be spent on work placements and leads to the same qualification. More than half a million students being trained by more than a quarter of a million recognised training companies is significant in a country with a population of 17 million.[24]

This analysis compares the types of occupations covered by apprenticeships by mapping Dutch and English apprenticeships to the English labour market. It provides insight into how the types of occupations covered by apprenticeships in England might change if it moved towards a Dutch-style system, and whether these Dutch-style apprenticeships would neglect parts of the labour market currently covered by the English system.

This report provides context for apprenticeships in England and the Netherlands, covering apprenticeship participation, age, funding and levels. It compares the findings and provides key insights for policymakers in England.

CONTEXT

Overview of the Vocational Education and Training (VET) system in the Netherlands

Upper secondary vocational education in the Netherlands follows two tracks: the work-based track and the school-based track. The work-based track requires at least 60% of learners' time to be spent in the workplace. However, the school-based vocational training track also requires between 20% and 60% of learners' time to be spent in the workplace. Practically all courses can be taken through either the work-based or school-based tracks, and both tracks lead to the same qualification. For example, a Level 2 Furniture Upholsterer course leads to the same qualification regardless of whether the learner has followed the work-based track or the school-based track. As such, while the primary definition of apprenticeships in this report is the work-based track, at times the school-based track numbers are included for additional context.

Upper secondary vocational education in the Netherlands is arguably broader in nature than apprenticeships in England. Courses have three main functions: labour market access, further learning and citizenship. As such, the intention of Dutch courses goes beyond the preparation of learners for a skilled job.

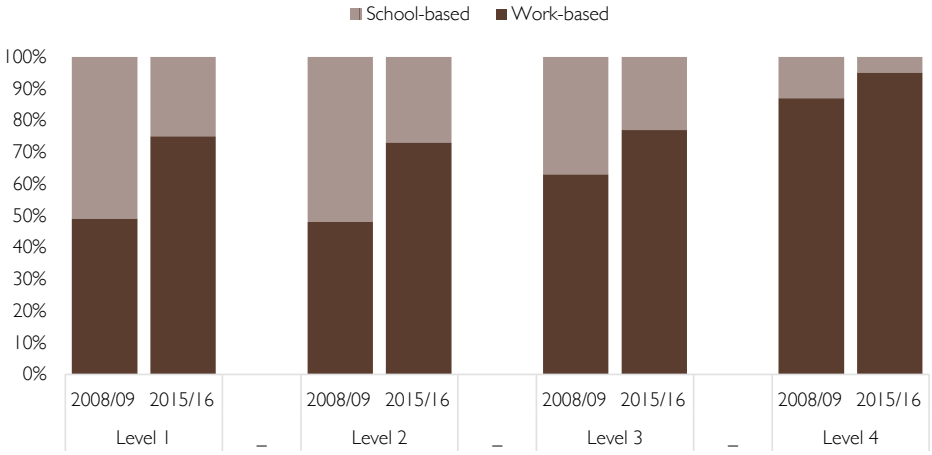
In recent years there have been two related shifts in upper secondary VET participation. The first is that the share of upper secondary VET students has risen at European Qualifications Framework (EQF) Level 4 and fallen at Levels 2 and 3 (see Table 7). The second is that the share of students following the work-based track has fallen at each of the four levels. For example, between 2008/09 and 2015/16, the share of Level 2 VET students following the work-based track fell from 52% to 27% (Chart 9). These trends are related as school-based students tend to study at higher levels than their work-based peers.

24 SBB. *Facts and numbers*. Available at: https://www.s-bb.nl/feiten-en-cijfers

Table 7: Share of upper secondary VET students by EQF level in 2015 and 2020[25]

Year	Level 1	Level 2	Level 3	Level 4
2015	3%	19%	27%	51%
2020	3%	16%	23%	58%

Chart 9: Share of VET students in their first year by VET level and track in the Netherlands[26] *in 2008/9 and 2015/16*



After completing an upper secondary vocational qualification, students have a range of further study options. Those with a qualification at EQF Level 3 can take a specialising training programme at EQF Level 4, which is shorter than a normal EQF Level 4 but can qualify students for entry to higher-level courses. Learners who already have a Level 4 VET qualification can go on to study at the tertiary level, either for an associate degree at Level 5 or a higher professional bachelor's degree at Level 6.[27]

Note, as there is no requirement for learners to sign a training employment contract with an employer, these vocational training options beyond the upper secondary level are not apprenticeships. Therefore, they are not included in the analysis, the sole focus of which is apprenticeships. As such, any gaps in labour market coverage identified by the analysis are not necessarily absent from the entire VET system, just apprenticeships.

One additional interesting aspect of higher education in the Netherlands is the dual degree. These are degree programmes for which learners must already be employed in jobs relevant to their studies. In 2020/21 there were 26,000 students studying towards dual degrees.[28] However, they are not included in the apprenticeship statistics presented in this report as they sit outside the apprenticeship system in the Netherlands, with different regulations and a different, pre-existing relationship between learners and employers.

25 Data source: StatLine. Available at: https://opendata.cbs.nl/statline/#/CBS/nl/dataset/83850NED/table?ts=1635861457776%2F

26 Data source: ECBO. Available at: https://ecbo.nl/onderzoekspublicatie/de-ontwikkeling-van-de-instroom-in-de-bbl/

27 European Centre for the Development of Vocational Training (Cedefop) (2016) *Vocational education and training in the Netherlands: Short description*. Available at: https://www.cedefop.europa.eu/files/4142_en.pdf

28 Central Bureau of Statistics. Available at: https://www.cbs.nl/nl-nl/cijfers/detail/83540NED?q=hoger%20beroep

Participation

There are fewer apprentices in the Netherlands than in England. Latest figures suggest that 127,000 learners follow the work-based vocational track in the Netherlands (about 0.7% of the population) compared with 719,000 in England (about 1.3% of the population).[29] The difference may be partially explained by the further 380,000 Dutch learners (about 2.09% of the population) following the school-based track.[30] As outlined above, the school-based track requires between 20% and 60% of a learner's time to be spent in the workplace, meaning these courses are closer to an apprenticeship in nature than England's school-based vocational track.

Age

Table 8 shows the similar age profiles of apprentices in England and the Netherlands. The age profile of Dutch learners following the school-based track is very different to that of the work-based track given here. 60% are under the age of 19 and just 6% are older than 23.

Table 8: Age distribution of apprentices in England and the Netherlands

Country	Under 19	19-24	25+[31]
England	21%	30%	50%
The Netherlands	23%	29%	48%

Apprentice wages

Minimum wages for apprentices in the Netherlands vary by age and by the number of hours worked per week. For a 36-hour week, a 15-year-old apprentice is entitled to a minimum hourly wage of €3.24. This increases by age before reaching €10.77 for those aged 21 and older.[32] The hourly wage decreases by around 5% if the apprentice works a 38-hour week, and by another 5% if the apprentice works a 40-hour week. Apprentices in England who are under the age of 19 or are in their first year are entitled to a minimum wage of £4.30, approximately €5.10.[33] Apprentices aged 19 or above and those who have completed their first year are entitled to the standard minimum wage for their age group: £6.56 (€7.68) for 18 to 20, £8.36 (€9.78) for 21 to 22 and £8.91 (€10.42) for 23 and over. Like-for-like comparisons are clearly not possible, but the evidence suggests minimum wages for older apprentices are similar between the two countries, while younger English apprentices are likely to earn slightly more.

Beyond the minimum level, apprentice wages in the Netherlands are set through collective bargaining between unions and employer groups at the sectoral level. In England, wages above the minimum level are set by individual employers.

29 Figure is for the latest available, 2019/20. Foley, N. (2021) *Briefing paper number 06113: Apprenticeship statistics*. London: House of Commons Library. Available at: https://researchbriefings.files.parliament.uk/documents/SN06113/SN06113.pdf

30 In addition, there were 26,000 students studying towards dual degrees in 2020/21.

31 23+ for the Netherlands.

32 Rijkoverheid (2020) *Bedragen minimumloon bbl 2020*. Available at: https://www.rijksoverheid.nl/onderwerpen/minimumloon/bedragen-minimumloon-bbl-opleiding/bedragen-minimumloon-bbl-2020

33 All pound to euro conversions used a rate of 1 pound = 1.18 euros.

Who pays for the system?

The costs of employing an apprentice and on-site training in the Netherlands are paid by the employer. However, the government subsidises these costs through the Practical Learning Subsidy Scheme, up to a maximum of €2,700 per apprentice.[34] The scheme is targeted at vulnerable groups, skills shortage sectors and scientific roles. The costs of financing the off-the-job training of apprentices in vocational schools are borne by the state.

In England, large employers (those with a payroll over £3m per year) pay an apprenticeship levy, equivalent to 0.5% of the annual pay bill. This amount – plus a 10% top up from central government – can be used to pay for training carried out off-site by a training provider. Small employers pay 5% of these training costs, with the rest covered by central government. All employers are responsible for covering the wage costs and on-the-job training of their apprentices (excluding any Covid-19 financial aid measures). As such, the vast majority of the costs of apprenticeships are borne by businesses, especially large ones.

Apprenticeship levels

Apprenticeships in the Netherlands range from Level 1 to Level 4 in the Dutch Qualifications Framework (NLQF). Each level in the Netherlands has a different principal aim. Level 1 is considered entrance training for those without a diploma. Level 2 is basic vocational training, which aims to give the learner a foundation in practical learning. Level 3 is core vocational training, helping learners to become independent professionals, while still maintaining a broad focus. Increased specialisation comes at Level 4, alongside training for middle management.

The Netherlands NLQF Level 3 (UK Level 2) has the highest level of participation (42%). Next is Level 4 (UK Level 3) with 32% and Level 2 (UK Level 1) with 23% of participants.[35] This contrasts with the school-based vocational pathway, where three-fifths of students study at NLQF Level 4. A Level 1 apprenticeship is expected to take one year to complete, a Level 2 two years, a Level 3 three years and a Level 4 three to four years.[36]

Apprenticeships in England have traditionally been categorised into three groups: intermediate (UK Level 2), advanced (UK Level 3) and higher (UK Level 4 and above). At each level different apprenticeships can have different durations, for example, a Level 3 Engineering Technician apprenticeship is expected to last three and a half years, more than twice that for Level 3 Retail Team Leader which is expected to last a year. Most English apprenticeships take less than the three to four years required by the Dutch system.

The presence of higher apprenticeships – including degree apprenticeships at UK Levels 6 and 7 – sets England apart from the Netherlands, where there is no formal apprenticeship provision beyond the equivalent of a UK Level 3, although there are dual degrees. However, participation in England is dominated by Level 2 (intermediate) and Level 3 (advanced) apprenticeships, which accounted for 26% and 45% of enrolments respectively in 2020/21.[37] Level 4 and 5 apprenticeships combined accounted for only 17% of enrolments and Levels 6 and 7 only 12%.

34 Rijksdienst voor Ondernemend Nederland (2021) *Subsidieregeling Praktijkleren* [Subsidy Scheme for Practical Learning]. Available at: https://www.rvo.nl/subsidies-regelingen/subsidieregeling-praktijkleren

35 Figures are for the 2020/21 academic year. Data source: https://www.s-bb.nl/feiten-en-cijfers

36 European Centre for the Development of Vocational Training (Cedefop). *Vocational education and training in Europe: Netherlands 2019*. Available at: Netherlands (europa.eu)

37 When accessed, data for 2020/21 was for quarters 1-3 only. Data may be revised by DFE.

RESULTS OF LABOUR MARKET COMPARISON

The results describe the occupations covered by English and Dutch apprenticeships as proxied by four-digit Standard Occupation Classification (SOC) codes. Note that where additional labour market information is included – size of workforce, number of skills shortage vacancies (SSVs) – this is based on data for England. In this sense, it is a measure of how coverage would theoretically change if England adopted the Dutch system. Brief analysis relating to the English and Dutch labour markets is presented in ISCO-08 analysis for the UK and the Netherlands.

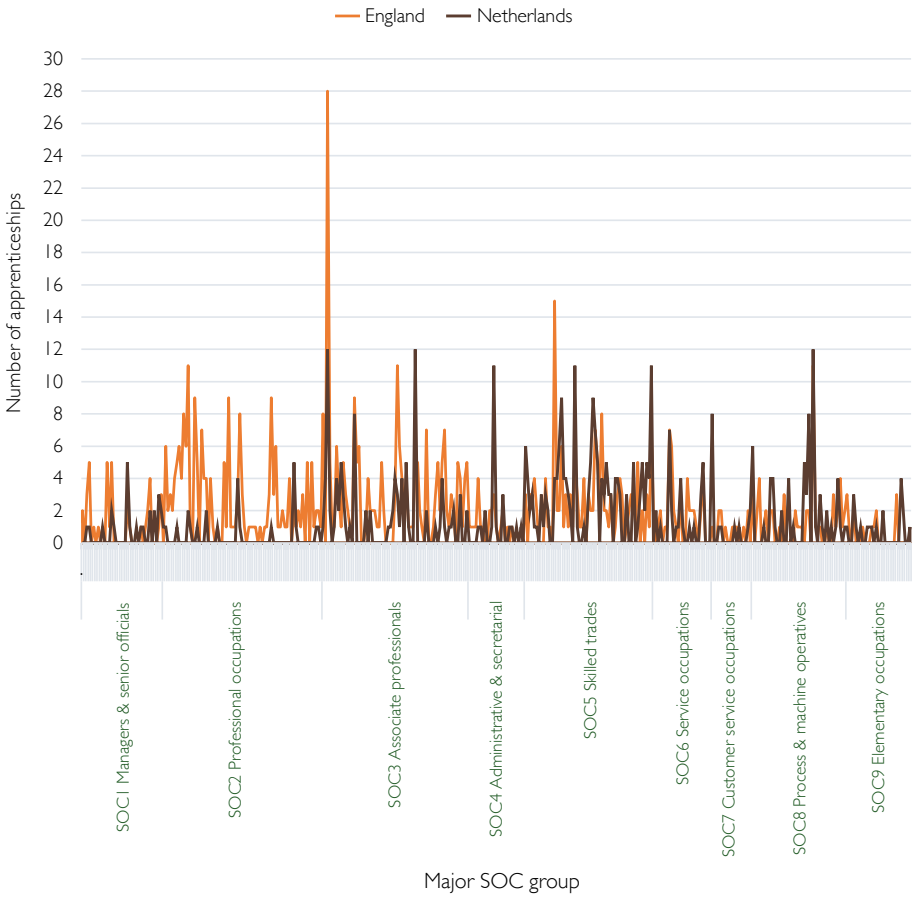
Headline coverage

Overall, the English apprenticeship system covers more occupations than does the Dutch system (68% compared with 46%). Table 9 shows that English standards cover a larger share of each major SOC group, apart from elementary roles. The disparity in coverage of professional occupations and the Dutch apprenticeship concentration in skilled trades is clear in Chart 10.

Table 9: Percentage of four-digit SOC code occupations covered by apprenticeships for each major SOC in England and the Netherlands

SOC group	England	The Netherlands
All	68%	46%
1: Managers, directors and senior officials	47%	39%
2: Professional occupations	82%	21%
3: Associate professional and technical occupations	83%	52%
4: Administrative and secretarial occupations	60%	44%
5: Skilled trades occupations	82%	75%
6: Caring, leisure and other service occupations	65%	46%
7: Sales and customer service occupations	50%	39%
8: Process, plant and machine operatives	62%	50%
9: Elementary occupations	28%	41%

Chart 10: Number of apprenticeships mapped to each 4-digit SOC code in England and the Netherlands



That coverage by English apprenticeships is higher is partly due to there being more of them. For the purposes of this analysis, 731 English apprenticeship standards have been mapped to 251 SOC codes. For the Netherlands, 473 apprenticeships have been mapped to 169 SOC codes.

The two systems are, however, concentrated in different types of occupations (Table 10). More than one in four English apprenticeships is linked to professional occupations, compared with just one in 20 for the Netherlands. Conversely, more than one in three Dutch apprenticeships is linked to skilled trades, compared with one in five for England. This is not to say that Dutch VET as a whole offers no coverage of professional and managerial types of occupations. In the Netherlands higher professional courses cover these roles. Yet it is notable that the use of apprenticeships differs between the two countries.

Table 10: Share of apprenticeships in each major SOC group in England and the Netherlands

SOC group	England	The Netherlands
1: Managers, directors and senior officials	5%	5%
2: Professional occupations	26%	5%
3: Associate professional and technical occupations	28%	21%
4: Administrative and secretarial occupations	3%	5%
5: Skilled trades occupations	20%	36%
6: Caring, leisure and other service occupations	6%	6%
7: Sales and customer service occupations	2%	3%
8: Process, plant and machine operatives	8%	14%
9: Elementary occupations	2%	4%

Coverage weighted by participation

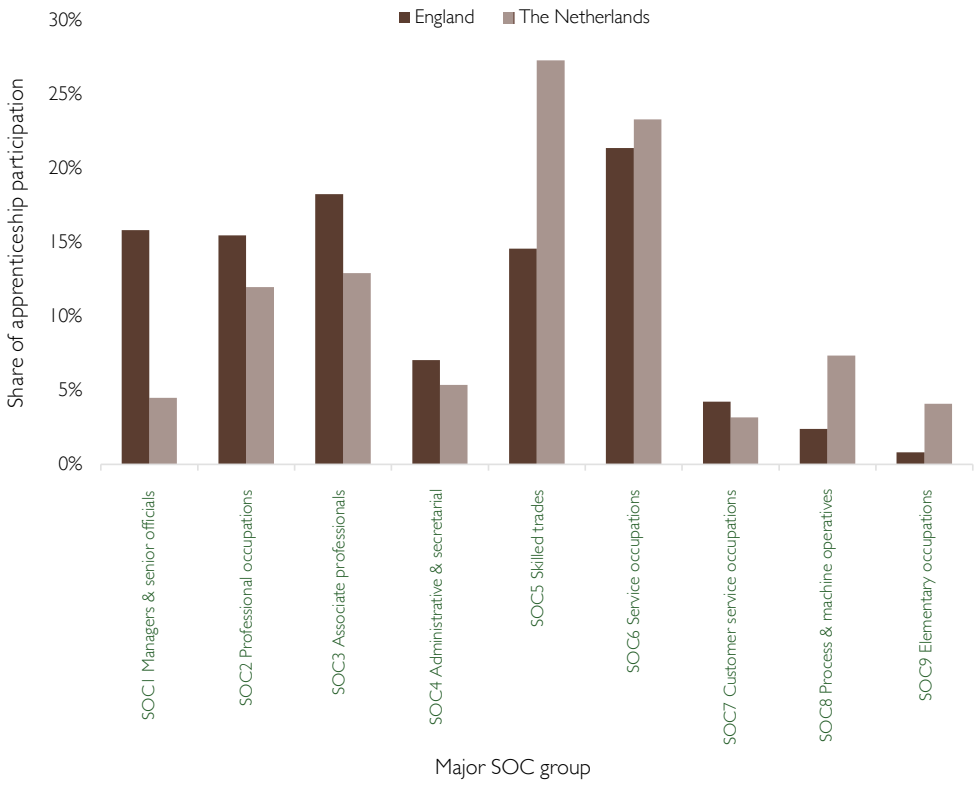
The analysis so far has focused on how the structure of both apprenticeship system maps onto the structure of the English labour market. This section of the report introduces participation measures, in terms of both apprenticeships and the labour market. Participation data for apprenticeships in the Netherlands is taken from Foundation for Cooperation on Vocational Education, Training and Labour Market (SBB) trend reports for each sector and covers the 2020/21 academic year.[38] Participation in England is taken from the number of enrolments in the first three-quarters of the 2020/21 academic year. The data will have been affected by the coronavirus pandemic and so should be interpreted with caution.

Chart 11 shows that apprenticeship participation for each major SOC group is similar in England and the Netherlands. Including the participation data moderates the differences observed in coverage in Table 10, with a higher level of correlation now seen between the two countries.

Some of the differences that do exist are, to a large extent, attributable to a concentration of participation in certain English standards. For example, the Team Leader and Supervisor apprenticeship accounted for 6% of all enrolments in 2020/21. The Institute for Apprenticeships and Technical Education (IFATE) linked this standard to an occupation in the managers, directors and senior officials group (SOC group 1). Removing this one standard from the data drops the share of apprenticeship starts mapped to SOC group 1 from 16% to 10%, although this remains nearly double the share of Dutch apprenticeships.

38 Data for this report were manually extracted from individual trend reports. The total number of participants observed using this method is lower than officially reported totals, perhaps due to reporting errors. Trend reports are available at: https://www.s-bb.nl/feiten-en-cijfers/trendrapportages

Chart 11: Share of apprenticeship participation for each major SOC group



Participation in the work-based track compared with the school-based track

Table 11 demonstrates that the share of participation in courses linked to each SOC group varies considerably between the work-based and the school-based tracks in the Netherlands. Participation in the school-based track is more concentrated in associate professional and technical occupations and less concentrated in skilled trades and in process, plant and machine operatives. In this sense, the school-based upper secondary VET track has a similar pattern of participation as apprenticeships in England.

That participation patterns differ between the two tracks is unsurprising. Though they cover the same list of VET qualifications now, the current system is the result of the two tracks merging. The work-based track has its roots in skilled trades occupations, including metal working, plumbing and carpentry. The school-based track traditionally prepared students for higher-level occupations and learning.

Table 11: Share of participation in the Netherlands for the work-based and the school-based track for each major SOC group

SOC group	Work-based	School-based
1: Managers, directors and senior officials	5%	8%
2: Professional occupations	12%	13%
3: Associate professional and technical occupations	13%	29%
4: Administrative and secretarial occupations	5%	10%
5: Skilled trades occupations	27%	10%
6: Caring, leisure and other service occupations	23%	23%
7: Sales and customer service occupations	3%	3%
8: Process, plant and machine operatives	7%	1%
9: Elementary occupations	4%	2%

Coverage compared with labour market demand

How do apprenticeship participation figures relate to estimates of labour market need? Table 12 includes the share of employment and the share of SSVs for the major SOC groups. It is important to remember when comparing apprenticeship participation to these figures that apprenticeships are not the only source of education or training. They also represent only a flow of skills, rather than the stock of skills in the economy. Nonetheless, insights can be gained from comparing the two different apprenticeship systems with the pattern of employment and skills shortages in England.

Table 12: Share of apprenticeship participation in England and the Netherlands and the share of employment and SSVs in England for each major SOC group[39]

SOC group	Apprenticeships – England	Apprenticeships – the Netherlands	Share of employment – England	Share of SSVs – England
1: Managers, directors and senior officials	16%	5%	12%	3%
2: Professional occupations	15%	12%	23%	19%
3: Associate professional and technical occupations	18%	13%	16%	12%
4: Administrative and secretarial occupations	7%	5%	10%	4%
5: Skilled trades occupations	15%	27%	9%	19%
6: Caring, leisure and other service occupations	21%	23%	9%	16%
7: Sales and customer service occupations	4%	3%	7%	6%
8: Process, plant and machine operatives	2%	7%	5%	9%
9: Elementary occupations	1%	4%	9%	11%

Charts 12 and 13 suggest that the Dutch apprenticeship system would better serve the needs of process, plant and machine operative occupations. These occupations make up 5% of employment and 9% SSVs, but only 2% of apprenticeship participation in England. In the Netherlands, however, 7% of apprenticeship participation is linked to these roles. These occupations, which include roles such as scaffolders and windscreen fitters, are likely to rely solely on vocational education for the supply of skilled labour.

Conversely, it is higher education that takes the leading role in supplying skilled labour for managerial and professional occupations. That the share of managerial roles in apprenticeship participation in England is higher than its share of employment suggests the system may be misbalanced. This is especially true given that managerial positions also accounted for only 3% of the SSVs in England, meaning the vast majority of skills shortages lie in other types of occupations (Chart 13). In the Netherlands, only 5% of apprenticeship participation is linked to managerial roles, which more closely reflects labour market need in England.

39 Employment data is for 2020 and is sourced from the *Annual population survey* via Nomis. SSV data is from the England dataset of the *Employer skills survey 2019*, available at: https://www.gov.uk/government/publications/employer-skills-survey-2019-england-results

Chart 12: Share of apprenticeship enrolments in England and the Netherlands and share of employment in England for each major SOC group

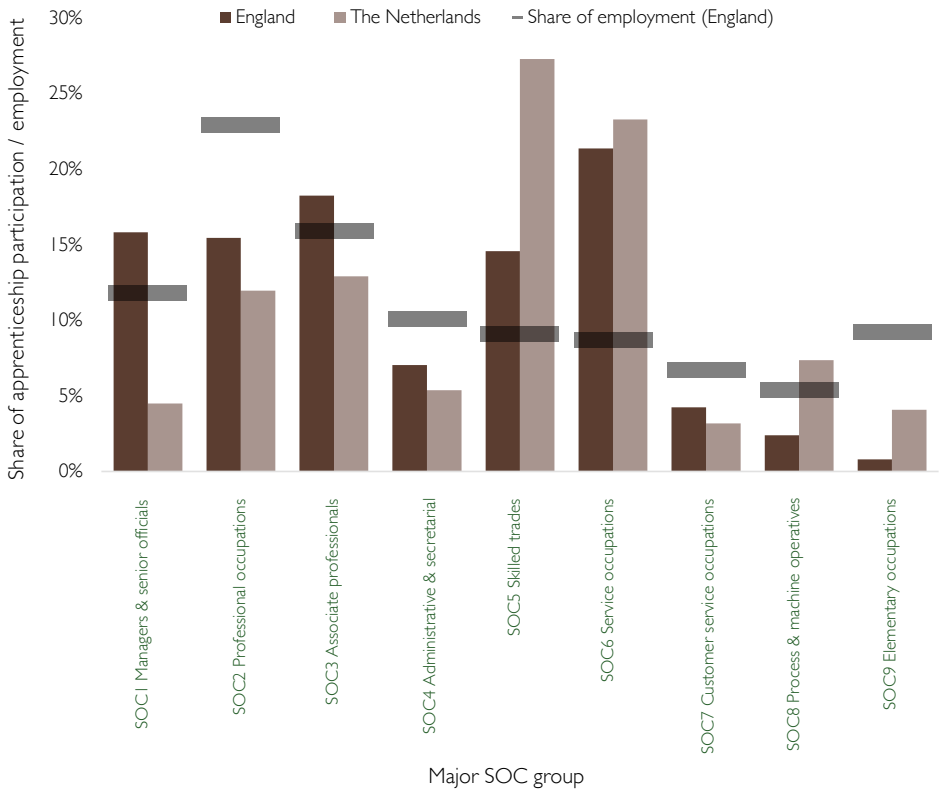
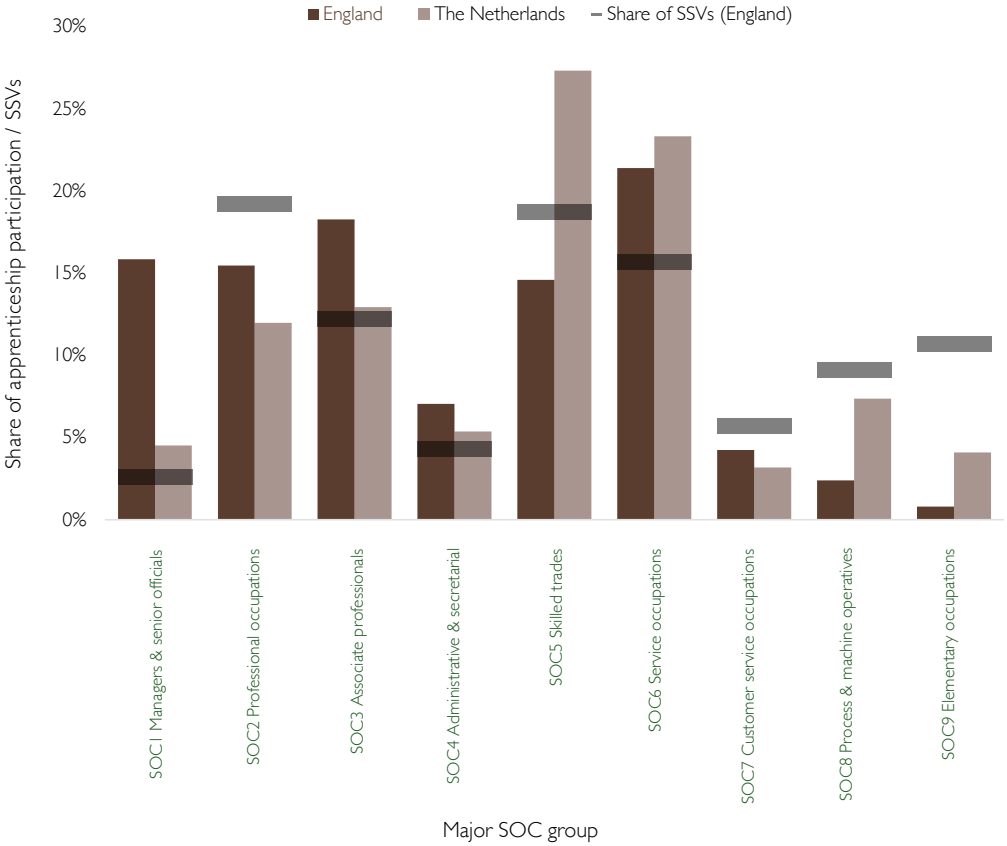


Chart 13: Share of apprenticeship participation in England and the Netherlands and share of total SSVs in England for each major SOC group



The impact of degree apprenticeships

The analysis so far has suggested that apprenticeships in England are more concentrated in professional and managerial positions, and less concentrated in skilled trades occupations, than their Dutch equivalents. Is it possible that these differences are related to degree apprenticeships in England at Levels 6 and 7?

Table 13 shows the share of 4-digit SOC code occupations covered by the English system with and without degree apprenticeships.[40] Overall coverage drops from 68% of 4-digit SOC codes to 64%, still significantly above the 46% coverage for the Netherlands. The biggest effect is to reduce coverage of professional occupations (SOC group 2) from 82% to 63%, although again this remains far above the 21% for Dutch apprenticeships. The effect of removing degree apprenticeships means the structure of the English system shifts away from professional roles and towards all other roles (with the exception of managerial roles, which sees a small reduction), and the structure of the two systems is more closely aligned. However, while removing degree apprenticeships softens the structural differences between the two systems, it does not eliminate them, and professional occupations still have three times the share of English apprenticeships mapped to them than Dutch apprenticeships have.

Table 13: Percentage of four-digit SOC code occupations covered by apprenticeships for each major SOC group and the share of apprenticeships in each major SOC group for the Netherlands and England with and without degree apprenticeships (England WDA)

	% coverage			Share of apprenticeships		
SOC group	England	England WDA	The Netherlands	England	England WDA	The Netherlands
All	68%	64%	46%	-	-	-
1: Managers, directors and senior officials	47%	44%	39%	5%	4%	5%
2: Professional occupations	82%	63%	21%	26%	16%	5%
3: Associate professional and technical occupations	83%	82%	52%	28%	31%	21%
4: Administrative and secretarial occupations	60%	60%	44%	3%	4%	5%
5: Skilled trades occupations	82%	82%	75%	20%	23%	34%
6: Caring, leisure and other service occupations	65%	65%	46%	6%	7%	8%
7: Sales and customer service occupations	50%	50%	39%	2%	2%	3%
8: Process, plant and machine operatives	62%	62%	50%	8%	9%	14%
9: Elementary occupations	28%	28%	41%	2%	4%	4%

40 The analysis includes both integrated degree apprenticeships and non-integrated degree apprentices in the category England WDA in Tables 13 and 14. Note, however, that there are some apprenticeships at Levels 6 and 7 which are nonetheless classed by IFATE as 'non-degree qualifications' and so are included in the England WDA figures. There are 50 of these non-degree qualifications.

Table 14 shows apprenticeship participation with and without degree apprenticeships. The main difference between the English and Dutch systems is higher participation in apprenticeships linked to managerial roles in England (SOC group 1) This is unchanged by the removal of degree apprenticeships. As already mentioned, this is because the Team Leader and Supervisor standard, which is responsible for around half of participation in apprenticeships linked to managerial roles, is a Level 3 qualification and not a degree apprenticeship. Beyond this, the participation across the two systems looks remarkably similar, with professional occupations in England brought into line with the Netherlands – although Dutch participation is still higher for skilled trades occupations and for process, plant and machine operatives.

Table 14: Share of apprenticeship participation in the Netherlands and England with and without degree apprenticeships (England WDA)

SOC group	England	England WDA	The Netherlands
1: Managers, directors and senior officials	16%	16%	5%
2: Professional occupations	15%	12%	12%
3: Associate professional and technical occupations	18%	18%	13%
4: Administrative and secretarial occupations	7%	8%	5%
5: Skilled trades occupations	15%	16%	27%
6: Caring, leisure and other service occupations	21%	23%	23%
7: Sales and customer service occupations	4%	5%	3%
8: Process, plant and machine operatives	2%	3%	7%
9: Elementary occupations	1%	1%	4%

KEY POLICY INSIGHTS

This report has examined how the labour market coverage of apprenticeships in England would change if it moved towards a Dutch-style system. It has shown that the types of occupations covered by each system differ significantly. As such, there is much to be gained from comparison of apprenticeships in England and the Netherlands. The key policy insights are:

Coverage

- **Fewer apprenticeships means lower coverage.** The Dutch system covers fewer occupations than the English system. However, this is almost entirely explained by the fact there are more English apprenticeships. England has 56% more apprenticeships and covers 49% more occupations, providing a more densely structured apprenticeship system.

- **A traditional definition of apprenticeships.** The biggest differences in terms of occupational structure between the two systems are that the Netherlands concentrates more on skilled trades (36% of apprenticeships compared with 20% in England) whereas England focuses more heavily on professional roles (26% compared with 5% in the Netherlands). This is not to say the Dutch vocational system as a whole excludes professional roles, but it is notable that apprenticeships do not focus on these occupations.

Participation

- **Including participation data smooths the sharp edges within each system.** Weighting the analysis by participation decreases the variation in the types of occupations covered by each system – ie the SOC structure is covered more evenly by each system after weighting than when each course counts the same.

- **Participation in both systems is similar when degree apprenticeships are excluded.** Other than the 12-percentage point difference between participation in apprenticeships linked to skilled trades occupations and the 11-percentage point difference linked to managerial roles, the occupational structure of participation is similar between the two systems. It becomes even more similar if we exclude both degree apprenticeships and the Team Leader standard, which accounts for a large share of participation in England linked to managerial roles.

CONCLUSION

This report has explored the differences that exist between the structure of the English and Dutch apprenticeship systems. It has also discussed the likely implications if England were to move towards a more Dutch-style apprenticeship provision.

While there are similarities, this report highlights some key differences between the two systems. In particular, English apprenticeships cover a much larger share of occupations than the Dutch system, particularly for professional roles. This can in part be explained by degree apprenticeships, which are blurring the lines between higher academic and vocational education and set England apart from its European neighbours. Yet differences – albeit reduced – remain even when excluding these from the analysis. Moving towards a Dutch-style system would require more than just axing degree apprenticeships.

While there are dual degree programmes which require employment, pure apprenticeships in the Netherlands only exist up to the UK equivalent of a Level 3. This necessarily limits the range of occupations Dutch apprenticeships support. There are tertiary VET courses in the Netherlands at higher levels that cover professional and managerial occupations, but it is notable that apprenticeships cover other types of roles.

The UK Government has signalled that vocational education, including apprenticeships, will be central to its efforts to level up the country. This may necessitate careful consideration of the types of jobs apprenticeships should focus on. English apprenticeships stand out because they cover so much of the labour market, including the professional and managerial occupations that have traditionally been the realm of higher education. The Netherlands provides an example of an alternative use of apprenticeships, one that focuses largely on skilled trades and on process and machine operative roles. It is for the government to decide if the English system is to follow this example.

ISCO-08 ANALYSIS FOR THE UK AND THE NETHERLANDS

Analysis of the differences between the English and Dutch labour markets uses data from the International Labour Organization's (ILO's) International Standard Classification of Occupations (ISCO).

The occupational structure of employment in the UK and the Netherlands is similar. For six of the 10 ISCO occupation groups, the difference in employment share is less than one percentage point (Table 15). The UK labour market is more concentrated in managerial roles, while the employment share of professionals; technicians and associate professionals; and elementary roles is higher in the Netherlands.

Table 15: Employment share by major ISCO-08 occupation group in the UK and the Netherlands[41]

ISCO group description	1-digit ISCO code	UK	The Netherlands
Armed forces occupations	0	0%	0%
Managers	1	12%	5%
Professionals	2	26%	28%
Technicians and associate professionals	3	12%	17%
Clerical support workers	4	9%	9%
Services and sales workers	5	17%	18%
Skilled agricultural, forestry and fishery workers	6	1%	2%
Craft and related trades workers	7	8%	8%
Plant and machine operators and assemblers	8	5%	4%
Elementary occupations	9	8%	10%

Mapping Dutch and English apprenticeships to four-digit ISCO codes gives broadly comparable findings to the SOC2010 analysis.[42] Table 16 shows that having more apprenticeships means England covers a larger share of occupations than the Netherlands (47% compared with 39%), especially for professional roles (60% compared with 29%). The ISCO mappings suggest English apprenticeships are more focused on professional; and technical and associate professional roles, both in terms of available standards (Table 17) and participation (Table 18). Dutch apprenticeships are generally more concentrated in craft; plant and machine operative; and services and sales roles.

41 Data is latest available: 2020 for the Netherlands and 2019 for the UK. Source: ILO Data Explorer. Available at: https://ilostat.ilo.org/data/

42 Mappings to ISCO broadly follow the methodology used to map Dutch apprenticeships to SOC2010, combining CASCOT and manual inspection.

Table 16: Percentage of four-digit ISCO code occupations covered by apprenticeships for each major group in England and the Netherlands

ISCO group description	1-digit ISCO code	England	The Netherlands
All	All	47%	39%
Armed forces occupations	0	25%	25%
Managers	1	33%	35%
Professionals	2	60%	29%
Technicians and associate professionals	3	59%	44%
Clerical support workers	4	35%	48%
Services and sales workers	5	48%	38%
Skilled agricultural, forestry and fishery workers	6	23%	22%
Craft and related trades workers	7	57%	59%
Plant and machine operators and assemblers	8	29%	33%
Elementary occupations	9	20%	33%

Table 17: Share of apprenticeships mapped to each major ISCO group in England and the Netherlands

ISCO group description	1-digit ISCO code	England	The Netherlands
Armed forces occupations	0	0%	0%
Managers	1	5%	6%
Professionals	2	29%	8%
Technicians and associate professionals	3	29%	22%
Clerical support workers	4	4%	5%
Services and sales workers	5	7%	10%
Skilled agricultural, forestry and fishery workers	6	2%	3%
Craft and related trades workers	7	18%	34%
Plant and machine operators and assemblers	8	4%	7%
Elementary occupations	9	4%	5%

Table 18: Share of apprenticeship participation mapped to each major ISCO group in England and the Netherlands

ISCO group description	1-digit ISCO code	England	The Netherlands
Armed forces occupations	0	0%	0%
Managers	1	15%	5%
Professionals	2	19%	17%
Technicians and associate professionals	3	19%	10%
Clerical support workers	4	8%	5%
Services and sales workers	5	23%	30%
Skilled agricultural, forestry and fishery workers	6	1%	3%
Craft and related trades workers	7	13%	22%
Plant and machine operators and assemblers	8	2%	6%
Elementary occupations	9	1%	3%

There is some evidence that the English apprenticeship system more closely follows the shape of the UK labour market than the Dutch system follows the Dutch labour market. Charts 14 and 15 plot employment share against apprenticeship participation share for major ISCO groups. The English chart shows a tighter fit between participation and employment, with a higher R-squared value.

Whether it is desirable to have apprenticeships match the whole labour market is open for debate. The data suggests that the apprenticeship system in England is catering to a large share of the labour market. The Netherlands offers an alternative in which apprenticeships focus on one part of the labour market while the rest is covered by different types of education, such as higher education.

Chart 14: Apprenticeship participation compared with employment share by major ISCO group in the Netherlands

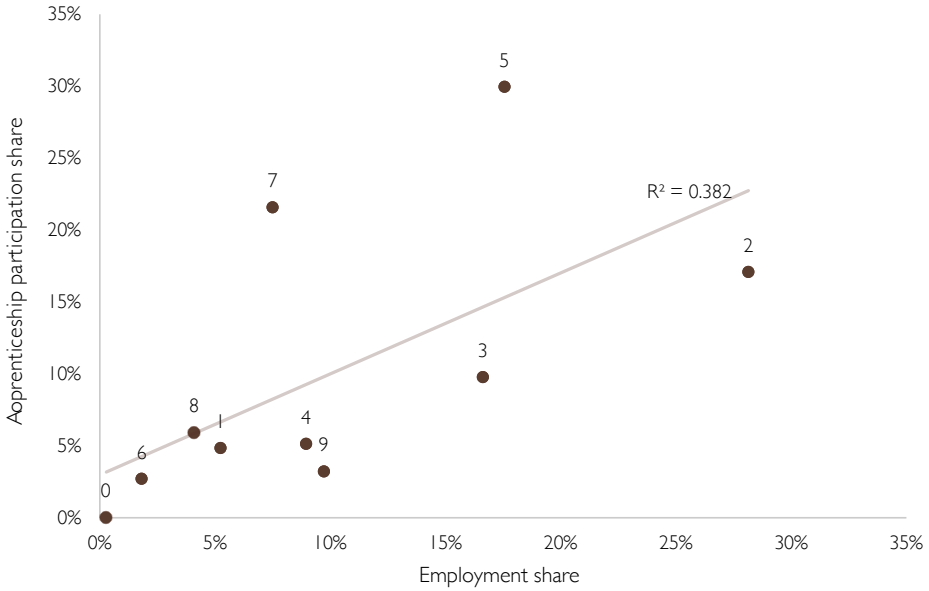
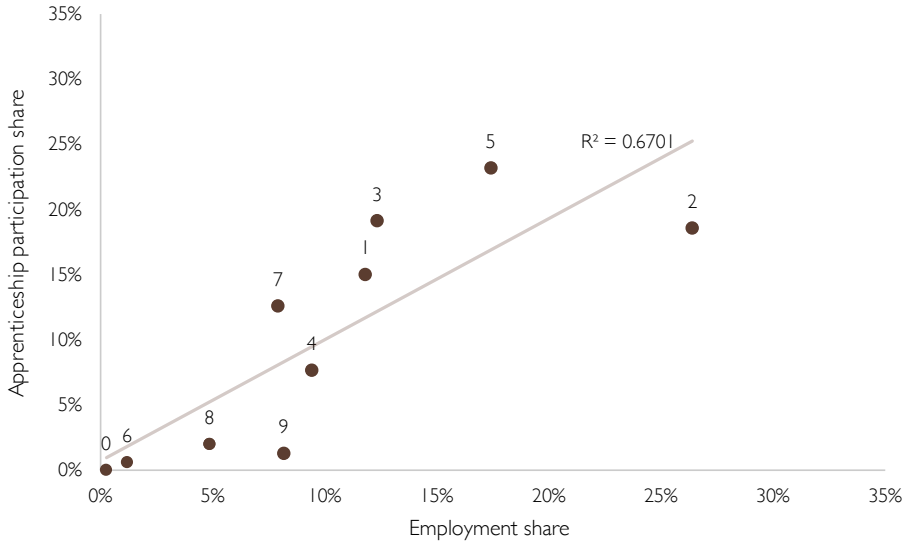


Chart 15: Apprenticeship participation compared with employment share by major ISCO group in England



SWITZERLAND: ANALYSIS OF COUNTRY SPECIFIC DATA

INTRODUCTION

Apprenticeships are deeply embedded in the Swiss economy and society. For school-leavers in Switzerland, apprenticeships are the norm – two-thirds of them enter the dual track after finishing compulsory education. In fact, many of Switzerland's most prominent politicians and business leaders entered the labour market as apprentices. Former President Ueli Maurer began as an apprentice commercial clerk at Hinwil, a farming cooperative. Sergio Ermotti, the CEO of Switzerland's largest bank until 2020, credits his time as an apprentice as an important factor in his career progression.[43] Even former Bayern Munich, Inter Milan and Liverpool footballer Xherdan Shaqiri was at one time an apprentice in Switzerland.[44]

Beyond incubating future presidents, banking leaders and international footballers, the Swiss apprenticeship system is more generally credited with keeping youth unemployment low. The share of young people not in education or employment in Switzerland is just 4.3%, below the OECD average of 6.7% and half the rate in the UK.[45] For many years, apprenticeships have offered young people routes into skilled work in Switzerland.

This report compares the types of occupations covered, mapping Swiss and English apprenticeships to the English labour market. It provides insight into how the types of occupations covered by apprenticeships might change if England moved towards a Swiss-style system, and whether these Swiss-style apprenticeships would neglect parts of the labour market currently covered by the English system.

The report provides context for apprenticeships in England and Switzerland, comparing apprenticeship participation, age, funding and levels. It compares the findings and provides key insights for policymakers in England.

CONTEXT

Overview of the Vocational Education and Training (VET) system in Switzerland

Vocational education in Switzerland is divided into two sections: upper secondary and professional tertiary. At the upper secondary level, students work towards federal diplomas and certificates in 240 subjects. Most learners at this level follow the dual-track approach – particularly in German speaking parts of the country – combining apprenticeship placements in host companies with one or two days a week of classroom instruction in vocational schools. This can be supplemented by branch courses, which take place in third party institutions and are intended to provide learners with essential practical skills.

43 Ermotti, S. (2014) *The Importance of being an apprentice*. Available at: https://www.linkedin.com/pulse/20140403142718-305585540-theory-and-practice-why-apprenticeships-matter/

44 Misicka, S. (2018) *Switzerland's top-scoring apprentices*. Available at: https://www.swissinfo.ch/eng/vocational-education_switzerland-s-top-scoring-apprentices-/44469850

45 OECD Data. *Youth not in employment, education or training (NEET)*. Available at: https://data.oecd.org/youthinac/youth-not-in-employment-education-or-training-neet.htm

One of the strengths in the Swiss system is the ability for VET students to progress from upper secondary to tertiary education. The Federal Vocational Baccalaureate – which can be taken alongside or after the federal diploma – enables entry to bachelor's and master's degree programmes in universities of applied sciences, or, for those who pass an aptitude test, can provide entry to Swiss universities.

The second tertiary VET option is professional education, which "imparts competences needed to handle challenging technical or managerial activities and provides the labour market with highly skilled workers."[46] This route is open to holders of a federal VET diploma or an equivalent upper secondary level qualification. In all, there are study programmes at professional education institutions for around 450 different occupations and they are designed to be completed part-time while in employment.[47]

However, these tertiary level options are not apprenticeships. The principal function of apprenticeships in Switzerland is to offer young people their first steps into skilled careers after leaving school. As such, and as this report will go on to show, the kinds of occupations covered by the Swiss system will necessarily be different to countries – such as England – where apprenticeships also cover the tertiary level. It is also important to consider that Swiss upper secondary VET is designed to be deliberately broad and to enable switching between topics, with career specialisation happening further down the line. In fact, the whole education system in Switzerland is set up for movement between different topics, with bridging courses being a common feature.

Participation

After adjusting for population size, apprenticeships are significantly more widespread in Switzerland than in England. In Switzerland there were 198,000 apprentices in 2020, approximately 2.3% of the population, compared with 719,000 in England, approximately 1.3% of the population.[48] Given these participation figures it is significant that the Swiss apprenticeship system is more focused in specific sections of the labour market.

Age

Almost half of all apprentices in England are 25 years of age or older (49.6%), 30.4% are 19-24 and 21% are under 19.[49] This is in sharp contrast to Switzerland, where apprenticeships are predominantly seen as the domain of school-leavers. In 2020, just 6.7% of apprentices in Switzerland were 25 or older, 31.7% were 19-24 and 61.6% were under 19.[50]

46 State Secretariat for Education, Research and Innovation (2021) Vocational and professional education and training in Switzerland – Facts and figures 2021. *Available at: https://www.sbfi.admin.ch/sbfi/en/home/services/publications/data-base-publications/vocational-and-professional-education-and-training-in-switzerland.html*

47 EURYDICE (2021) *Switzerland: programmes outside the bachelor and master structure*. Available at: https://eacea.ec.europa.eu/national-policies/eurydice/content/programmes-outside-bachelor-and-master-structure-108_en

48 The figure for Switzerland was obtained through author correspondence with the State Secretariat for Education, Research and Innovation. The figure for England is for the latest available, 2019/20. Source: Foley, N. (2021) *Briefing paper number 06113: Apprenticeship statistics*. London: House of Commons Library. Available at: https://researchbriefings.files.parliament.uk/documents/SN06113/SN06113.pdf

49 Data is for 2020/21 academic year. Available at: https://explore-education-statistics.service.gov.uk/find-statistics/apprenticeships-and-traineeships/2020-21

50 Figures obtained by the author through email correspondence with the Swiss Office fédéral de la statistique.

Apprentice wages

Apprentices in England who are under the age of 19 or are in their first year are entitled to a minimum wage of £4.30. Apprentices aged 19 or above and those who have completed their first year are entitled to the standard minimum wage for their age group: £6.56 for 18 to 20, £8.36 for 21 to 22 and £8.91 for 23 and over.

Unlike in England, there is no statutory minimum wage for apprentices in Switzerland, although sector-based trade associations recommend salary brackets for apprentices.[51] As such, comparisons of wage levels between the two countries are difficult. According to Glassdoor, the average annual apprentice salary in the UK is £19,300.[52] Swiss jobs website jobs.ch gives an average salary of 17,400 Swiss francs, or £13,700.[53] Comparison of these figures should be made with caution, but given the older average age of apprentices in England and the presence of degree apprenticeships it is not unreasonable to assume average wages will be higher.[54] This is corroborated by a study from the mid-2000s which found that apprentice base pay as a share of skilled worker base pay was 17.9% in Switzerland and 45.2% in Great Britain.[55]

Who pays for the system?

The apprenticeship system in Switzerland is largely devolved, while remaining underpinned by federal legislation. In terms of finance, about three-quarters of public funding for apprenticeships comes from the Cantons (districts).[56] The public sector is responsible for recruiting and training teachers, setting up and maintaining vocational schools and for all administrative costs for course development and student enrolment.

About 45% of the costs of the apprenticeship system in Switzerland are borne by the private sector, compared with an OECD average of 14%.[57] It is claimed this high level of financial investment ensures apprenticeship programmes are in line with labour market demand. Individual businesses are responsible for the training costs and salaries of apprentices, and business groups help finance training centres and specific courses in local areas.[58]

In England, large employers (those with a payroll over £3m per year) pay an apprenticeship levy, equivalent to 0.5% of the annual pay bill. This amount – plus a 10% top up from central government – can be used to pay for training carried out off-site by a training provider. Small employers pay 5% of these training costs, with the rest covered by central government. All employers are responsible for covering the wage costs and on-the-job training of their apprentices (excluding

51 ILO. *Tools: formulating apprenticeship agreements*. Available at: https://www.ilo.org/global/topics/apprenticeships/publications/toolkit/programme-and-project-level/preparing-training-places/formulating-apprenticeship-agreements/tools/lang--en/index.htm

52 As of 26 September 2021. Glassdoor (2021) *How much does a apprentice make*. Available at: https://www.glassdoor.co.uk/Salaries/apprentice-salary-SRCH_KO0,10.htm

53 As of 26 September 2021. Jobs.ch (2021) *Lohn für apprentice*. Available at: https://www.jobs.ch/en/salary/?canton=ch&term=apprentice

54 Note, the figure from jobs.ch uses the median. It is not clear whether the Glassdoor figure is mean or median. The jobs.ch figure is based on 699 salaries, compared with 1,072 for the Glassdoor figure. It is not clear the extent to which either is representative of the whole apprenticeship market.

55 Wagner, K. et al. (2011) *Financial aspects of apprenticeship training in Germany, Great Britain and Switzerland*. Available at: https://www.researchgate.net/publication/281725951_Financial_aspects_of_apprenticeship_training_in_Germany_Great_Britain_and_Switzerland

56 Apprenticeship Toolbox (2019) *Funding arrangements in Switzerland*. Available at: https://www.apprenticeship-toolbox.eu/financing/funding-arrangements/46-funding-arrangements-in-switzerland

57 Atkins, R. (2017) *Switzerland thrives on apprenticeship tradition*. Available at: https://www.ft.com/content/98e06036-d99b-11e7-a039-c64b1c09b482

58 Apprenticeship Toolbox (2019) *op cit.*

any Covid-19 financial aid measures). As such, the vast majority of the costs of apprenticeships are borne by businesses, especially large ones.

Apprenticeship levels

Apprenticeships in Switzerland range from Level 2 to Level 5 on the European Qualifications Framework (EQF) (UK Level 1 to 4). Federal certificates take two years to complete, while federal diplomas take three to four years. In 2019, over 90% of completions were for three- or four-year federal diplomas.[59] However, while diplomas tend to be at a higher level than certificates, there are exceptions. For example, there are federal certificates at Level 4 that take two years. Unfortunately, the Swiss government does not publish data on participation by level.

Apprenticeships in England have traditionally been categorised into three groups: intermediate (UK Level 2), advanced (UK Level 3) and higher (UK Level 4 and above). At each level different apprenticeships can have different durations, for example, a Level 3 Engineering Technician apprenticeship is expected to last three and a half years, more than twice that for Level 3 Retail Team Leader which is expected to last a year. This is less than the two years it takes to complete a federal certificate in Switzerland.

The presence of higher apprenticeships – including degree apprenticeships at UK Levels 6 and 7 – sets England apart from Switzerland, where there is no formal apprenticeship provision beyond the equivalent of a UK Level 4. However, participation in England is dominated by Level 2 (intermediate) and Level 3 (advanced) apprenticeships, which accounted for 26% and 45% of enrolments respectively in 2020/21.[60] Level 4 and 5 apprenticeships combined accounted for only 17% of enrolments and Levels 6 and 7 only 12%.

RESULTS OF LABOUR MARKET COMPARISON

The results describe the occupations covered by English and Swiss apprenticeships, as proxied by four-digit Standard Occupation Classification (SOC) codes. Note that where additional labour market information is included – size of workforce, number of skills shortage vacancies (SSVs) – this is based on data for England. In this sense, it is a measure of how coverage would theoretically change if England adopted the Swiss system. Brief analysis relating to both the English and Swiss labour markets is presented in ISCO-08 analysis for the UK and Switzerland.

It is important to note that some of the 244 Swiss apprenticeships contain multiple specialisms that students can follow. For example, a Commercial Employee apprentice can choose to specialise in the automotive trade, in banking or in a number of other routes. Depending on how they are defined, including specialisms boosts the number of courses to around 400. Rather than counting each specialism as an individual apprenticeship, the principal analysis only covers those listed as full apprenticeships on the government websites. This inevitably means fewer occupations are covered. However, additional mappings were conducted for the specialisms, and analysis for an expanded list of Swiss apprenticeships is included where appropriate.

59 State Secretariat for Education, Research and Innovation (2021) *op cit.*

60 When accessed, data for 2020/21 was for quarters 1-3 only. Data may be revised by DFE.

Headline coverage

The English apprenticeship system covers more than twice the share of occupations than covered by the Swiss system. Table 19 shows that English apprenticeships cover a larger share of every four-digit SOC code occupation group apart from elementary occupations. Coverage by the English system is especially comprehensive for associate professional and technical occupations; professional occupations; and skilled trades. Coverage by the Swiss system is highest for skilled trades. In fact, this is the only occupation group for which Swiss apprenticeships cover more than half of the occupations. As such, coverage by each system is most similar for skilled trades and for elementary occupations and least similar for professional occupations; associate professional and technical occupations; and administrative and secretarial occupations (Chart 16).

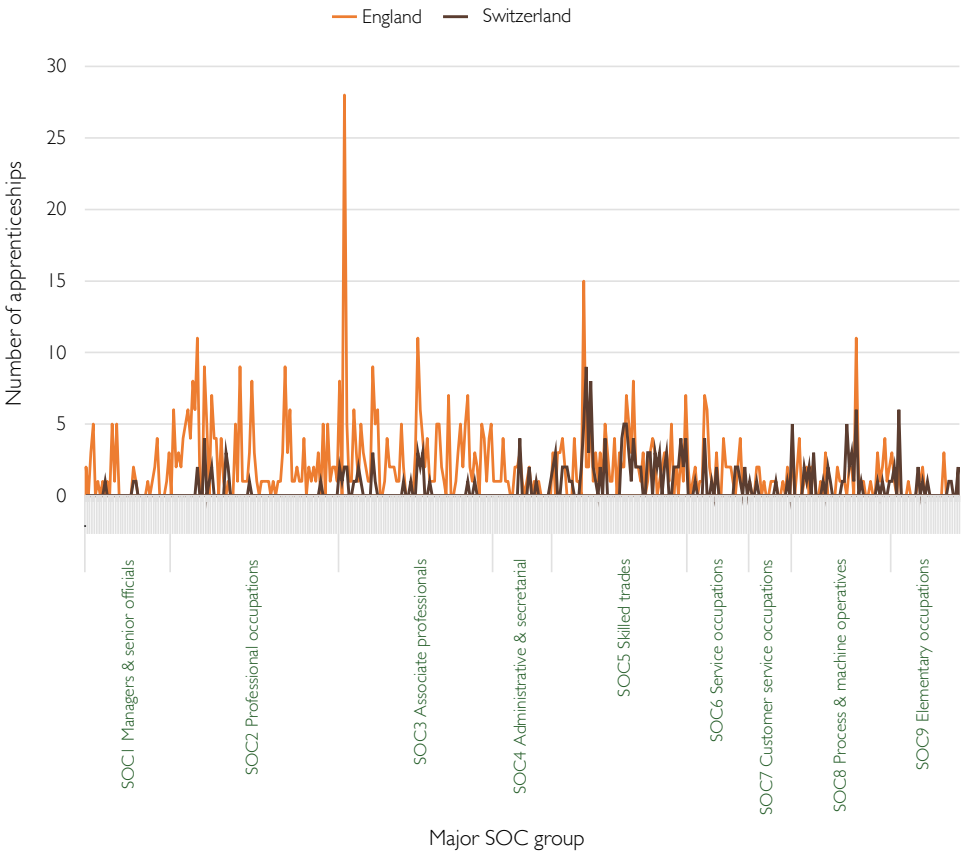
Table 19 shows that coverage of managerial and professional roles is low for Swiss apprenticeships, at just 8% and 11% respectively. This is not to say that VET in Switzerland as a whole does not cover these roles; there are many tertiary professional education courses that do. What it does show, however, is that apprenticeships are not generally used to cover these types of occupations.

Coverage by Swiss apprenticeships is only slightly higher under the expanded list including the specialisms: boosting the share of occupations covered from 30% to 33%. This suggests that different specialisms within the same apprenticeship programme often cover the same four-digit SOC code, this is unsurprising as the classifications at this level include multiple related occupations.

Table 19: Percentage of four-digit SOC code occupations covered by apprenticeships for each major SOC in England and Switzerland

SOC group	England	Switzerland
All	68%	30%
1: Managers, directors and senior officials	47%	8%
2: Professional occupations	82%	11%
3: Associate professional and technical occupations	83%	28%
4: Administrative and secretarial occupations	60%	16%
5: Skilled trades occupations	82%	67%
6: Caring, leisure and other service occupations	65%	31%
7: Sales and customer service occupations	50%	22%
8: Process, plant and machine operatives	62%	45%
9: Elementary occupations	28%	31%

Chart 16: Number of apprenticeships mapped to each 4-digit SOC code in England and Switzerland



That coverage by English apprenticeships is higher is partly due to there being more of them. For the purposes of this analysis, 731 English apprenticeship standards have been mapped to 251 SOC codes. For Switzerland, 244 apprenticeships have been mapped to 111 SOC codes. As such, the English system has approximately three times as many apprenticeships, but only covers approximately 2.3 times as many occupations, suggesting Swiss apprenticeships are less concentrated. This is confirmed by the fact that, excluding those that are not covered, each occupation is linked to an average of 2.9 English apprenticeships, compared with 2.2 Swiss apprenticeships.

However, including Swiss specialisms reverses this finding. The analysis mapped 403 specialisms to 121 occupations, meaning the extra 159 courses boosted coverage by only 10 four-digit SOC codes. As such, again excluding those that are not covered, each occupation is linked to an average of 3.3 Swiss apprenticeships. The failure of the extra 159 courses to significantly increase the number of occupations covered can in part be explained by the fact that, while the terms are used interchangeably in this report, in reality each four-digit SOC code can include multiple related occupations.

Table 20 suggests the structures of the two systems concentrate on different types of occupations. Nearly half (46%) of Swiss apprenticeships are mapped to skilled trades occupations. No other group accounts for more than one in six Swiss apprenticeships. The English system is more spread out, with 28% mapped to associate professional and technical roles, 26% to professional roles and 20% mapped to skilled trades. Overall, it appears that the Swiss system is designed to

concentrate on skilled trades, whereas the English system is intended to include professional occupations alongside skilled trades.

Table 20 also details the occupational distribution of apprenticeships for the expanded list of specialisms in the Swiss system. There are subtle shifts, including greater shares for managerial; associate professional and technical; administrative and secretarial; and sales and customer services roles. A lower share of apprenticeships is mapped to professional; skilled trades; process, plant and machine operatives; and elementary occupations. Despite these shifts, the key differences between England and Switzerland persist.

Table 20: Share of apprenticeships in each major SOC group in England and Switzerland

SOC group	England	Switzerland core	Switzerland spec.
1: Managers, directors and senior officials	5%	1%	5%
2: Professional occupations	26%	7%	4%
3: Associate professional and technical occupations	28%	12%	14%
4: Administrative and secretarial occupations	3%	3%	11%
5: Skilled trades occupations	20%	46%	38%
6: Caring, leisure and other service occupations	6%	6%	6%
7: Sales and customer service occupations	2%	2%	9%
8: Process, plant and machine operatives	8%	16%	11%
9: Elementary occupations	2%	7%	1%

Coverage weighted by participation

The analysis so far has focused on how the structure of both apprenticeship system maps onto the structure of the English labour market. This section of the report introduces participation measures, in terms of both apprenticeships and the labour market. Participation data for apprenticeships in Switzerland was obtained through correspondence with the State Secretariat for Education, Research and Innovation and covers total enrolments in 2020.[61] Participation in England is taken from the number enrolled in the first three-quarters of the 2020/21 academic year. The data will have been affected by the coronavirus pandemic and so should be interpreted with caution.

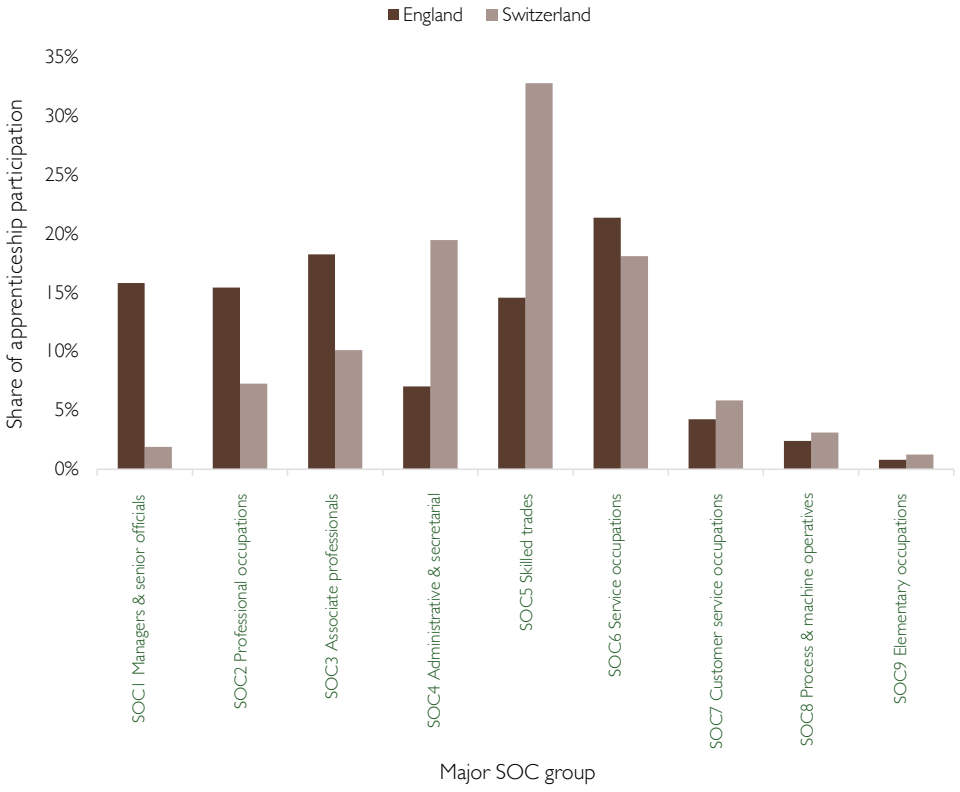
Including participation measures moderates the variation between major occupation groups within each system. This means that, in both countries, student choices are more evenly spread across occupation groups. In Switzerland, apprenticeships are not as concentrated in skilled trades, which has a third of participation but almost half of apprenticeships. This drop in concentration for skilled trades is distributed mainly between administrative and secretarial occupations (19% of participation) and caring, leisure and other service occupations (18% of participation). This has the effect of concentrating participation in the occupation groups in the middle of the SOC classification (groups 4-6), which produces a pyramid-like spike in Chart 17. However, this finding is highly sensitive to the 27,000 Commercial Employee apprentices that account for 15% of the total. These enrolments have been mapped to administrative and secretarial occupations.

61 Note that the data provided did not match well with the apprenticeship titles obtained from the government website. Around 1% of reported participation for 2020 is for apprenticeships that officially do not come into effect until 2022. There was also no data for around a quarter of Swiss apprenticeships, which may suggest they are not currently active.

The shape of participation does not significantly change when considering the expanded list of apprenticeship specialisms in Switzerland. The share mapped to skilled trades drops only 2 percentage points, from 33% to 31%, with a similar rise recorded for machine operatives (3% to 6%).

Apprenticeship participation in England is more evenly spread than when looking at coverage alone. The majority of participation is closely distributed between managerial; professional; associate professional and technical; skilled trades; and caring occupations – with each accounting for between 15 and 21% of the total. However, despite making the distribution of coverage more even within each system, weighting by participation does not make coverage within the two systems more similar. One clear difference in terms of participation is seen with managerial roles (SOC group 1). 16% of participation in England is mapped to managerial roles, compared with just 2% in Switzerland (Chart 17).

Chart 17: Share of apprenticeship participation for each major SOC group in England and Switzerland



Coverage compared with labour market demand

How do apprenticeship participation figures relate to estimates of labour market need? Table 21 includes the share of employment and the share of SSVs for the major SOC groups. It is important to remember when comparing apprenticeship participation to these figures that apprenticeships are not the only source of education or training. They also represent only a flow of skills, rather than the stock of skills in the economy. Nonetheless, insights can be gained from comparing the two different apprenticeship systems with the pattern of employment and skills shortages in England.

Table 21: Share of apprenticeship participation in England and Switzerland and the share of employment and SSVs in England for each major SOC group[62]

SOC group	Apprenticeships – England	Apprenticeships – Switzerland	Share of employment – England	Share of SSVs – England
1: Managers, directors and senior officials	16%	2%	12%	3%
2: Professional occupations	15%	7%	23%	19%
3: Associate professional and technical occupations	18%	10%	16%	12%
4: Administrative and secretarial occupations	7%	19%	10%	4%
5: Skilled trades occupations	15%	33%	9%	19%
6: Caring, leisure and other service occupations	21%	18%	9%	16%
7: Sales and customer service occupations	4%	6%	7%	6%
8: Process, plant and machine operatives	2%	3%	5%	9%
9: Elementary occupations	1%	1%	9%	11%

How would Swiss apprenticeship coverage match English labour market demand? As already discussed, Swiss participation is concentrated in skilled trades roles, with 33% of all apprentices in these occupations, compared with 15% for England. These roles account for 9% of employment and 19% of SSVs in England. Therefore, policymakers who believe apprenticeships are a valid route into all types of employment may conclude that the Swiss system is too concentrated in skilled trades roles, but that the English system better fulfils the need. However, policymakers of the opinion that apprenticeships should be a first step into careers in traditionally vocational jobs may conclude that it is more desirable for greater participation in skilled trades apprenticeships, with higher education focusing on professional and managerial roles – in this case, the Swiss model would be the better fit. Either way, it seems that both systems could increase their focus on process, plant and machine operative occupations. These roles account for

62 Employment data is for 2020 and is sourced from the *Annual population survey* via Nomis. SSV data is from the England dataset of the *Employer skills survey 2019*, available at: https://www.gov.uk/government/publications/employer-skills-survey-2019-england-results

9% of employment and 11% of SSVs in England, yet they make up just 3% of apprenticeship participation in Switzerland and 2% in England.

That the share of managerial roles in apprenticeship participation in England is higher than its share of employment (Chart 18) suggests the system may be misbalanced given that it is perhaps more traditionally the domain of higher education in the form of MBAs. This is especially true given that managerial positions accounted for only 3% of the SSVs in England, meaning the vast majority of skills shortages lie in other types of occupations (Chart 19).

Chart 18: Share of apprenticeship participation in England and Switzerland and share of employment in England for each major SOC group

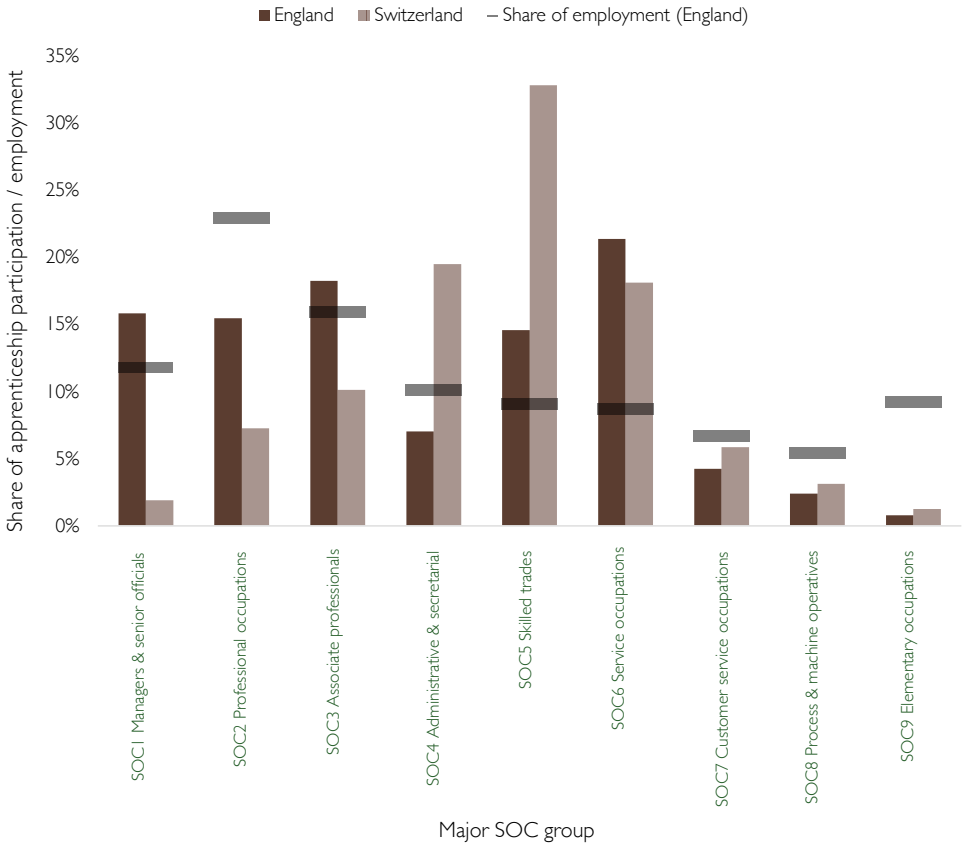
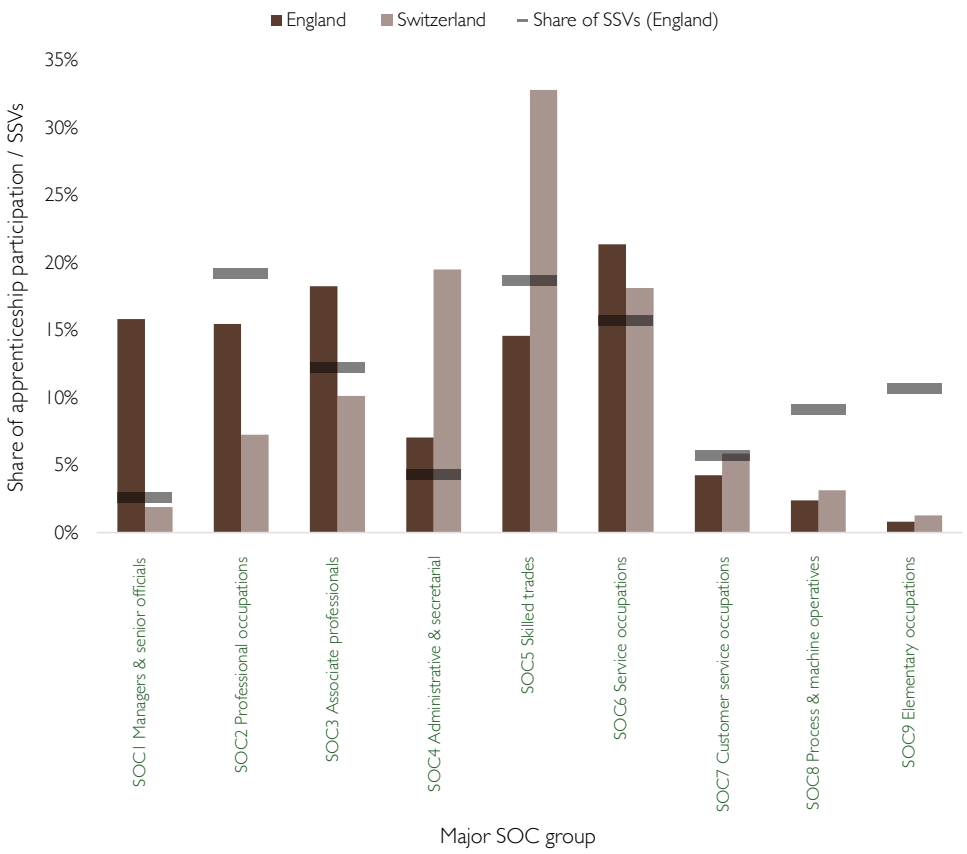


Chart 19: Share of apprenticeship participation in England and Switzerland and share of total SSVs in England for each major SOC group



The impact of degree apprenticeships

The analysis so far has suggested that apprenticeships in England are more concentrated in professional and managerial positions, and less concentrated in skilled trades occupations, than their Swiss equivalents. Is it possible that these differences are related to degree apprenticeships in England at Levels 6 and 7?

Removing degree apprenticeships from the data does reduce some of the differences between the two systems, but not significantly so.[63] There is greater correlation between the Swiss system and the English system without degree apprenticeships both in terms of share of apprenticeships and participation in apprenticeships. Yet, clearly significant differences remain.

The share of English apprenticeships mapped to professional roles is still more than double that for Swiss apprenticeships – and the gap in the share mapped to associate professional and technical occupations increases (Table 22).

63 The analysis includes both integrated degree apprenticeships and non-integrated degree apprenticeships in the category England WDA in Tables 22 and 23. Note, however, that there are some apprenticeships at Levels 6 and 7 which are nonetheless classed by IFATE as 'non-degree qualifications' and so are included in the England WDA figures. There are 50 of these non-degree qualifications.

Table 22: Percentage of four-digit SOC code occupations covered by apprenticeships for each major SOC group and the share of apprenticeships in each major SOC group for Switzerland and England with and without degree apprenticeships (England WDA)

	% coverage			Share of apprenticeships		
SOC group	England	England WDA	Switzerland	England	England WDA	Switzerland
All	68%	64%	30%	-	-	-
1: Managers, directors and senior officials	47%	44%	8%	5%	4%	1%
2: Professional occupations	82%	63%	11%	26%	16%	7%
3: Associate professional and technical occupations	83%	82%	28%	28%	31%	12%
4: Administrative and secretarial occupations	60%	60%	16%	3%	4%	3%
5: Skilled trades occupations	82%	82%	67%	20%	23%	46%
6: Caring, leisure and other service occupations	65%	65%	31%	6%	7%	6%
7: Sales and customer service occupations	50%	50%	22%	2%	2%	2%
8: Process, plant and machine operatives	62%	62%	45%	8%	9%	16%
9: Elementary occupations	28%	28%	31%	2%	4%	7%

Removing English degree apprenticeships from participation data (Table 23) has little affect and the difference in participation in managerial roles remains, even after removing degree apprenticeships. This is because the Team Leader standard, which is responsible for around half of participation in apprenticeships linked to managerial roles, is a Level 3 qualification and not a degree apprenticeship.

Table 23: Share of apprenticeship participation in Switzerland and England with and without degree apprenticeships (England WDA)

SOC group	England	England WDA	Switzerland
1: Managers, directors and senior officials	16%	16%	2%
2: Professional occupations	15%	12%	7%
3: Associate professional and technical occupations	18%	18%	10%
4: Administrative and secretarial occupations	7%	8%	19%
5: Skilled trades occupations	15%	16%	33%
6: Caring, leisure and other service occupations	21%	23%	18%
7: Sales and customer service occupations	4%	5%	6%
8: Process, plant and machine operatives	2%	3%	3%
9: Elementary occupations	1%	1%	1%

KEY POLICY INSIGHTS

This report has examined how the labour market coverage of apprenticeships in England would change if it moved towards a Swiss-style system. It has shown that the types of occupations covered by each system differ significantly. As such, there is much to be gained from comparison of apprenticeships in England and Switzerland. The key policy insights are:

Coverage

- **Fewer apprenticeships means lower coverage**. Switzerland's 244 apprenticeship standards mean it covers a smaller share of occupations (30%) than England's 731 (68%). The English system covers more roles in every occupation group except elementary roles. The high number of courses also means English coverage can be more concentrated. The occupations covered by the English system have an average of 2.9 courses mapped to them, compared with 2.2 for the Swiss system.

- **Sharper focus on a smaller range of occupations**. The Swiss apprenticeship system is highly focused on skilled trades roles. Nearly half (46%) of all apprenticeships are mapped to occupations in this group. Of the other eight occupation groups, the next largest share is for process, plant and machine operatives with 16%. English apprenticeships are more evenly spread with no one occupation group accounting for more than 28% of apprenticeships. The groups with the biggest shares are associate professional and technical occupations (28%) and professional occupations (26%).

- **A traditional definition of apprenticeships**. Historically, apprenticeships have prepared young people for occupations in skilled trades and in process, plant and machine operative roles. These two groups account for 62% of all apprenticeships in Switzerland, but only 28% in England. Conversely, managerial; professional; and associate professional and technical occupations account for only 20% of apprenticeships in Switzerland, but 59% in England.

Participation

- **Including participation data smooths the sharp edges within each system but does not bring them closer together.** Weighting coverage by apprenticeship participation makes each system more evenly spread across different occupation groups. However, having smoother edges does not make the two systems more similar. In fact, the correlation in the share of apprenticeships mapped to each occupation group decreases slightly when weighting by participation.

- **Low numbers of managerial apprentices in Switzerland.** Just 2% of participation in Switzerland is mapped to managerial roles, compared with 16% in England. This difference is not explained by degree apprenticeships in England, as the majority of managerial occupation participation is for the Level 3 Team Leader standard. Beyond managerial roles, removing degree apprenticeships reduces the differences between the two systems, but not significantly.

- **Evaluations of success depend on the goals of the apprenticeship system.** If the goal of apprenticeships is to provide a valid route into a wide variety of roles, this would suggest that the Swiss system focuses too much on skilled trades compared with the levels of employment and SSVs in England. However, if the goal is to train people in skilled trades because this is what apprenticeships are inherently more suitable for, then the English system should focus more on these

roles rather than professional occupations. It may be cause for concern that the share of participation in apprenticeships in managerial roles in England is greater than both the share of employment and SSVs.

CONCLUSION

This section has compared the types of occupations covered by the Swiss and English systems, highlighting significant differences. While England's apprenticeship system covers a wider variety of occupations, the Swiss system has a tighter focus, principally on skilled trades.

Driving these differences in coverage are differences in the stated purpose for the two systems. In England, apprenticeships are seen as a valid training route both for already skilled adults and for young people leaving school taking their first steps in the skilled labour market. Conversely, in Switzerland they are used for the latter far more than the former. That is not to say VET for already skilled Swiss adults does not exist. On the contrary, Switzerland has a thriving tertiary VET sector that covers the parts of the labour market apprenticeships do not. Yet it is notable that the types of occupations that apprenticeships are deemed suitable for differ significantly between the two countries.

Even after removing English degree apprenticeships from the analysis, the differences remain strong. In fact, some standards at Level 3 drive high participation in apprenticeships linked to managerial roles in England. As such, it is not a simple case of upper secondary versus tertiary. The differences in coverage between English and Swiss apprenticeships transcend qualification levels. They speak to differing conceptions of the types of roles apprenticeships are suitable for. As such, implementing a Swiss-style system would mean a significant change of direction in England.

ISCO-08 ANALYSIS FOR THE UK AND SWITZERLAND

Analysis of the differences between the English and Swiss labour markets uses data from the International Labour Organization's (ILO's) International Standard Classification of Occupations (ISCO).[64]

There are important similarities and also differences in the structure of employment in the UK and Switzerland (Table 24). Around a quarter of employment in both countries is concentrated in professional roles and around 5% in plant and machine operators and assemblers. However, around 12% of employment in England is in managerial roles, compared with 7% in Switzerland. England also has a greater share of employment in services and sales workers (17% compared with 14% in Switzerland) and elementary occupations (8% compared with 5%). Swiss employment is more concentrated in technician and associate professional roles (16% compared with 12% in England), clerical support workers (13% compared with 9%) and craft workers (11% compared with 8%).

Table 24: Employment share by major ISCO-08 group in the UK and Switzerland [65]

ISCO group description	1-digit ISCO code	UK	Switzerland
Armed forces occupations	0	0%	0%
Managers	1	12%	7%
Professionals	2	26%	26%
Technicians and associate professionals	3	12%	16%
Clerical support workers	4	9%	13%
Services and sales workers	5	17%	14%
Skilled agricultural, forestry and fishery workers	6	1%	3%
Craft and related trades workers	7	8%	11%
Plant and machine operators and assemblers	8	5%	4%
Elementary occupations	9	8%	5%

Mapping Swiss and English apprenticeships to four-digit ISCO codes gives broadly comparable findings to the SOC2010 analysis. Table 25 shows that having more apprenticeships means England covers a larger share of occupations than Switzerland (47% compared with 27%), especially for professional roles (60% compared with 10%). The ISCO mappings suggest English apprenticeships are more focused on managerial; professional; technical and associate professional; and services and sales roles in terms of available standards (Table 26) and on professional; and technical and associate professional roles in terms of participation (Table 27). Swiss apprenticeships are generally more concentrated in craft roles.

64 Mappings to ISCO broadly follow the methodology used to map Swiss apprenticeships to SOC2010, combining CASCOT and manual inspection.

65 Data is latest available, 2019. Source: ILO Data Explorer. Available at: https://ilostat.ilo.org/data/

Table 25: Percentage of four-digit ISCO code occupations covered by apprenticeships for each major group in England and Switzerland

ISCO group description	1-digit ISCO code	England	Switzerland
All	All	47%	27%
Armed forces occupations	0	25%	0%
Managers	1	33%	1%
Professionals	2	60%	10%
Technicians and associate professionals	3	59%	10%
Clerical support workers	4	35%	4%
Services and sales workers	5	48%	8%
Skilled agricultural, forestry and fishery workers	6	23%	4%
Craft and related trades workers	7	57%	46%
Plant and machine operators and assemblers	8	29%	9%
Elementary occupations	9	20%	7%

Table 26: Share of apprenticeships mapped to each major ISCO group in England and Switzerland

ISCO group description	1-digit ISCO code	England	Switzerland
Armed forces occupations	0	0%	0%
Managers	1	5%	6%
Professionals	2	29%	8%
Technicians and associate professionals	3	29%	22%
Clerical support workers	4	4%	5%
Services and sales workers	5	7%	10%
Skilled agricultural, forestry and fishery workers	6	2%	3%
Craft and related trades workers	7	18%	34%
Plant and machine operators and assemblers	8	4%	7%
Elementary occupations	9	4%	5%

Table 27: Share of apprenticeship participation mapped to each major ISCO group in England and Switzerland

ISCO group description	1-digit ISCO code	England	Switzerland
Armed forces occupations	0	0%	0%
Managers	1	15%	2%
Professionals	2	19%	10%
Technicians and associate professionals	3	19%	11%
Clerical support workers	4	8%	19%
Services and sales workers	5	23%	25%
Skilled agricultural, forestry and fishery workers	6	1%	4%
Craft and related trades workers	7	13%	27%
Plant and machine operators and assemblers	8	2%	2%
Elementary occupations	9	1%	1%

There is evidence that the apprenticeship system in England more closely follows the shape of the UK labour market than the Swiss system follows the Swiss labour market, this is indicated by the higher R-squared value in Chart 21 than that in Chart 20. Chart 20 shows that the share of apprenticeship participation in Switzerland for craft and related trades workers (point 7); services and sales workers (point 5); and clerical support workers (point 4) is significantly higher than the share of employment. Whereas participation in professional roles (point 2) is significantly lower than its share of employment in Switzerland. The relationship between employment and apprenticeship participation share is a tighter fit in England (Chart 21).

Chart 20: Apprenticeship participation compared with employment share by major ISCO group in Switzerland

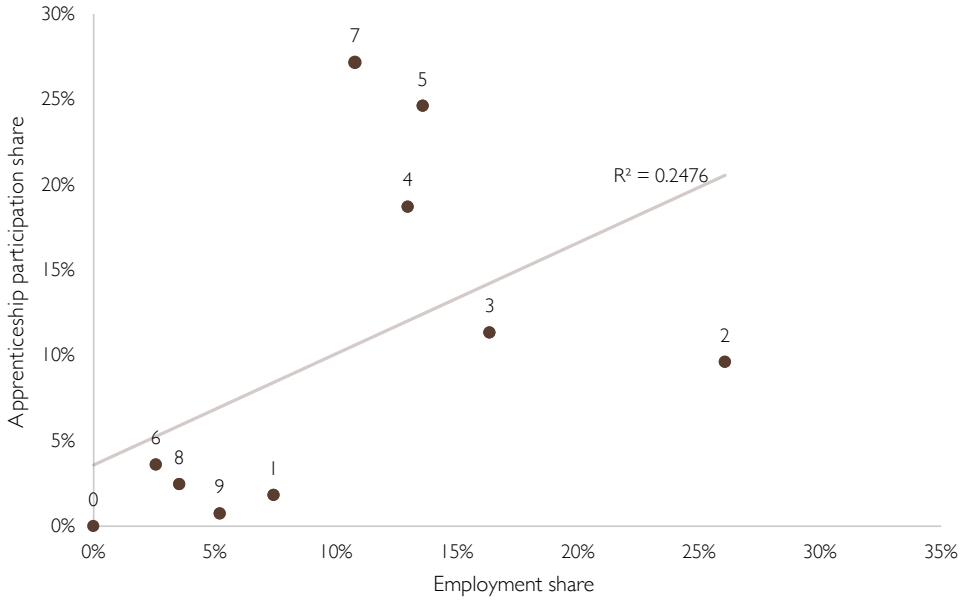
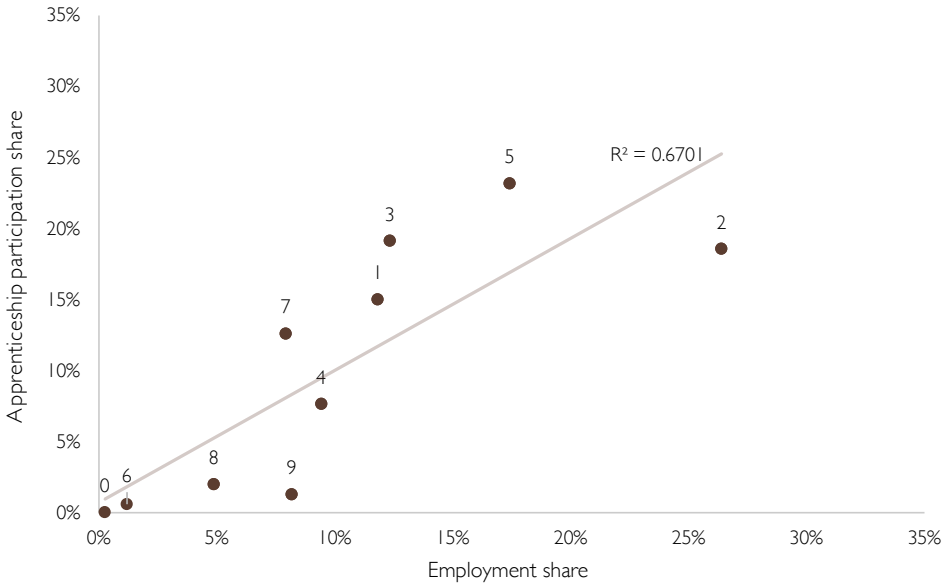


Chart 21: Apprenticeship participation compared with employment share by major ISCO group in England



GERMANY: ANALYSIS OF COUNTRY SPECIFIC DATA

INTRODUCTION

In debates about technical education policy, it is often argued that the English system should strive to become more like the German system. While in office, the former Education Secretary Gavin Williamson spoke of his desire "to build a world-class, German-style further education system in Britain, and level up skills and opportunities."[66]

Germany's apprenticeship training is occupationally focused, the direction English apprenticeship policy has been moving in since the Richard Review.[67] This report maps English and German apprenticeships to occupations in the English labour market and compares coverage, highlighting where the systems diverge. It explores any gaps in the English system that could be filled by adopting a German approach to apprenticeships. It also investigates whether English standards have expanded into areas of the labour market that a German-style system would consider beyond the remit of apprenticeships. By answering these types of questions, policymakers will be better able to ensure apprenticeship standards play an effective role in the English skills system.

The report provides context for apprenticeships in Germany and England, comparing apprenticeship participation, age, funding and levels. It compares findings and provides key insights for policymakers in England.

CONTEXT

Overview of the Vocational Education and Training (VET) system in Germany

Vocational education starts at the upper secondary level in Germany. While school-based provision does exist at this level, the work-based dual system (apprenticeships) – for which Germany is renowned – dominates, with around 75% of upper secondary VET students following this path.[68] For both pathways, common standards are guaranteed through the completion of final exams that are regulated by law and delivered by the various chambers of commerce.

Upon completion of the apprenticeship, learners achieve a highly valued vocational qualification, allowing them to enter the labour market as skilled workers. Progression to VET courses at higher levels is also possible. There are three types of advanced vocational courses, running from European Qualifications Framework (EQF) Level 5 to 7: professional specialist, professional bachelor's, and professional master's.[69] The new Vocational Training Act of 2020 introduced professional bachelor's and master's programmes in an effort to "underline the equivalence of vocational training and studies" with academic courses.[70] They are also designed to allow for combination with and transfer between academic courses, emphasising flexibility and fluidity.

66 The Rt Hon Gavin Williamson CBE MP (2020) *Education Secretary FE speech with Social Market Foundation*. Available at: https://www.gov.uk/government/speeches/education-secretary-fe-speech-with-social-market-foundation

67 Richard, D. (2012) *The Richard review of apprenticeships*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/34708/richard-review-full.pdf

68 European Centre for the Development of Vocational Training (Cedefop) (2020) *Vocational education and training in Germany: Short description*. Available at: https://www.cedefop.europa.eu/files/4184_en.pdf

69 *Ibid.*

70 Bundesinstitut für Berufsbildung (2021a) *„Bachelor Professional" und „Master Professional" erstmals in acht Fortbildungsverordnungen verankert*. Available at: https://www.bibb.de/de/134236.php

As they are not apprenticeships, these higher-level vocational qualifications are not included in the data presented in this report. As such, any gaps identified in the labour market coverage of German apprenticeships do not imply gaps in the coverage of all vocational courses.

Participation

After adjusting for population size, the difference in participation in apprenticeships in Germany and England appears to be relatively small. There were 1.33 million apprentices in Germany in 2018 (approximately 1.6% of the population), compared with 742,000 in England (approximately 1.3% of the population).[71]

Age

Apprentices in Germany tend to be young, and it is common for students to move directly into an apprenticeship after finishing high school. According to the Federal Institute for Vocational Education and Training (BIBB), over half (54.5%) of the 2018 school cohort started an apprenticeship in Germany.[72] This compares to just 5.5% of 16- to18-year-olds in England participating in an apprenticeship in 2018/2019.[73] 87.5% of apprentices signing contracts in Germany in 2018 were aged 23 or younger, whereas in England 54% of those starting an apprenticeship in 2018/19 were under the age of 25.[74]

Who pays for the system and how much do apprentices earn?

The apprenticeship system in Germany is jointly financed by the public and private sector.[75] The majority of training that takes place away from the workplace (ie in vocational schools) is financed by the *Länder* (Federal States), with some costs covered by municipal governments and the Federal Ministry of Education and Research. All workplace costs of the apprenticeship are borne by the employer. This includes the apprentice's salary, which is set through collective agreements between social partners (employer groups and trade unions) at the sector level. It was not until January 2020 that a minimum wage was introduced for apprentices – set at €515 a month in the first year.[76] However, the average apprentice salary is much higher at €795 per month.[77] Salaries are generally set through collective bargaining agreements, but any firms not part of these agreements can pay wages that are 20% lower.

In England, large employers (those with a payroll over £3m per year) pay an apprenticeship levy, equivalent to 0.5% of the annual pay bill. This amount – plus a 10% top up from central government – can be used to pay for training carried out off-site by a training provider. Small employers pay 5% of these training costs, with the rest covered by central government. All employers are responsible for covering the wage costs and on-the-job training of their apprentices (excluding

71 Foley, N. (2021) *Briefing paper number 06113: Apprenticeship statistics*. London: House of Commons Library. Available at: https://researchbriefings.files.parliament.uk/documents/SN06113/SN06113.pdf

72 Bundesinstitut für Berufsbildung (2020a) *Datenreport zum Berufsbildungsbericht 2020: Informationen und Analysen zur Entwicklung der beruflichen Bildung*. Available at: https://www.bibb.de/dokumente/pdf/bibb_datenreport_2020.pdf

73 Data accessed via *National Statistics: Apprenticeships and traineeships*. Available at: https://explore-education-statistics.service.gov.uk/find-statistics/apprenticeships-and-traineeships/2020-21

74 The German data is from Bundesinstitut für Berufsbildung (2020a) *op cit*. The English data can be accessed via *National Statistics: Apprenticeships and traineeships*. Available at: https://explore-education-statistics.service.gov.uk/find-statistics/apprenticeships-and-traineeships/2020-21

75 For a more in-depth explanation of apprenticeship funding in Germany see Voss, E. & Schöneberg, K. (2018) *Germany: Policy developments on apprenticeship*. Available at: https://euagenda.eu/upload/publications/untitled-185267-ea.pdf

76 L&E Global (2019) *Germany: Wide minimum wage for apprentices will come into force by 2020*. Available at: https://knowledge.leglobal.org/germany-wide-minimum-wage-for-apprentices-will-come-into-force-by-2020/

77 Voss, E. & Schöneberg, K. (2018) *op cit*.

any Covid-19 financial aid measures). As such, the vast majority of the costs of apprenticeships are borne by businesses, especially large ones.

Apprentices in England who are under the age of 19 or are in their first year are entitled to a minimum hourly wage of £4.30. Apprentices aged 19 or above and those who have completed their first year are entitled to the standard minimum wage for their age group: £6.56 an hour for 18 to 20, £8.36 for 21 to 22 and £8.91 for 23 and over. Direct comparisons with German apprentices are difficult, but assuming English apprentices are paid for a 35-hour week, this would suggest a rough minimum wage of €1,100-1,500 per month (depending on age).[78] According to Glassdoor, the average apprentice salary in the UK is around €1,900 a month, although this may reflect the older average age of apprentices in England and the presence of degree apprenticeships.[79]

Apprenticeship levels

The majority (94%) of German apprentices study at Level 4 under the German qualification framework (DQR), which usually takes three to three and a half years to complete and is roughly equivalent to a UK Level 3.[80] The remaining apprentices (6%) study at DQR Level 3, which takes two years to complete and is equal to a UK Level 2. While these are the typical lengths of apprenticeships in Germany, apprentices who do particularly well during training can reduce the duration by six months, as can learners with a university access diploma.

Apprenticeships in England have traditionally been categorised into three groups: intermediate (UK Level 2), advanced (UK Level 3) and higher (UK Level 4 and above). At each level different apprenticeships can have different durations, for example, a Level 3 Engineering Technician apprenticeship is expected to last three and a half years, more than twice that for Level 3 Retail Team Leader which is expected to last a year. In general English apprenticeships are shorter than those in Germany.

While intermediate and advanced apprenticeships are of a similar level to those in Germany, the presence of higher apprenticeships – including degree apprenticeships at UK Levels 6 and 7 – sets England apart from Germany. Vocational provision at these levels does exist in Germany, and there are some attempts to introduce something akin to a degree apprenticeship, but these are not well established. However, participation in England is dominated by Level 2 (intermediate) and Level 3 (advanced) apprenticeships, which accounted for 26% and 45% of enrolments respectively in 2020/21.[81] Level 4 and 5 apprenticeships combined accounted for only 17% of enrolments and Levels 6 and 7 only 12%.

And so, despite the presence of higher-level apprenticeships in England but not in Germany, the majority of apprentices study at similar levels in both countries. However, this may change in the not-too-distant future as participation rates in higher-level apprenticeships grow quickly from their small base.

78 This is calculated by multiplying the minimum wage by 35 for hours worked per week and then multiplying for four working weeks in a month, which is a slight underestimate. Conversion to euros assumes 1.18 euros to the pound.

79 Glassdoor (2021) *How much does a apprentice make*. Available at: https://www.glassdoor.co.uk/Salaries/apprentice-salary-SRCH_KO0,10.htm

80 Figure based on analysis of data from Bundesinstitut für Berufsbildung (2020b) *Verzeichnis der anerkannten Ausbildungsberufe 2020*. Available at: https://www.bibb.de/dienst/veroeffentlichungen/de/publication/show/16754

81 When accessed, data for 2020/21 was for quarters 1-3 only. Data may be revised by DFE.

RESULTS OF LABOUR MARKET COMPARISON

The results compare the occupations covered by English apprenticeships and German apprenticeships proxied by four-digit Standard Occupation Classification (SOC) codes. Note that where additional labour market information is included – size of workforce, number of skills shortage vacancies (SSVs) – this is based on data for England. In this sense, it is a measure of how coverage would theoretically change if England adopted the German system. Brief analysis relating to the German labour market is presented in ISCO-08 analysis for the UK and Germany.

Headline coverage

The English apprenticeship system covers a greater proportion of the English labour market than the German system. Table 28 shows that more than two-thirds of four-digit SOC code occupations are covered by at least one English apprenticeship standard, but only a third are covered by at least one German apprenticeship. Coverage of English standards is particularly high for professional occupations (82%), associate professional and technical occupations (83%) and skilled trades occupations (82%). For German apprenticeships, coverage of occupations is highest in skilled trades (65%) and process, plant and machine operatives (50%). Differences in coverage between the two systems are largest for professional occupations (82% compared with 7%) and smallest for elementary occupations (28% compared with 28%).

Table 28: Percentage of four-digit SOC code occupations covered by apprenticeships for each major SOC group in England and Germany

SOC group	England	Germany
All	68%	33%
1: Managers, directors and senior officials	47%	6%
2: Professional occupations	82%	7%
3: Associate professional and technical occupations	83%	35%
4: Administrative and secretarial occupations	60%	40%
5: Skilled trades occupations	82%	65%
6: Caring, leisure and other service occupations	65%	35%
7: Sales and customer service occupations	50%	28%
8: Process, plant and machine operatives	62%	50%
9: Elementary occupations	28%	28%

This higher level of coverage across the board is at least partly because of the larger number of apprenticeship standards in England. For the purposes of this analysis, 731 English apprenticeship standards are mapped to SOC codes, compared with 482 German apprenticeships, including specialisms.[82] Of these 482, 44% are mapped to skilled trades occupations, compared with just 20% of English standards (see Table 29). Differences in the share of apprenticeships for professional occupations are evident. Over a quarter of English apprenticeship standards are mapped to professional occupations compared with just 1% of German apprenticeships.

82 Note, there are 39 standards for which there are two versions (usually listed by IFATE as version 1 and version 1.1). Given that some standards with two versions are mapped by IFATE to different occupations, this report treats them as different standards. If two versions were treated as one standard there would be 701 in total.

Table 29: Share of apprenticeships in each major SOC group in England and Germany

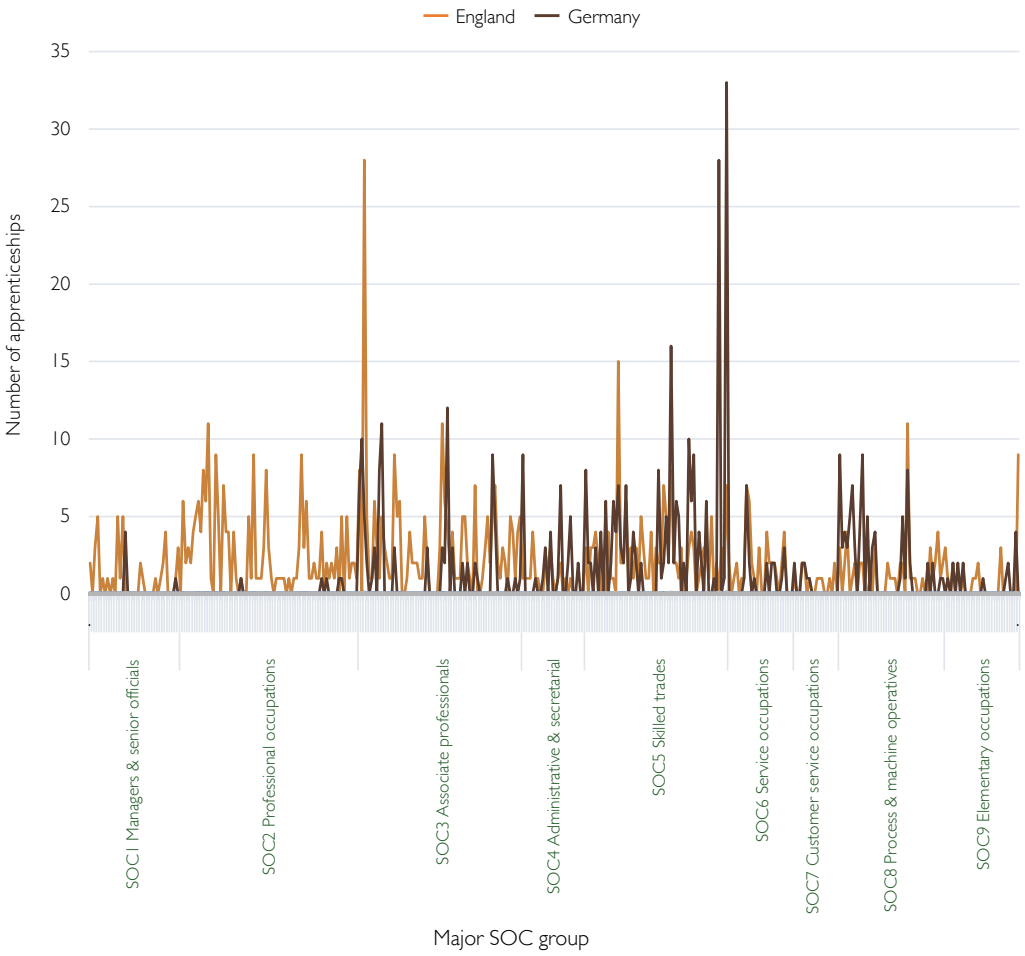
SOC group	England	Germany
1: Managers, directors and senior officials	5%	1%
2: Professional occupations	26%	1%
3: Associate professional and technical occupations	28%	20%
4: Administrative and secretarial occupations	3%	7%
5: Skilled trades occupations	20%	44%
6: Caring, leisure and other service occupations	6%	4%
7: Sales and customer service occupations	2%	2%
8: Process, plant and machine operatives	8%	17%
9: Elementary occupations	2%	3%

The greater number of standards naturally means that, on average, each four-digit SOC code has more English apprenticeships mapped to it than German ones. The average (mean) number of standards mapped to each four-digit SOC code is 2 for England, compared with 1.3 German apprenticeships. While the English system has 54% more apprenticeships, it covers 108% more four-digit SOC codes, meaning that the German system covers fewer occupations even after accounting for the smaller number of different apprenticeships. This shows that the German system is designed to focus on specific areas of the labour market, whereas the English system has a broader spread. This is reflected in the fact that for those occupations that are covered by each system, there are an average (mean) of 2.9 English apprenticeships and 4 German apprenticeships.[83] The sharper focus is shown in Chart 22, where Germany has fewer but on average higher peaks. In contrast, England's peaks are more widespread and are generally at a lower level, despite the fact there are far more apprenticeships overall. The three occupations with the most apprenticeships mapped to them for both countries can be seen in the Appendix.

Driving these findings is – in large part – the fact that apprenticeships in Germany are designed to provide a first step into skilled work. It is unsurprising, therefore, that they largely do not cover managerial and professional occupations, for which higher-level qualifications are usually a requirement. That is not to say there is no vocational provision in Germany that covers these occupations – professional bachelor's and master's courses certainly do. But it is noteworthy that apprenticeships serve different functions in England and Germany.

83 This difference is only partly due to the presence of 'Industry and Commerce' and 'Craft' versions of some German apprenticeships in the data. Merging these reduces the 4 figure to 3.4, still significantly above 2.9 in England.

Chart 22: Number of apprenticeships mapped to each 4-digit SOC code in England and Germany



Coverage weighted by participation

So far the analysis has focused on how the structure of German and English apprenticeships maps to the structure of the English labour market. This section of the report introduces participation measures, in terms of both apprenticeships and the labour market. Participation in the German system is given by the number of learners in 2018, indicated in the BIBB's list of recognised vocational training occupations 2020.[84] Participation in England is taken from the number enrolled in the first three-quarters of the 2020/21 academic year. The data will have been affected by the coronavirus pandemic and so should be interpreted with caution.

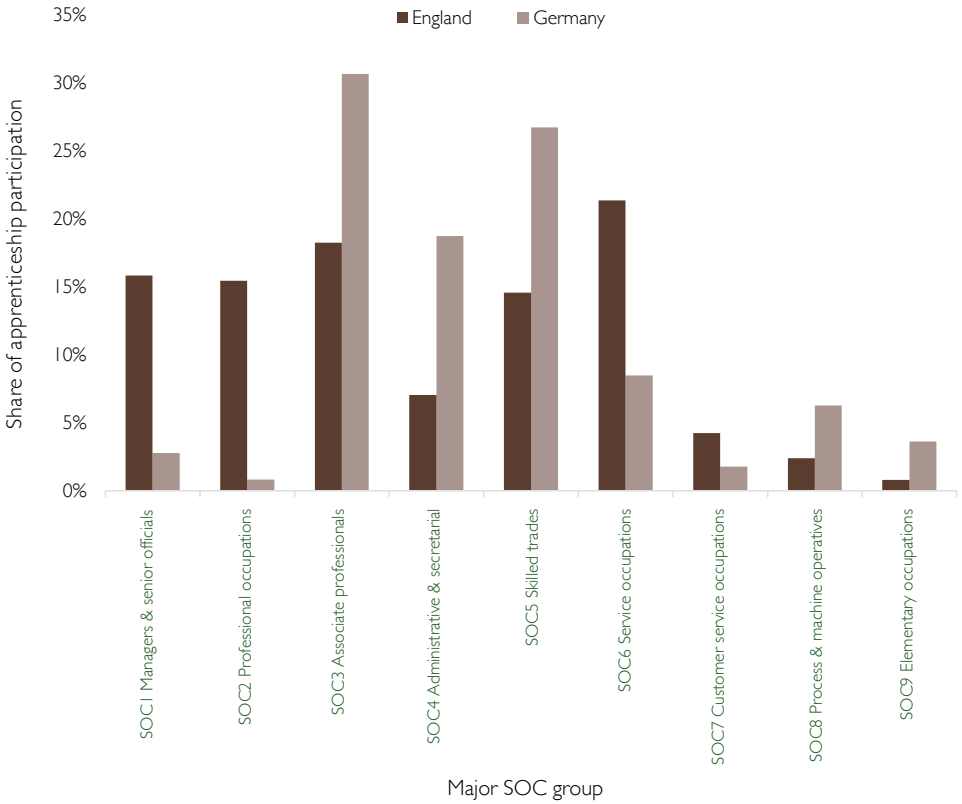
Table 30 details the share of apprenticeship participation in England and Germany mapped to major SOC groups. The overall effect of weighting by participation is to smooth some of the differences seen in terms of coverage displayed in Table 29. However, the observation that the English system covers more of the labour market, while the German system concentrates on specific occupation groups still holds, as illustrated in Chart 23.

84 Bundesinstitut für Berufsbildung (2020b) *op cit.*

Table 30: Share of apprenticeship participation in England and Germany and the share of employment and SSVs in England for each major SOC group[85]

SOC group	Apprenticeships – England	Apprenticeships – Germany	Share of employment – England	Share of SSVs – England
1: Managers, directors and senior officials	16%	3%	12%	3%
2: Professional occupations	15%	1%	23%	19%
3: Associate professional and technical occupations	18%	31%	16%	12%
4: Administrative and secretarial occupations	7%	19%	10%	4%
5: Skilled trades occupations	15%	27%	9%	19%
6: Caring, leisure and other service occupations	21%	8%	9%	16%
7: Sales and customer service occupations	4%	2%	7%	6%
8: Process, plant and machine operatives	2%	6%	5%	9%
9: Elementary occupations	1%	4%	9%	11%

Chart 23: Share of apprenticeship participation for each major SOC group in England and Germany



85 Employment data is for 2020 and is sourced from the *Annual population survey* via Nomis. SSV data is from the England dataset of the *Employer skills survey 2019*, available at: https://www.gov.uk/government/publications/employer-skills-survey-2019-england-results

More than three-quarters of apprentices in Germany can be linked to three groups: associate professional and technical occupations; administrative and secretarial; and skilled trades occupations. Participation in English standards, on the other hand, is more evenly spread across the major occupation groups, spiking at 21% for caring, leisure and other service occupations. Again, managerial and professional roles stand out. Over 30% of participation in English apprenticeships is in standards mapped to managerial and professional roles, compared with just 4% in Germany. The proportion mapped to skilled trades roles – thought of as more traditionally suited to apprenticeships – is just over half the share of that in Germany.

Coverage compared with labour market demand

How do apprenticeship participation figures relate to estimates of labour market need? Table 30 includes the share of employment and the share of SSVs for the major SOC groups. It is important to remember when comparing apprenticeship participation to these figures that apprenticeships are not the only source of education or training. They also represent only a flow of skills, rather than the stock of skills in the economy. Nonetheless, insights can be gained from comparing the two different apprenticeship systems with the pattern of employment and skills shortages in England.

16% of apprenticeship participation in England is linked to managerial positions (SOC group 1), despite these occupations accounting for just 12% of employment (Chart 24). Managerial positions also accounted for only 3% of the SSVs in England, meaning the vast majority of skills shortages lie in other types of occupations (Chart 25). Taking into account the academic route into managerial positions, the evidence suggests the English system is oversupplying skills for managerial roles compared with Germany. The concentration of English apprenticeships in caring, leisure and other service occupations (SOC group 6) also stands out, covering 21% of participation but just 9% of employment (Chart 24) and 16% of SSVs (Chart 25).

Chart 24: Share of apprenticeship participation in England and Germany and share of employment in England for each major SOC group

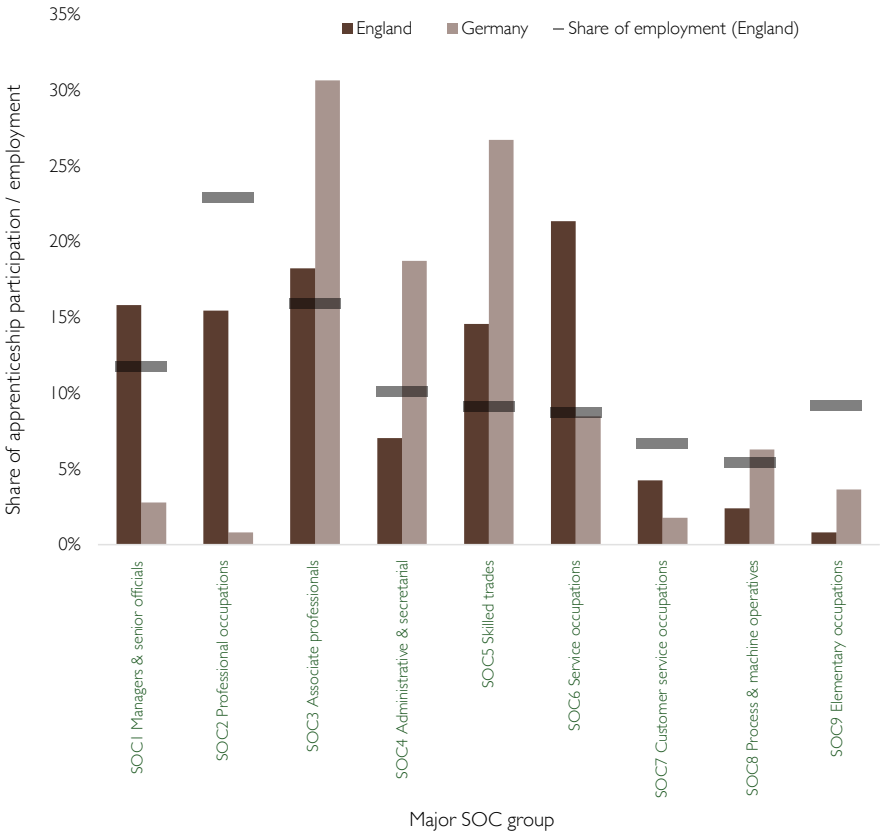
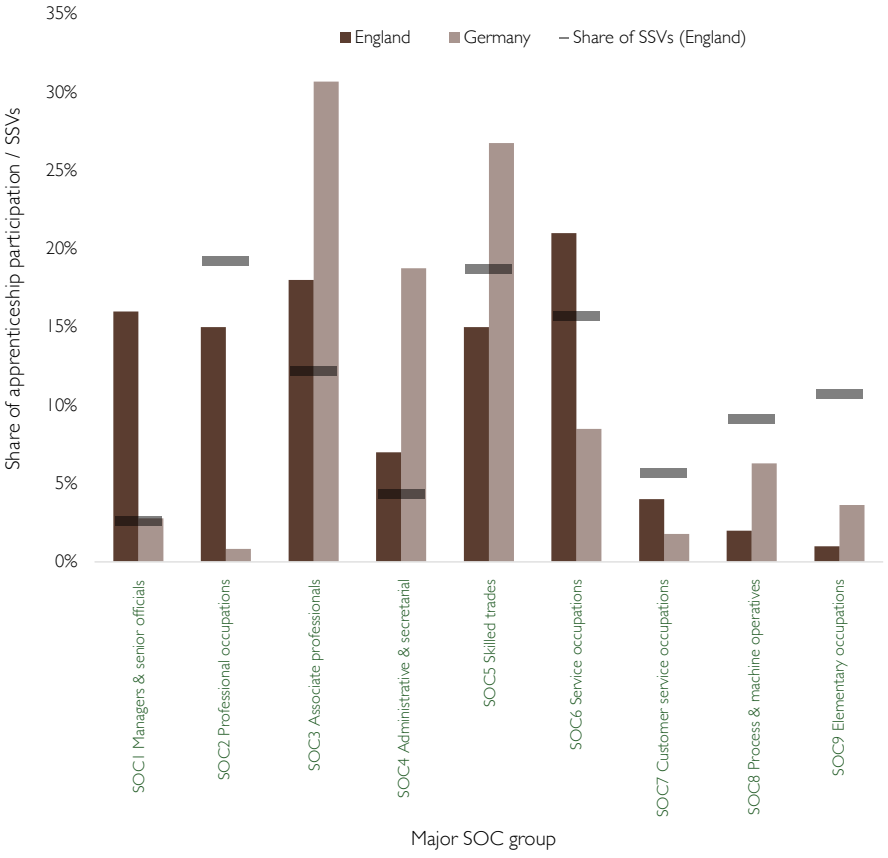


Chart 25: Share of apprenticeship participation in England and Germany and share of total SSVs in England for each major SOC group



The impact of degree apprenticeships?

The analysis so far has suggested that apprenticeships in England are more concentrated in professional and managerial positions and less concentrated in skilled trades occupations than their German equivalents. Is it possible that these differences are related to degree apprenticeships in England at Levels 6 and 7?

Tables 31 and 32 show how the German system compares to an English system that includes degree apprenticeships and how it compares to one without degree apprenticeships.[86] Removing degree apprenticeships does have an impact on the coverage of the English system. However, perhaps somewhat surprisingly, the effect is small and does not account for the differences between the two systems.

Removing degree apprenticeships from the data means overall coverage of four-digit SOC codes drops 4 percentage points to 64% overall, and by 3 percentage points for managerial occupations and 19 percentage points for professional roles. 16% of apprenticeships in England are mapped to professional roles when degree apprenticeships are excluded, compared with 26% when they are included. Despite this the design of the apprenticeship system in England is still more concentrated in managerial and professional roles than is the German system.

Table 31: Percentage of four-digit SOC code occupations covered by apprenticeships for each major SOC group and the share of apprenticeships in each major SOC group for Germany and England with and without degree apprenticeships (England WDA)

	% coverage			Share of apprenticeships		
SOC group	England	England WDA	Germany	England	England WDA	Germany
All	68%	64%	33%	-	-	-
1: Managers, directors and senior officials	47%	44%	6%	5%	4%	1%
2: Professional occupations	82%	63%	7%	26%	16%	1%
3: Associate professional and technical occupations	83%	82%	35%	28%	31%	20%
4: Administrative and secretarial occupations	60%	60%	40%	3%	4%	7%
5: Skilled trades occupations	82%	82%	65%	20%	23%	44%
6: Caring, leisure and other service occupations	65%	65%	35%	6%	7%	4%
7: Sales and customer service occupations	50%	50%	28%	2%	2%	2%
8: Process, plant and machine operatives	62%	62%	50%	8%	9%	17%
9: Elementary occupations	28%	28%	28%	2%	4%	3%

86 The analysis includes both integrated degree apprenticeships and non-integrated degree apprentices in the category England WDA in Tables 31 and 32. Note, however, that there are some apprenticeships at Levels 6 and 7 which are nonetheless classed by IFATE as 'non-degree qualifications' and so are included in the England WDA figures. There are 50 of these non-degree qualifications.

Excluding degree apprenticeships makes little difference to participation (Table 32). The biggest effect is that the share of participation in professional roles falls from 15% to 12%. Yet this is still far above the 1% share of participation under the German system.

Many apprenticeships in England cover managerial and professional occupations that are not classed as degree apprenticeships. Some of these are at levels above those available in Germany, which helps explain the differences in labour market coverage. But some – like the Team Leader standard – are not. This supports the suggestion of inherent differences in the ways apprenticeships are deployed in the two countries.

Table 32: Share of apprenticeship participation in Germany and in England with and without degree apprenticeships (England WDA)

SOC group	England	England WDA	Germany
1: Managers, directors and senior officials	16%	16%	3%
2: Professional occupations	15%	12%	1%
3: Associate professional and technical occupations	18%	18%	31%
4: Administrative and secretarial occupations	7%	8%	19%
5: Skilled trades occupations	15%	16%	27%
6: Caring, leisure and other service occupations	21%	23%	8%
7: Sales and customer service occupations	4%	5%	2%
8: Process, plant and machine operatives	2%	3%	6%
9: Elementary occupations	1%	1%	4%

KEY POLICY INSIGHTS

This report has examined how the labour market coverage of apprenticeships in England would change if it moved towards a German-style system. It has shown that the types of occupations covered by each system differ significantly. As such, there is much to be gained from comparison of apprenticeships in England and Germany. The key policy insights that can be drawn from the analysis are:

Coverage

- **Narrower coverage of the labour market by German apprenticeships**. The German system has fewer than half the number of occupations linked to an apprenticeship standard as the English system. In addition, the English system covers a larger proportion of occupations in all the major occupation groups apart from elementary roles.

- **Sharper focus on a smaller range of occupations**. The German apprenticeship system may cover less of the labour market, but those occupations are covered more comprehensively. German apprenticeships cover 120 four-digit SOC codes, but those occupations are linked to an average of four apprenticeships – in the English system it is less than three. Building a German-style system would mean focusing attention and resources on apprenticeships for a smaller set of occupations.

- **Clear line between higher and technical education**. While German apprenticeships barely cover managerial and professional roles at all, nearly one in three English standards do. In Germany higher-level vocational courses – such as

professional bachelor's and master's programmes – cover these occupations. It is notable that apprenticeships are used in different ways in the two countries.

– **A more traditional definition of apprenticeships**. More than two-fifths of German apprenticeships are mapped to skilled trades occupations. These types of roles – like metalworker, electrician and construction – arguably fit more closely with the traditional understanding of apprenticeships compared with the professional roles, which are more prominent in English apprenticeships.

Participation

– **Including participation data smooths the sharp edges within each system**. Weighting the analysis by participation decreases the variation in the types of occupations covered by each system – ie the SOC structure is covered more evenly by each system after weighting than when each course counts the same.

– **Broad differences between systems remain**. Though there is less variation in the types of occupations covered by each system, it remains the case that English apprenticeships cover a wider range of occupations, whereas there is more specialisation in Germany. For example, 76% of apprentices in Germany can be linked to just three groups: associate professional and technical occupations; administrative and secretarial occupations; and skilled trades occupations.

CONCLUSION

This report has explored how the types of occupations apprenticeships in England cover might change if we moved to a German-style system. The analysis suggests that German apprenticeships cover a smaller proportion of the labour market than their English counterparts. Focusing more closely on traditional apprenticeship subjects, the German education system has a tighter definition of the jobs apprentices can train for, largely leaving professional and managerial roles to higher academic education and classroom-based higher vocational education. The reach of English apprenticeships, on the other hand, extends into a much wider range of occupations.

Degree apprenticeships are blurring the lines between higher and vocational education in England, bringing more professional and managerial roles into the orbit of apprenticeships. Yet, even without degree apprenticeships, the system tends towards occupations that German apprenticeships almost entirely ignore.

Of course, apprenticeships are just one part of a vocational education system. Professional bachelor's and master's in Germany cover many of the occupations that apprenticeships do not. But it is important to recognise that apprenticeships – a work-based training contract supplemented by classroom instruction – are differently deployed in England and Germany.

Apprenticeships, and vocational education more generally, are seen by the government as a policy priority, central to their levelling up agenda. As part of this, senior ministers – including the former Education Secretary – have spoken of moving apprenticeships in England towards a German-style system. The analysis presented in this report suggests that in practice this would involve apprenticeships that support a narrower, more vocational set of occupations, leaving professional and managerial roles to other parts of the education system.

ISCO-08 ANALYSIS FOR THE UK AND GERMANY

Analysis of the differences between the English and German labour markets uses data from the International Labour Organization's (ILO's) International Standard Classification of Occupations (ISCO).

Table 33 shows that the largest differences in the share of employment in the UK and Germany occur in professional and skilled trades occupations, with the UK having more professional and Germany having more technician occupations.

Table 33: Employment share by major ISCO-08 group in the UK and Germany[87]

ISCO group description	1-digit ISCO code	UK	Germany
Armed forces occupations	0	0%	0%
Managers	1	12%	5%
Professionals	2	26%	18%
Technicians and associate professionals	3	12%	23%
Clerical support workers	4	9%	13%
Services and sales workers	5	17%	14%
Skilled agricultural, forestry and fishery workers	6	1%	1%
Craft and related trades workers	7	8%	12%
Plant and machine operators and assemblers	8	5%	6%
Elementary occupations	9	8%	8%

Mapping German and English apprenticeships to four-digit ISCO codes gives similar findings to the SOC2010 analysis.[88] Table 34 shows that having more apprenticeships means England covers a larger share of occupations than Germany (47% compared with 34%), especially for professional roles (60% compared with 4%). Compared with the German system, the English apprenticeship system is more concentrated in managerial and professional occupations, both in terms of available standards (Table 35) and participation (Table 36). German apprenticeships, generally speaking, are more heavily skewed towards craft, trades and technician occupations.

87 Employment data is 2018 for Germany and 2019 for the UK.

88 Mappings to ISCO broadly follow the methodology used to map German apprenticeships to SOC2010, combining CASCOT and manual inspection.

Table 34: Percentage of four-digit ISCO code occupations covered by apprenticeships for each major group in England and Germany

ISCO group description	1-digit ISCO code	England	Germany
All	All	47%	34%
Armed forces occupations	0	25%	0%
Managers	1	33%	3%
Professionals	2	60%	4%
Technicians and associate professionals	3	59%	32%
Clerical support workers	4	35%	19%
Services and sales workers	5	48%	6%
Skilled agricultural, forestry and fishery workers	6	23%	2%
Craft and related trades workers	7	57%	26%
Plant and machine operators and assemblers	8	29%	5%
Elementary occupations	9	20%	2%

Table 35: Share of apprenticeships mapped to each major ISCO group in England and Germany

ISCO group description	1-digit ISCO code	England	Germany
Armed forces occupations	0	0%	0%
Managers	1	5%	1%
Professionals	2	29%	5%
Technicians and associate professionals	3	29%	18%
Clerical support workers	4	4%	8%
Services and sales workers	5	7%	5%
Skilled agricultural, forestry and fishery workers	6	2%	4%
Craft and related trades workers	7	18%	43%
Plant and machine operators and assemblers	8	4%	15%
Elementary occupations	9	4%	2%

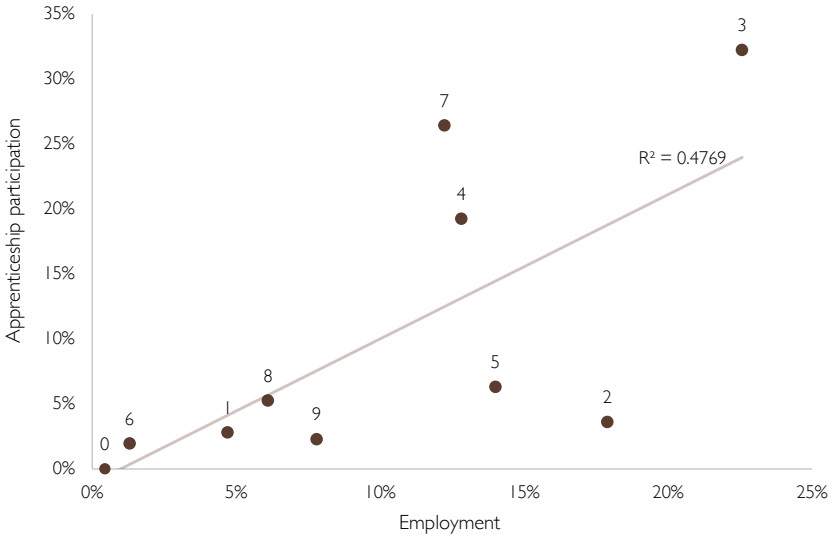
Table 36: Share of apprenticeship participation mapped to each major ISCO group in England and Germany[89]

ISCO group description	1-digit ISCO code	England	Germany
Armed forces occupations	0	0%	0%
Managers	1	15%	3%
Professionals	2	19%	4%
Technicians and associate professionals	3	19%	32%
Clerical support workers	4	8%	19%
Services and sales workers	5	23%	6%
Skilled agricultural, forestry and fishery workers	6	1%	2%
Craft and related trades workers	7	13%	26%
Plant and machine operators and assemblers	8	2%	5%
Elementary occupations	9	1%	2%

There is some evidence that the English apprenticeship system more closely follows the shape of the UK labour market than the German system follows the German labour market. Charts 26 and 27 plot employment share against the apprenticeship participation share for major ISCO groups. The English chart shows a tighter fit between participation and employment, with a higher R-squared value.

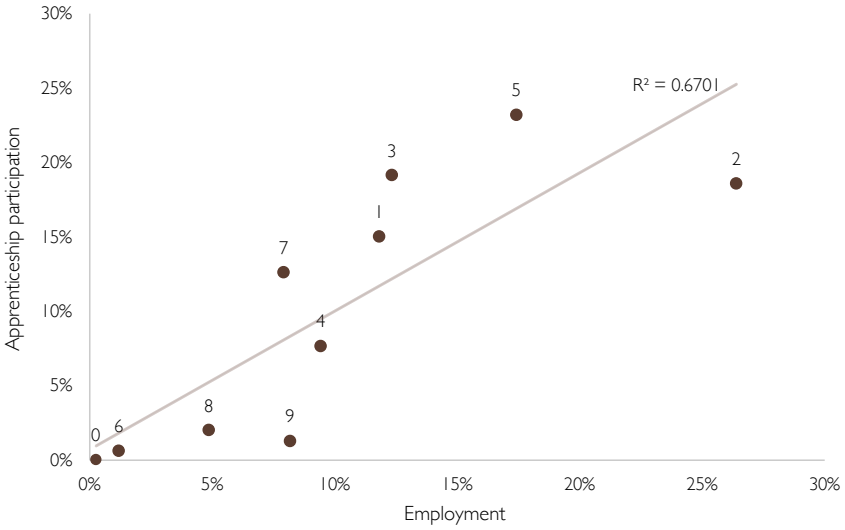
Whether it is desirable to have apprenticeships match the whole labour market is open for debate. What does seem clear is that the apprenticeship system in England caters to a large share of the labour market. Germany offers an alternative in which apprenticeships focus on one part of the labour market while the rest is covered by different types of education, such as higher education.

Chart 26: Apprenticeship participation compared with employment share by major ISCO group in Germany



89 Data for Germany is 2018 and for England is the first three-quarters of the 2020/21 academic year.

Chart 27: Apprenticeship participation compared with employment share by major ISCO group in England



DENMARK: ANALYSIS OF COUNTRY SPECIFIC DATA

INTRODUCTION

Apprenticeships are well established in Denmark, having been an important part of the economy for hundreds of years. The system is based on partnerships between unions, learners, businesses and the government. Apprenticeships are a common choice for both school-leavers and adults looking to qualify as skilled workers.

This report compares the types of occupations covered by mapping Danish and English apprenticeships to the English labour market. It provides insight into how the types of occupations covered by apprenticeships in England might change if it moved towards a Danish-style system, and whether these Danish-style apprenticeships would neglect parts of the labour market currently covered by the English system.

The report provides context on apprenticeships in England and Denmark, comparing apprenticeship participation, age, funding and levels. It compares the findings and provides key insights for policymakers in England.

CONTEXT

Overview of the Vocational Education and Training (VET) system in Denmark

Vocational education in Denmark starts at the upper secondary level. Students begin with a basic course, the first half of which is general in nature. Students are taught basic and vocational skills for half a school year. In the second half of the basic course students begin to acquire the specialist knowledge and competencies relating to a specific vocation, alongside non-vocational education in maths, science and foreign languages etc. This section of the basic course again takes half a school year and is the starting point for those who left school more than two years previously but who are still under the age of 25. Having finished the basic course, students begin their apprenticeship by signing an employment contract with an employer. Apprentices alternate their time between vocational schools and the workplace. In addition to their vocational studies, apprentices can take the EUX route which combines vocational education and training with a general upper secondary diploma.[90]

The EUV route is for those over the age of 25 and is vocational training that builds on existing education and experience. Vocational schools assess an adult's existing skills and tailor the apprenticeship to their needs. As such, apprenticeships for adults tend to be shorter than for young people.

Having completed an apprenticeship, learners become qualified skilled workers. They can progress to higher technical and professional education, including business academy courses, which take between one and a half, and two and a half years to complete. Vocational students can also go onto professional bachelor's programmes. These courses consist of both theoretical and practical teaching and usually last three and a half years.[91]

90 Ministry of Children and Education (2019) *Vocational education and training in Denmark*. Available at: https://eng.uvm.dk/upper-secondary-education/vocational-education-and-training-in-denmark

91 Ministry of Children and Education. *Education guide*. Available at: https://www.ug.dk/uddannelser/professionsbacheloruddannelser

Participation

Statistics Denmark reports that in 2020 there were 113,500 people enrolled in upper secondary vocational education in Denmark, equating to around 1.9% of the population.[92] However, this figure covers the whole upper secondary vocational education system. According to the Danish Ministry of Children and Education, "the majority of the VET-programmes is practical training in an approved company or organization."[93] Participation data supplied by Statistics Denmark suggests there were 98,000 apprentices as of October 2020, which is 1.7% of the population. In England, apprentices account for around 1.3% of the population.[94]

Age

Almost half of all apprentices in England are 25 years of age or older (49.6%), 30.4% are 19-24 and 21% are under 19.[95] The data for Denmark suggests a similar demographic split. 37% of those enrolled in upper secondary vocational education in 2020 were 25 or older, 40% were 19-24 and 23% were 18 or younger. This suggests that, while many Danish school-leavers choose this path, apprenticeships are an attractive option for adults too. This may in part be because adults over the age of 25 have their prior learning recognised, placing them on an accelerated pathway to becoming a qualified skilled worker.[96]

Apprentice wages

Apprentices in England who are under the age of 19 or are in their first year are entitled to a minimum hourly wage of £4.30. Apprentices aged 19 or above and those who have completed their first year are entitled to the standard minimum wage for their age group: £6.56 an hour for 18 to 20, £8.36 for 21 to 22 and £8.91 for 23 and over.

There is no national minimum apprentice wage in Denmark, rather rates are set through collective bargaining agreements in each sector. The initial salary is 9,500-2,500 DKR (£1,070-1,410) per month, or roughly £7.50 to £10 an hour, based on a 35-hour work week, suggesting Danish apprentices earn more than their English counterparts.[97] As in England, wages are paid to apprentices in Denmark even during off-the-job training in vocational schools. This is paid for through an employer levy fund.[98]

92 *UDDAKT35: Educational activity at upper secondary vocational educations by education, age, ancestry, national origin, sex, status and enrolment type*. Available at: https://www.statbank.dk/statbank5a/SelectTable/Omrade0.asp?SubjectCode=5&ShowNews=OFF&PLanguage=1

93 Ministry of Children and Education (2019) *op cit*.

94 The figure for England is for the latest available, 2019/20. Source: Foley, N. (2021) *Briefing paper number 06113: Apprenticeship statistics*. London: House of Commons Library. Available at: https://researchbriefings.files.parliament.uk/documents/SN06113/SN06113.pdf

95 Data is for 2020/21 academic year. Available at: https://explore-education-statistics.service.gov.uk/find-statistics/apprenticeships-and-traineeships/2020-21

96 Apprenticeship Toolbox (2019a) *Apprenticeship system: Denmark*. Available at: https://www.apprenticeship-toolbox.eu/denmark/apprenticeship-system-in-denmark

97 Apprenticeship Toolbox (2019b) *Company costs and benefits in Denmark*. Available at: https://www.apprenticeship-toolbox.eu/financing/company-costs-benefits/54-company-costs-and-benefits-in-denmark

98 OECD (2017) *Striking the right balance: Costs and benefits of apprenticeships*. Available at: https://www.oecd-ilibrary.org/education/striking-the-right-balance_995fff01-en

Who pays for the system?

In Denmark, vocational schools are funded by the state. Each institution's allocation is made up of a basic grant plus a variable grant based on factors including student numbers, completion rates and the number of apprenticeships the Centre of Placement manages to secure. If an apprentice does not have an apprenticeship contract upon finishing the basic course, they can carry out their practical training with the Centre of Placement instead (effectively a workshop), with financial support from the government.[99] In this sense, vocational schools are incentivised to find apprenticeship contracts with businesses for their students, so that the state does not have to step in.[100]

As described above, employers are responsible for paying the wages of apprentices while in the workplace. All employers – regardless of whether they have any apprentices – pay into an employer levy fund, topped up by the government, from which apprentice wages can be paid for time they spend outside of the business (ie in off-the-job training in vocational schools).[101] This contrasts with other countries, for example Germany, where employers receive no financial support for paying the wages of apprentices during off-the-job training.

In England, large employers (those with a payroll over £3m per year) pay an apprenticeship levy, equivalent to 0.5% of the annual pay bill. This amount – plus a 10% top up from central government – can be used to pay for training carried out off-site by a training provider. Small employers pay 5% of these training costs, with the rest covered by central government. All employers are responsible for covering the wage costs and on-the-job training of their apprentices (excluding any Covid-19 financial aid measures). As such, the vast majority of the costs of apprenticeships are borne by businesses, especially large ones.

Apprenticeship levels

20% of apprentices in Denmark study at a European Qualifications Framework (EQF) Level 3 (UK Level 2), 73% study at a EQF Level 4 (UK Level 3) and just 7% study at a EQF Level 5 (UK Level 4). After completing the basic programme (which takes between six months and a year), apprenticeships in Denmark typically take one and a half years at EQF Level 3, three years at EQF Level 4 and five years at EQF Level 5.

Apprenticeships in England have traditionally been categorised into three groups: intermediate (UK Level 2), advanced (UK Level 3) and higher (UK Level 4 and above). At each level different apprenticeships can have different durations, for example, a Level 3 Engineering Technician apprenticeship is expected to last three and a half years, more than twice that for Level 3 Retail Team Leader which is expected to last a year. This is less than the two years it takes to complete a federal certificate in Switzerland.

The presence of higher apprenticeships – including degree apprenticeships at UK Levels 6 and 7 – sets England apart from Denmark, where apprenticeships do not go beyond a UK Level 4.[102] However, participation in England is dominated by Level

99 Apprenticeship Toolbox. *Funding arrangements in Denmark*. Available at: https://www.apprenticeship-toolbox.eu/?id=45:funding-arrangements-in-denmark

100 European Centre for the Development of Vocational Training (Cedefop) (2020) *Financing apprenticeships in the EU*. Available at: https://www.cedefop.europa.eu/files/4192_en.pdf

101 European Centre for the Development of Vocational Training (Cedefop). *Database on financing apprenticeships in the EU*. Available at: https://www.cedefop.europa.eu/fi/tools/financing-apprenticeships/apprenticeship-schemes/apprenticeship

102 Although non-apprenticeship vocational courses do go beyond this level.

2 (intermediate) and Level 3 (advanced) apprenticeships, which accounted for 26% and 45% of enrolments respectively in 2020/21.[103] Levels 4 and 5 apprenticeships combined accounted for only 17% of enrolments and Levels 6 and 7 only 12%.

RESULTS OF LABOUR MARKET COMPARISON

The results describe the occupations covered by English and Danish apprenticeships, as proxied by four-digit Standard Occupation Classification (SOC) codes. Note that where additional labour market information is included – size of workforce, number of skills shortage vacancies (SSVs) – this is based on data for England. In this sense, it is a measure of how coverage would theoretically change if England adopted the Danish system. Brief analysis relating to both the English and Danish labour markets is presented in ISCO-08 analysis for the UK and Denmark.

Headline coverage

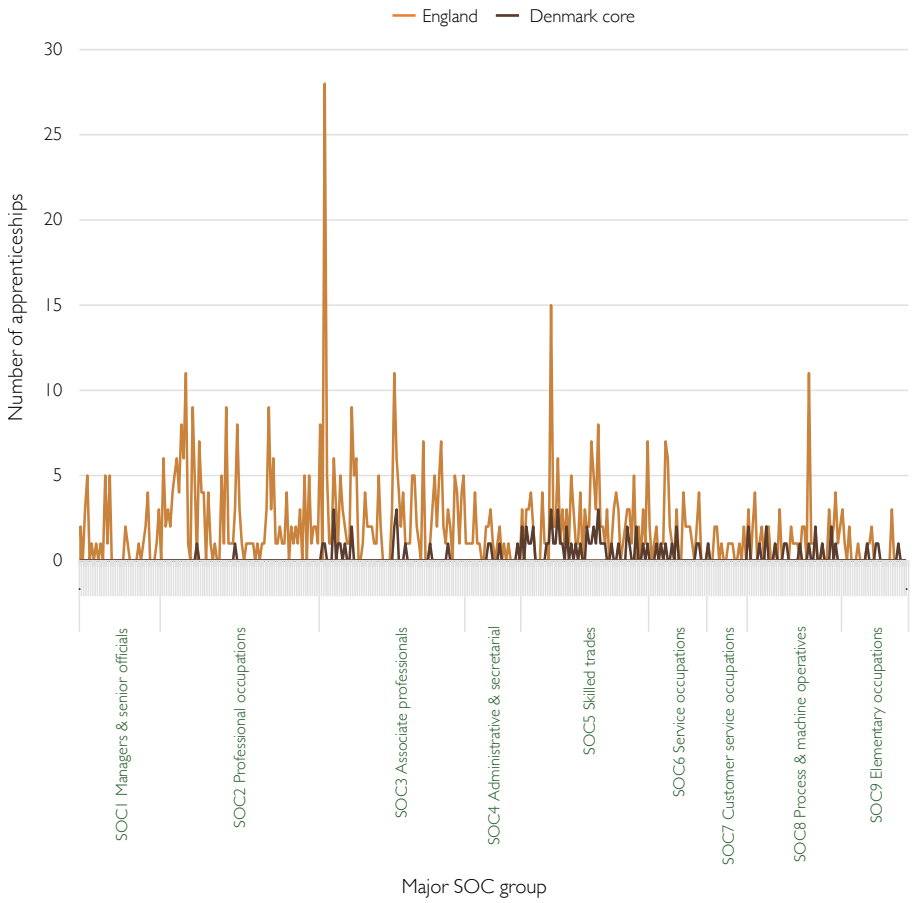
It is little surprise that English apprenticeships cover more of the labour market than even the expanded list of Danish courses. While there are 100 apprenticeships mapped to SOC codes for the Denmark core list and 234 in the Denmark specialisms list, there are 731 apprenticeship standards in England. These 731 apprenticeships cover 68% of four-digit SOC code occupations. The core list of Danish apprenticeships covers just 20% – adding the specialisms boosts this figure to 29%, still less than half the English coverage (see Table 37). For Denmark, the major occupation group with the highest coverage is skilled trades, with 58-67% coverage. No other group has more than 29% coverage by the core set of apprenticeships (Chart 28), or 43% by the expanded list of specialisms.

Table 37: Percentage of four-digit SOC code occupations covered by apprenticeships for each major SOC in England and Denmark

SOC group	England	Denmark core	Denmark spec.
All	68%	20%	29%
1: Managers, directors and senior officials	47%	0%	14%
2: Professional occupations	82%	3%	6%
3: Associate professional and technical occupations	83%	18%	25%
4: Administrative and secretarial occupations	60%	16%	36%
5: Skilled trades occupations	82%	58%	67%
6: Caring, leisure and other service occupations	65%	27%	31%
7: Sales and customer service occupations	50%	6%	11%
8: Process, plant and machine operatives	62%	29%	43%
9: Elementary occupations	28%	14%	24%

103 When accessed, data for 2020/21 was for quarters 1-3 only. Data may be revised by DFE.

Chart 28: Number of apprenticeships mapped to each 4-digit SOC code in England and Denmark (core)



As well as covering more of the labour market, English apprenticeships cover them more intensively. Each occupation covered by the English system has 2.9 apprenticeships mapped to it, compared with 1.3 Danish core programmes or 2.2 for the expanded list of specialisms. However, the additional 134 apprenticeships only boost the number of occupations covered by 32, which means that many of the Danish specialisms are mapped to the same occupations as the core programmes (Chart 29). The one exception is that more of the specialisms are mapped to managerial positions.

Chart 29: Number of apprenticeships mapped to each 4-digit SOC code – Denmark core compared with Denmark specialisms (spec.)

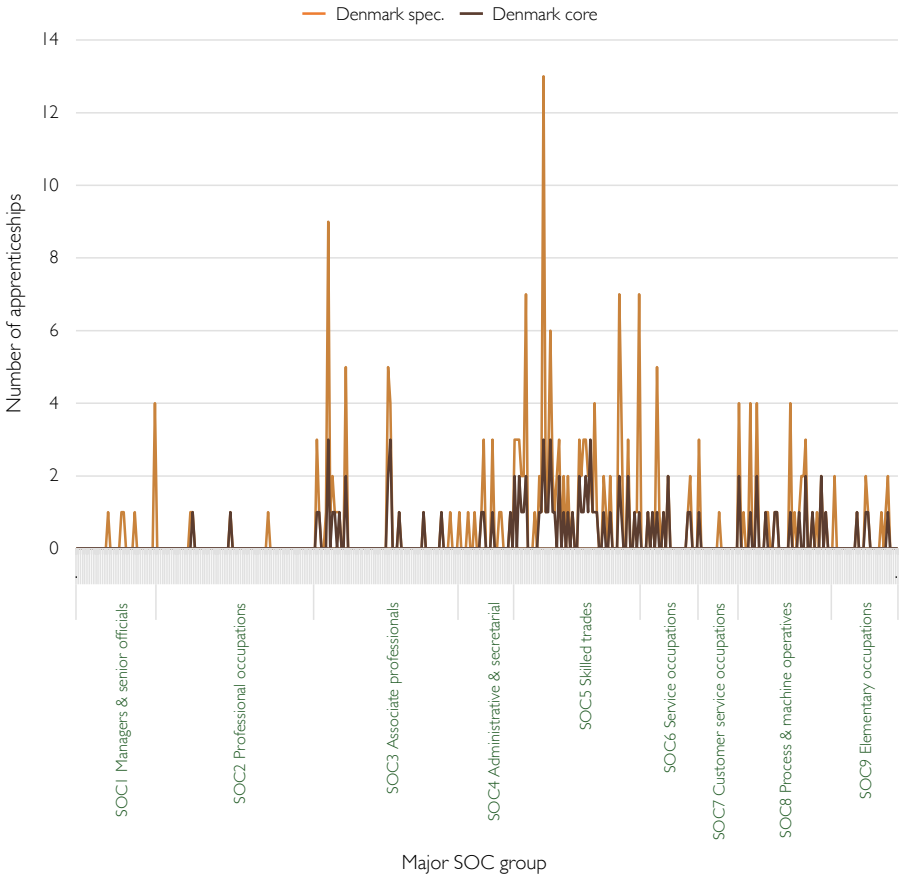


Table 38 shows that the Danish apprenticeship system focuses its attention on specific sections of the labour market. Almost half (47%) of the core Danish apprenticeships are mapped to skilled trades occupations, compared with just one in five English apprenticeships. The focus in England is on professional type roles, with 54% of standards linked to professional and associate professional and technical occupations, compared with 20% of core Danish courses. In fact, only 2% of Danish apprenticeships (either core programmes or specialisms) are mapped to professional occupations (SOC group 2).

While higher-level and degree apprenticeships in England cover professional and some managerial occupations, in Denmark this is the responsibility of vocational education in business academies and professional bachelor's programmes – in addition of course to academic higher education. The professional bachelor's programmes and courses taught in business academies do not fit a strict definition of an apprenticeship (they are perhaps similar to higher technical qualifications in England) and so are not included in the analysis. But it would be misleading to conclude that the VET system in Denmark as a whole ignores these types of occupations.

One other clear difference is coverage of process, plant and machine operatives. Danish apprenticeships are linked to 15-16% of these occupations, double that of English apprenticeships. It is also notable that there is little difference at this level in the coverage of core Danish apprenticeships and specialisms. Again, this is likely due to different specialisms within the same programme falling within the same major (one-digit SOC code) occupation group, if not the same four-digit group, which is much more tightly defined.

Table 38: Share of apprenticeships in each major SOC group in England and Denmark

SOC group	England	Denmark core	Denmark spec.
1: Managers, directors and senior officials	5%	0%	3%
2: Professional occupations	26%	2%	2%
3: Associate professional and technical occupations	28%	18%	16%
4: Administrative and secretarial occupations	3%	4%	6%
5: Skilled trades occupations	20%	47%	46%
6: Caring, leisure and other service occupations	6%	8%	6%
7: Sales and customer service occupations	2%	1%	2%
8: Process, plant and machine operatives	8%	16%	15%
9: Elementary occupations	2%	4%	4%

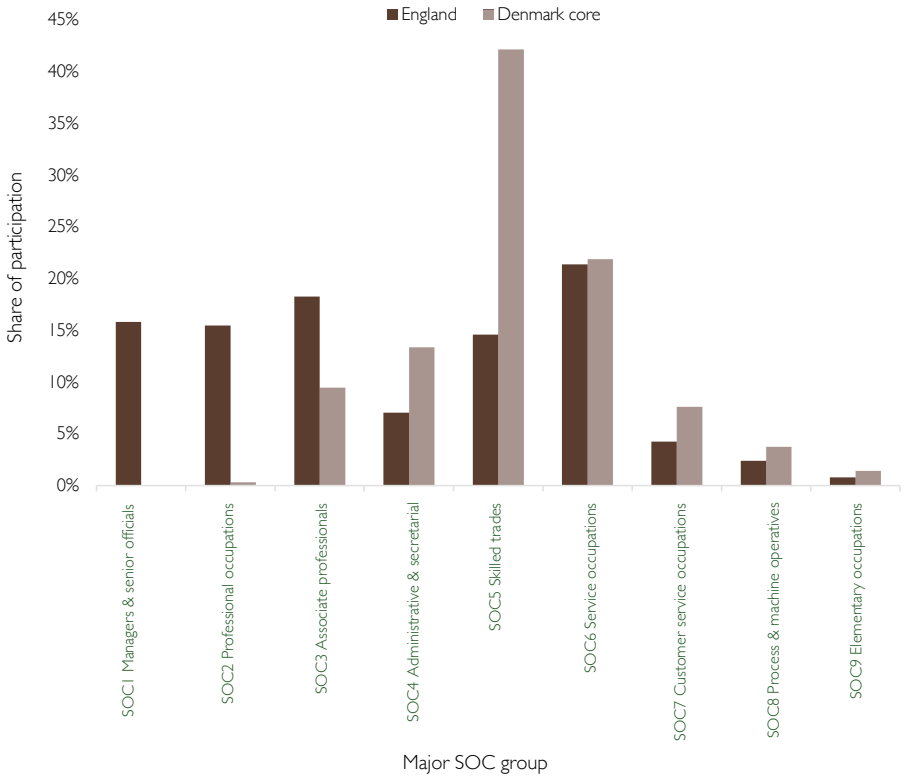
Coverage weighted by participation

The analysis so far has focused on how the structure of both apprenticeship system maps to the structure of English occupations. This section of the report introduces participation measures, in terms of both apprenticeships and the labour market. Participation data for Danish apprenticeships was obtained through correspondence with Statistics Denmark and refers to the number of apprentices enrolled as of October 2020.[104] Data is only available for core programmes, not specialisms. Participation in England is given by the number enrolled in the first three-quarters of the 2020/21 academic year. The data for both countries will have been affected by the coronavirus pandemic and so should be interpreted with caution.

Chart 30 shows the key trends in coverage remain the same even after adding participation measures. Participation in Denmark is concentrated in apprenticeships linked to skilled trades occupations, with 42% of the total. Participation in England is more evenly spread. The majority of participation is closely distributed between managerial; professional; associate professional and technical; skilled trades; and caring occupations, with each accounting for between 15 and 21% of the total.

104 Publicly available participation data can be found on the Statistics Denmark website but the tables group educational programmes together in categories. See dataset *UDDAKT35: Educational activity at upper secondary vocational educations by education, age, ancestry, national origin, sex, status and enrolment type*, available at https://www.statbank.dk/

Chart 30: Share of apprenticeship participation for each major SOC group in England and Denmark



Coverage compared with labour market demand

How do apprenticeship participation figures relate to estimates of labour market need? Table 39 includes the share of employment and the share of SSVs for the major SOC groups. It is important to remember when comparing apprenticeship participation to these figures that apprenticeships are not the only source of education or training. They also represent only a flow of skills, rather than the stock of skills in the economy. Nonetheless, insights can be gained from comparing the two different apprenticeship systems with the pattern of employment and skills shortages in England.

Table 39: Share of apprenticeship participation in England and Denmark and the share of employment and SSVs in England for each major SOC group[105]

SOC group	Apprenticeships – England	Apprenticeships – Denmark core	Share of employment – England	Share of SSVs – England
1: Managers, directors and senior officials	16%	0%	12%	3%
2: Professional occupations	15%	0%	23%	19%
3: Associate professional and technical occupations	18%	9%	16%	12%
4: Administrative and secretarial occupations	7%	13%	10%	4%
5: Skilled trades occupations	15%	42%	9%	19%
6: Caring, leisure and other service occupations	21%	22%	9%	16%
7: Sales and customer service occupations	4%	8%	7%	6%
8: Process, plant and machine operatives	2%	4%	5%	9%
9: Elementary occupations	1%	1%	9%	11%

If England were to adopt the Danish apprenticeship system, how might coverage compare to English labour market demand? As already explored, Danish participation is concentrated in skilled trades roles, with 42% of apprentices in these occupations compared with 15% of English apprentices. On the other side of the demand–supply equation, skilled trade occupations make up 9% of employment (Chart 31) and 19% of SSVs in England (Chart 32).

Therefore, policymakers who believe vocational education in general – and apprenticeships in particular – is a valid route into all types of employment may conclude that the Danish system is too focused on skilled trades roles and that the English system better fulfils the need. On the other hand, policymakers of the opinion that apprenticeships should be a route into specific occupations may conclude that it is more desirable for greater participation in skilled trades apprenticeships. These policymakers may be comfortable leaving higher education – both in the form of academic courses and non-apprenticeship tertiary vocational provision – to supply a steady stream of qualified labour for professional and managerial roles. In this case the Danish model would be the better fit.

For both types of policymakers, however, the share of managerial roles in apprenticeship participation in England would be a concern. Currently, the share of apprentices in England linked to managerial occupations is higher than its share of employment, even before including classroom-based higher academic and vocational education. This apparent misbalance is especially pronounced given managerial positions account for only 3% of the SSVs in England, meaning the vast majority of skills shortages lie in other types of occupations (Chart 32).

105 Employment data is for 2020 and is sourced from the *Annual population survey* via Nomis. SSV data is from the England dataset of the *Employer skills survey 2019*, available at: https://www.gov.uk/government/publications/employer-skills-survey-2019-england-results

Chart 31: Share of apprenticeship participation in England and Denmark and share of employment in England for each major SOC group

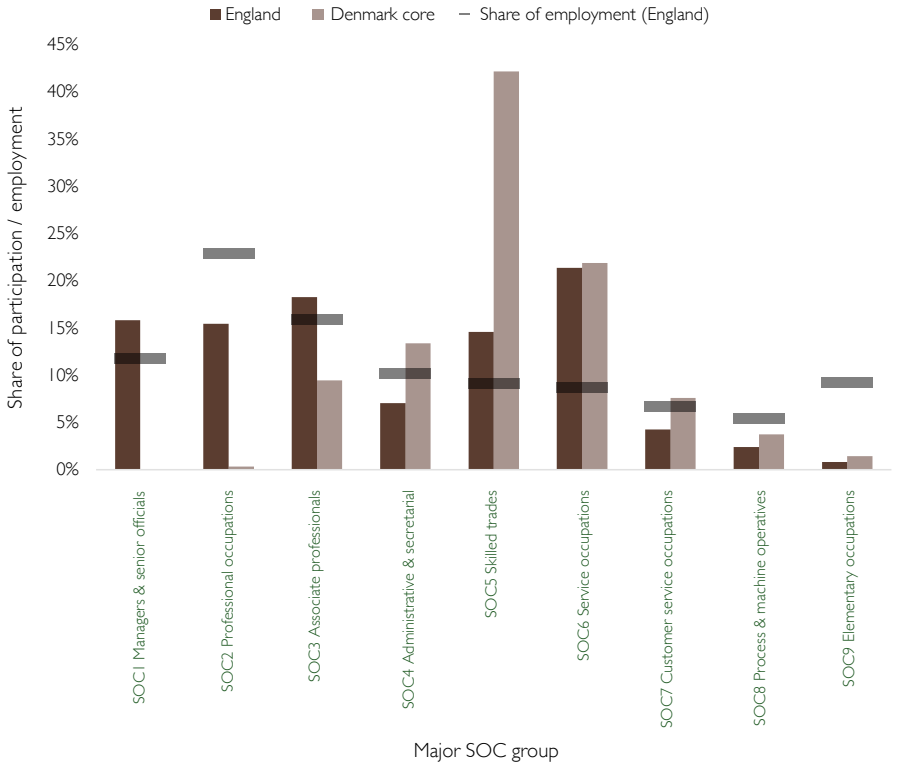
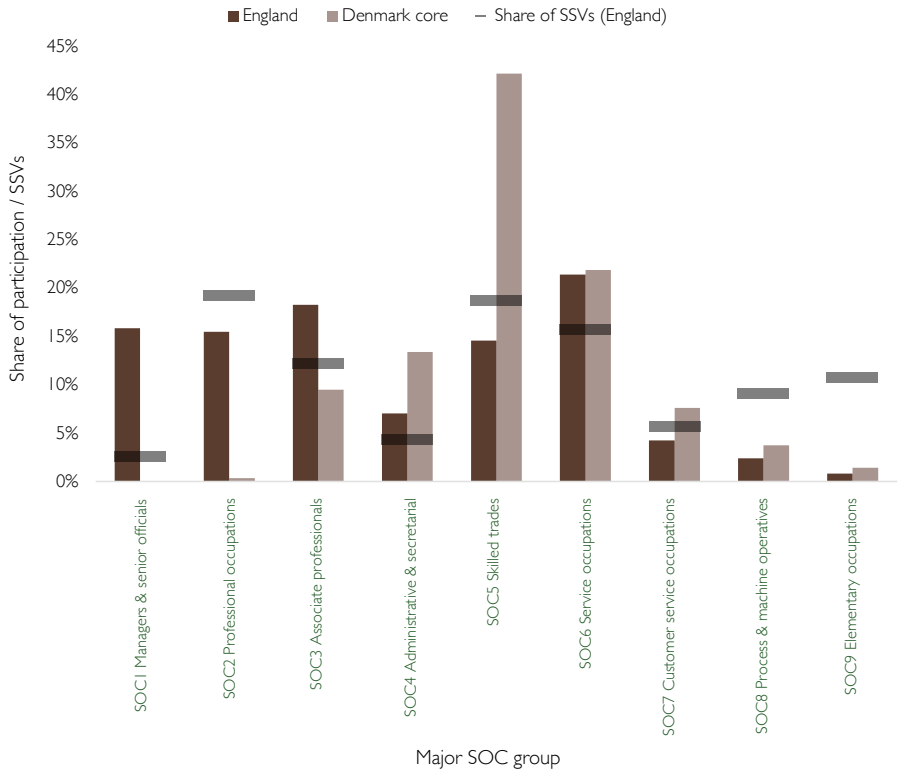


Chart 32: Share of apprenticeship participation in England and Denmark and share of total SSVs in England for each major SOC group



The impact of degree apprenticeships

The analysis so far has suggested that apprenticeships in England are more concentrated in professional and managerial positions, and less concentrated in skilled trades occupations, than their Danish equivalents. Is it possible that these differences are related to degree apprenticeships in England at Levels 6 and 7?

Removing degree apprenticeships from the English data does reduce the differences between the two countries, but not significantly (Table 40).[106] Overall coverage is only slightly reduced, from 68% to 64%, and is still double the coverage of the Danish system, even when specialisms are included. The biggest impact is the reduction in the share of apprenticeships in England mapped to professional occupations from 26% to 16%. However, with only 2% of core Danish apprenticeships mapped to this occupation group, it remains a key difference. Likewise, the share of standards in England mapped to skilled trades roles rises from 20% to just 23% when degree apprenticeships are excluded, so Dutch apprenticeships remain far more concentrated in these occupations (47%).

Table 40: Percentage of four-digit SOC code occupations covered by apprenticeships for each major SOC group and the share of apprenticeships in each major SOC group for Denmark and England with and without degree apprenticeships (England WDA)

	% coverage			Share of apprenticeships		
SOC group	England	England WDA	Denmark core	England	England WDA	Denmark core
All	68%	64%	20%	-	-	-
1: Managers, directors and senior officials	47%	44%	0%	5%	4%	0%
2: Professional occupations	82%	63%	3%	26%	16%	2%
3: Associate professional and technical occupations	83%	82%	18%	28%	31%	18%
4: Administrative and secretarial occupations	60%	60%	16%	3%	4%	4%
5: Skilled trades occupations	82%	82%	58%	20%	23%	47%
6: Caring, leisure and other service occupations	65%	65%	27%	6%	7%	8%
7: Sales and customer service occupations	50%	50%	6%	2%	2%	1%
8: Process, plant and machine operatives	62%	62%	29%	8%	9%	16%
9: Elementary occupations	28%	28%	14%	2%	4%	4%

Table 41 provides a similar picture. When excluding degree apprenticeships, participation in courses linked to professional occupations falls from 15% to 12%, still significantly above the share in Denmark, where there is almost no participation in apprenticeships linked to either managerial or professional occupations.

106 The analysis includes both integrated degree apprenticeships and non-integrated degree apprenticeships in the category England WDA in Tables 40 and 41. Note, however, that there are some apprenticeships at Levels 6 and 7 which are nonetheless classed by IFATE as 'non-degree qualifications' and so are included in the England WDA figures. There are 50 of these non-degree qualifications.

A similarity in the systems, regardless of whether or not degree apprenticeships are included, is in the share of participation in caring, leisure and other service occupations. 21% of participation in England (23% WDA included) is linked to these occupations, compared with 22% in Denmark. It seems both countries agree on the role of apprenticeships in supplying skilled labour to these types of roles.

Table 41: Share of apprenticeship participation in Denmark and England with and without degree apprenticeships (England WDA)

SOC group	England	England WDA	Denmark core
1: Managers, directors and senior officials	16%	16%	0%
2: Professional occupations	15%	12%	0%
3: Associate professional and technical occupations	18%	18%	9%
4: Administrative and secretarial occupations	7%	8%	13%
5: Skilled trades occupations	15%	16%	42%
6: Caring, leisure and other service occupations	21%	23%	22%
7: Sales and customer service occupations	4%	5%	8%
8: Process, plant and machine operatives	2%	3%	4%
9: Elementary occupations	1%	1%	0%

KEY POLICY INSIGHTS

This report has examined how the labour market coverage of apprenticeships in England would change if it moved towards a Danish-style system. It has shown that the types of occupations covered by each system differ significantly. As such, there is much to be gained from comparison of apprenticeships in England and Denmark. The key policy insights are:

Coverage

- **Fewer apprenticeships means lower coverage**. In Denmark, there are only 100 apprenticeship programmes. Even when specialisms within these programmes are included the number of courses is just 234. Given there are 731 standards in England, it is unsurprising that Danish apprenticeships cover a much lower share of SOC code occupations. English standards cover 68% of the labour market, whereas – even with specialisms included – the Danish system covers less than a third.

- **Skilled trades dominate in Denmark**. Nearly one in every two apprenticeships in Denmark can be mapped to skilled trades occupations. No other occupation group comes close, with the next most common – associate professional and technical occupations – accounting for fewer than one in five apprenticeships. Apprenticeships in England, on the other hand, are more evenly spread across the occupation groups, with three groups – associate professional and technical; professional; and skilled trades – accounting for between 20% and 28% each.

- **A traditional definition of apprenticeships**. Process, plant and machine operative occupations account for 16% of core Danish apprenticeship programmes, double the rate in England. Like skilled trades, these types of occupations could be considered more vocational in nature – adding to the evidence that the focus in Denmark is on 'traditional' apprenticeships.

Participation

- **Key differences in coverage remain after introducing participation measures.** Participation in Denmark is, like coverage, dominated by apprenticeships linked to skilled trades occupations (42%, compared with 15% in England). Participation in England, on the other hand, is more evenly spread than pure coverage alone. Managerial; professional; associate professional and technical; skilled trades; and caring occupations each account for between 15 and 21% of total participation.

- **Managerial; professional; and associate professional and technical roles are not well covered by apprenticeships in Denmark**. Together, apprenticeships linked to managerial; professional; and associate professional and technical roles account for half of participation in England. For Danish apprenticeships, it is just 9%. In Denmark, professional bachelor's programmes and higher vocational education in business academies cover these roles, but it is notable that apprenticeships largely do not.

- **What are apprenticeships for?** Comparisons of apprenticeship supply and labour market demand can point to potential mismatches, but judgements about the relative success of one system or another depends on the goals of policymakers. The Danish apprenticeship system offers an alternative to the English model, focusing on specific sections of the labour market with other types of vocational courses and higher academic education concentrating on the rest.

CONCLUSION

Apprenticeships play an important role in supplying the labour market with skilled workers in both England and Denmark. However, while apprenticeships in England cover a wide variety of occupations, they are more focused in Denmark. In contrast to the English system, Danish apprenticeships cover almost no managerial or professional roles. Danish apprentices are far more likely to be training towards skilled trades roles.

There are higher-level vocational courses in Denmark that do cover some managerial and professional roles. But it is noteworthy that apprenticeships are used only for certain roles. The demarcation does not appear to be an issue of age. While apprenticeships are a popular route for school-leavers, many adults in Denmark also choose them. Rather, the analysis suggests that England and Denmark have different views on the kinds of jobs that the apprenticeship model – that is, courses combining a formal employment contract with off-the-job instruction in vocational schools – are appropriate for.

ISCO-08 ANALYSIS FOR THE UK AND DENMARK

Analysis of the differences between the English and Danish labour markets uses data from the International Labour Organization's (ILO's) International Standard Classification of Occupations (ISCO).[107]

Table 42 shows the employment share in the UK and Denmark by major ISCO-08 group. Employment in both countries is similarly concentrated in professional roles, making up 26% of the total in the UK and 29% in Denmark. Both have a similar share of services and sales workers, with 17% in the UK and 18% in Denmark. Managerial roles, however, make up 12% of employment in the UK, compared with just 3% in Denmark.

Table 42: Employment share by major ISCO-08 group in the UK and Denmark[108]

ISCO group description	1-digit ISCO code	UK	Denmark
Armed forces occupations	0	0%	1%
Managers	1	12%	3%
Professionals	2	26%	29%
Technicians and associate professionals	3	12%	18%
Clerical support workers	4	9%	7%
Services and sales workers	5	17%	18%
Skilled agricultural, forestry and fishery workers	6	1%	2%
Craft and related trades workers	7	8%	7%
Plant and machine operators and assemblers	8	5%	5%
Elementary occupations	9	8%	10%

Mapping apprenticeships in both countries to four-digit ISCO codes yields similar results to the SOC2010 mappings. Table 43 shows that having more apprenticeships means England covers more occupation groups (47% compared with 18%), especially for professional roles (60% compared with 5%). Compared with the Danish system, the English apprenticeship system is more concentrated in professional; and technical and associate professional occupations in terms of available standards (Table 44) and services; professional; and technical and associate professional occupations in terms of participation (Table 45). Danish apprenticeships are concentrated in crafts and related trades workers in terms of available standards and also in terms of participation.

107 Mappings to ISCO broadly follow the methodology used to map Danish apprenticeships to SOC2010, combining CASCOT and manual inspection.

108 Data is latest available: 2019 for the UK, 2020 for Denmark. Source: ILO Data Explorer. Available at: https://ilostat.ilo.org/data/

Table 43: Percentage of four-digit ISCO code occupations covered by apprenticeships for each major group in England and Denmark

ISCO group description	1-digit ISCO code	England	Denmark
All	All	47%	18%
Armed forces occupations	0	25%	0%
Managers	1	33%	0%
Professionals	2	60%	5%
Technicians and associate professionals	3	59%	23%
Clerical support workers	4	35%	14%
Services and sales workers	5	48%	25%
Skilled agricultural, forestry and fishery workers	6	23%	17%
Craft and related trades workers	7	57%	41%
Plant and machine operators and assemblers	8	29%	25%
Elementary occupations	9	20%	0%

Table 44: Share of apprenticeships mapped to each major ISCO group in England and Denmark

ISCO group description	1-digit ISCO code	England	Denmark
Armed forces occupations	0	0%	0%
Managers	1	5%	0%
Professionals	2	29%	7%
Technicians and associate professionals	3	29%	24%
Clerical support workers	4	4%	4%
Services and sales workers	5	7%	11%
Skilled agricultural, forestry and fishery workers	6	2%	5%
Craft and related trades workers	7	18%	38%
Plant and machine operators and assemblers	8	4%	11%
Elementary occupations	9	4%	0%

Table 45: Share of apprenticeship participation mapped to each major ISCO group in England and Denmark

ISCO group description	1-digit ISCO code	England	Denmark
Armed forces occupations	0	0%	0%
Managers	1	15%	0%
Professionals	2	19%	2%
Technicians and associate professionals	3	19%	13%
Clerical support workers	4	8%	13%
Services and sales workers	5	23%	32%
Skilled agricultural, forestry and fishery workers	6	1%	4%
Craft and related trades workers	7	13%	33%
Plant and machine operators and assemblers	8	2%	3%
Elementary occupations	9	1%	0%

Charts 33 and 34 plot the relationship between employment and apprenticeship participation in Denmark and England respectively. They suggest that the shares of employment and participation for each occupation group are more highly correlated in England than in Denmark, suggesting that the English apprenticeship system more accurately mirrors the shape of the domestic labour market. In Denmark, relative to employment, there is high participation in apprenticeships linked to services and sales workers (point 5) and craft and related trades workers (point 7), but low participation in those linked to other occupation groups. As such, there is essentially no correlation with employment shares in Denmark.

Again, it is important to remember that this analysis only covers apprenticeships. Including other areas of the vocational education system may shift these findings, bringing Danish coverage closer to or in line with that seen in England. However, it is notable that the role of apprenticeships is seen differently by the two countries.

Chart 33: Apprenticeship participation compared with employment share by major ISCO group in Denmark

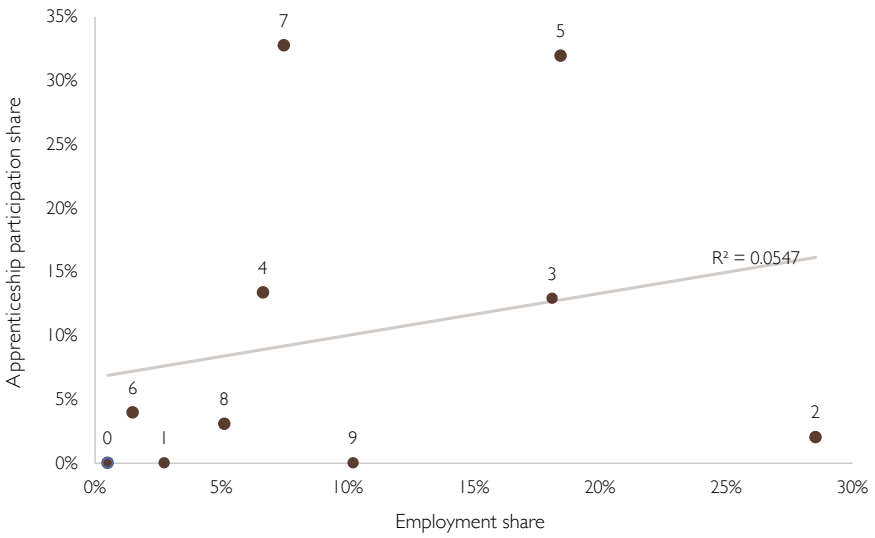
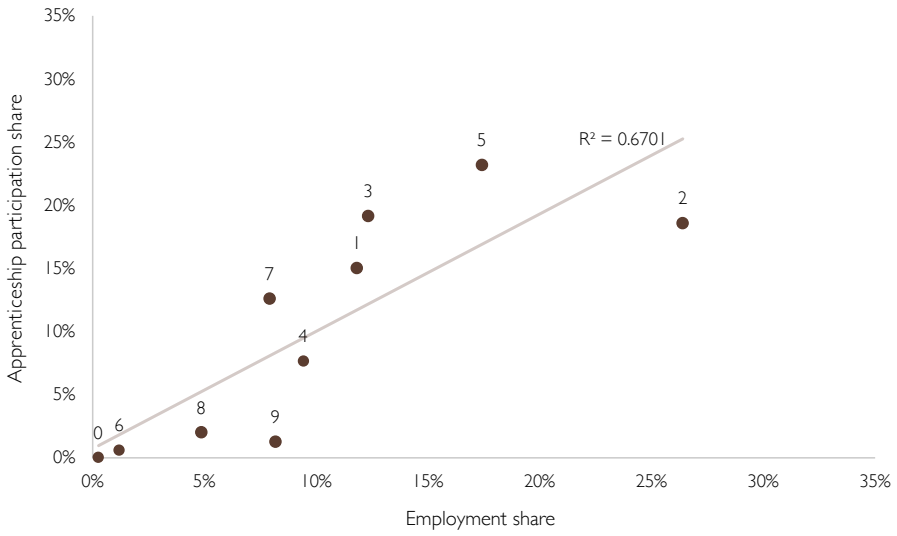


Chart 34: Apprenticeship participation compared with employment share by major ISCO group in England



APPENDIX: OCCUPATIONS WITH THE MOST APPRENTICESHIPS MAPPED

England

Engineering Technicians (28)

- Aerospace Manufacturing Fitter
- Aircraft Certifying Technician
- Aircraft Maintenance Certifying Technician
- Building Services Engineering Technician
- Compressed Air and Vacuum Technician
- Construction Site Engineering Technician
- Control Technical Support Engineer
- Engineering Manufacturing Technician
- Engineering Technician
- Healthcare Engineering Specialist Technician
- Heritage Engineering Technician
- High Speed Rail and Infrastructure Technician
- Lead Engineering Maintenance Technician
- Leisure and Entertainment Engineering Technician
- Lift Truck and Powered Access Engineering Technician
- Maintenance and Operations Engineering Technician
- Manufacturing Engineer (Degree)
- Propulsion Technician
- Rail Engineering Advanced Technician
- Rail Engineering Operative
- Rail Engineering Technician
- Railway Engineering Design Technician (Version 1)
- Railway Engineering Design Technician (Version 1.1)
- Scenic Automation Technician
- Science Industry Maintenance Technician
- Space Engineering Technician
- Utilities Engineering Technician (Version 1)
- Utilities Engineering Technician (Version 1.1)

Metal Working Production and Maintenance Fitters (15)

- Aircraft Maintenance Fitter or Technician (Fixed and Rotary Wing)
- Bicycle Mechanic
- Building Services Engineering Craftsperson
- Building Services Engineering Installer
- Building Services Engineering Service and Maintenance Engineer
- Commercial Catering Equipment Technician
- Construction Equipment Maintenance Mechanic
- Engineering Fitter
- Food and Drink Maintenance Engineer
- Land-Based Service Engineer
- Land-Based Service Engineering Technician
- Lift and Escalator Electromechanic
- Metal Fabricator
- Powered Pedestrian Door Installer and Service Engineer
- Stairlift, Platform Lift, Service Lift Electromechanic

Engineering Professionals New Engineering Contract (NEC) (11)

- Advanced Dairy Technologist
- Electrical or Electronic Technical Support Engineer (Degree)
- Fire Safety Engineer (Degree)
- Food Industry Technical Professional (Integrated Degree)
- Food Technologist
- Light Water Reactor Scientist and Engineer (Degree)
- Materials Science Technologist (Degree)
- Nuclear Scientist and Nuclear Engineer (Integrated Degree)
- Ordnance Munitions and Explosives Specialist (Integrated Degree)
- Post Graduate Engineer
- Project Controls Professional

The Netherlands

Engineering Technicians (12)

- All-Round Craftsman GWW
- All-Round Maritime Engineering Employee
- All-Round Water Builder
- Assistant Installation and Construction Technology
- Commercial Engineering Technician
- Electrical Engineering Technician
- Engineering Technician
- First Mechanic Service and Maintenance Mechanical Engineering
- Mechanics Technician
- Technician Service and Maintenance Electrical Engineering and Instrumentation
- Technician Service and Maintenance Mechanical Engineering
- Technician Service and Maintenance Mechanical Installations

Ship and Hovercraft Officers (12)

- Captain Inland Navigation
- Maritime Officer All Ships Nautical, Fishing
- Maritime Officer All Ships Nautical, Hydraulic Engineering
- Maritime Officer All Ships Nautical, Merchant Navy
- Maritime Officer All Ships Technical
- Maritime Officer Small Ships Nautical, Fishing
- Maritime Officer Small Ships Nautical, Merchant Navy
- Maritime Officer Small Ships Technical
- Skipper Canal Boat Limited Sailing Area
- Skipper Inland Shipping
- Upcoming Petty Officer Ground Action
- Upcoming Petty Officer Maritime

Construction Operatives NEC (12)

- All-Round Concrete Repairman
- All-Round Specialist Maintenance and Handyman
- All-Round Wrecker
- Concrete Repairman
- Craftsman Restoration Grouting
- Demos
- Earthmoving Engineer
- Employee Sign
- Façade Handler Jointing Company
- Grout
- Insulation Technician
- Opmeter Technical Insulation

Switzerland

Precision Instrument Makers and Repairers (9)

- Optician in Precision Instruments
- Qualitician in Microtechnology (professional field of microtechnology)
- CFC Watch
- CFC Watchmaking Finisher
- Stringed-Instrument Maker
- Wind Instrument Letter Carrier (professional field: Musical Instrument Bill)
- Piano Maker (professional field: Musical Instrument Invoice)
- Organ Builder (professional field: Musical Instrument Invoice)
- Organ Pipe Letter Carrier (professional field: Musical Instrument Invoice)

Vehicle Technicians, Mechanics and Electricians (8)

- Motor Mechanic
- Car Mechanic
- Cycle Mechanic
- Mechanic in Small Motorcycles and Cycles
- Motorcycle Mechanic
- Automotive Maintenance Assistant
- Automotive Mechatronics
- Car Maintenance Mechanic

Construction Operatives NEC (6)

- Constructor of Precast Concrete Elements
- Building Technical Assistance
- Assistant-Construction of Foundations (professional field: Construction of Communication Routes)
- Practitioner in Blinds (professional field: Envelope of Buildings)
- Drainage Technologist
- Sanitation Maintenance Worker

Germany

Other Skilled Trades NEC (33)

- Lacquer Laboratory Assistant
- Brush and Brush Maker/Brush and Brush Maker training according to focus areas: Production of Brushes/Production of Brushes
- Wickerwork Designer training according to main areas: Basketry/ Wickerwork Furniture/Braiding Objects (Industry and Commerce)
- Wickerwork Designer training according to main areas: Basketry/ Wickerwork Furniture/Braiding Objects (Craft)
- Biology Model Maker
- Technical Model Builder. Training in disciplines: Foundry/Bodywork and Production – View
- Candle Manufacturer and Wax Maker/Candle Manufacturer and Waxcreation training according to focus areas: Candle Production/Wax Painting (Industry and Commerce)
- Candle Manufacturer and Wax Maker/Candle Manufacturer and Waxcreation training according to focus areas: Candle Production/Wax Painting (Craft)
- Gemstone Barreler (Industry and Commerce)
- Gemstone Barreler (Craft)
- Gemstone Grinder/Gemstone Grinder. Training in specialisations: Gemstone Grinding/Industrial Diamond Grinding/Jewellery Diamond Grinding/ Gemstone Engraving
- Goldsmith. Training in disciplines: Jewellery/Chains (Industry and Commerce)
- Goldsmith. Training in the field of specialisation: Jewels (Industry and Commerce)
- Goldsmith. Training in disciplines: Jewellery/Chains (Craft)
- Goldsmith. Training in the field of specialisation: Jewels (Craft)
- Silversmith. Training by focus: Metal/Enamel (Industry and Commerce)
- Silversmith. Training by focus: Metal/Enamel (Craft)
- Engraver
- Metalworker/Metalworker. Training in the field of specialisation: Ziseliertechnik
- Sign and Light Advertising Manufacturer. Training according to focus areas: Technology, Assembly, Advertising Electrics/Electronics, Graphics, Printing, Application
- Bowmaker
- Violin Maker
- Tow Instrument Maker. Training in disciplines: Guitar Construction/Harp Construction
- Woodwind Instrument Maker (Industry and Commerce)
- Woodwind Instrument Maker (Craft)
- Metal Blowing Instrument Maker/Metal Bleak Streamer (Industry and Commerce)
- Metal Blowing Instrument Maker/Metal Bleak Streamer (Craft)
- Piano and Harpsichord Maker. Training in disciplines: Piano Construction/ Harpsichord Construction (Industry and Commerce)
- Piano and Harpsichord Maker. Training in disciplines: Piano Construction/ Harpsichord Construction (Craft)
- Organ Builder. Training in disciplines: Organ Building/Pipe Construction

(Industry and Commerce)
- Organ Builder. Training in disciplines: Organ Building/Pipe Construction (Craft)
- Handheld Instrument Maker (Industry and Commerce)
- Handheld Instrument Maker (Craft)

Glass and Ceramics Makers, Decorators and Finishers (28)
- Glassmaker
- Process Mechanic Glass Technology
- Glass Baffle/Glass Apparatus Engineer (Industry and Commerce)
- Glass Baffle/Glass Apparatus Engineer (Craft)
- Luminous Tube Glass Blower/Light Tube Blower
- Thermometer Maker. Training in the field of specialisation: Thermometer Bubbles (Industry and Commerce)
- Thermometer Maker. Training in the field of specialisation: Thermometer Bubbles (Craft)
- Flat Glass Technologist
- Glass Refiner. Training in the field of specialisation: Stained Glass and Art Glazing (Industry and Commerce)
- Glass Refiner. Training in the field of specialisation: Cut and Engraving (Industry and Commerce)
- Glass Refiner. Training in the field of specialisation: Edge and Surface Refinement (Industry and Commerce)
- Glass Refiner. Training in the field of specialisation: Edge and Surface Refinement (Craft)
- Glass Refiner. Training in the field of specialisation: Cut and Engraving (Craft)
- Glass refiner. Training in the field of specialisation: Stained Glass and Art Glazing (Craft)
- Thermometer Maker. Training in the field of specialisation: Thermometer Adjustment (Industry and Commerce)
- Thermometer Maker. Training in the field of specialisation: Thermometer Adjustment (Craft)
- Precision Optician (Industry and Commerce)
- Precision Optician (Craft)
- Process Mechanic for Eyeglass Optics
- Figure Ceramic Shaper
- Industrial Ceramic Model Technology/Industrial Ceramicist Model Technology
- Glass and Porcelain Painter
- Industrial Ceramic Decoration Technology
- Manufactory Porcelain Painter
- Glassblower/Glass Blower. Training in disciplines: Glass Design/Christmas Tree Decorations (Industry and Commerce)
- Glassblower/Glass Blower. Training in the field of: Artificial Eyes (Industry and Commerce)
- Glassblower/Glass Blower. Training in disciplines: Glass Design/Christmas Tree Decorations (Craft)
- Glassblower/Glass Blower. Training in the field of: Artificial Eyes (Craft)

Construction and Building Trades NEC (16)

- Precast Concrete Builder
- Process Mechanic in the Stone and Earth Industry. Training in disciplines: Building Materials/Asphalt Technology
- Process Mechanic in the Stone and Earth Industry. Training in the field of specialisation: Prefabricated Concrete Products
- Process Mechanic in the Stone and Earth Industry. Training in disciplines: Gypsum Boards or Fibre Cement/Lime Sandstones or Aerated Concrete
- Process Mechanic in the Stone and Earth Industry. Training in the field of: Ready-Mixed Concrete
- Engineered Stone Technologist
- Building Construction Workers/Building Construction Specialists. Training by focus: Masonry Work/Concrete and Reinforced Concrete Work/Firing and Chimney Construction (Industry and Commerce)
- Building Construction Workers/Building Construction Specialists. Training by focus: Masonry Work/Concrete and Reinforced Concrete Work/Firing and Chimney Construction (Craft)
- Concrete and Reinforced Concrete Builder (Industry and Commerce)
- Concrete and Reinforced Concrete Builder (Craft)
- Firing and Chimney Builder/Firing and Chimney Builder (Industry and Commerce)
- Firing and Chimney Builder/Firing and Chimney Builder (Craft)
- Façade Fitter
- Specialist for Wood and Building Protection Specialists
- Wood and Building Protectors. Training in special fields: Wood Protection/ Building Protection
- Building Material Tester. Training according to specialisations: Geotechnics/ Mortar and Concrete Technology/Asphalt Technology

Denmark

Metal Working Production and Maintenance Fitters (3)
- Boat Mechanic
- Fine Mechanic
- Ship Mechanic

Graphic Designers (3)
- Digital Media
- Graphic Technician
- Media Graphic Designer

Science, Engineering and Production Technicians NEC (3)
- Automation and Process Training
- The Industrial Technician Education
- Foundry Technician

Vehicle Technicians, Mechanics and Electricians (3)
- The Bicycle and Motorcycle Mechanic Education
- Truck Mechanic
- Car Mechanic

Construction and Building Trades NEC (3)
- Construction Designer, Building Designer and Paver
- Real Estate Service Technician
- The Wooden Subjects' Construction Education

The Gatsby Charitable Foundation
The Peak, 5 Wilton Road, London SW1V 1AP
T +44 (0)20 7410 0330 www.gatsby.org.uk
Registered Charity number 251988

July 2022