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Process for aggregating and linking Further Education courses supply and demand data

A project for the London LSIP funded by the Department for Education

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Introduction

This working paper sets out the process developed in 2020 to create the supply data from West London colleges to feed into the supply and demand tool launched by the West London Alliance in 2021. This is to inform a course open data standard project funded by the Department for Education through the London LSIP and being led by West London Business for BusinessLDN and delivered by the Open Data Institute. The project will ultimately investigate whether this manual process could be automated in some way.

The paper also sets out our understanding of XCRI-CAP although whether the data standard developed for Post-Graduate courses could be extended to accommodate Further Education data and tackle the issue of understanding both what courses are available and the places available on those courses is not clear. This will be addressed by Cetus LLP. A data standard or process is needed to bring greater transparency to understand the skills pipeline, whether existing provision meets jobs demand and what courses are needed to plug the gap.

Since 2021 there have been developments on these issues such as the National Careers Website which features relevant courses and providers and the development of Vector. This is software used by colleges to align courses with labour market data. However this is proprietary software and like most economic demand studies not freely accessible.

As part of this project we will be conducting an updated review of data sources and opportunities as well as gaining a better understanding of the Working Futures initiative and developments around London's Local Skills Improvement Plan (LSIP) applications all of which have commissioned some form of skills demand forecasts which may be helpful in the next phase of this work.

This report should be used in conjunction with the data capture form and the existing data on 1000 courses that have already been allocated Standard Occupational Classifications (SOC) and Standard Industrial Classifications (SIC) codes already provided to the project team by Rocket Science.

The issue

For context it is helpful to understand the background to the project and how we were able to think of the opportunity of using the West London Alliance (WLA) work to investigate an Open Data Standard.

Our own work in developing skills and employment plans always features some form of supply and demand mapping, which is incredibly frustrating to do due to the lack of usable data. We were commissioned by the Greater London Authority (GLA) in 2019 to consult on the online hub that was proposed in the Skills for Londoners Strategy at the time. Our conclusions were that there was scope for the GLA to lead this approach based on their developing work with Adult Education Budget (AEB) data, the London datastore and their role as skills commissioners. We consulted with over 120 organisations and the following were the main concerns identified from this process:

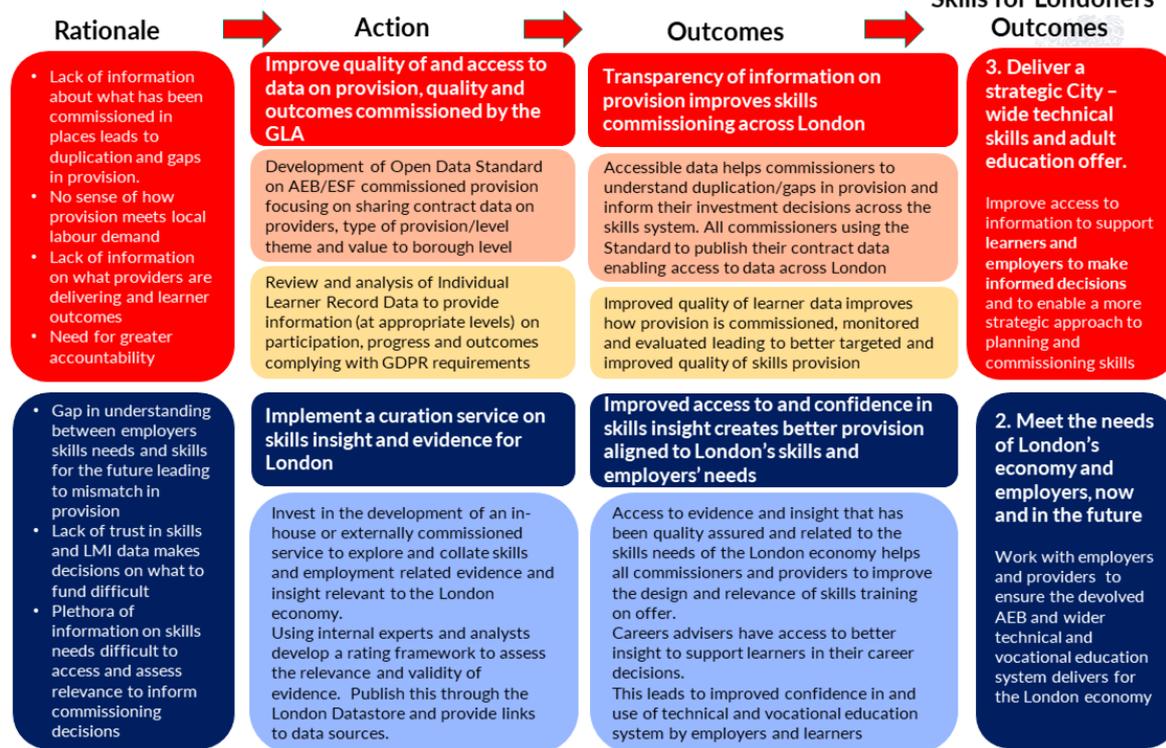
- “Lack of clarity about the potential budget for the Hub and where funding would come from to sustain it. It was felt that the costs for setting up a new entity and the ongoing challenge of finding resources to maintain it and sustain it into the future were disproportionate, particularly in light of previous initiatives (i.e. the London Skills Observatory) that had received investment but not been able to be sustained in the long term.
- Understanding the primary audience for Knowledge Hub. Although the initial scope for the Hub was broad, it became clear that its focus needed to be on commissioners, providers and front-line advisors to support better decision making around procurement, delivery and support to learners. This was felt to be where the hub could make the greatest impact on outcomes for learners.
- The potential to use existing assets including the London Datastore more effectively in the publication and use of labour market insight and information on GLA’s employment and skills programmes. It was felt that the London Datastore was already a trusted and well used source of information and that this should be the gateway through which information and data should be published.
- The need for trusted and reliable data which has been quality assured and readily accessible. Most stakeholders commented on the plethora and confusing nature of careers and skills information and insight within the public domain. What is missing is not quantity but trusted and quality assured information that they could be confident in using to inform commissioning and programme design.” (Consultation report 2019 for the GLA)

The two main conclusions on the role for the GLA were:

- **“Providing greater transparency on skills and employment programmes for which it is responsible for commissioning** including those funded through Adult Education Budget and European Social Fund. This would help commissioners and providers to be clear on what was commissioned locally and, in time, as more data through Individual Learner Records becomes available, greater understanding on the quality and impact of provision on learner outcomes and employers’ needs.
- **Providing at London-level a curatorial and publicising role on skills and labour market insight relevant to the capital focusing on sectoral, skills and careers trends.** This would help commissioners, providers and front-line advisors to be able to readily access information to inform their commissioning, services and support to learners as well as have greater trust and confidence in the information so that they are able to use it to inform and shape services for learners and employers.”

Although this work was not taken forward, due to complexity and changes within the GLA, the issues and challenges remained the same. We recommended that the GLA should look at a data standard as part of a high-level theory of change to underpin the recommendations.

Transparency



Curation

At the time we were also commissioned to deliver several employment and skills strategies for different areas, including the Old Oak & Park Royal Development Corporation (OPDC) area and were convinced on the need for an open data standard to improve transparency in the system as set out in this blog [Three words could transform the employment and skills system - Rocket Science \(rocketsciencelab.co.uk\)](https://rocketsciencelab.co.uk).

We were subsequently commissioned by the West London Alliance with the Institute for Employment Studies (IES) to develop the [supply and demand tool](#). This provided us with an opportunity to look practically at the issue of supply data and how to source it, code it and publish it. Our initial thoughts were to use AEB data which can be accessed through the Data Cube¹. However there were several issues:

- Limitations on access to the data and because of GDPR concerns only certain data could be published and at a level of aggregation and scope that was meaningless.

¹ ESFA Data Cube, Accessed at: <https://data.london.gov.uk/esfa-data-cube/>

- The AEB data is generated from the Individual Learning Record (ILR) which tracks participation and retrospectively (quarterly in arrears) which would illustrate take up of places but not actual places.
- ILRs do not record SOC codes so courses were not able to be matched to demand data.

We therefore had to find another way of sourcing course information, places and SOC codes which is described in the next section. It is important also to reflect on the work we had to do to show what was in scope and out of scope. Assigning a SIC and SOC code is dependent on there being sufficient information about a job role/title to be able to identify and code the course.

We conducted a review of education levels and had to set parameters in terms of the data collected. Any course data below Level 2 was excluded as this was generic and difficult to assign a code to. We also found that data above Level 5 was also too generic. Our focus was on capturing Level 2 through to Level 5 provision excluding academic qualifications.

We also excluded private providers although it is highly likely that providers which support apprenticeships in the workplace would be offering higher level qualifications for staff and there would be a lot of data here on in-work provision. However this data could be difficult to access without the agreement of providers and issues of commercial confidentiality could also be a barrier.

Summary of process

Sourcing places data

First of all we created a data capture sheet in consultation with colleges, reflecting on where we needed accurate data (course information, places and take up) and where we could use 'best judgement' (% of students outside the geographic boundaries and travel to work areas).

The sheet was checked first by a college to ensure that completing it was not too onerous and then it was forwarded on to Principals to be completed by their data leads. This was a relatively painless process although we did need to chase data leads several times. In practice the feedback was that this was an easy exercise and did not take data leads too long to produce.

The following sets out the process we used to capture college data, source job titles and codes and complete data sheets:

- Data sent by each college for each academic year containing:
 - o Course title
 - o Qualification
 - o Sector Subject Area
 - o NVQ level or equivalent
 - o Duration of course (Weeks)
 - o Duration of course (Hours per week)
 - o Target places – academic year needs to be specified by data requester
 - o Actual Places
 - o Number of zero paid (i.e. those funded wholly by Government).
 - o % of students from within WLA catchment, Delivery Location (postcode)
- Not all data sheets contained information, so we had to assign SIC codes
 - o Companies house was a useful tool to do this:
<http://resources.companieshouse.gov.uk/sic/> as you can search for a key term (e.g. hairdressing) and it will come up with a SIC code, and in some cases a couple of SIC codes.
 - o Best judgement was used and in some cases, this was more problematic (e.g. business qualifications). In this instance we used the SOC codes (2010 and 2020) to help

match SIC codes. You can type in SOC codes at the following link to understand the industry they cover:

- <https://cascotweb.warwick.ac.uk/#/classification/soc2020>
- <https://cascotweb.warwick.ac.uk/#/classification/soc2010>
- We aimed to get job titles from qualification prospectuses where possible, and where not a google search or best judgement were used.
- Sourcing the qualification and downloading the specification using google searching or Institute of Apprenticeships occupational maps.
 - E.g. [Specification - Pearson BTEC Level 3 National Certificate in Engineering](#)
 - E.g. [Occupational Maps / Institute for Apprenticeships and Technical Education](#)
- Identifying job roles through searching specifications and identifying job titles that could then be searched on Cascot framework to source the SOC code- e.g. the following highlighted text in the BTEC specification.

Title	Size and structure	Summary purpose
Pearson BTEC Level 3 National Diploma in Computer Engineering	720 GLH (985 TQT) Equivalent in size to two A Levels. 10 units of which 6 are mandatory and 2 are external. Mandatory content (67%). External assessment (33%).	This qualification is aimed at learners preparing for roles in computer engineering, for example computer engineering technician or computer support analyst . Learners gain relevant skills and knowledge from studying a range of units, for example in computer programming, website design and/or cyber security . The qualification is designed to be the substantive part of a 16–19 study programme for learners who want a strong core of knowledge in computer engineering. It may be complemented with other BTEC Nationals or A Levels or non-qualification elements to support progression to specific job roles or to higher education courses in engineering.
Pearson BTEC Level 3 National Diploma in Manufacturing Engineering	720 GLH (980 TQT) Equivalent in size to two A Levels. 10 units of which 6 are mandatory and 2 are external. Mandatory content (67%).	This qualification is aimed at learners preparing for roles in manufacturing engineering, for example manufacturing engineering technician or welding operative . Learners gain relevant skills and knowledge

- o Sourcing the SOC and SIC codes from the Cascot web tool and adding these to the course data in the spreadsheet:

Input

Text: Code

Recommendations

Code	Title	Best Matching Index Entry	Score
5213	Welding trades	Welder	95
5212	Metal plate workers, smiths, moulders and related occupations	Plater-welder	37
8149	Assemblers and routine operatives n.e.c.	Welder, plastic	37
5315	Plumbers and heating and ventilating installers and repairers	Plumber-welder	37
5317	Glaziers, window fabricators and fitters	Welder (double glazing units)	35
5412	Footwear and leather working trades	Welder (footwear mfr)	35
5214	Pipe fitters	Fitter-welder, pipe	24

Classification Structure - SOC 2020 (v7)

- ▶ 51 SKILLED AGRICULTURAL AND RELATED TRADES
- ▶ 52 SKILLED METAL, ELECTRICAL AND ELECTRONIC TRADES
 - ▶ 521 Metal Forming, Welding and Related Trades
 - 5211 Sheet metal workers
 - 5212 Metal plate workers, smiths, moulders and related occupations
 - 5213 Welding trades
 - 5214 Pipe fitters
 - ▶ 522 Metal Machining, Fitting and Instrument Making Trades
 - ▶ 523 Vehicle Trades
 - ▶ 524 Electrical and Electronic Trades
 - ▶ 525 Skilled Metal, Electrical and Electronic Trades Supervisors
- ▶ 53 SKILLED CONSTRUCTION AND BUILDING TRADES
- ▶ 54 TEXTILES, PRINTING AND OTHER SKILLED TRADES
- ▶ 6 CARING, LEISURE AND OTHER SERVICE OCCUPATIONS
- ▶ 7 SALES AND CUSTOMER SERVICE OCCUPATIONS
- ▶ 8 PROCESS, PLANT AND MACHINE OPERATIVES

Job Titles in this Unit Group

- Solderer (metal trades)
- Solderer and joiner, case
- Sweater (metal trades)
- Technician, welding
- Welder
- Welder and cutter
- Welder, CO2
- Welder, arc
- Welder, chain
- Welder, coded
- Welder, electric
- Welder, fabrication
- Welder, fabricator

Description

5213 WELDING TRADES

Welding trades workers join metal parts by welding, brazing and soldering, and cut and remove defects from metal using a variety of equipment and techniques.

TYPICAL ENTRY ROUTES AND ASSOCIATED QUALIFICATIONS

Entrants typically possess GCSEs/S grades. Training is typically by apprenticeship incorporating practical experience and technical training. NVQs/SVQs at Levels 1, 2 and 3 and apprenticeships are available. Welders must normally pass a competency test in the particular type of welding to be carried out.

TASKS

- selects appropriate welding equipment such as electric arc, gas torch, etc.
- connects wires to power supply, or hoses to oxygen, acetylene, argon, carbon dioxide, electric arc, or other source and adjusts controls to regulate gas pressure and rate of flow
- cuts metal pieces using gas torch or electric arc
- guides electrode or torch along line of weld, burns away damaged areas, and melts brazing alloy or solder into joints
- cleans and smooths weld
- checks finished workpiece for defects and conformity with specification

RELATED JOB TITLES

Fabricator-welder
Fitter-welder
Spot welder (metal)
Welder
Welding technician

APPRENTICESHIPS (ENGLAND)

One or more occupations within this unit group are covered by an English Apprenticeship Standard

[Plate welder ST0852](#)
[Pipe welder ST0851](#)
[General welder \(arc processes\) ST0349](#)

All returns from the colleges were aggregated into one spreadsheet which was then used to populate the google dashboard.

The process itself was relatively simple although manual and time intensive. However if this could be automated in some way then this would make the task much simpler. The challenge comes from making the judgement about the course and its relevance to a job role so the source data from a prospectus, qualification framework or pathway is really important and something that probably could be easily done at source i.e. by the awarding authority if it were mandated by the Department for Education (DfE).

Sourcing demand data

Most of this section has been taken from our joint report with IES for the West London Alliance which can be accessed [here](#) for greater detail about the supply and demand mapping project.

Key to the work was creating a sustainable tool that could easily be updated both in terms of supply data (updated annually) and demand data (updated regularly using our methodology). Fundamentally it was important to be able to link supply and demand data together using a common code which we agreed as being the four-digit SOC code. The following sets out the method for gathering and forecasting demand data, although this was conducted during the pandemic, so we had to make adjustments for that impact. It is also important to note the limitations of the demand data however whether updates are done for free, at marginal cost or as part of an economic study, the supply data should be easy to 'plug in' using the SOC code approach. In this regard the demand of places is something that could be generated in various ways and then linked to the supply data.

Method for demand data (extracted from the report by IES and Rocket Science in 2021 for the West London Alliance):

- Annual Population Survey data were extracted from NOMIS for London, the WLA and constituent boroughs by Standard Occupational Classification (SOC)2010 'major' and minor groups for the period 2004-2019 (the longest data run currently available). When possible, any missing values (suppressed) were extrapolated (typically via an averaging over years or in cases via inputting a trend figure).
- Detailed occupational data (employment estimates by 4 digit or SOC unit) were extracted for London for the same period, and a map constructed showing the distribution of employment from detailed (4 digit/unit level) to high level (i.e. SOC minor 2 digit) SOC produced.
- This map was then applied to borough figures to provide employment estimates by detailed occupational group for each of the seven WLA boroughs and the WLA as a

whole (i.e. it was assumed at this point that the mapping from major to minor SOC at London/sub-region are broadly equal at this level of detail).

- Employment trends for each of the occupational (unit) groups and each of the WLA areas were extrapolated forwards for the 2020-2030 period using a simple regression.
- Any negative estimates arising in the forecasts for the 2020-30 period were held at zero (typically in cases where employment estimates/trends were very low and as such subject in any case to very high levels of potential error).
- The sum of forecast employment by detailed occupational (unit) group in any particular year was constrained to the forecast in employment as a whole for that particular area.
- To adjust for changes arising due to COVID, QLFS data were extracted by detailed occupation (unit) for London for the first three quarters of 2020 and the associated trends projected forward through to 2023. These near-term estimates were appended to the original trend data set and a revised set of forecasts produced.

In this way two sets of forecasts were obtained a) baseline estimates which were based upon data up until the COVID pandemic and b) revised estimates incorporating known employment trend data for the first three quarters of the 'COVID year' for London.

- In addition to these 'base forecasts' of employment, further forecasts were also produced to show the anticipated 'replacement demand' for labour and skills arising over the coming ten years i.e. demand arising due to individuals leaving employment and entering retirement, inactivity or unemployment as outlined within the earlier reports and forecasts by Oxford Economics. These replacement demand figures were then added to the original estimates of employment growth (or decline) to show the 'total demand' for particular occupations and WLA areas over the 2020 -30 period. More specifically these figures were produced in the following manner:
 - London based estimates of replacement demand for the 2011-2019 period were produced via an analysis of QLFS data held at the UK Data Service (April-June quarters only).
 - These replacement demand estimates were converted to percentages (i.e. the percentage of the London workforce in specific SOC groups that required replacement in each year) and a rolling average of these percentages taken for the 9 years.
- These average percentages (by area/ SOC) were then multiplied by the employment

forecasts above to give estimates of future replacement demand.

Note that we elected to use these 'rolling proportions' as opposed to annual replacement demand estimates due to the comparatively low sample base for these data and the associated adjustments required for their analysis - i.e. questions concerning employment flows in the LFS are only asked in one quarter of the year and as such, not only is it impossible to create annual averages by combining data for four quarters of a specific year (a common and historically favoured approach to QLFS analysis) but when undertaking any analysis of 'non-core' questions¹³ (like those concerning replacement demand), it is also necessary to make a very crude adjustment to the data to compensate for this.

- The resulting estimates for replacement demand were then combined with estimated employment change figures to show total demand for specific years, areas and occupations arising over the 2020-30 period.

It should be noted that this project has not investigated whether the aggregation of this demand side data could be automated.

This data was presented on a series of excel spreadsheets and then combined with the supply data to form the tool. The following section sets out this process.

Creating the tool

The processes outlined above essentially gave us three different data sources:

- Course details, giving course identifier code, name of course, sector subject area, college, qualification, NVQ and postcode information
- SIC and SOC codes for each course – with some individual courses being linked to multiple SIC and SOC codes
- Demand data, broken down for each local authority by 4-digit SOC codes and with a sector subject area consistently linked to each 4-digit SOC code.

We set up an interactive analysis tool using Google Studio (now Looker) that joined these three data sources by individual course, SOC code and subject area to produce an interactive dashboard that compares the supply of places to demand and allows users to filter by:

- College name
- Local authority
- Sector subject area
- Occupation sector
- Occupation
- NVQ level

Once the filters are applied, users can compare supply vs demand at a detailed level.

Figure 1 - WLA dashboard produced in 2020-21

1. Courses vs demand analysis tool

Make a selection

Confirm your selection of one or more choices by pressing the green 'ok' button at the bottom of each list:

College name: All

Local Authority: All

Sector Subject Area: All

Choose **one** Occupation Sector and / or Occupation to filter the Demand information as well as the Provider information:

Occupation Sector: All

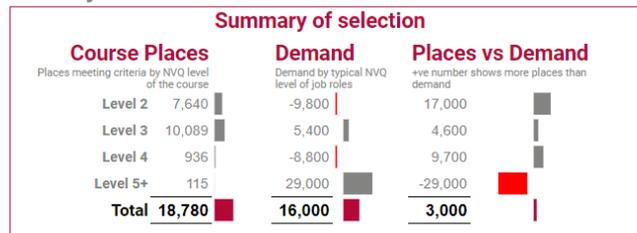
Selection:

Occupation: All

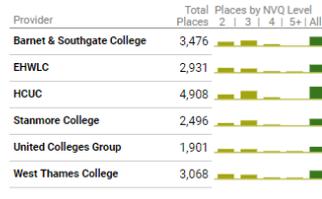
Selection:

Filter course details below by NVQ level(s):

NVQ level or equivalent: All



Places by provider



Demand by Local Authority



ROCKET SKILLS | ies | West London Alliance

Analysis by sector subject area

Sector	Total jobs	Total demand	Places	Places v Demand
Arts, Media & Publishing	67,000	9,200	1,618	-7,600
Business, Admin & Law	318,000	7,700	2,683	-5,000
Construction & Planning	57,000	-11,000	2,602	13,000
Education and Training	81,000	1,400	546	-900
Engineering & Manufacturing	89,000	5,900	1,388	-4,500
Health, Public Service & Care	140,000	3,100	3,148	40
ICT	76,000	-8,900	1,823	11,000
Leisure, Travel & Tourism	51,000	-7,100	2,090	9,200
Retail & Commercial	107,000	3,400	1,801	-1,600
Science and Mathematics	25,000	6,300	1,081	-5,200
Sectors not covered by providers (e.g. Agriculture)	14,000	5,300		-5,300

Jobs and demand figures are 2021 forecast estimates, which have been variably rounded. These roundings may cause some totals to vary slightly from individual figures.

Details of courses meeting the criteria (click on the chart to scroll through courses)

Course title	College name	Sector Subject Area	NVQ	Total hrs	Places
2391-52 L3 Award In Initial Verification & Periodic Inspection Testing (combined) CARRYOVER ONLY	Barnet and Southgate College	Construction, Planning, and the Built Environment	3	48	27
90-credit Diploma in Public Services (QCF)	HCUC	Health, Public Services, and Care	3	546	17
90-credit Diploma in Public Services (QCF) a	West Thames College	Health, Public Services, and Care	3	360	23
90-credit Diploma in Public Services (QCF) b	West Thames College	Health, Public Services, and Care	3	360	2

Recommendations

Based on our work on this project, discussions with colleagues from the ODI and consultants we have set out the following table reflecting our thoughts and recommendations for the future.

Issue	Finding	Recommendation
Accessing a dataset of course places that enables you to match demand against predicted jobs	To be able to understand the volume of places you need to understand capacity, and this can only be sourced directly from the colleges	We adopted a method of accessing course data directly from colleges as this was the most effective way of getting the data both in terms of predicted number of available places and take up. The impact on colleges was very low in terms of providing this data annually. We suspect that this could be replicated simply if no other dataset is or becomes available.
Using SOC and SIC codes to match courses with job predictions	Having investigated the different ways of matching data and the limitations of different approaches in terms of assessing demand using SIC and SOC codes currently makes sense. Although in some cases this may not fit new job titles and as Cascot admit the framework has a margin of error.	At this moment SIC and SOC codes remain the most reliable way of coding courses and jobs data. However as new technology is developed and tools such as Burning Glass and Adzuna become more utilised alternatives should be considered in the future.
Identifying and analysing demand data	As described above we developed a method for forecasting at sub-regional and borough level, but it has its limitations as does the various datasets used	We recommend that the focus of the tool is on supply and that it could be simply developed as a plug in to add into other demand data whether this is produced freely or through commissioned economic forecasting. This on the basis that forecasts use SOC and SIC codes. This would also help focus on the

Issue	Finding	Recommendation
		development and sustainability of supply data rather than on a whole tool which could be adapted for different circumstances.
Coding course data to SOC/SIC Codes	This has been a manual process and at this stage not clear as to whether any of this can be automated. However there are over 1000 courses already coded which provides a good start	The Warwick Institute for Employment Research (IER) have been approached but not responded. However the Cascot framework they developed and maintain remains the most reliable way of coding courses to SOC codes. For a manual process to continue this would need to be funded to keep an up-to-date record of SOC and course data. An option would be for awarding bodies to include SOC and SIC codes on their course frameworks at source although they might lack independence and inconsistently apply the codes. Colleges could then access this information from the national Learning Aims database and provide this on the data they submit.
Future sustainability	The tool was developed on the premise that it could be easily updated without having to significantly invest further funding to source demand and supply data. The methods and tools are free to use however there is a cost of time to update the tool. It was assumed that WLA or similar partnerships would be able to deliver this within their programme of work and their experts.	Our recommendation is that a host needs to be found for the tool for it to sustain itself and to scale. There are various options for this – the DfE Unit for Future Skills, combined authorities in the regions perhaps with one taking the lead on behalf of others, an LSIP Employer Representative Body (ERB) or organisations like IES, IER and organisations interested in the

Issue	Finding	Recommendation
		<p data-bbox="1066 230 1406 297">national application of the tool.</p> <p data-bbox="1066 349 1445 976">As a minimum securing and coding the supply data is a relatively easy task if we are able to build on the existing national processes that support the National Careers Service Course finder. The time/ cost would then be focused on maintaining the data mapping table (course/ qual to four-digit SOC code) and would probably be in the region of 10 -20 days per annum to do across London or much less if aggregated by DfE.</p> <p data-bbox="1066 1028 1457 1532">The demand data is more complex and would require more time. Which follows from our previous recommendation of focusing on supply data with a view to potentially selling on a data plug-in for use by others if revenue needs to be generated to support the work. This could also easily be homed within organisations such as AELP.</p>

Appendices

Appendix 1. XCRI-CAP review

What is XCRI-CAP?

XCRI-CAP, which stands for “eXchanging Course Related Information – Course Advertising Profile”, is a data standards project aiming to build a high-quality, replicable infrastructure for educational institutions and other stakeholders to store and share information about higher education courses.

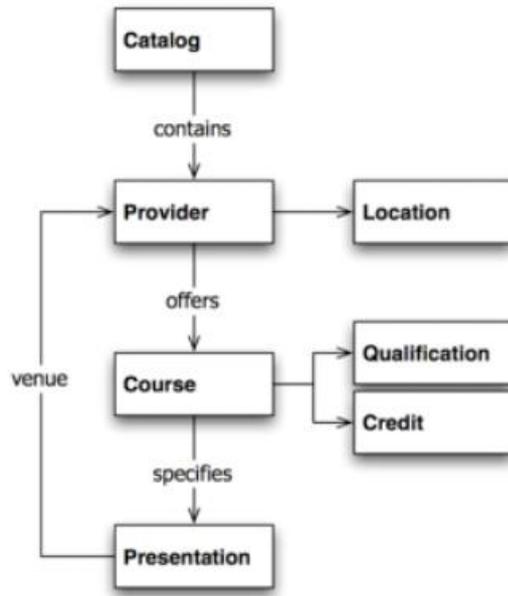
The standard was developed to respond to the inefficiencies, inconsistencies, and costs incurred by the lack of a standardised format for data about higher education courses, resulting in institutions and aggregators each having to manually compile data from multiple sources with incompatible architectures. XCRI-CAP was proposed as a single unifying framework to cut out these issues, at the cost of a non-negligible combined efforts by a range of institutions to update their data standards and IT infrastructures to accommodate common use of the standard.

XCRI-CAP’s full UK standard name is “XCRI-CAP 1.2”, as defined within British Standard BS8581:2012 (details available [here](#)), and was recommended by the UK government for use across all sectors of UK education and training. XCRI-CAP also later influenced European data standard EN15982 MLO-AD (Metadata for Learning Opportunities; details available [here](#)), with which XCRI-CAP conforms.

The XCRI-CAP data architecture

XCRI-CAP is a data architecture in Extensible Markup Language (XML), a widely-used text-based format similar to HTML used to represent structured information online.

The core elements of the XCRI-CAP architecture are: catalog, provider, course, presentation, qualification, credit, and location (which can be attached to both providers and presentations).



XCRI-CAP Information Model (from the Data Definitions document)

Each core element contains its own set of data. In other words, XCRI-CAP is a nested architecture, which means that ‘parent’ elements containing a number of ‘children’ elements. Data elements can be mandatory (must be included in the feed), preferred (ideally included in the feed), and optional.

Catalog @generated
Provider identifier*, title*, subject*, description*, relation*, URL, image, address
Course identifier*, title*, subject*, description*, relation*, URL, image, qualification*, credit*
Presentation identifier*, title*, subject*, description*, relation*, URL, image, start, end, duration, studyMode, attendanceMode, attendancePattern, languageOfInstruction, languageOfAssessment, placesAvailable, cost, enquireTo, applyFrom, applyUntil, applyTo, entryProfile*, entryRequirements*, venue*

* = multiples permitted

Nested architecture of XCRI-CAP’s core elements (Allan Paul)

A full description of each element of the XCRI-CAP framework, as well as its relation to other elements, can be found in the XCRI-CAP Data Definitions document (accessible [here](#)).

Below is an example of an XCRI-CAP entry in the XML format.

```
<?xml version="1.0" encoding="UTF-8"?>
<catalog xmlns: xsi:schemaLocation="
  http://xcri.org/profiles/1.2/catalog http://www.alanpaul.co.uk/xcri/xcri_cap_1_2.xsd
  http://xcri.co.uk http://www.alanpaul.co.uk/xcri/coursedataprogramme.xsd
  http://xcri.org/profiles/1.2/catalog/terms http://www.alanpaul.co.uk/xcri/xcri_cap_terms_1_2.xsd
  http://www.w3.org/2003/01/geo/wgs84_pos http://www.craighawker.co.uk/xcri/validation/xsds/geo.xsd"
  generated="2014-10-27T08:17:52"
  xmlns="http://xcri.org/profiles/1.2/catalog"
  xmlns:credit="http://purl.org/net/ctm"
  xmlns:dc="http://purl.org/dc/elements/1.1/"
  xmlns:dcmitype="http://purl.org/dc/dcmitype/"
  xmlns:dcterms="http://purl.org/dc/terms/"
  xmlns:mlo="http://purl.org/net/mlo"
  xmlns:xhtml="http://www.w3.org/1999/xhtml"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:geo="http://www.w3.org/2003/01/geo/wgs84_pos"
  xmlns:xcri="http://xcri.co.uk"
  xmlns:xcriTerms="http://xcri.org/profiles/1.2/catalog/terms"
  xmlns:fo="http://www.w3.org/1999/XSL/Format"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:fn="http://www.w3.org/2005/xpath-functions">
  <dc:description>XCRI-CAP 1.2 feed</dc:description>
  <provider>
    <mlo:hasPart>Faculty of Arts</mlo:hasPart>
    <mlo:hasPart>Faculty of Humanities</mlo:hasPart>
    <mlo:hasPart>Faculty of Science</mlo:hasPart>
    <mlo:hasPart>Faculty of Mathematics, Computing and Technology</mlo:hasPart>
    <mlo:hasPart>Faculty of Education and Language Studies</mlo:hasPart>
    <mlo:hasPart>Faculty of Business and Law</mlo:hasPart>
    <mlo:hasPart>Centre for Inclusion and Collaborative Partnerships</mlo:hasPart>
    <mlo:hasPart>Faculty of Social Sciences</mlo:hasPart>
    <mlo:hasPart>Faculty of Health and Social Care</mlo:hasPart>
    <mlo:hasPart>Institute of Educational Technology</mlo:hasPart>
    <dc:description>The Open University is a world leader in modern distance learning, the pioneer of teaching and learning methods which enable
    people to achieve their career and life goals studying at times and in places to suit them.</dc:description>
    <dc:identifier>http://www.open.ac.uk/</dc:identifier>
    <dc:identifier xsi:type="xcri:ukpm">1000773</dc:identifier>
    <dc:title>The Open University</dc:title>
    <mlo:ur>http://www.open.ac.uk/</mlo:ur>
  </course>
  <mlo:isPartOf>Faculty of Humanities</mlo:isPartOf>
  <dc:description>
```

Example XML record extract (Implementation Manual)

Prospects also published a “statement of alternatives for data architecture” (Appendix 6, pp. 26-27, Implementation Manual, 2015).

Development and implementation of XCRI-CAP

Since its inception, the project has been supported by [Jisc](#), a British non-profit specialised in providing further and higher education institutions with IT and digital support. It was first seed-funded in 2005, with implementation rounds with higher education institutions later funded by Jisc in 2011, 2012, and 2014. Following a Jisc-funded feasibility study in 2014, the XCRI-CAP standard was adopted and operationalised for postgraduate courses by [Prospects](#), an online aggregator of graduate career and post-graduate recruitment options.

Existing implementations of XCRI-CAP include the following.

- **Course Exchange**, the system which underpins Prospects' XCRI-CAP database. It was designed to pull XCRI-CAP feeds from higher education providers and aggregate them onto the Prospects search platform. According to the Prospects website, it is still currently operating.
- **Course Check**, a validation tool hosted by Prospects for institutions to check the syntax of a newly created XCRI-CAP feed. Course Check is available [here](#).
- **Course listings (various institutions)**. The standard also seems to have been adopted by a range of colleges and universities to structure their own course listings as part of the feasibility study.

The materials published by Prospects and Jisc around 2014-2016 mention discussions with a range of other aggregators and platforms including Hotcourses (now [IDP Connect](#)), [StudyLink](#), and [UCAS](#). However, little information is available about whether the standard was in fact later implemented by these platforms.

XCRI-CAP's current status is archived.

XCRI-CAP Support Materials

Existing support materials around XCRI-CAP include the following.

It should be noted that many of the resources are outdated, contain broken links (e.g., to college or university course repositories which have since been moved to other platforms), or are now off-server (e.g., much of the original XCRI-CAP documentation previously hosted by Jisc).

- **The XCRI-CAP webpage**. Hosted by Prospects, it is accessible [here](#). The original website for the project no longer exists, although it has been archived by the Internet Archive's Wayback Machine [here](#). Its resources page, accessible [here](#), indexes many of the original documents pertaining to XCRI-CAP's early implementation. In 2016, the website migrated to co-creator and information consultant Allan Paul's website, which likewise no longer exists.
- **XCRI-CAP Implementation Manual for Post-graduate Courses (Prospects & Jisc, 2015)**. Available [here](#). This is the most accessible and extensive documentation of XCRI-CAP, which includes implementation process maps and other guidance intended to reduce barriers to adopting the standard.
- **XCRI-CAP Data Definition (post-graduate) (Prospects, 2015)**. Available [here](#).

- **XCRI-CAP Code of Practice (British Standards Institution, 2012).** Available [here](#). Under paywall (£198).
- **XCRI-CAP Self-Assessment Framework (Jisc, date unknown).** Can be downloaded [here](#). Designed to help institutions evaluate their readiness to implement a standardised approach to course marketing. An example of self-assessment, completed by Royal Holloway, can be accessed [here](#).
- **XCRI-CAP Implementation Report (University of Cambridge, 2015).** It can be downloaded [here](#), noting that most of the report's links to its XCRI-CAP feeds and outputs are broken.

Additional materials documenting XCRI-CAP include the following.

- **Jisc XCRI mailing list.** A resource for questions about XCRI-CAP. Accessible [here](#), disused since June 2015.
- **Various presentations on XCRI-CAP (Allan Paul, APS Ltd).** Allan Paul, freelance information consultant previously of APS Ltd, was heavily involved in designing and promoting XCRI-CAP. Records of his presentations on XCRI-CAP can be found on SlideShare [here](#).
- **Various blogs and podcasts (various institutions).** Several institutions, namely those having participated in Jisc's feasibility study, documented the process of adopting XCRI-CAP in public-facing pieces.

The potential for use of XCRI-CAP, <https://schema.org/Course> which then followed, and most recently <https://credreg.net/ctdl/handbook#learningopportunityprofile> to be used as the data standard for FE course data will be explored further, and hopefully resolved with a detailed specification, by Cetus LLP in the next phase of this project.

Appendix 2. Cascot review

What is Cascot?

[Cascot](#) (Computer-Assisted Structured Coding Tool) is a piece of proprietary software developed by Professor Peter Elias at the Warwick Institute for Employment Research (IER), University of Warwick, in December 2014. The program was developed as an extension of the Data Service Infrastructure for the Social Sciences and Humanities (DASISH) project (February-December 2014), funded by the European Commission.

[Cascot International](#), a multi-lingual beta version of the software featuring fourteen languages, was also developed between 2014 and 2016. Nine languages were included in the 2014 DASISH work (Dutch, English, Finnish, French, German, Italian, Portuguese, Slovak and Spanish) and five languages (Arabic, Chinese, Hindi, Indonesian and Russian) added in 2016 as part of the Synergies for Europe's Research Infrastructures in the Social Sciences (SERISS) project.

The software is a classifier algorithm written in Javascript and built to assign standard occupation and industrial codes to natural text inputs. The reference codes used are the Office for National Statistics' Standard Occupational Classification (SOC) and Standard Industrial Classification (SIC). Cascot currently supports SOC codes up to the 2020 version and SIC codes up to the 2007 version, both the latest versions of the ONS classifications.

An online version of the software is available [here](#) for SOC2020 data, SOC2010 data, SIC2007 data, and multilingual data (ISCO-08). For higher volumes of data, a desktop version costing £350 is available for purchase, licensed on a site-based, organisational basis (one license per same-site institution rather than one license per user). The threshold for the amount of data requiring purchasing the desktop software is not stated. Further, the information concerning coding speed is based on average processing power circa 2015 and is therefore outdated.

According to the IER website, the Higher Education Statistics Agency ([HESA](#)), now part of Jisc, freely distributes a version of Cascot adapted for a variant of the SOC2010 classification. Abbreviated as SOC2010 (DLHE), this version was created for coding data contained in the Survey of Destinations of Leavers from Higher Education Institutions and is documented [here](#).

How does Cascot work?

Cascot inputs is natural language text about occupations. The software can code manual entries (e.g., typing “doctor” into the software) or a text-file input (tab- or comma-delineated text files). As such, it is highly sensitive to the quality of the input data (i.e., should not contain unnecessary words, words should be specific enough, etc.).

Cascot then assigns a code from its reference index (e.g., SOC2020) to the input text, with the aim to match it with a standard occupation code. The software also returns an occupation title, best matching index entry, and “certainty score”. The matching is based on text frequency and similarity and is probabilistic, which means that the software only codes text to some *degree* of certainty, which the software represents with a certainty score between 1 and 100. As Cascot is proprietary, the methodology by which the software ranks likelihood and calculates its confidence intervals is not accessible to review.

To illustrate, coding the text “lead consultant” with the online SOC2020 version of Cascot returns the following. Recommendations are first (scored by likelihood on a 0-100 scale), followed by the first recommendation’s location in the classification structure, job titles in the corresponding group, and job description.

Input
Code

Text:

Recommendations

Code	Title	Best Matching Index Entry	Score
2431	Management consultants and business analysts	Leader, team, consultancy, management	52
2139	Information technology professionals n.e.c.	Consultant (computing)	29
2113	Biochemists and biomedical scientists	Consultant (pharmaceutical)	28
2212	Specialist medical practitioners	Consultant (medical)	28
2136	IT quality and testing professionals	Consultant, test	26
2134	Programmers and software development professionals	Consultant, application	26
2125	Production and process engineers	Consultant, industrial	26

Classification Structure – SOC 2020 (v7)

- 24 BUSINESS, MEDIA AND PUBLIC SERVICE PROFESSIONALS
 - 241 Legal Professionals
 - 242 Finance Professionals
 - 243 Business, Research and Administrative Professionals
 - 2431 Management consultants and business analysts
 - 2432 Marketing and commercial managers
 - 2433 Actuaries, economists and statisticians
 - 2434 Business and related research professionals
 - 2435 Professional/Chartered company secretaries
 - 2439 Business, research and administrative professionals n.e.c.
 - 244 Business and Financial Project Management Professionals
 - 245 Architects, Chartered Architectural Technologists, Planning Officers, Surveyors and Construction Professionals
 - 246 Welfare Professionals
 - 247 Librarians and Related Professionals

Job Titles in this Unit Group

- Facilitator, governance, clinical
- Head of business management
- Leader, team (management consultancy)
- Leader, team, consultancy, management
- Manager, continuity, business
- Manager, improvement, business
- Manager, improvement, continuous
- Manager, intelligence, business
- Modeller (financial services)
- Modeller, financial
- Officer, intelligence, trade
- Officer, service management

Description

2431 MANAGEMENT CONSULTANTS AND BUSINESS ANALYSTS

Management consultants and business analysts advise industrial, commercial and other establishments on a variety of management and business-related matters to assist in the formulation of financial and business policies in order to maximise growth or improve business performance.

TYPICAL ENTRY ROUTES AND ASSOCIATED QUALIFICATIONS
Entry is most common with a degree or equivalent qualification but is possible with other academic qualifications. Professional qualifications are available and will be a requirement in some areas.

TASKS

- assesses the functions, objectives and requirements of the organisation seeking advice
- identifies problems concerned with business strategy, policy, organisation, procedures, methods and markets
- determines the appropriate method of data collection and research methodology, analyses and interprets information gained and formulates and implements recommendations and solutions
- advises governments, commercial enterprises, organisations and other clients in light of research findings
- runs workshops, and addresses seminars, conferences and the media to present results of research activity or to express professional views

RELATED JOB TITLES

Business adviser
Business consultant
Business continuity manager
Digital business analyst
Financial risk analyst
Management consultant

APPRENTICESHIPS (ENGLAND)
One or more occupations within this unit group are covered by an English Apprenticeship Standard

[Operational research specialist ST0884](#)
[Systems thinking practitioner ST0787](#)
[Improvement specialist ST0555](#)
[Improvement practitioner ST0192](#)
[Improvement technician ST0193](#)
[Business analyst ST0117](#)
[Junior management consultant ST0273](#)
[Corporate responsibility and sustainability practitioner ST0934](#)

In this example, the input text (“lead consultant”) is ambiguous, so the confidence score for best match is relatively low (52). A more successful instance of coding follows.

Input
Text: Code

Recommendations

Code	Title	Best Matching Index Entry	Score
2211	Generalist medical practitioners	Doctor	94
2212	Specialist medical practitioners	Doctor, speciality	37
2252	Optometrists	Doctor of optometry	37
2111	Chemical scientists	Doctor of chemistry	36
8139	Plant and machine operatives n.e.c.	Doctor, saw	36
5222	Tool makers, tool fitters and markers-out	Doctor, tool	36
4211	Medical secretaries	Secretary, doctor's	29

Classification Structure - SOC 2020 (v7)

- 1 SENIORS, OFFICIALS AND SENIOR OFFICIALS
- 2 PROFESSIONAL OCCUPATIONS
 - 21 SCIENCE, RESEARCH, ENGINEERING AND TECHNOLOGY PROFESSIONALS
 - 22 HEALTH PROFESSIONALS
 - 221 Medical Practitioners
 - 2211 Generalist medical practitioners**
 - 2212 Specialist medical practitioners
 - 222 Therapy Professionals
 - 223 Nursing Professionals
 - 224 Veterinarians
 - 225 Other Health Professionals
 - 23 TEACHING AND OTHER EDUCATIONAL PROFESSIONALS
 - 24 BUSINESS, MEDIA AND PUBLIC SERVICE PROFESSIONALS
 - 3 ASSOCIATE PROFESSIONAL OCCUPATIONS
 - 4 ADMINISTRATIVE AND SECRETARIAL OCCUPATIONS

Job Titles in this Unit Group

Job Titles
Adviser, medical
Assistant, clinical (qualified)
Doctor
Doctor of medicine
Doctor, health, public
Doctor, hospital
Doctor, medical
Examiner, medical (Jobcentre Plus)
FRCP
GP
LRCP

When Cascot encounters terms (e.g., “teacher” or “engineer”) which are descriptive at occupation or industry-level but not detailed enough to be assigned to high-granularity SOC or SIC data groups, the confidence score will be capped at 40.

The confidence score is also used to set an “automation threshold,” i.e. a confidence score by which a user is happy to let Cascot assign codes automatically without manual checking (e.g., above 64, which is the threshold recommended by the developers). Cascot can also be used in a “hybrid” way, with a

user approving each code, or completely manually. These options each offer a different balance of accuracy and cost.

Cascot outputs can either be individual codes if the user is working with individual manual entries, or a tab- or comma-delineated text file in case of batch coding. Cascot's default output file is tab-delineated.

Cascot Editor

Cascot Editor is an addition to the desktop Cascot package which allows a user to create and/or edit existing classifications (e.g., to add occupations to the SOC2010 classification). It can be included in the desktop package upon request. Developers note its use is not supported. Documentation for Cascot Editor can be downloaded [here](#).

Appendix 3. Update on the qualifications landscape

This is an updated version of the qualifications landscape scoping paper produced for the West London Alliance report in 2021.

The Skills Landscape

The skills landscape in England is an incredibly complex system comprised of a range of actors including employers, training providers, government agencies, educational institutions, and learners. This is readily affirmed in the UK's Industrial Strategy: 'The system can be complex and confusing, not always meeting the needs of individuals or those of employers and the wider economy'.² Broadly speaking, frameworks and standards for qualifications and training are 'quality assured by the State, but which qualifications employers and learners choose to invest in is left to them'.³ The base assumption of this set-up is that employer and learners, as purchasers of training, are properly acquainted with the training products available to them. The following paper suggests just how difficult a well-informed decision is to make, and outlines some of the changes currently being made to the skills system to rectify that.

Providers

As the British Council points out, supporting learning to acquire the wide range of skills need to drive productivity and industry in England requires a range of teaching methods beyond just classroom teaching. As such, public and private learning providers work directly with employers to offer 'a mix of practical learning in the workplace, simulated work environments, project and team based activities, as well as online and classroom based learning'.⁴

The main providers are:

- Colleges
- Employers
- Independent training providers
- Schools – deliver some vocational courses for learners aged 14-18
- Universities (mainly academic, but some vocational)

² https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf

³

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/571688/ER6_The_UK_skills_system_how_well_does_policy_help_meet_evolutionary_demand.pdf

⁴ https://www.britishcouncil.org/sites/default/files/bc_uk_skills_sector-an_introduction-june_2017_0_0.pdf

- Career Colleges – separate trusts established within FE colleges that offer highly practical vocational and technical education designed to equip young people with the skills to enter a career in a specific industry
- National Colleges – high tech training funded by government to ensure industries crucial to economic growth have skilled people, e.g. National College for High Speed Rail
- Universal Technical Colleges (UTCs) – an alternative to mainstream schools. These are sponsored by universities and linked to industry. UTCs focus on applied learning in science, technology, engineering, and maths.

Typically, independent training providers, employers, and colleges work in partnership to provide support to learners. Independent training providers often will directly support employers who require external expertise to help them manage their training. Providers will organise and assess on-the-job training provided by the employer and may work with colleges to provide technical learning off-the-job.

Courses, qualifications, and apprenticeships

At its simplest, the skills system consists of the following key routes for learners:

- **Subject Based Academic Courses**
 - A levels, International Bac - routes for those who wish to engage in more in-depth subject based learning and who may wish to progress into HE
- **Vocational Courses**
 - BTEC Firsts
 - BTEC Nationals
 - HNCs (Higher National Certificate) and HNDs (Higher National Diploma)
 - NVQ/QCF/RQF
 - Cambridge Technicals
 - T-levels
 - The above are courses which combine practical learning with technical skills relating to a specific employment sector or subject area, and often provide a flexible route to progression in FE, training, employment, apprenticeships, or HE
- **Apprenticeships**
 - Consisting of intermediate, advanced, higher, and degree
 - Traineeships offer a route for progression to apprenticeships or employment

For the purposes of this paper, we will be focussing on industry/sector-specific vocation and technical training routes. As such, subject-based academic courses will not be reviewed.

Vocational Training

BTEC Firsts/Nationals

Business and Technology Education Council (BTEC) Firsts/Nationals are specialist work related qualifications. These are designed for young people interested in a particular sector but unsure yet what job they would like to do. There are over 2000 qualifications across 16 sectors available from entry level to level 7. Firsts are available from entry level to level 2 (equivalent to GCSEs) and offer an introduction to work in a vocational sector. Nationals are available from level 3 (equivalent to A-levels) onward, often leading to further study, an apprenticeship or employment.

In 2022 the government announced funding would be withdrawn from Level 3 BTECs which overlap with the newly created T-Levels, affecting starts in 2024. BTECs were considered to overlap if it was technical (vocational), had the same occupational standard outcomes as a T-Levels, and supported the same entry to the same occupation as a T-level⁵. The government's own analysis identified the changes will mostly impact people with female students, students Special Educational Needs and Disabilities (SEND), and students from the most deprived areas⁶. Consequently, most universities believe that removing funding from BTECs will ultimately narrow access to higher education⁷.

The initial criteria placed Level 3 BTEC Health and Social Care at risk of defunding. NHS employers and other stakeholders warned that Health and Social Care T-Levels were not an equivalent, and axing the Level 3 BTEC would lead to fewer nursing recruits – exacerbating the workforce crisis^{8,9}. The Secretary of State for Education subsequently paused defunding of level 3 health and science qualifications that overlapped with T-Levels¹⁰. In the list published in October 2022, qualifications in Engineering, construction, and childcare and others were outlined for 16 to 19 funding withdrawal for new starts in August 2024¹¹.

⁵ <https://www.gov.uk/government/publications/qualifications-that-overlap-with-t-levels>

⁶ <https://www.gov.uk/government/publications/qualifications-that-overlap-with-t->

⁷ www.educationopportunities.co.uk

⁸ <https://www.hepi.ac.uk/2022/07/15/btec-cull-unpalatable-impacts-for-health-social-care-and-engineering-progression/>

⁹ <https://www.nhsconfed.org/news/changes-vocational-btec-health-care-qualifications-could-see-loss-thousands-new-nurse-0>

¹⁰ <https://www.nhsemployers.org/news/removal-qualifications-overlap-t-levels>

¹¹ <https://www.gov.uk/government/publications/review-of-post-16-qualifications-at-level-3-in-england>

HNC/HND

Higher National Certificates and Higher National Diplomas are work-related courses provided by HE and FE colleges. HNCs take one year to complete and are a level below HNDs which take two years to complete. They are equivalent to level 4 and level 5 consecutively, roughly approximate to year 1 of university, and years 2 and 3 of university.

NVQ/QCF/RQF

National Vocations Qualifications are work-based, competency-based qualification designed to test your ability to complete a job to a required standard. These are assessed through portfolio work and observational session within your work/work placement. The Qualification and Credit Framework is based on a system whereby learners earn credits during the course of their employment, with one credit taking approximately 10 hours to complete. The Regulated Qualifications Framework was introduced in 2015 and was designed to offer a simpler system for managing work-based qualifications. While QCF was designed to supplant NVQ, and RQF was designed to replace QCF, all three are still offered by providers.

Cambridge Technicals

Vocational qualifications at levels 2 and 3 for learners aged 16+ designed with the workplace in mind and as an alternative to A-levels. Subjects include Art and Design, Business, Media, Engineering, Health and Social Care, IT, Performing Arts, Science, and Sport.

T-levels

T-levels is a flagship policy of the government's industrial strategy, developing off the back of a report published in 2016 by an expert independent panel headed by Lord Sainsbury, which recommended the implementation of a common framework of 15 routes encompassing all employment-based and college-based technical education at levels 2-5.¹²

Rationale for T-levels is two-fold: they serve to simplify routes into technical and vocational education, and also gives parity to technical education as a viable alternative to the academic study. T-levels are a technical alternative to A-levels. A T-level is equivalent to three A-levels and have been developed with employer and businesses so that course content meets the needs of industry. They two year

¹²

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/536046/Report_of_the_Independent_Panel_on_Technical_Education.pdf

courses that include a mix of classroom learning and at least 315 hours (approximately 45 days) of an industry placement. T-Levels are based on the same standards as apprenticeships, designed by employers and approved by the Institute for Apprenticeships and Technical Education. They differ from apprenticeships in that T-levels are mostly classroom-based, with apprenticeships typically being 80% 'on-the-job' and 'more suited to those who know what occupation they want to pursue, want to earn a wage and learn at the same time and are ready to enter the workforce at age 16'.¹³

The T-Level Transition Programme (TLTP) is a one-year Level 2 course designed to support progression into a T-Level. These technical courses include opportunities to develop English, Maths, and Digital Skills alongside work experience and personal development. Compared to T-Levels, the Ofsted interim review found more areas of concern for TLTP delivery ¹⁴.

The review found that teaching was generally of a high standard. However, The review found courses were not always set up with the clear purpose of transitioning into T-Levels, and in some cases offered them in subjects not yet offered at T-Level – such as Sport. Consequently, some learners were unclear about their next steps to the desired career path, and the review found some examples of learners moving to retake GCSE's to move into their preferred subject through A-Level. The best work experience opportunities were relevant to the course and organised by staff. However, the review found providers also did not always secure meaningful and high quality work experience, and in some cases this was left to learners to organise.

In October 2022 Ofsted published an interim review into the quality of T-Level courses¹⁵. Overall, courses which were the most effective used the flexibility awarded by the T-level framework, and when curriculums which were developed collaboratively between employers and learning providers. More effective placements also had broad and high quality learning experiences which 'helped learners to make decisions about their futures'. However, the reviews found some providers did not have access to resources, including text-books and exam papers. Recruiting and retaining suitably qualified staff was challenging due to the pandemic and wider workforce challenges. Teachers also faced challenges balancing the requirements of the course, and many did not receive training to deliver the course. Learners appreciated of the quality of courses delivered, though some reported not feeling prepared for the level of work required on the course.

¹³ <https://www.gov.uk/government/publications/introduction-of-t-levels/introduction-of-t-levels>

¹⁴ <https://www.gov.uk/government/publications/a-review-of-the-quality-of-t-level-courses-interim-report/a-review-of-the-quality-of-t-level-courses-interim-report#report-findings>

¹⁵ <https://www.gov.uk/government/publications/a-review-of-the-quality-of-t-level-courses-interim-report/a-review-of-the-quality-of-t-level-courses-interim-report>

The review found at the time of visits that digital, and construction, and health and sciences courses struggled to find employers and many industry placements were delayed in starting. This was mostly attributed to the impact of COVID-19 at the time¹⁶. However, in March 2023 the government announced the next stage of roll-out for some T-Level courses – including beauty therapy - would be delayed to ensure courses were of sufficient quality¹⁷. The current schedule of T-level roll-out includes¹⁸:

September 2021 (completed):

- Building services engineering for construction
- Digital business services
- Digital support services
- Health
- Healthcare science
- Onsite construction
- Science

September 2022 (completed):

- Accounting
- Design and development for engineering and manufacturing
- Engineering, manufacturing, processing and control
- Finance
- Maintenance, installation and repair for engineering and manufacturing
- Management and administration

September 2023 (future):

- Agriculture, land management and production
- Legal services

September 2024 (future):

- Animal care and management.
- Craft and design

¹⁶ <https://www.gov.uk/government/publications/a-review-of-the-quality-of-t-level-courses-interim-report/a-review-of-the-quality-of-t-level-courses-interim-report>

¹⁷ <https://www.bbc.co.uk/news/education-64904427>

¹⁸ <https://www.gov.uk/guidance/t-levels-next-steps-for-providers>

- Hairdressing, barbering and beauty therapy
- Media, broadcast and production

September 2025 (future):

- Marketing

Planned beyond 2024 (future):

- Catering

Apprenticeships

Apprenticeships are paid jobs which incorporate on and off the job training. Apprenticeships provide qualifications between Level 2 (equivalent to GCSE's) up to Level 6 and 7 through degree apprenticeships (equivalent to Bachelor's and masters degrees):

Name	Level	Equivalent education level
Intermediate	2	5 GCSE passes
Advanced	3	2 A-level passes
Higher	4, 5, 6, and 7	Foundation degree and above
Degree	6 and 7	Bachelor's or master's degree

Stakeholders in the education and skills sector have vocally advocated for raising the profile of apprenticeships. This includes recognising it's parity with other qualifications, and In 2023 UCAS announced it would work to ascribe UCAS points to apprenticeships, which would enable apprenticeships to act as a route into university-level courses ¹⁹. In March 2023 the government also announced a returnership scheme for older adults, which includes promoting apprenticeships for over 50's ²⁰. Apprenticeships are also considered an important training and skills pathway for young people with Special Educational Needs and Disabilities (SEND) for supporting people in the workplace ²¹. While the number of people with Learning Difficulties and or disabilities (LLDD) starts decreased between 2016/17 and 2021/22. However, the number of learners with Autism Spectrum Condition increased

¹⁹ <https://feweek.co.uk/ucas-points-for-apprenticeships-planned-by-the-end-of-2023/>

²⁰ <https://educationhub.blog.gov.uk/2023/03/07/transforming-student-finance-lifelong-loan-entitlement/>

²¹ <https://feweek.co.uk/why-apprenticeships-can-be-key-to-supporting-learnerswith-send-into-employment/>

173% in the same period ^{22, 23}. There is also an attainment gap between LLDD and non-LLDD learners, with the achievement rate of LLDD learners 54.6% compared to 58.1% ^{24,25}.

Apprentices have the same rights as other employees are entitled to be paid at least the apprentice rate of the national minimum wage. Apprentices may receive a recognised qualification on completing their contract. Since August 2020, new apprenticeship starts have to follow an approved apprenticeship standard according to the type of employment: guidance which, according to job role, sets out what apprentices should be doing on their role and what skills they should have ²⁶. In-line with the approved standard, employers can then choose what training apprentices do, so long as it is delivered by government approved providers ²⁷.

Funding bands set the maximum funding that the government will contribute to off-job training according to the apprenticeship standard – ranging from £1,500 to £27,00. For example, a Level 6 Space Systems Engineer apprenticeship for 48 months can receive a maximum of £27,000 for training. Meanwhile, a level 3 Peer worker apprenticeship for 15 months can receive a maximum of £5,000 ²⁸.

Apprenticeships are largely funded via the apprenticeship levy. All UK employers with a pay bill of over £3 million per year pay 0.5% of their pay bill, minus the apprenticeship levy allowance of £15,000, into an apprenticeship service account. Funds from this account must be spent on apprenticeship training and assessment. Each apprenticeship standard is associated with a funding band, with the government paying a share of the costs below the upper limit of the funding band. Levy funds are used by employers paying the levy for training and assessment of apprentices up to the upper limit of the funding band. Employers not paying the levy pay 10% of the costs of training and assessment, with government paying the rest up to the upper limit of the funding band. The Small employer waiver provides 100% training funding for organisations with fewer than 50 employees to train 16 to 18 year old or 19 to 24 year olds who have an Education, Health and Care Plan, or who have been in care of their local authority.

²² <https://explore-education-statistics.service.gov.uk/data-tables/fast-track/4bded8ed-7c99-474b-a039-14e87206b617>

²³ <https://feweek.co.uk/why-apprenticeships-can-be-key-to-supporting-learnerswith-send-into-employment/>

²⁴ <https://explore-education-statistics.service.gov.uk/data-tables/fast-track/b6dc17c3-7d42-4155-9f69-f884ec61bd75>

²⁵ <https://feweek.co.uk/why-apprenticeships-can-be-key-to-supporting-learnerswith-send-into-employment/>

²⁶ <https://www.gov.uk/guidance/search-for-apprenticeship-standards>

²⁷

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1148731/2023-04-03 Apprenticeship funding in England from April 2023 Final .pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1148731/2023-04-03_Apprenticeship_funding_in_England_from_April_2023_Final_.pdf)

²⁸ <https://www.instituteforapprenticeships.org/apprenticeship-standards/>

Funding mechanisms for apprenticeships have been heavily criticised since their introduction in 2017. Currently the government pays employers £1000 per new apprentice hire aged between 16-18-year or for and those aged 19 to 25 with an Education, Health and Care Plan, or who has been in care of their local authority. In response to a large fall in apprenticeship starts leading up to 2020 ²⁹, the government introduced additional incentives to employers, paying businesses to hire new apprentices between the 1st August 2020 until the end of January 2022. Employers received £1,500 for apprenticeships aged 25, and £2000 per apprentice under the age of 25 – later rising to £3,000. The enhanced incentive scheme was considered highly effective at boosting placements for young people. Though despite this, scheme came to an end in 2022.

Traineeships

Traineeships are education and training programmes combined with work experience aimed at young people aged 16 to 24 whose preference is to find a job or apprenticeship, but who lack the skills, experience and behaviours sought by employers. Traineeships support young people to become ready for work or for an apprenticeship, and last anywhere between six weeks and six months. They are free, but trainees do not get paid. ESFA provide funding for traineeships. At a minimum, traineeships should include the following:

- A work experience placement of at least 100 hours
- An interview for an apprenticeship or job if available, or an exit interview with written feedback
- Work preparation training covering areas like CV-writing, interview preparation, job search and inter-personal skills
- English and mathematics courses, unless the trainee has achieved a GCSE grade 9 to 4 or A* - C in those subjects

The Government expanded eligibility for traineeships to those with Level 3 qualifications to offer more young people access to training and have pledged an additional £111 million for traineeships in response to the COVID-19 pandemic's disproportionate effect on youth unemployment. As part of this additional funding, the government announced it would pay employers £1,000 for every new trainee.³⁰ However, in 2022 the government announced it would scrap the scheme, blaming sustained decline in start rates over the past 10 years between³¹. Between 2020 and 2022, only a third of the government traineeship budget was spent – meaning providers will hand back nearly £230 million to

²⁹ <https://commonslibrary.parliament.uk/research-briefings/sn03052/>

³⁰ <https://commonslibrary.parliament.uk/research-briefings/cbp-7305/>

³¹ <https://feweek.co.uk/government-scrap-traineeships-amid-years-of-low-starts/>

the treasury³². The decision was controversial among providers, some of whom criticised this decision to scrap traineeships, arguing the government's own evaluations had shown they were effective. Others argued the but unpaid work experience requirements were displaced by better paid alternatives through apprenticeships and the kickstart programme ³³.

³² <https://feweek.co.uk/treasury-recoups-230m-as-employers-miss-traineeships-target/>

³³ <https://feweek.co.uk/government-scrap-traineeships-amid-years-of-low-starts/>

Appendix 4. Qualification level equivalents

Qualification Level	Qualification
Entry level	<ul style="list-style-type: none"> • Entry level award • Entry level certificate (ELC) • Entry level diploma • Entry level English for speakers of other languages (ESOL) • Entry level essential skills • Entry level functional skills • Skills for Life
Level 1	<ul style="list-style-type: none"> • First certificate • GCSE - grades 3, 2, 1 or grades D, E, F, G • Level 1 award • Level 1 certificate • Level 1 diploma • Level 1 ESOL • Level 1 essential skills • Level 1 functional skills • Level 1 national vocational qualification (NVQ) • Music grades 1, 2 and 3
Level 2	<ul style="list-style-type: none"> • CSE - grade 1 • GCSE - grades 9, 8, 7, 6, 5, 4 or grades A*, A, B, C • Intermediate apprenticeship • Level 2 award • Level 2 certificate • Level 2 diploma • Level 2 ESOL • Level 2 essential skills • Level 2 functional skills • Level 2 national certificate • Level 2 national diploma • Level 2 NVQ • Music grades 4 and 5 • O level - grade A, B or C
Level 3	<ul style="list-style-type: none"> • A level • Access to higher education diploma • Advanced apprenticeship • Applied general • AS level • International Baccalaureate diploma • Level 3 award • Level 3 certificate • Level 3 diploma • Level 3 ESOL • Level 3 national certificate • Level 3 national diploma • Level 3 NVQ • Music grades 6, 7 and 8 • Tech level

Level 4	<ul style="list-style-type: none"> • Certificate of higher education (CertHE) • Higher apprenticeship • Higher national certificate (HNC) • Level 4 award • Level 4 certificate • Level 4 diploma • Level 4 NVQ
Level 5	<ul style="list-style-type: none"> • Diploma of higher education (DipHE) • Foundation degree • Higher national diploma (HND) • Level 5 award • Level 5 certificate • Level 5 diploma • Level 5 NVQ
Level 6	<ul style="list-style-type: none"> • Degree apprenticeship • Degree with honours - for example bachelor of the arts (BA) honours, bachelor of science (BSc) honours • Graduate certificate • Graduate diploma • Level 6 award • Level 6 certificate • Level 6 diploma • Level 6 NVQ • Ordinary degree without honours
Level 7	<ul style="list-style-type: none"> • Integrated master's degree, for example master of engineering (MEng) • Level 7 award • Level 7 certificate • Level 7 diploma • Level 7 NVQ • Master's degree, for example master of arts (MA), master of science (MSc) • Postgraduate certificate • Postgraduate certificate in education (PGCE) • Postgraduate diploma
Level 8	<ul style="list-style-type: none"> • Doctorate, for example doctor of philosophy (PhD or DPhil) • Level 8 award • Level 8 certificate • Level 8 diploma