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Technical Report

Teacher Labour Market in England: Annual Report 2024

Methodology appendix

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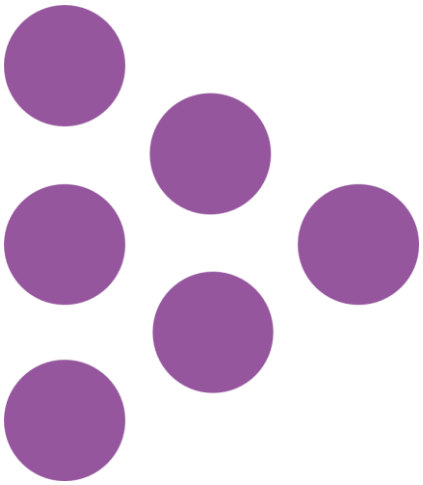

Teacher Labour Market in England: Annual Report 2024 – Methodology Appendix

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Contents

1. Introduction

This methodology appendix explains the data we used and the analysis we undertook to produce our findings in the 2024 Teacher Labour Market in England Annual Report. Section 2 lists all of the secondary data sources we used in the analysis. The remaining sections then each cover methodological detail relevant to the analysis in each section of the main report.

Section 3 explains how we used data from the School Workforce Census (SWC), initial teacher training (ITT) census and DfE Apply data to report on the ITT recruitment and teacher retention figures. This section also includes detail on how we used ITT application statistics to forecast this year's ITT recruitment.

Section 4 discusses how we used data from the School Teachers' Pay and Conditions Document (STPCD) and from the Annual Survey of Hours and Earnings (ASHE) to show how teacher pay has become less competitive over time.

Section 5 then shows how we used the Labour Force Survey (LFS) to measure teachers' working hours and perceptions of their workload along with the prevalence of flexible working in the graduate labour force. This section explains key variable definitions, provides sample sizes and outlines our methodology for identifying teachers and similar graduates in the LFS data.

Finally, section 6 shows how we used the Global Survey of Working Arrangements (G-SWA) to analyse how much graduates value remote working and by how much frontline public sector workers may need to be compensated to accept the inflexibility inherent in their jobs. This section explains the key variable definitions, sample sizes and methodology relevant to this area of the analysis.

2. Data sources

The following data sources were used to inform this research report:

- Initial Teacher Training: Trainee Number Census. Available: https://www.gov.uk/government/collections/statistics-teacher-training
- Monthly initial teacher training applications. Available: https://www.apply-for-teacher-training.service.gov.uk/publications/monthly-statistics
- Postgraduate initial teacher training targets. Available: https://explore-education-statistics.service.gov.uk/find-statistics/postgraduate-initial-teacher-training-targets
- School Workforce in England. Available: https://www.gov.uk/government/collections/statistics-school-workforce
- LFS. Available from UK Data Service. More information:
- https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/methodologies/labourforcesurveyuserguidance
- ASHE. Available from the Office for National Statistics (ONS). More information: https://www.ons.gov.uk/surveys/informationforbusinesses/businesssurveys/annualsurveyofhoursandearningsashe
- G-SWA. Available from WFH Research. More information: https://wfhresearch.com/gswadata/

3. Initial teacher training recruitment and teacher retention analysis

3.1. Recruitment in the 2023/24 cycle

Our reporting on overall initial teacher training (ITT) recruitment relative to target was based on figures collected in the Department for Education's (DfE) ITT census, for the 2023/24 cycle. This data provides a time series of how overall postgraduate ITT recruitment compared to target, from 2015/16 to 2022/23. The data also provides breakdowns by numerous characteristics, including subject and nationality of the trainee, which we used for our reporting.

3.2. Forecast of recruitment for the 2024/25 cycle

Our forecast of ITT recruitment in 2024/25 was based on monthly ITT applications data, made up to February 2024. The data is collected by the DfE Apply platform through which all applications for postgraduate ITT in England have been made since 2022/23 (except for applications to Teach First and those that are made directly to providers).

We forecast end-of-cycle recruitment based on placed applicants in primary and secondary subjects. We used placed applicants rather than total applicants as there is more certainty that placed applicants are likely to be reflective of the actual number of trainees that enrol in an ITT course.

For primary and all secondary subjects except physics and modern foreign languages (MFL), we made the forecast based on how many placed applicants there were in February 2023 and how this compared to end-of-cycle recruitment in the ITT Census for 2023/24. We then analysed how the number of placed applicants in February 2024 compared to the previous year and what this implies about the end of the current cycle, assuming recruitment trends are similar to the previous year.

We calculated the year-on-year proportional increase in placed applicants in each subject separately for UK and non-UK nationals.[1] To generate the final forecast for each subject, we then weighted the proportional increase in UK and non-UK nationals by the fraction each group made up in placed applicants in the 2023/24 cycle. For example, for English, suppose there was a 50 per cent increase in UK national placed applicants and a 25 per cent increase in non-UK nationals. If UK nationals made up 75 per cent of applicants in 2023/24, then the overall forecasted increase would be 43.8 per cent. If there were 500 placed applicants at the end of the 2023/24 cycle, then our final 2024/25 forecast would be 719.

We then compared these forecasts to DfE's recruitment targets for the 2024/25 cycle. We divided the total forecast recruitment in primary and each secondary subject by its recruitment target to determine what proportion of the target is forecast to be met by recruitment this year.

[1] The DfE Apply data records the domicile of the applicant, while the ITT Census records their nationality. While there is likely a strong correlation between domicile and nationality, there may be cases (e.g. UK nationals living abroad or vice versa) where an individual's recorded domicile differs from their nationality and they are mis-classified in the forecasts.

We estimated uncertainty in the forecast by comparing how forecasts performed compared to actual recruitment in previous years. We used the under- and over-predictions from previous years' forecasts to generate an estimate of the confidence interval in the current year's forecast.

Overall, the forecast performs well. ITT forecasts for the 2023/24 cycle were generally within the margin of error for most subjects. The forecasts were also considerably more informative than a naïve estimate of recruitment based simply on last year's recruitment (Jack Worth [@JackWorthNFER], 2023).

As we outlined in the main report, this year's recruitment forecast involved more uncertainty than in previous years. This was primarily due to mid-cycle policy changes which the Government introduced to help support international teacher recruitment, which meant that the surge in international applicants did not translate into a surge in ITT registrations of equal size.

We therefore altered the forecasting methodology to account for the surge in international physics and MFL recruitment. For these subjects, the overall approach was similar, but involved separately forecasting the number of applicants that were UK nationals, European Economic Area (EEA) nationals and 'rest of world' nationals (i.e. those from all other countries), which we then added together to generate the final, overall forecast.

We forecasted the number of UK and EEA nationals by first calculating the percentage change in placed applicants between February 2024 and 2023. We then multiplied this by the total number of UK / EEA national placed applicants at the end of the 2023/24 cycle. However, for rest of world nationals, we instead multiplied the February 2024 year-on-year change by the total number at the end of the 2022/23 cycle. This was because the end of the 2022/23 cycle was unaffected by the introduction of international recruitment policy measures and therefore provides a better benchmark with which to compare to.

3.3. Analysis of retention rates

Our analysis of teacher retention was based on published figures from the School Workforce Census (SWC). The SWC reports the proportion of the full-time equivalent (FTE) workforce lost due to deaths, retirements and teachers leaving service. Our reporting was based on the total proportion lost due to any reason (which the DfE refers to as 'wastage').

Our analysis of retention rates for first-year early career teachers (ECTs) was based on DfE's 'retention grid', which shows teacher leaving rates within the first few years of a teacher's career, split by entry cohort. For our analysis, we focussed only on retention one year after qualifying, for those who qualified between 2010/11 and 2021/22.

4. Analysis of the competitiveness of teacher pay over time

4.1. Growth in real-terms pay by scale point

We calculated how pay has fallen at each pay scale point primarily by using data (from 2010/11 to 2023/24) on teacher pay at each scale point as published in the School Teachers' Pay and Conditions Document (STPCD). We use the Rest of England pay scales, which differ to the Inner London, Outer London and London Fringe pay scales in pay level, but are similar in trend over time relative to 2010/11 level. To show how pay has fallen in real terms, we adjusted for inflation using the Consumer Price Index with Housing (CPI-H), averaged over the four quarters of each fiscal year.[2] As a final step, we calculated growth since 2010/11 by dividing pay at each scale point in each year (after adjusting for inflation) by what it was in 2010/11.

Our forecast of future real earnings growth was based on the Office for Budget Responsibility's (OBR) March 2024 projections. We used these projections (which are based on fiscal years), combined with the OBR's forecast of fiscal-year CPI inflation[3] to estimate real earnings growth from 2024/25 to 2028/29.

4.2. The position teachers hold in the income distribution of full-time workers in England

To analyse how teachers' position in the income distribution in England has changed over time, we used data from the Annual Survey of Hours and Earnings (ASHE) for 2011 to 2023 (the last year of available data at time of publication). Since the ASHE is collected in April of each year, we re-aligned the data so that the 2011 ASHE represented the 2010/11 academic year while 2023 represented the 2022/23 academic year.

Our sample consisted of individuals in the ASHE working full-time in one 'main job'. For those working in a 'main job' and an 'additional job', we discarded the 'additional job'. For those working in multiple part-time jobs or multiple full-time jobs, we discarded their records altogether. We also discarded anyone not on a permanent employment contract, anyone with missing earnings records or occupation / industry codes, anyone working a junior pay rate or who were on an apprenticeship and anyone whose earnings were affected by leave.[4]

The ASHE has some known limitations, such as non-coverage of those in self-employment, relatively high non-response rates and non-sampling bias (since the ASHE only samples jobs

[2] That is, we averaged over the CPI-H for Q2 to Q1 for each year. While the fiscal year does not align with the academic year, using the fiscal year CPI-H greatly simplified the real earnings growth forecasting we performed as part of the analysis. CPI-H data is not yet available for fiscal year 2023/24, so we used the OBR CPI forecast for this year.

[3] OBR projections forecast future changes in CPI inflation, not CPI-H inflation. However, the two series are similar and projections of CPI inflation are a reasonable approximation of CPI-H inflation.

[4] We included in the analysis those who were put on furlough during the Covid-19 pandemic but who were still paid at their full rate of pay. We excluded those who were put on furlough where it impacted their earnings. Due to small sample sizes in 2020 (when the collection of the ASHE was impacted by the pandemic), excluding all workers on furlough would have dramatically reduced sample sizes and likely also had implications for the occupational composition of the sample.

registered on a pay as you earn (PAYE) scheme). To minimise the impact of these limitations, we applied the ASHE calibration weight to our analysis. This helped to ensure that our estimates were weighted to be representative of the entire labour force in England, as per the Labour Force Survey (LFS). The total sample size of individuals in our main analysis sample each year is provided in Table 1.

Using our full sample of full-time teachers and non-teachers, for each year from 2010/11 to 2022/23, we estimated each percentile of the income distribution (i.e. we estimated 100 percentiles so that each represented one per cent of the income distribution). Using historical data from the STPCD, we then determined in which percentile each pay point sat in each year. For instance starting salaries in 2010/11 were £21,588. This was in the 37th percentile as the 37th percentile was just lower than this amount, while the 38th percentile was just higher. We did not adjust the estimated percentiles for inflation as each calculation involved nominal-terms comparisons of pay scales and percentiles of the income distribution within the same year.

Table 1: Sample sizes for ASHE analysis

Year	Total in-sample full-time workers in England
2011	112,593
2012	108,029
2013	108,490
2014	110,129
2015	108,751
2016	105,990
2017	107,177
2018	107,196
2019	104,746
2020	65,997
2021	77,204
2022	83,632
2023	87,872

Source: NFER analysis of ASHE data for 2011 to 2023

5. Analysis of teachers' perceptions of their workload compared to similar graduates

Our analysis of teachers' workload and perceptions of their workload primarily used data from the LFS. The advantage of using the LFS data, compared to other sources of information such as the Working Lives of Teachers and Leaders (WLTL) survey was two-fold. First, the LFS data enabled us to measure how workload and workload perceptions have changed over time (particularly since the pandemic). Secondly, it also enabled us to compare how workload and its perceptions compare to those in other occupations (and how this difference has changed over time).

The analysis involved several key steps, including identifying teachers and a suitable comparison group in the data, ensuring comparability in the two groups, and defining the key indicators for reporting.

5.1. Identifying teachers and a suitable comparison group

In the LFS data, we defined our sample of teachers as those employed in England's state-funded primary, secondary and special schools. We used standard occupational codes (SOC)[5] and standard industrial classifications (SIC) to identify teachers in our primary sample. Specifically, we defined our sample as:

- Industry (SIC) = 'Primary education' or 'General secondary education'
- Occupation (SOC) = 'Primary and nursery education teaching professionals' or 'Secondary education teaching professionals' or 'Special needs education teaching professionals' or 'Senior professionals of educational establishments'
- Country of work = 'England'
- Sector = 'Public'.

We specifically excluded from our definition the following occupations:

- 'Teaching and Educational Professionals not elsewhere classified', which includes adult education tutors, education consultants and private tutors
- 'Education advisers and school inspectors'
- 'Higher education teaching professionals'
- 'Further education teaching professionals'.

For our comparison group, we included all those in the LFS with at least an undergraduate degree who were working in any private or public sector occupation outside of teaching. We identified graduates across all years using the *HIQUAL* variable, which records the highest level of education achieved by the respondent. We used graduates as our comparison group (rather than professionals) because NFER research has shown that a significant proportion of teachers who

[5] In 2022, the ONS announced that LFS data for 2021 and 2022 were impacted by a mis-coding of SOC codes during data processing (Office for National Statistics, 2022). For this year's analysis, we used the most recent version of the re-issued datasets (summer 2023), in which the problem had been corrected. We also analysed whether the mis-coding issue had likely impacted our analysis in previous teacher labour market reports. However, comparing our main results on working hours and workload perceptions between the affected and updated data showed negligible differences.

leave teaching leave for other, non-professional occupations (Worth and McLean, 2022). Therefore, comparing teachers to a wider group of graduates likely includes all the graduate-level occupations that teachers may be more likely to actually consider transitioning into.

Comparing teachers to all graduate employees in a meaningful way is challenging because the two groups are likely to differ in a number of important ways. For example, they may be different because people with different characteristics or motivations select to go into different occupations. No comparison of different occupations should therefore be interpreted as the effect of entering that profession, although working conditions, and employees' perceptions of them, can be influenced by entering that occupation rather than another.

We aimed to improve the comparability of our analysis as much as we could. Instead of comparing all teachers to all graduate employees, we analysed a group of graduates with similar characteristics to teachers. We did so by re-weighting the graduates group to improve comparability in the underlying personal characteristics between the teacher and graduates groups. This ensured that the distribution of gender, age and region was the same among the teachers and the group of graduates. We used a technique called entropy balancing to re-weight the graduates group within each survey wave and derive a 'similar graduates' group (Hainmueller, 2012). This re-weighting approach did not remove all the underlying differences in characteristics and motivations between teachers and 'other graduates'. However, it minimised the risk that any observed differences in working conditions were driven by differences in the distribution of gender, age and region between the two groups.

5.2. Sample sizes and analytical approach

We conducted the analysis using an approximation to an academic year, combining the four quarterly LFS datasets from the beginning of October to the end of the following September. For the analysis, we used the cross-sectional analysis weights provided in the data set, ensuring the analysis was representative of UK households, and therefore, of English teachers in the state sector.

The sample sizes in the LFS analysis are shown in Table 2. Sample sizes for each individual measure differed, depending on the extent of missing data for each measure. The sample sizes of both teachers and other graduates have generally been falling slightly over time, which is due to falling response rates to the LFS across the whole population (Office for National Statistics, 2024)

In the main report we presented the results from a simple average of each measure for teachers and similar graduates, split by year. We used a weighted average, with the weight reflecting the cross-sectional survey weight of the respondent and the entropy balancing weight. Where we compared our key measures over time and between teachers and similar graduates, we tested whether any differences were statistically significant by conducting a t-test that the difference was statistically significantly different from zero.

Table 2: Sample sizes for LFS analysis

Year	Number of teachers	Number of similar graduates
2010/11	3,771	31,521
2011/12	4,155	37,392
2012/13	3,922	38,201
2013/14	4,072	40,941
2014/15	3,848	40,096
2015/16	3,724	39,125
2016/17	3,410	40,196
2017/18	3,369	41,467
2018/19	3,151	40,133
2019/20	3,049	38,666
2020/21	3,326	42,739
2021/22	3,021	39,079
2022/23	1,874	29,606

Source: NFER analysis of Labour Force Survey data for 2010/11 to 2022/23

5.3. Variables used in the analysis

The questions in the LFS survey which we reported on are as follows:

Full-time working hours in the reference week

Source: LFS. Average (mean) response to 'Thinking now about the seven days ending Sunday the [last week], how many hours did you actually work in your (main) job/business – please exclude meal breaks?' Only includes respondents who reported being scheduled to work on every day from Monday-Friday in the reference week and did not have any days off in the reference week due to being sick/injured.

Proportion full-time wanting to work fewer hours

Source: LFS. The measure is derived from a combination of responses and routed questions - see LFS user guide for details. Proportion of respondents: 'Would you rather work shorter hours than in your present job?' Full-time teachers and similar graduates only.

Proportion who usually work evenings

Source: LFS. The average proportion who responded ‘during the evening’ to the question: ‘Within your regular pattern of work is it usual for you to work:

- during the day
- during the evening
- at night?

Proportion who mainly work from home

Source: LFS. The proportion who responded with either ‘In your own home’, ‘In the same grounds or buildings as your home’ or ‘In different places using home as a base’ to the question ‘In your main job do you work mainly:’

- In your own home
- In the same grounds or buildings as your home
- In different places using home as a base
- Or somewhere quite separate from home

6. Analysis of the value of remote working

Our analysis of how much teachers value the ability to work remotely was based on data from the Global Survey of Working Arrangements (G-SWA). The G-SWA is an online survey administered to 36,078 respondents in 27 countries. Respondents are all full-time workers aged 20-59 who finished primary school (Aksoy *et al.*, 2022).

The samples are reasonably representative of the full-time workforce in most countries. However, as it is an online survey, it tends to skew towards the well-educated, particularly in advanced-economy countries such as the UK (Aksoy *et al.*, 2022).

There are currently two waves of microdata publicly available to researchers (July-August 2021 and January-February 2022). The survey collected information on employees' remote working arrangements, future plans and perceptions of flexible working, as well as demographic information and other characteristics. More information, including key findings, questionnaires and analysis of the representativeness of respondents, can be found on the survey's website and the report accompanying the data.

6.1. Sample sizes and analytical approach

Unlike with the LFS analysis, the G-SWA data does not provide enough granularity to robustly identify teachers in the data. We therefore primarily used it to analyse attitudes towards remote working amongst graduates working outside of the education sector. We excluded anyone outside of the UK and identified graduates using the *education* variable (we included those with 'tertiary education' or a 'graduate degree'). We also excluded those in the education sector (i.e. where *industry_job* = "Education") to ensure that our comparison sample did not include any teachers.

Like with the LFS, we also weighted the data using entropy balancing to ensure that the characteristics of graduates were similar to those of teachers. However, since there were relatively few demographic characteristics recorded in the G-SWA data, we weighted the data based only on gender and age category (under 25, 25-29, 30-39, 40-49, 50-59 and 60+) breakdowns for the teacher workforce. This was based on manually setting the entropy balancing targets.[6] We weighted the two waves of data separately, using 2020/21 and 2021/22 summary statistics from the SWC (DfE, 2023b).[7] This led to a total sample of 865 similar graduates, 389 in wave 1 and 476 in wave 2.

To estimate the prevalence of hybrid working, respondents' reactions to employers mandating a full return to the office, and respondents' value of the ability to work remotely, we took a simple average of each of these key variables, pooled across survey waves and weighted by our entropy balance weight.

[6] We performed the weighting in *Stata* using the *ebalance* command (Hainmueller and Xu, 2013). See the users guide for a detailed outline of how to manually set balance targets.
[7] The breakdowns we used are available at: https://explore-education-statistics.service.gov.uk/find-statistics/school-workforce-in-england

6.2. Variables used in the analysis

The questions in the G-SWA survey which we used for the analysis were as follows:

Proportion who work either hybrid or fully remotely

Source: G-SWA. The proportion of respondents who responded one, two, three, four or five days to the question 'How many full paid working days are you working from home this week?'

Proportion who would seek a new job if their employer mandated a full return to the office

Source: G-SWA. The proportion of respondents who reported 'I would quit my job on or before February 1st, regardless of whether I got another job' or 'I would start looking for a job that lets me work from home at least 1 or 2 days a week, but return to the worksite if I don't find one by February 1st' to the question 'How would you respond if your employer announced that all employees must return to the worksite 5+ days a week starting on February 1, 2022?' Second wave only.

Average amenity value of the option to work from home two or three days per week

Source: G-SWA. This variable was derived based on several survey questions – see the user guidance for details. Based on the following responses to the question 'How much of a pay raise (as a per cent of your current pay) would you value as much as the option to work from home two or three days a week?':

- Less than a five per cent pay raise
- A five to 10 per cent pay raise
- A 10 to 15 per cent pay raise
- A 15 to 25 per cent pay raise
- A 25 to 35 per cent pay raise
- More than a 35 per cent pay raise

This question was posed only to those who responded 'Positive – I would view it as a benefit or extra pay' to the question 'After COVID, in 2022 and later, how would you feel about working from home two or three days a week?' Those who responded 'Negative' were asked the same question but instead about how much of a pay cut the respondent valued home working as. Those who responded 'Neutral' were assigned an amenity value of zero. Responses to this question were converted to a numeric value by taking the midpoint of each response option above. For example, a response of 'five to 10 per cent pay raise (or cut)' would be converted to a numeric amenity value of 7.5 per cent (or -7.5 for those who viewed home worked as a negative amenity value).

6.3. Estimating a compensatory pay rise for teachers

To estimate how frontline public sector workers like teachers should be compensated for the lack of flexibility inherent in their jobs, we combined data from the LFS and the G-SWA. First, we calculated how the growth in the proportion of the graduate workforce who primarily work from home changed between 2018/19 and 2022/23 and how this compared to teachers (i.e. a

‘difference-in-differences’ – the difference between teachers and similar graduates in the growth in working from home since the pandemic).

This measure, outlined in Table 3, reflects how much more remote working has grown in the graduate workforce than in teaching. This ‘difference-in-differences’ measure is important because it is the change in the prevalence of remote working in the graduate workforce (and its lack of availability in teaching) which drives the further loss in attractiveness of teaching relative to other jobs.

Table 3: Calculating the difference in the proportion of the workforce that primarily works from home pre- and post-pandemic

Year	Proportion of teachers who primarily work from home (%)	Proportion of similar graduates who primarily work from home (%)
2018/19	0.5	15.7
2022/23	1.7	45.5
Difference 2018/19 – 2022/23	**1.3**	**29.8**
Difference-in-differences	**28.5**	

Note: The difference between the values listed in rows one and two of this table may not exactly equal row three due to rounding.

Source: NFER analysis of LFS data for 2018/19 and 2022/23

To derive our final measure reflecting the compensatory pay rise, we multiplied the ‘difference-in-differences’ value (28.5 percentage points) by 6.2 per cent, the average value (in terms of salary) that similar graduates have for being able to work one to two days per week from home.[8] We used the overall amenity value of remote working as it was the broadest reflection of how much the graduate workforce values flexible working overall. Multiplying 28.5 percentage points by 6.2 per cent yields our final estimate of the pay rise needed to compensate teachers for the lack of flexibility in their job – 1.8 per cent.

[8] Working one to two days from home is a different flexible working arrangement than working primarily from home. However, neither the LFS nor the G-SWA provides a sufficiently long time series of data on hybrid working to analyse the prevalence of hybrid working pre-pandemic. The prevalence of hybrid working has likely followed a similar trend to fully remote working in the graduate workforce, so our estimates based on fully remote working is likely to be similar to hybrid working.

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