



Department
for Education

Analysis of school and teacher level factors relating to teacher supply

September 2017

Executive summary

A school's ability to achieve a supply of teachers is linked to a large range of factors, varying from national level issues to teachers level characteristics. To support this, the Department for Education (DfE) has moved towards more local analysis of the teacher workforce. This compendium of teacher supply analysis follows on from two previous publications: the local analysis of the teaching workforce¹, which looked at regional trends in certain teacher supply measures, and the first compendium of teacher supply analysis², which looked at entrants to the teaching profession, teacher retention, and teacher mobility between jobs.

Given that detailed underlying data have already been published alongside each SFR³; this report does not seek to provide an exhaustive or comprehensive set of fine-grained data. Instead, it aims to generate new insights and is intended to be an accessible resource to stimulate debate, improve the public understanding of our data, and generate ideas for further research, rather than to provide authoritative answers to research questions.

Section 1 presents the Supply Index, an experimental methodology designed to identify schools which have significant teacher supply issues. When using the Supply Index, we can see no clear geographic patterns in schools facing teacher supply issues.

The Supply Index is an experimental methodology which attributes a score to each school, depending on the severity of its teacher supply issues. It uses School Workforce Census data: 7 measures of teacher movement for primary schools and 8 measures for secondary schools (7 measures of teacher movement and 1 measure of teacher specialism) to calculate an overall score for each school.

The Supply Index methodology was tested through qualitative research with 150 schools. Seven out of every ten schools that were interviewed agreed with their classification (either having or not having a significant issue) regarding teacher supply. Schools did highlight that some of supply issues they experienced were not captured in the Supply Index, such as the number or quality of applicants to a post, as we did not collect this data in the School Workforce Census. When the Supply Index scores are mapped (see Annex 1), we can see no strong geographic trends in teacher supply issues, showing that it is a school level issue. We welcome user

¹ <https://www.gov.uk/government/statistics/local-analysis-of-teacher-workforce-2010-to-2015>

² <https://www.gov.uk/government/statistics/teachers-analysis-compendium-2017>

³ <https://www.gov.uk/government/statistics/school-workforce-in-england-november-2016>

feedback on how we can further develop/improve this approach – see page 14 for how to get in touch.

Section 2 contains maps showing access to Initial Teacher Training (ITT) providers and places, and shows regional variation in ease of access. Almost 90% of the country is within 5 miles of a school involved in ITT.

Three maps are presented. The approach in all these maps counts all trainees with the provider – rather than viewing where they may be placed in schools, or where they may end up in employment after training.

The first shows the number of trainees per teacher for each Local Authority District (LADs) for 2016-17. Most LADs have at least some provision. High provision per teacher is seen in urban areas, typically where Higher Education Institutions (HEI) are located. The majority of rural LADs also have some provision, but of those LADs with no provision, they are predominantly rural.

The second and third maps show the proximity to ITT providers and schools involved with ITT respectively. Again, there are spatial variations in the distance to an ITT provider, however over 80% of the country is within 10 miles of an HEI, School Centred ITT provider (SCITT) or School Direct lead school.

Section 3 contains a review of the evidence of the factors which cause teachers to leave the profession, as well as three infographics on factors related to teacher supply.

There are a wide range of factors that influence teachers' and schools' decisions relating to teacher supply, and factors affecting teachers' decisions to leave the profession are a particular important set of influences. Evidence shows that the decision to leave teaching is a complex one influenced by numerous personal and professional factors (Ávalos & Valenzuela, 2016; Borman & Dowling, 2008; Grissom, Viano, & Selin, 2016b; Lindqvist & Nordänger, 2016). These factors also change throughout a teacher's career. However, in 2003 Smithers and Robinson found that workload and accountability pressure, wanting a change or a challenge, the school situation (including pupil behaviour and school leadership) and salary considerations were the most prominent factors in leaving. Across studies, teachers in the US, Canada, Europe and Australia report broadly similar factors for deciding to leave the profession.

Following the review of evidence on teachers' decisions to leave, this section broadens to consider factors affecting teacher supply decisions more widely. The three infographics detail the range of factors that affect individual agents' (teachers and schools) decisions relating to teacher supply, which demonstrate the vast range of factors which influence decisions. These factors range from national level factors such as the state of the economy to micro-level factors such as individual agent's characteristics: a school's location or a teacher's age for example.

Section 4, continues the theme of Section 3 – it is a survey of ex-teachers on their reasons for leaving, which checks whether the main reasons given for leaving are still consistent with the seminal but dated study in this area.

Workload, government policy, and lack of support from leadership were cited as the three main reasons for leaving. These top three held when respondents were split by a range of characteristics, including gender, subject taught, school's Ofsted rating, age, and working in London or the Rest of England. Pay was not a major factor, however, of those who cited lack of progression as a factor for leaving, 38% left for a higher salary, compared to 22% of those who did not cite lack of progression as factor. As mentioned in Section 3, Smithers and Robinson (2003) found that a range of factors influenced teachers' decisions to leave, including the top 3 from this survey. However, they did find that salary considerations were also a factor.

The survey found that 85% of respondents said that they didn't plan to or were undecided about going back into teaching. In terms of their next job, over 50% said they left for a job that did not pay as well as their final teaching job, and 60% of those who left remained in the education sector (the main destinations in the education sector were independent schools or supply teaching). Of those who did move out of the education sector, there were no clear industries which they moved into.

The final section, Section 5, details how changes in average teacher pay can be deconstructed into two different effects – a 'progression effect' and a 'workforce composition effect'.

The first effect is a 'progression effect': the change in average pay for teachers in the workforce in two consecutive years – this includes the increases from promotions and responsibility allowances. This has a positive effect on average teacher pay changes. As a percentage of average gross pay for the 2015-16 academic year, which was £39,000⁴, the average progression pay rise was 4% (£1,500).

The second effect is a 'workforce composition effect': the change in the overall pay bill associated with reductions in the paybill of those teachers who leave (on average older and higher paid teachers) and the increase in the paybill of those teachers who join (on average younger and lower paid teachers). This has a negative effect on average teacher pay changes. The average salary was £38,000 of those who left, through wastage, retirement, or death, between 2015/16 and 2016/17. The average salary of those joining the profession was £27,500. This change on the workforce composition contributed a £420 million reduction to the pay bill for all teachers. Overall, these effects combine to explain the change in average pay.

⁴ For teachers who were in service in that year and the previous year.

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Introduction

Background and the School Workforce Census

The annual School Workforce Census was introduced in November 2010, replacing a number of different workforce data collections. It collects information on school staff from all state-funded schools in England, including local-authority-maintained (LA-maintained) schools, academy schools (including free schools, studio schools and university technology colleges) and city technology colleges, special schools and pupil referral units (PRU)⁵.

The statistical first release (SFR) “School Workforce in England” provides the main annual dissemination of statistics based on the data collected, as well as details of the underlying methodology for those and the collection itself. The latest publication was released in July 2017, with results from the November 2016 census⁶. Alongside the SFRs, an underlying dataset is released, giving some of the workforce statistics at school level alongside details of regions, local authorities, wards and parliamentary constituencies. The information is used by the Department for Education for analysis and modelling, including the Teacher Supply Model⁷, as well as research purposes.

Aims of the report

The latest School Workforce Census covers November 2016, so **this report does not replace the SFR as the authoritative source of the latest school workforce statistics.**

The report is designed to look at some of the key questions around the school workforce in order to improve our understanding of these areas. These sections are designed to be standalone analyses to cover key themes, while the executive summary pulls together some of the key findings into a brief overarching narrative.

⁵ It collects information from LAs on their centrally employed teachers but does not cover early years settings, non-maintained special schools, independent schools, sixth form colleges and other further education colleges.

⁶ ‘School workforce in England: November 2016’, Department for Education (2017). Available at: <https://www.gov.uk/government/collections/statistics-school-workforce>

⁷ More information on the Teacher Supply Model can be found at: [Teacher Supply Model 2017 to 2018](#)

Organisation of the report

There are five sections in the report:

- **The Supply Index:** We have developed the Supply Index to help identify schools that are most likely to have significant supply issues. This section contains the methodology used to construct the Supply Index, the maps of the results, and qualitative verification work, carried out with 150 schools to confirm the accuracy of the Supply Index. The Supply Index is an experimental methodology, so we would welcome feedback on the approach.
- **Access to initial teacher training maps:** This contains two sets of maps, one set showing proximity to Initial Teacher Training providers and one set showing the number of trainees per teacher in each Local Authority District. These maps show the variation in access to ITT provision across the country.
- **Infographics on factors affecting teacher supply and international evidence on why teachers leave:** This section provides additional context on the factors related to teacher supply. Firstly, it focuses on the factors influencing a teacher's decision to leave the profession with a review of international evidence on why teachers do leave. The review shows that the decision to leave teaching is a complex one influenced by many factors. It then presents a series of infographics showing factors linked to schools' and teachers' decisions relating to teacher supply.
- **Survey with ex-teachers:** These are survey findings of ex-teachers about their reasons for leaving. This research has been done to support work on teacher retention, to help design initiatives to encourage more teachers to stay in the profession. The survey concludes that there are a range of factors that influence a teacher's decision to leave.
- **Decomposition of teacher pay rises:** This section deals with teachers' average pay and how it has changed since 2013. Any change between two consecutive years can be decomposed into two effects: a 'progression effect' whereby teachers receive uplifts based on their performance, and a 'workforce composition effect' whereby higher-paid, older teachers leave and are replaced by lower-paid, younger teachers.

A glossary of terms is available in the previous Teachers Analysis Compendium⁸.

⁸ 'Teachers Analysis Compendium', Department for Education (2017). Available at: <https://www.gov.uk/government/statistics/teachers-analysis-compendium-2017>

Methodology

This report uses data from a variety of sources to analyse the trends in teacher supply, retention and mobility. This includes the School Workforce Census, information on school characteristics and those of the local area. The School Workforce Census is an annual collection of the composition of the schools workforce in England employed in: local-authority-maintained nursery, primary, secondary and special schools; all primary, secondary, and special academy schools; and free schools. Data have been included from each of the censuses from 2010 to 2016.

For more information on how the School Workforce Census data is collected and how the statistics are produced see the statistical first release (SFR):

<https://www.gov.uk/government/collections/statistics-school-workforce>.

These data have been supplemented with schools' data collected from 'Get information about schools', a register of educational establishments in England and Wales, maintained by the Department of Education. It provides information on establishments providing compulsory, higher and further education.

More information on 'Get information about schools' is available here:

<https://www.get-information-schools.service.gov.uk/>

This paper looks at local-authority-maintained nursery, primary and secondary schools and all primary and secondary academy schools and free schools in England. Special schools and pupil referral units have not been included in the analysis. This is because the numbers of teachers are significantly smaller for these schools, thus making comparisons across the different classifications much less reliable.

1. The Supply Index

The national teacher vacancy rate has been stable at around 0.3% of the teacher workforce for the last few years. This measure is based on census data from November each year. There have been concerns that the vacancy rate, due to the time in the year at which the data is taken, is not reflective of the reality of the situation facing schools.

In September 2016, the DfE published new analysis⁹ looking at the local trends and comparisons of data from the School Workforce Census. In this, we presented a new way of looking at vacancies: **the proportion of schools within a region, which have at least one advertised vacancy or temporarily filled post on the census day in November.**

This analysis showed that:

1. Overall, the proportion of schools reporting classroom teacher vacancies has increased since 2010, with London consistently reporting the highest level
2. The proportion of schools with vacancies and temporarily-filled posts increased as school-to-school mobility increased
3. There were no noticeable trends in the proportion of schools reporting a head teacher vacancy

In order to build on this further DfE is looking at a range of data related to teacher recruitment and retention to construct a Supply Index. The index forms part of the Department's analysis of teacher supply at a sub-national level, and is being considered as part of a process to identify schools, which are likely to be experiencing significant supply issues, with a view to exploring these issues in more detail with these schools and identifying possible solutions.

The Supply Index focuses predominantly on measures of supply issues that relate to teacher movement (see further below for a list of measures which make up the index). There are a number of other types of supply issue which were not included, either because they did not fit with the focus of the index, or because data was not held on them. Of particular note of supply issues not included are measures of the length of time vacancies are open for, the number of applicants for vacancies, or the perceived quality of applicants, which are not held by DfE.

⁹ <https://www.gov.uk/government/statistics/local-analysis-of-teacher-workforce-2010-to-2015>

Calculation of the Supply Index

All primary and secondary schools in England with a complete set of supply variables (see below) are analysed. Because primary and secondary schools' labour markets have different characteristics, and London and the Rest of England's¹⁰ labour markets are different, four subsets of data are created and analysed separately:

- Primary schools in London
- Primary schools in the Rest of England
- Secondary schools in London
- Secondary schools in the Rest of England

It is important to note that data is not available for all schools. This is because for the Supply Index to be accurately calculated, a school must have a complete set of data, otherwise it would have a lower score when summed (see below for methodology) suggesting that it was less likely to have supply issues. The proportions of schools with complete data for the four subsets above is as follows:

- Primary schools in London – 94.4%
- Primary schools in the Rest of England - 91.4%
- Secondary schools in London – 73.3%
- Secondary schools in the Rest of England – 68.7%

The proportion of secondary schools included is lower than for primary schools because the proportion of secondary schools providing curriculum data (data which is required for one of the variables for the secondary school Supply Index) as part of the School Workforce Census return is lower than other measures. The inclusion of a measure which uses curriculum data reduces the percentage of secondary schools with a Supply Index by 11.6 percentage points for London and 11.2 percentage points for the Rest of England.

The index is comprised of seven variables for primary schools and eight variables for secondary schools. The following steps are taken to derive the index:

1. For each variable, schools receive a normalised score between 0 and 5
 - a. A higher score indicating a characteristic of supply in that school which is more likely to cause a supply issue
 - b. Each variable is normalised on the values for that variable for all schools in that subset between 2011 and 2016
2. These scores are then summed up. This ranges from a minimum of 0 to a maximum of 35 for primary schools and 40 for secondary schools.

¹⁰ London has been separated due to the findings from the previous regional analysis that showed London behaved differently on a range of indicators.

3. The summed score is then expressed as a percentage of the total score.

For example, if a primary school scores [2,3,2,4,0,5,2] across the 7 variables then their total score is 18. In this example, their Supply Index is 18/35 or 51%, so they receive a Supply Index score of 51. The Supply Index ranges from 0 (0/35 or 0/40) to 100 (35/35 or 40/40).

The variables used in the Supply Index are all derived from the School Workforce Census. In each case, we explain why they are included, but there may be a variety of reasons other than teacher supply / retention challenges that explain what is happening in a school.

The variables used are:

- **Percentage Planned Change in Staff:** the higher the value the higher the number of staff the school plans to bring in, and the greater chance there is that not all places are filled, and so a shortage occurs. Therefore, these schools are awarded a higher score.

$$\frac{\text{Number of staff entering the school in Year 1} - \text{Number of staff leaving the school in Year 0} + \text{Number of vacancies and temporarily filled posts in Year 1}}{\text{Total headcount of Staff in Year 1}}$$

- **Planned:Actual Change Ratio:** the higher the value the greater the difference between planned and actual change of staff numbers between school years. For example, where a school has a planned change of 3 more staff (+3) but an actual change of 2 fewer staff (-2) this may indicate that the school has been unable to fill positions. Therefore, these schools are awarded a higher score. .

$$\frac{\text{Number of staff entering the school in Year 1} - \text{Number of staff leaving the school in Year 0} + \text{Number of vacancies and temporarily filled posts in Year 1}}{\text{Number of staff entering the school in Year 1} - \text{Number of staff leaving the school in Year 0}}$$

- **Percentage Shortage (vacancies and temporarily filled posts):** The higher the value (e.g. the more vacancies or temporarily filled posts), the higher the score, as this may reflect the school being unable to fill positions.

$$\frac{\text{Number of vacancies and temporarily filled posts in Year 1}}{\text{Total headcount of Staff in Year 1} + \text{Number of vacancies in Year 1}}$$

- **Staff In:Staff Out Ratio:** The lower the value (e.g. the greater the number of staff leaving relative to the number coming in), the higher the score, as this may reflect the school being unable to either retain or recruit enough staff. A ratio of 1 or over shows there is equal inflow and outflow or greater inflow than outflow respectively, and so they score a zero on this measure.

$$\frac{\text{Number of staff leaving the school in Year 0}}{\text{Number of staff entering the school in Year 1}}$$

- **Percentage of staff on permanent contract:** The lower the value (e.g. the lower the number of staff on permanent contracts), the higher the score, as a higher proportion of staff on temporary contracts may reflect a challenge in filling posts.

$$\frac{\text{Number of staff on permanent contracts in Year 1}}{\text{Total headcount of staff in Year 1}}$$

- **Total loss of experience through turnover/wastage:** the higher the value (e.g. the more staff leaving the state funded teaching profession, particularly with more experience), the higher the score, as this may reflect the school having a greater challenge in retaining staff. Experience is strongly correlated to a teacher's propensity to leave the profession (excluding retirement) or move roles within the profession – more experienced teachers are less likely to move. Therefore, the experience of teachers needs to be controlled for when considering the number leaving a school.

1. For each member of a school, calculate the length of time they have been qualified
2. Sum years of experience for all members of staff who left the school as wastage or turnover, depending on which measure is being calculated
3. To control for the size of the school, divide this number total number of years of experience for the entire school

Not controlling for this would artificially inflate the Supply Index of schools with larger numbers of younger teachers.

- **Total loss of experience through turnover:** The higher the value (e.g. the more staff moving between state funded schools, particularly with more experience¹¹), the higher the score, as this may reflect a more challenging situation. The method for calculating this measure is the same as with total loss of experience through wastage, except with teachers that have left but remained within the state funded teaching profession.
- **Percentage of teaching hours by specialists:** The lower the value (e.g. the lower the number of hours taught by a teacher without a relevant post A-level qualification), the higher the score.

$$\frac{\textit{Total Number of Hours per Week Taught by Specialists}^{12}}{\textit{Total Number of Hours per Week Taught}}$$

This is an experimental methodology, so we would welcome feedback on the methodology. Please send comments to the Teachers Analysis Mailbox: TeachersAnalysisUnit.MAILBOX@education.gov.uk.

The results are not presented for individual schools at this stage whilst we develop the measure, nor is the underlying data used to construct the Supply Index – the Supply Index is designed to help target delivery of local supply initiatives and we are continuing to work with schools to test out this approach. At the same time as we are keen to get users' views (see page 14 for contact details).

¹¹ Teacher mobility amongst teachers who have qualified more recently is known to be higher than those who have been qualified a longer time, and so a large number of newly qualified teachers leaving a school is likely to be of less concern than a large number of those who have been qualified a while leaving. This excludes those retiring.

¹² Specialists are those teachers with a post A-level qualification in the subject they are teaching

Findings from the Supply Index verification work

The analysis represented in this report is new and experimental; we are seeking to verify them with schools through qualitative work. We have conducted initial survey work with 90 schools who were 'high' on the Supply Index, with a further 60 to do with schools who had 'low' scores. This was designed to see if the findings from the Supply Index reflected schools' experiences with recruitment and retention. A full report on the research will be published later in the year. The key findings of this qualitative work were:

- Over three quarters of the schools we identified as having high supply problems in 2015 reported that they had significant problems with recruitment, retention or both, most of the remaining schools who answered no to the initial question indicated supply problems to some extent in the following discussion.
- Seven out of every ten schools that were interviewed agreed with their classification (either having or not having a significant issue) regarding teacher supply
- The level of agreement was highest for secondary schools in the rest of England
- The combination of factors listed was different for most schools, but some commonalities in factors mentioned are listed below.
- Some of the types of issues highlighted as contributing to supply challenges were:
 - Low response rates in relation to recruitment
 - A lack of choice of quality applicants when making an appointment decision
 - Schools in deprived areas
 - Schools being in Ofsted in level 3 or 4
 - Schools with gaps in leadership or leadership perceived to be of poor quality
 - Location challenges around being in remote areas, areas where property was unaffordable or where teachers could easily earn more across a border.
- The majority of the schools in the survey had reported they experienced supply problems, some for multiple years. The Supply Index has mixed findings on the consistency of supply issues across a number of years in any particular school.

The initial research also identified some circumstances where this index methodology does not work as well. For example where the school is very small so the movement of staff would be exaggerated, where the school is shrinking, where the school is or has been restructured, and where the school has or is currently converting to an Academy.

Maps showing the results of the Supply Index for 2016 can be found in Annex 2. Each schools has been placed in a band depending on its Supply Index score – the number of schools in each of these bands is provided in the accompanying Excel tables. The maps are constructed using the programming language R, using a technique called ‘Voronoi polygons’. Each polygon corresponds to a school: at any point within that polygon the school is the closest school by straight-line distance. **The boundaries do represent any specific geographic boundary.** Along a boundary two schools are equidistant from that point. We chose Voronoi polygons instead of just points showing the location of each school because they are far easier to interpret visually for a large number of items. **These show that there are no clear geographic patterns to teacher supply issues when using this methodology.**

2. Access to Initial Teacher Training provision

This section contains four maps showing access to Initial Teacher Training (ITT) provision across England. It uses provider level data from the 2016 to 2017 academic year which was published in the Initial Teacher Training: Trainee Number Census – 2016 to 2017:

<https://www.gov.uk/government/statistics/initial-teacher-training-trainee-number-census-2016-to-2017>.

The approach in all these maps counts all trainees with the provider – rather than viewing where they may be placed in schools, or where they may end up in employment after training.

There are three maps included:

- A map showing the number of trainee places per teacher in each Local Authority District (LAD). This is designed to show the location of providers across the country. The map shows a huge variation across different LADs. However, it should be noted that because LADs are arbitrary boundaries, whilst one LAD will have no provider, parts of it or all of it may be within the sphere of influence of providers in an LAD close by.
- A map showing the proximity to ITT providers: Higher Education Institutions (HEIs), School Centred ITT providers (SCITTs), and School Direct providers. These are broken down into concentric contours, showing distances between 0 and 60 miles, by 10 mile intervals. Table 2.1 below shows the proportion of the country within a certain distance to an ITT provider.
- A map showing the proximity to lead and partner schools involved in ITT¹³. As there are a far higher number of lead and partner schools than ITT providers, the gradations here are at 5 mile intervals.

Table 2.1: Proportion of country within a certain distance of an ITT provider

Band	Percentage of Country Within Distance
0 to 10 miles	81.1%
10 to 20 miles	17.0%
20 to 30 miles	1.5%
30 to 40 miles	0.4%
40 to 50 miles	0.1%

¹³ This does not cover schools that may be involved in core HEI ITT provision

Figure 2.1 and Figure 2.2 show the distribution of ITT providers and ITT training places. They are unsurprisingly centred around major urban areas, with provision in London, Birmingham, and the northern cities particularly noticeable. Conversely, there is less coverage in East Anglia, along the east coast, in rural northern areas, and across parts of the rural South West. However, Figure 2.3 shows that access to schools involved in ITT is far more prominent, covering many of the areas which are not covered by ITT providers. Almost 90% of the country is within 5 miles of a school involved in ITT.

Table 2.2: Proportion of country within a certain distance of a school involved in ITT¹⁴

Band	Percentage of Country Within Distance
0 to 5 miles	89.9%
5 to 10 miles	8.1%
10 to 15 miles	1.4%
15 to 20 miles	0.4%
20 to 25 miles	0.1%

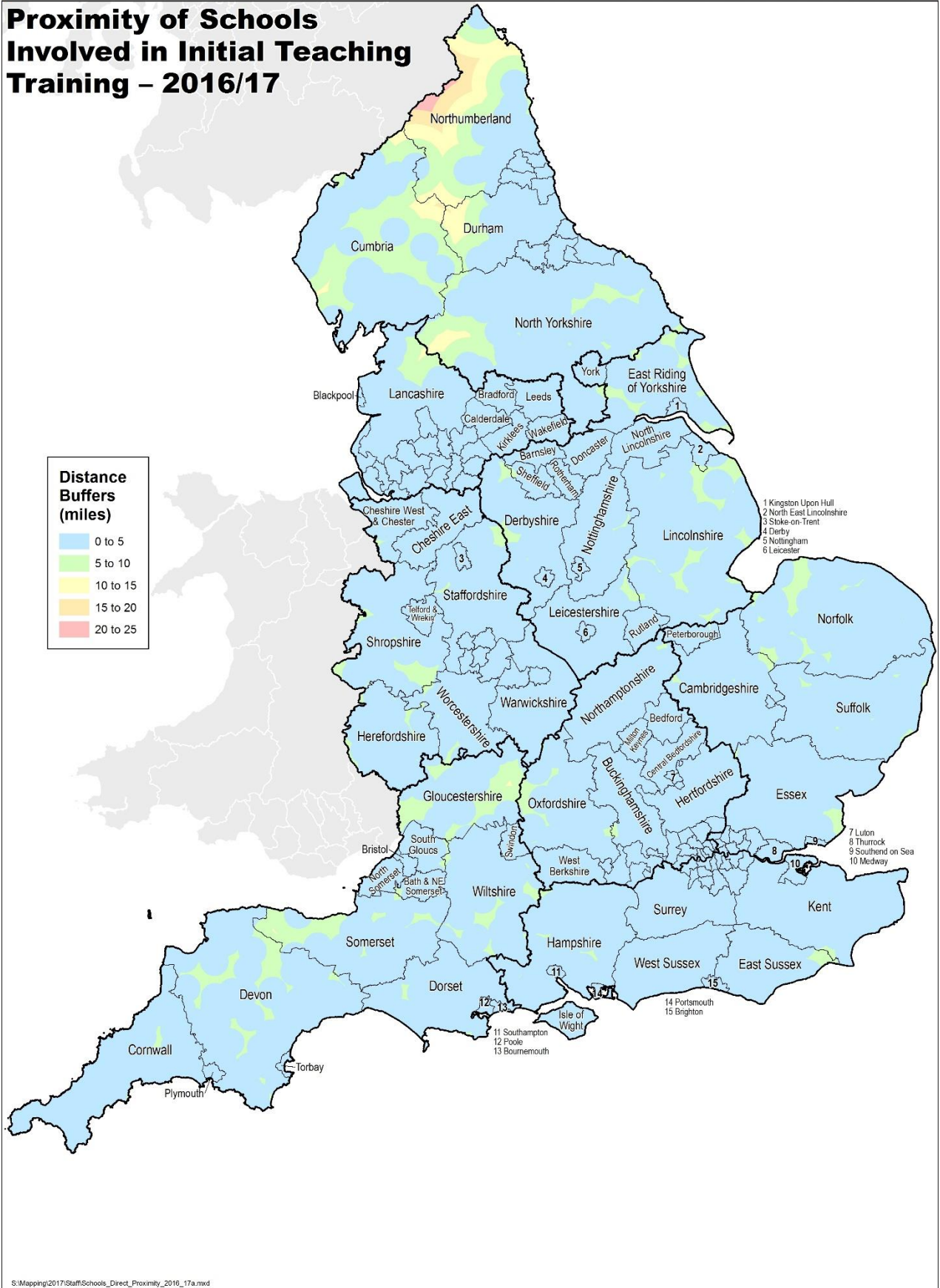
Please note that all data is based on management information as reported by providers of initial teacher training. Future work in this area will look at exploratory mapping provision by where the successful trainees end up in state funded school employment.

¹⁴ This does not cover schools that may be involved in core HEI ITT provision

Figure 2.1: Number of ITT trainee places per teacher, by Local Authority District



Proximity of Schools Involved in Initial Teaching Training – 2016/17



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3. Factors related to teacher supply and retention

This section considers the wide range of factors that are related to the supply and retention of teachers. It first specifically explores the factors influencing teachers' decisions to leave the profession with a review of international evidence on teacher attrition. The section then presents three visualisations demonstrating the range of factors that are linked to schools' and teachers' decisions around teacher supply.

Factors influencing teachers' decisions to leave – a review of international literature

The Department's *Analysis of teacher supply, retention and mobility* (Department for Education, 2017) set out analyses of administrative data to explore geographical factors, school characteristics and teacher characteristics that predict whether a teacher remained within or left the profession. This section focusses on evidence of personal and professional reasons that may influence a teacher's decision to leave the profession that cannot be captured through administrative data, summarising available evidence on why teachers decide to leave the teaching profession, covering evidence from the US, Canada, Europe and Australia. This section provides the wider context for the findings from a recent study on the reasons for leaving the profession reported by 1,023 former teachers in England, as presented in the next chapter.

Terminology: Distinction between turnover, mobility and attrition/wastage

When studying barriers to teacher retention, teacher labour market researchers often distinguish between different pathways out of a given teaching position (Grissom, Viano, & Selin, 2016a). Most commonly, turnover has been separated into mobility and attrition or 'wastage'. For teachers, mobility typically refers to moves to other teaching positions, whereas attrition or 'wastage' refers to leaving the profession altogether. Distinguishing between these two categories of turnover is important, because studies have often found that predictors of teachers' moves to new teaching jobs are not necessarily the same factors that predict leaving the profession (Grissom et al., 2016).

Key findings

- The decision to remain or to leave teaching is a complex one influenced by numerous personal and professional factors that change throughout teachers' careers (Ávalos & Valenzuela, 2016; Borman & Dowling, 2008; Grissom, Viano, & Selin, 2016b; Lindqvist & Nordänger, 2016).
- Research asking ex-teachers about their reasons to leave the profession has identified a multitude of factors, most prominently workload and accountability pressure, wanting a change or a challenge, the school situation (incl. pupil behaviour and school leadership) and salary considerations (Smithers & Robinson, 2003).
- The reasons for intending to leave and actually leaving the profession might not be the same (Grissom, Rodriguez, & Kern, 2017; Tye & O'Brien, 2002). Limited evidence also suggests that the teachers who intend to leave the profession might not be the same teachers who end up leaving the profession (Worth, Bramford, & Durbin, 2015).
- Across studies, teachers in the US, Canada, Europe and Australia report broadly similar factors for deciding to leave the profession.
- The variability of research methods, countries' educational policies, and the characteristics of teachers across studies warrants caution when drawing general conclusions about teachers' reasons for leaving.

Scope and methodological considerations

Given that ex-teachers have left the school system, researchers can no longer go through their schools in order to recruit them for their research. This poses a difficulty to reach the target group and often leads to low response rates, making it hard to draw any general conclusions (Gu et al., 2015; Karsenti & Collin, 2013; Tye & O'Brien, 2002). Many researchers, therefore, revert to alternative approaches involving current teachers who are thinking of leaving, and asking them, for example, about their reasons for considering leaving the profession (Ryan et al., 2017; Vekeman, Devos, Valcke, & Rosseel, 2016; Worth et al., 2015). Other researchers ask teachers to identify aspects of their job that would have dissuaded them from going into teaching if they had known about them before they started (Barmby, 2006), or factors that they think drive teachers out of the profession in general (National Foundation for Educational Research, 2008). However, this might be a problem for several reasons: (1) it is unclear whether the teachers who report that they intend to leave are those more likely to actually leave (Worth et al., 2015); (2) reasons for intending to leave might differ from reasons for actually leaving (Grissom et al., 2016b; Tye & O'Brien, 2002), (3) compared to the proportion of teachers *intending to leave* the profession, a smaller proportion *actually leaves* (Lynch, Bamford, & Wespieser, 2016). Thus, this review focuses on research with teachers who actually left the teaching profession.

Most of the relevant research involved surveying ex-teachers and asking them to rank a number of potential reasons according to how important they were for their decision to leave. This section provides a summary of the key findings. A detailed overview of recent studies and their main findings is provided in the appendix.

Teachers decide to leave the profession for a number of reasons

As teacher attrition seems to result from a combination of factors that accumulate over time, researchers aim to capture multiple motives rather than asking teachers to identify an individual reason for leaving the profession (e.g. Karsenti & Collin, 2013; Lindqvist & Nordänger, 2016; Makela et al., 2014). The most robust and comprehensive study on the reasons why teachers decide to leave was conducted in England in 2002-2003 (Smithers and Robinson, 2003). The researchers asked 1,066 leavers to rate 16 possible reasons for how much they contributed to their decision to leave. In a second step, they interviewed 306 of those respondents to explore the factors around their decision to leave in more detail. The authors identified five main factors: workload, new challenge, the school situation, personal circumstances and salary. Of these, workload was by far the most important reason cited, and salary the least. They also found that former secondary school teachers more often referenced working conditions, particularly poor pupil behaviour, than leavers from primary schools.

Workload. Other research supports these high-level findings. Overwhelmingly, studies find workload to be one of the top reasons cited (e.g. Howes & Goodman-Delahunty, 2015; Karsenti & Collin, 2013; Struyven & Vanthournout, 2014; Tye & O'Brien, 2002). While some studies used a general 'workload' category, several studies had a more detailed breakdown of related tasks, with 'too much work out of school hours' (Buchanan, Prescott, Schuck, Aubusson, & Burke, 2013; Karsenti & Collin, 2013; Struyven & Vanthournout, 2014), 'accountability' and 'increased paperwork' (Tye & O'Brien, 2002) as main leaving factors. This is in line with findings from the Teacher Workload Survey 2016 in England, that found that teachers generally felt they spent too much time on lesson planning, marking and data management rather than actually too much time on teaching (Higton et al., 2017). A breakdown by phase suggests that workload might be a more decisive reason for quitting for primary than secondary school teachers (Smithers & Robinson, 2003).

New challenge. Needing change or a challenge as well as personal reasons were other motives for leaving the profession that played an important role in several studies. There is limited evidence that this is more pronounced among younger and early-career teachers (Smithers & Robinson, 2003; Struyven & Vanthournout, 2014) as well as among PE teachers (Makela et al., 2014) compared to the general population of ex-teachers. In their study of 235 newly qualified teachers who left

teaching within five years after graduating, Struyven & Vanthournout (2014) identified a 'lack of future prospects' as main reason for teachers leaving the profession early. Similarly, a survey of 230 former PE teachers in Finland identified the 'need for a better use of abilities' and 'Routinisation of work' to be participants' top motives for leaving.

School situation. Leavers in all reviewed studies cited working conditions, mainly feeling undervalued or lacking support, pupils' behaviour or attitudes and school management, as factors that greatly contributed to their decision to leave (Howes & Goodman-Delahunty, 2015; Karsenti & Collin, 2013; Smithers & Robinson, 2003; Tye & O'Brien, 2002). Lacking support, feeling undervalued or lacking recognition were prominent factors themes across several studies (Buchanan, 2009; Howes & Goodman-Delahunty, 2015; Makela et al., 2014; Smithers & Robinson, 2003; Struyven & Vanthournout, 2014; Tye & O'Brien, 2002). Mostly these factors were linked to school management, but sometimes also to educational policy (Smithers & Robinson, 2003; Struyven & Vanthournout, 2014) or parental support (Tye & O'Brien, 2002). Overall, relations with parents and colleagues played a smaller role, but were still found to contribute to teachers' decision to leave (Buchanan, 2009; Struyven & Vanthournout, 2014; Tye & O'Brien, 2002). A comparison across school phases suggests that poor pupil behaviour and the way a school is run might be more important in secondary school teachers' decision to leave (Smithers & Robinson, 2003). Furthermore, school factors were ranked as more influential by men than by women (Smithers & Robinson, 2003).

Pay. Pay clearly plays a role in teachers' decisions to leave (Buchanan et al., 2013; Hancock, 2016; Makela et al., 2014; Smithers & Robinson, 2003; Tye & O'Brien, 2002), but there is mixed evidence on how important this factor is. On the one hand, there is evidence that pay plays a comparably minor role in teachers' decisions to leave. For example, while low pay is one of the reasons that teachers cite for having left the profession across studies, it consistently ranks fairly low compared to other reasons (e.g. Hancock, 2016; Makela et al., 2014; Smithers & Robinson, 2003; Tye & O'Brien, 2002). In line with this, destination research¹⁵ finds that teachers do not leave for better paying jobs and in fact often accept a pay cut when changing careers (Smithers & Robinson, 2003; Worth et al., 2015).

On the other hand, there is some limited evidence suggesting pay matters for teacher retention. When asked about what would have made them stay in the teaching profession, one study found many former teachers indicated that better pay

¹⁵ 'Destination research' refers to studies that explore what former teacher do upon leaving the teaching profession, i.e. their next destination (e.g. whether they take up a new job and what kind of new job they take up).

might have been a factor (Smithers & Robinson, 2003). The authors found pay was ranked the third most frequently mentioned desirable change after workload reduction and more support from school leadership. A smaller study of 116 current and former teachers compared motives for leaving across the two groups (Tye & O'Brien, 2002). The authors found salary considerations to be the top motive out of seven for those considering leaving and the bottom motive for those who had actually left (Tye & O'Brien, 2002). This finding would need to be verified by further research directly comparing both groups. As both leavers and those intending to leave ranked paperwork and accountability pressure high, the authors recommend further research on whether current teachers feel that only higher pay could compensate for the stress and alienation they are experiencing (Tye & O'Brien, 2002).

Personal reasons. Although working conditions, such as workload, needing a challenge, the school situation and pay, matter a lot to teacher decision to stay or leave, there is some evidence that the decision to leave the profession is also strongly related to individuals' personal lives outside of school (Lindqvist & Nordänger, 2016; Schaefer, Long, & Jean Clandinin, 2012). While a range of personal reasons for leaving the profession came up across studies (e.g. personal circumstances, family responsibilities, desire to travel, and sometimes wanting change), most studies did not explore them in detail. Smithers and Robinson (2003) found women more likely to leave for personal reasons than men. Exploring personal factors in more detail, a case study of five former teachers who have been part of a larger longitudinal study of a group of teachers in Sweden, provides some tentative evidence that suggests that teacher attrition is a process that starts long before teachers actually leave the profession and is linked to individuals' self-image (Lindqvist & Nordänger, 2016). This fits the idea that there is no clear set of factors, but a complex interplay that builds up over time (Karsenti & Collin, 2013; Makela et al., 2014). The authors also conclude that teachers whose self-image does not fit well with their professional identity might over time be more likely to quit (Lindqvist & Nordänger, 2016).

The importance of identifying with intrinsic and altruistic reasons for staying teaching (e.g. having a personal interest in one's subject, wanting to make a difference to pupils' lives and a feeling of being good at teaching) is also highlighted in a recent study of long-serving teachers' motivations to stay within the profession. Chiong, Menzies, & Parameshwaran (2017) conducted a survey of over 900 English teachers and interviews with a subgroup of 14 teachers who have been in the profession for over 30 years. They note the importance of identification with intrinsic and altruistic reasons for teaching as decisive retention factors for long-serving teachers (Chiong et al., 2017).

Limitations and evidence gaps

Overall, there is very limited evidence available on teachers' self-reported reasons for having left the profession and the data for the methodologically most rigorous study was collected 15 years ago (Smithers and Robinson, 2003). Some of the studies on this topic include only small samples or focus on very specific subgroups of former teachers (e.g. music teachers or PE teachers), which might mean that findings cannot be generalised to other groups of teachers. While tentative evidence suggests similar reasons across subject groups (Smithers & Robinson, 2003), further research would be needed to replicate this. Similarly it is unclear to what extent cultural differences and countries' educational policies might impact on teachers' decisions to leave, so while the current evidence provides us with important insights into why teachers are leaving the profession, these might not all translate into the English context.

Depending on how long ago a teacher left the profession, reported reasons could be biased, as participants' comments might reflect their current perceptions of their reasons for leaving rather than the ones that were present when they decided to quit (Howes & Goodman-Delahunty, 2015). However, there is some evidence that reasons remain rather stable over time. Re-contacting leavers six to 12 months after they had decided to leave, Smithers and Robinson (2003) found that the structure of the reported motive to leave was very similar when comparing the follow-up to the time of leaving itself. However, more research would be needed on how reliable these reports are when studies go beyond the one-year time span.

As previously described, research with ex-teachers has often proved difficult, so further exploration of the validity of alternative approaches would be useful. This could include research on whether the teachers who report that they intend to leave are those more likely to actually leave and whether reasons for intending to leave match reasons for actually leaving.

Visualisations of factors relating to teacher supply

Below are three visualisations which give an indication of the range of factors which affect teacher supply. Figure 3.1 is a thematic visualisation to exemplify how different 'levels' of factors influence teacher supply – from national level issues right down to teacher characteristics. Figure 3.2 is at a school level, and shows factors which affect a school's ability to recruit teachers or influencing their decision-making around approaches to teacher supply. Figure 3.3 is at a teacher level, and shows the factors which influence a teacher's behaviour relating to job movement and retention.

The maps have been developed through literature reviews, conversations with a range of stakeholders, including Department for Education staff and academics as part of a workshop run in conjunction with the UK Data Service, and from interviews

conducted with 152 headteachers and senior staff as part of the Supply Index verification work. They are meant to be comprehensive but are not exhaustive, as they are designed to be indicative of the range of factors which influence the teacher labour market, demonstrating how teacher supply can vary at a granular level.

In Figure 3.2 and Figure 3.3 influences and characteristics are listed as either factors or sub-factors. Individual influences and characteristics (for example being a primary, secondary, or special school) are listed as 'sub-factors', which then feed into a common 'factor' (for example primary, secondary, or special school feeds into 'phase').

Figure 3.1: Different levels of factors affecting teacher supply

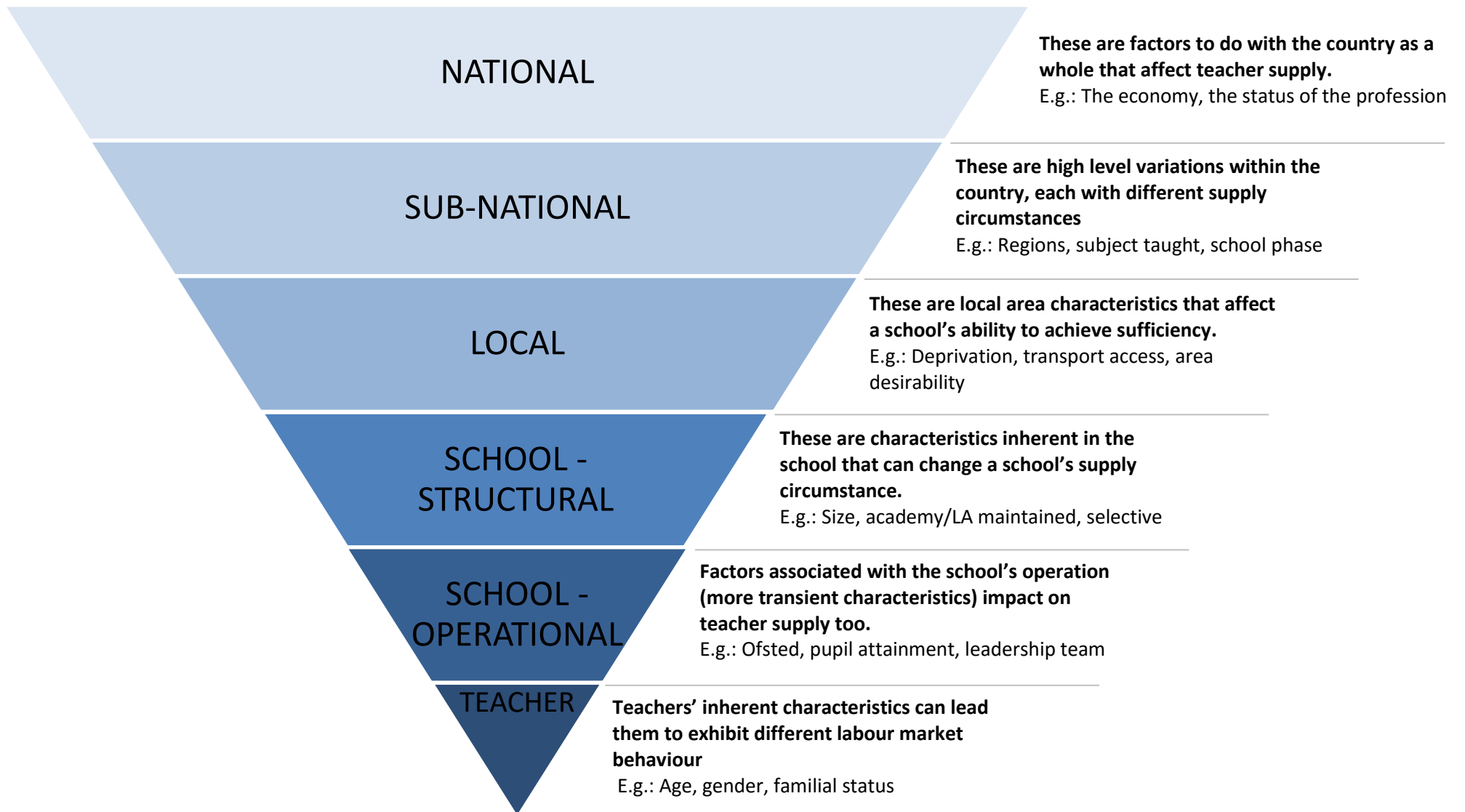
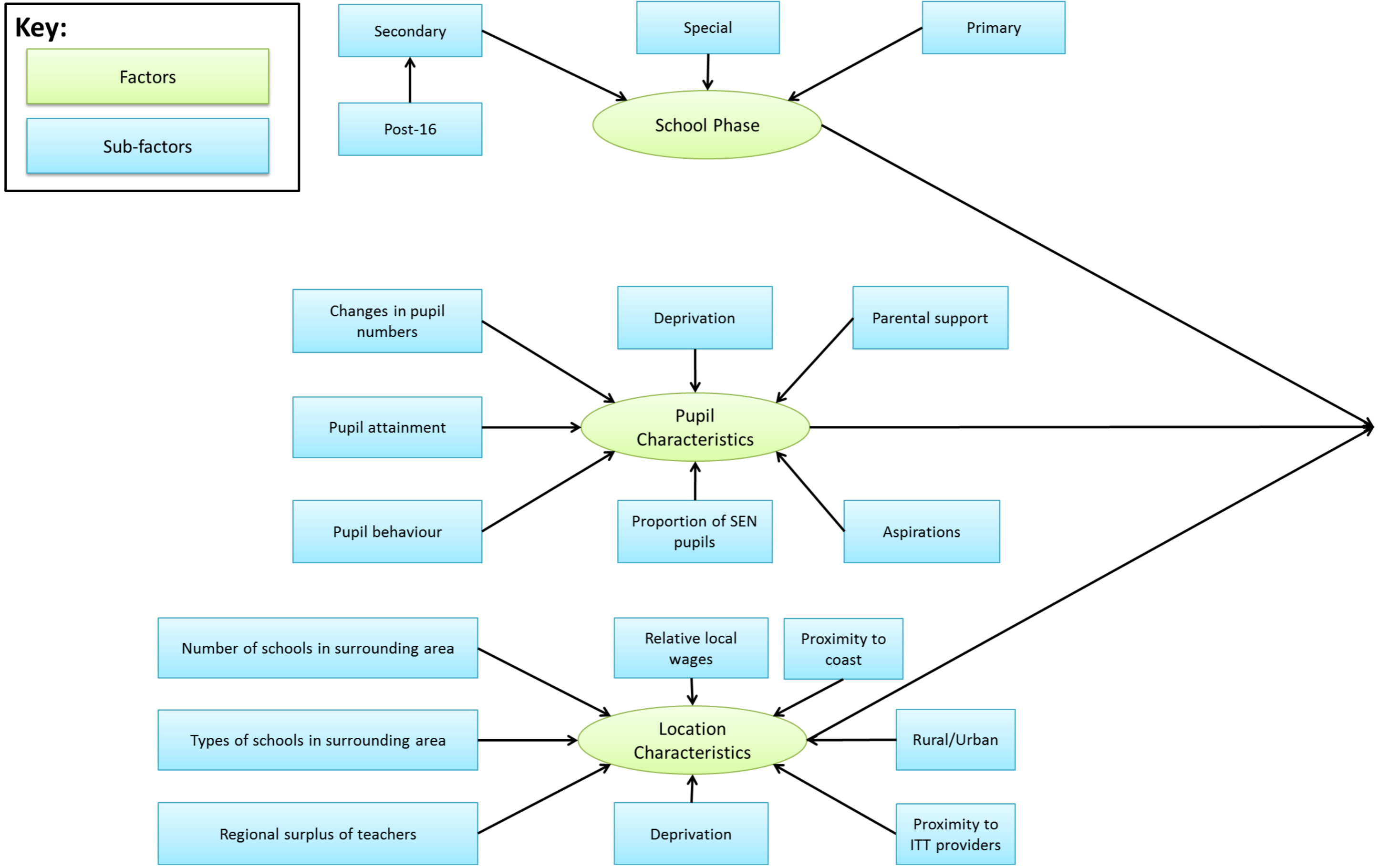
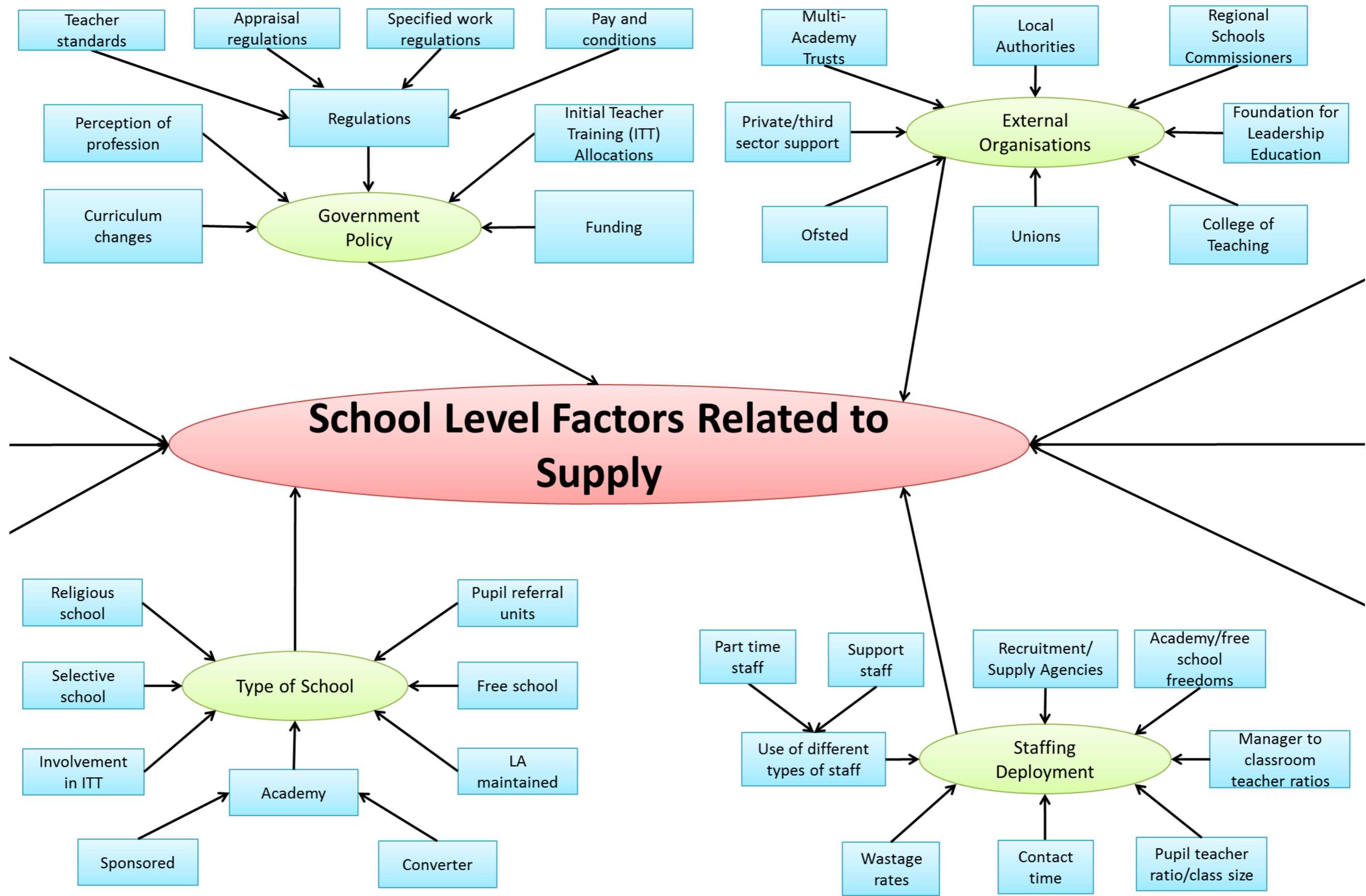


Figure 3.2: School level factors that influence teacher supply





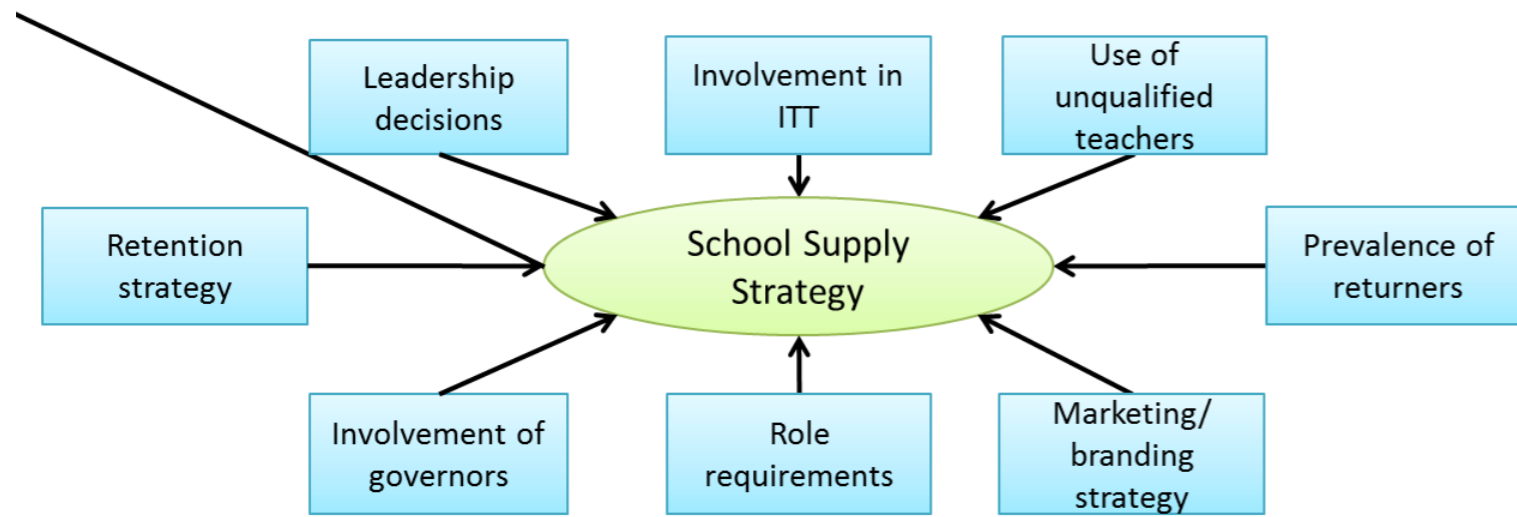
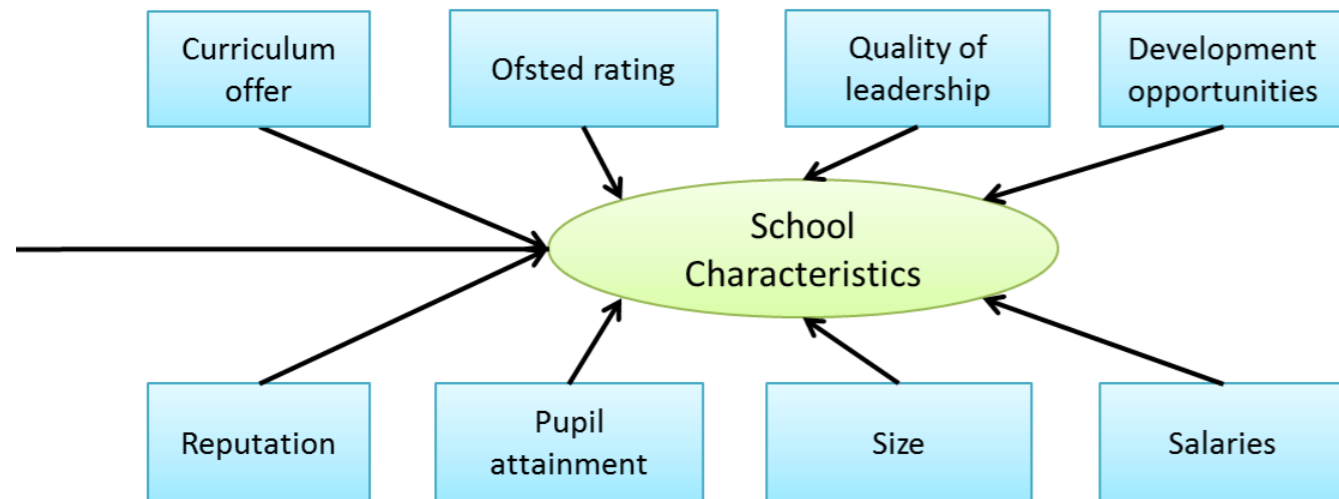
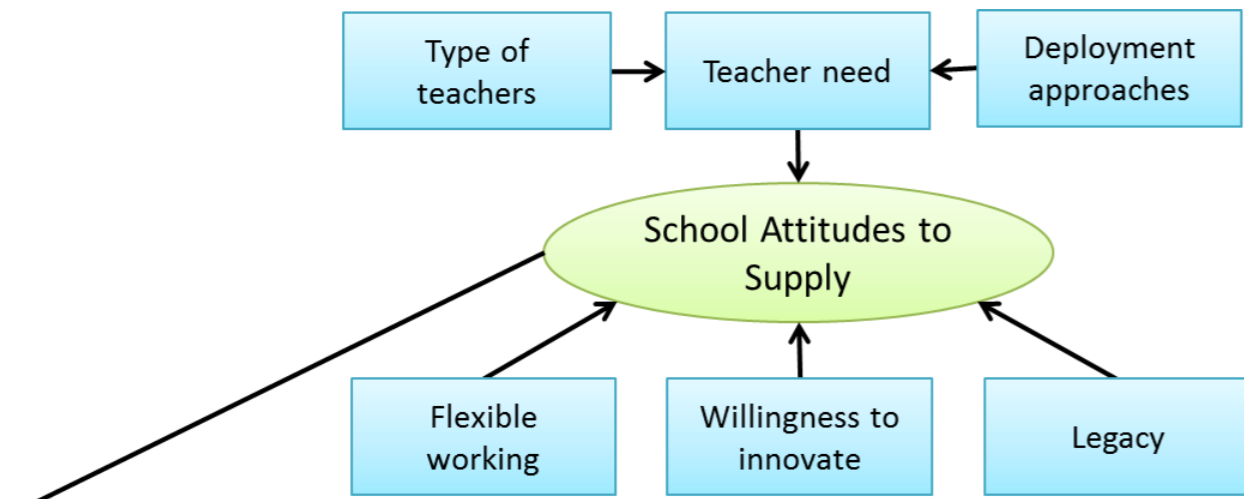
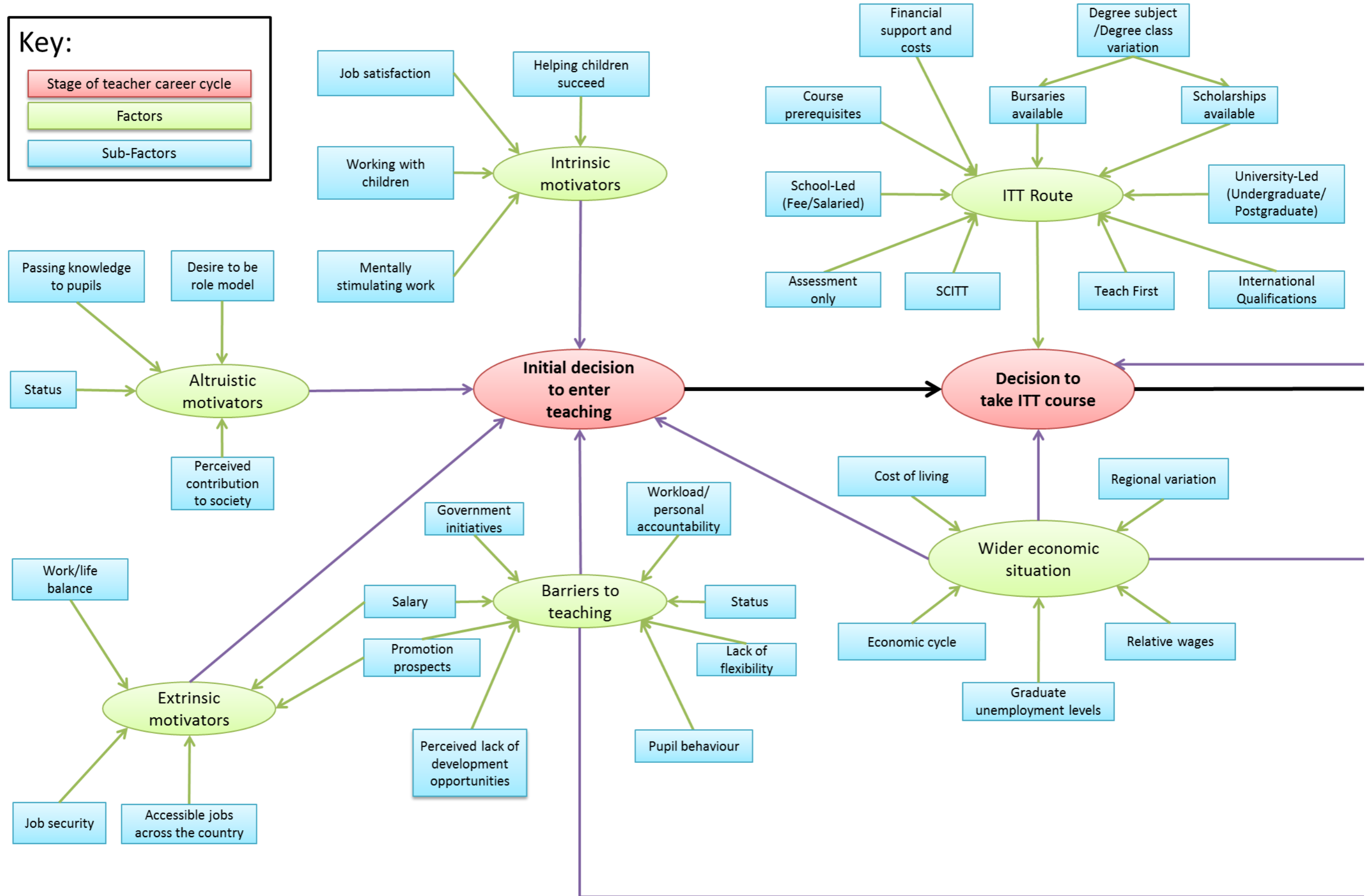
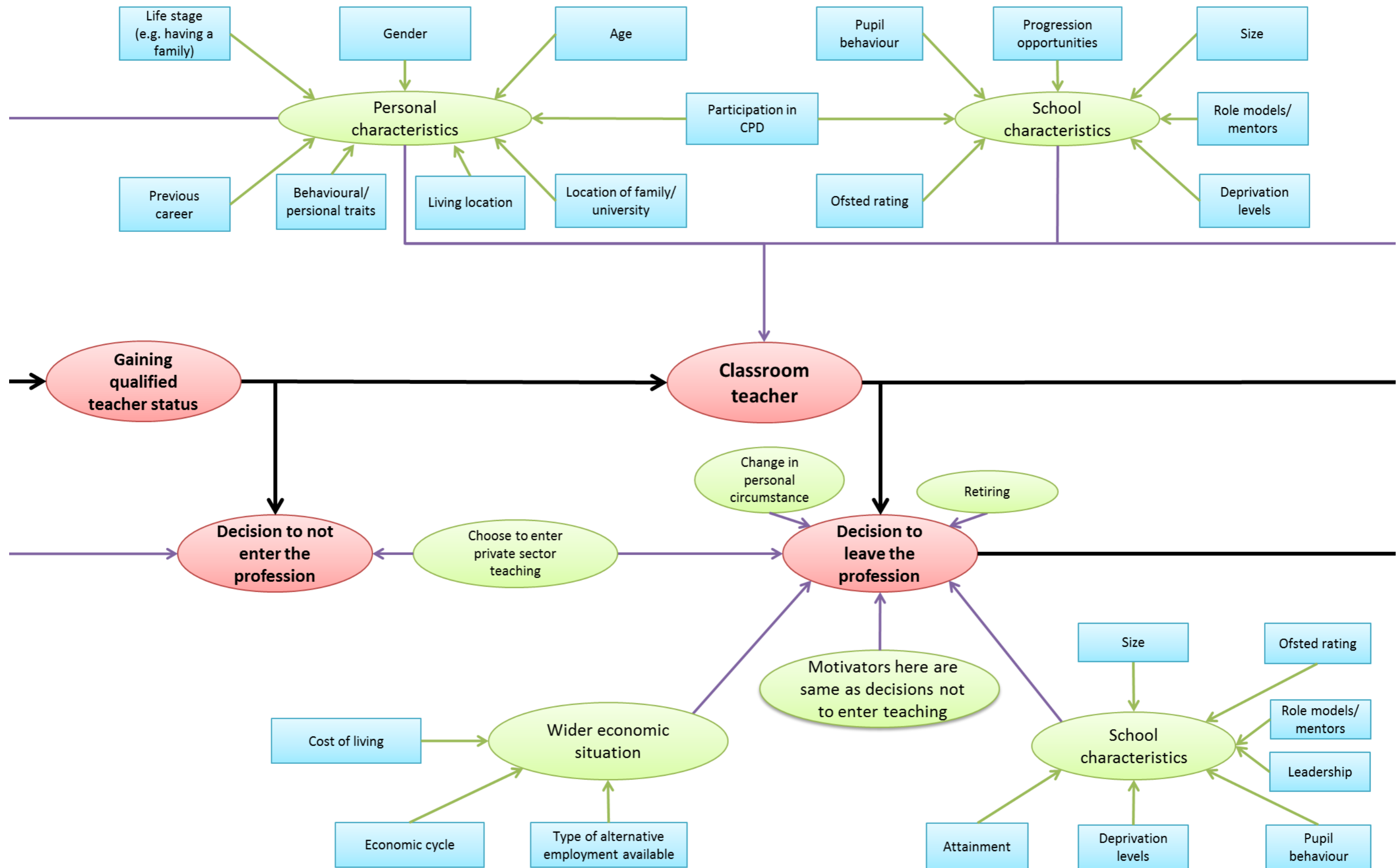
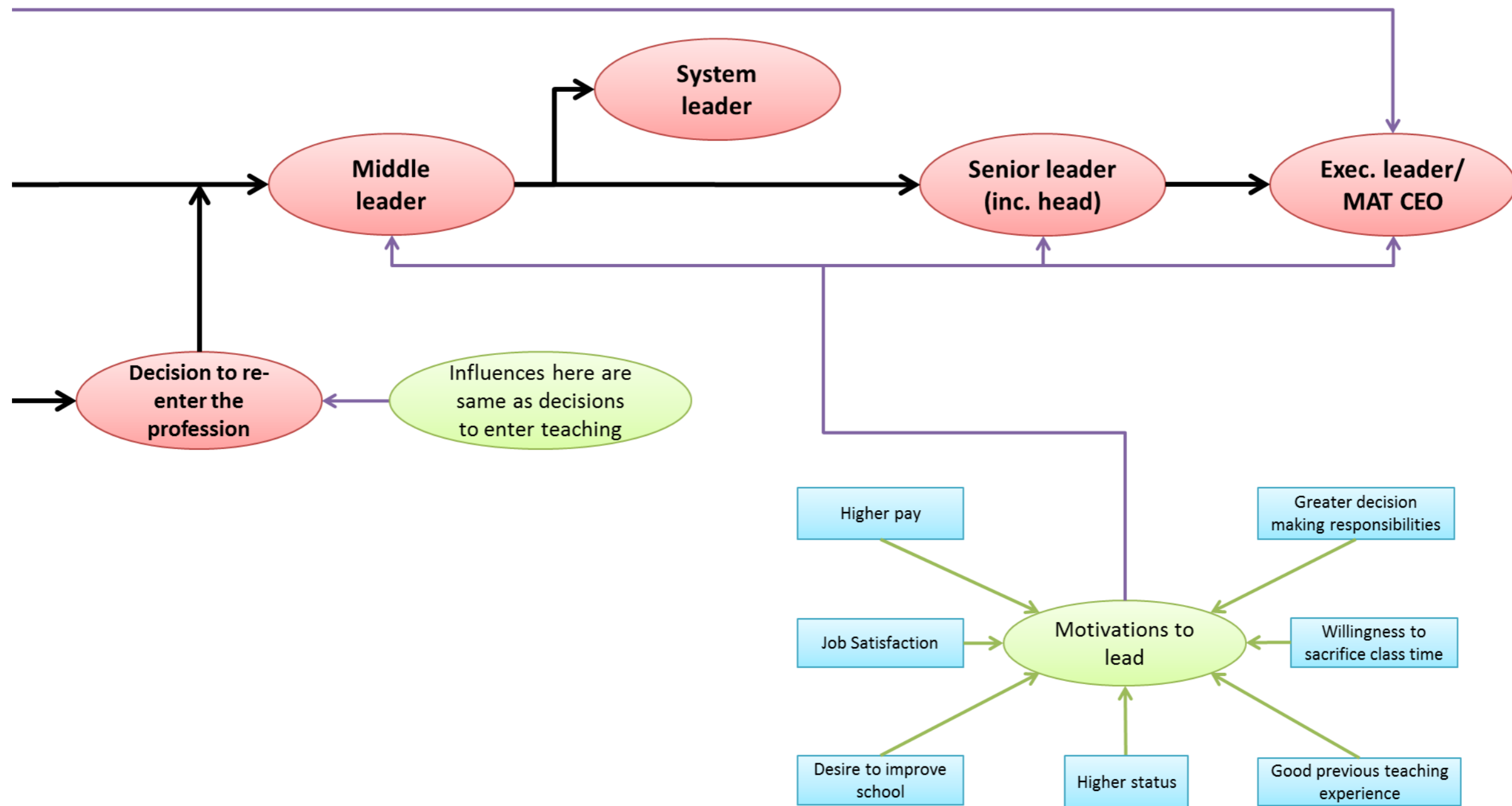


Figure 3.3: Teacher level factors that influence supply







4. Ex-teachers' reasons for leaving

Aim of the analysis

Section 5 outlines some of the literature available on reasons for teachers leaving the profession, showing that there are a number of reasons, and that these reasons are often inter-related.

The aim of the analysis was to gather updated information about the reasons why teachers had left the profession, specifically through asking those who had left as opposed to those who planned to. This was timely as the seminal English study in this area was over a decade ago, so this work was to test that the main factors quoted had changed or were still the same¹⁶. In addition, previous analysis has shown that leaving rates are particularly high for early-career teachers in science, maths and languages^{17 18}. The analysis presented here focuses on the teachers who have left since 2015.

The analysis was divided into a quantitative survey with teachers who had already left the profession to understand their reasons for leaving. From these responses people were asked if they were happy to be contacted for further follow up qualitative interviews to understand the survey responses in more detail.

The quantitative survey ran from early February until late March 2017 and accrued 2,642 completed responses. However, as explained in the next section on the methodology, this was stripped down to 1,023 responses to be used for analysis (the reasons for this are detailed in the methodology below). The sample achieved in the survey is unlikely to be fully representative of the overall population as:

- the survey was distributed through subject specialist associations and other organisations;
- the sample is self-selecting;
- whilst the sample reflects high level characteristics of the population, the full degree of representativeness of the sample is impossible to quantify.

¹⁶ Smithers, A., & Robinson, P. (2003). Factors Affecting Teachers' Decisions to Leave the Profession. Research Report RR430. Liverpool. [https://doi.org/10.1016/S0742-051X\(02\)00101-4](https://doi.org/10.1016/S0742-051X(02)00101-4)

¹⁷ <https://www.nfer.ac.uk/publications/NUFS01/>

¹⁸ <https://www.gov.uk/government/statistics/teachers-analysis-compendium-2017>

Survey Methodology

The questions were designed by analysts within DfE and are set out at the end of this section. The survey was produced on SmartSurvey, with cognitive testing conducted with a group of ex-teachers within the department. The survey ended automatically if a respondent said they had not left yet and have not handed in their notice/accepted another job. It also automatically ended early if they had left for retirement reasons as these were out of scope of the survey's aims.

The survey ran from early February until late March 2017, and it was distributed on different dates by different organisations.

Table 3: Organisation and survey dissemination method

Organisation	How survey sent out	Date survey sent
Institute of Physics	Email to 13 ex-scholars	07/02/17
Education Support Partnership	Newsletter	31/01/17
Association for Language Learning	Newsletter	01/02/17
Geographical Association	A bespoke email to retired members & as an item in the GA's e-newsletter	02/03/17
TES	Email to inactive users	18/02/17
Royal Society of Chemistry Teachers	Facebook & Twitter	30/01/17 & 07/02/17
Council for Subject Associations	Mailing list	01/02/17
STEM learning	Newsletter	01/02/17
Teach First	Community webpage	10/02/17
Royal Society of Biology	Email to Policy Advisory Group and Biology Education Research Group & newsletter	07/03/17 (newsletter)

There were 3,347 responses to the survey. However, 705 were not complete, reducing the sample to 2,642. For the purpose of the analysis the focus was on those who left since 2015 (removing 1,539), as a) they were likely to best recall reasons for leaving, and (b) we wanted to ensure the research was relevant to the most recent economic and school sector factors. In addition those who reported being on the Teach First programme were also removed (68) as they follow a different career progression model and could bias the results. A further 12 were removed as they had incomplete information. This resulted in having a sample of 1,023 cases for analysis. At the end of the qualitative survey respondents were asked if they were prepared to provide details for us to conduct follow up interviews – the findings from these interviews will be published later in the year.

The sample used for analysis was found to be representative of the population in terms of gender, but over-represents secondary teachers (representing nearly 70% of the sample). This is unsurprising given the organisations that disseminated the survey. Within this the sample over-represents MFL teachers and under-represents PE and STEM teachers. The sample was also skewed towards older teachers.

Findings

Workload was the most important factor amongst ex-teachers' for leaving the profession

Respondents were asked to rank how important certain factors were in their decision to leave, on a scale of 1 to 5 (1 not being a factor, 5 being a very important factor). Of those surveyed, 75% stated that workload was the reason they left the profession, making it most common reason for deciding to leave. This is in line with findings from research conducted by the National Foundation for Education Research (NFER), which found that workload was the central cause of teachers considering leaving the profession¹⁹. Changes in policy or initiatives by Government was the second highest cause, with feeling undervalued by their leadership or team being the third. Again, both of these are notable reasons provided in the NFER research.

Conversely, only 17.1% of respondents said that earning a higher salary elsewhere was a major factor in their decision to leave – in this cohort of teachers pay was not a major driver for leaving the profession.

When questioned on the number of factors or events that influenced a decision to leave the profession, 61% of respondents said that it was a single factor (from the list above or other) or event that triggered their departure.

Reasons for leaving were compared between sub-groups with different characteristics. There were 5 characteristics that respondents were compared on:

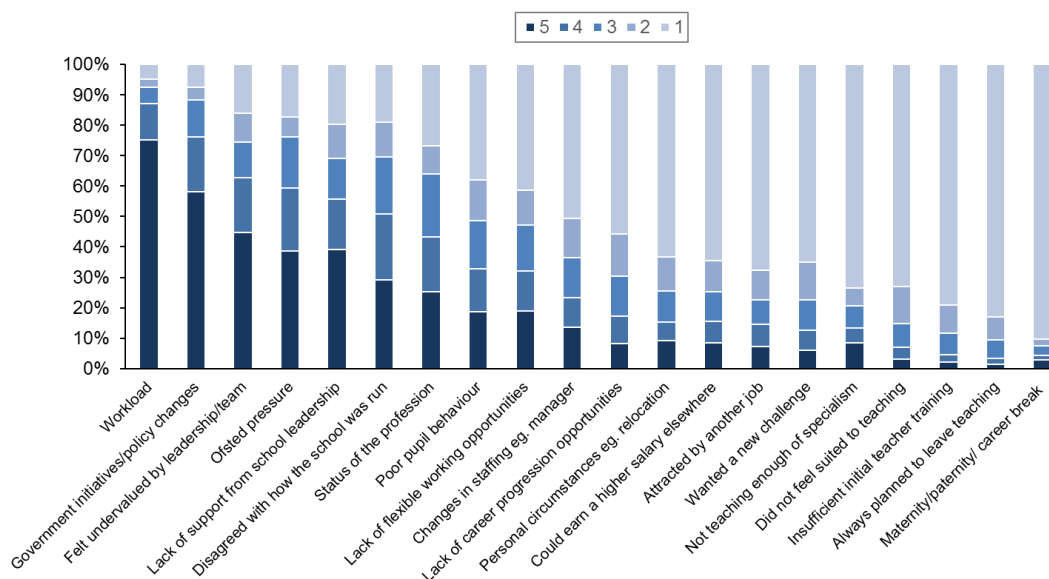
- Gender
- London/Rest of England
- Teaches STEM subject/Teaches non-STEM subject
- Ofsted rating
- Age (20-30, 31-40, 41- 50, 51+)

The full results of this segmentation are available in the Excel files associated with this report. However, across all splits by each characteristics, the top three reasons remained as workload, government initiatives/policy changes, and feeling undervalued by their

¹⁹ *Engaging Teachers: NFER Analysis of Teacher Retention*. National Foundation for Education Research, 2016. <https://www.nfer.ac.uk/publications/LFSB01/LFSB01.pdf>.

leadership or team. In fact, there were no discernible differences between cohorts when split by the top three characteristics.

Figure 4.1: Importance of reasons for leaving the profession



When split by Ofsted rating of school, there is a correlation between a poorer Ofsted score and higher proportion of that split cohort claiming certain factors were a more important factor. Those factors were:

- Feeling undervalued by leadership or team
- Ofsted inspection pressure
- Lack of support from school leadership
- Disagreeing with how the school was run
- Poor pupil behaviour

When split by age, whilst low pay, no progression, and lack of ambition were still relatively minor reasons for teachers aged between 20 and 30, compared to older age groups they were far higher. The table below shows the average score on a 1 to 5 scale for each age category and reason for leaving. It also shows how ‘pull’ factors from other jobs are far higher for younger teachers too, which are linked to the previous three factors.

Table 4: Average score (on 1-5 scale) for selected reasons to leave, by age group

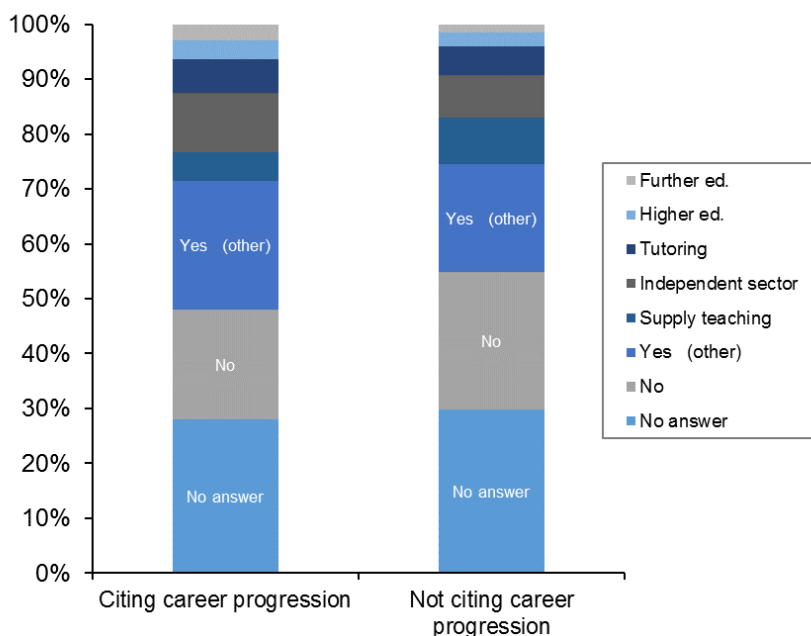
Age	20-30	31-40	41-50	51+
Salary	2.4	1.9	1.7	1.5
No progression	2.1	2.1	2.0	1.9
Ambition	1.9	1.8	1.7	1.6
Other job attractive	2.1	1.9	1.7	1.5

Workload, pupil behaviour, Ofsted pressure, and flexible working were also higher factors for younger teachers. However, older teachers were more affected by not feeling valued or supported by leadership or a change in leadership.

Those who cited lack of progression as a reason for leaving were more likely to leave the education sector and to have a higher salary in their next role.

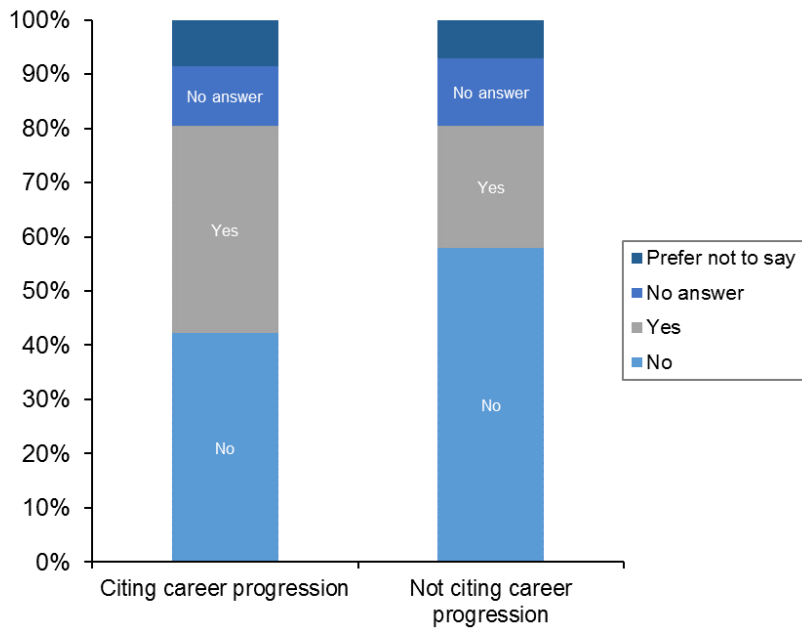
Of those who answered the question ‘when you left the state-funded sector, did you remain in the education sector?’, those who gave ‘lack of progression’ a score of 4 or 5 when asked about its importance as a contributory factor to leaving were 5 percentage points more likely to leave the education sector entirely than those who did not cite progression as an important factor. Including those who did not answer, 25% of those who cited lack of progression as an important factor left the education sector, compared to 20% for those who did not cite lack of progression as an important factor.

Figure 4.2: Answers to the question ‘did you remain in the education sector?’, dependent on citing lack of progression as a factor for leaving



Of those who cited lack of progression as a factor for leaving, 38% left for left for a higher salary, compared to 22% of those who did not cite lack of progression as factor.

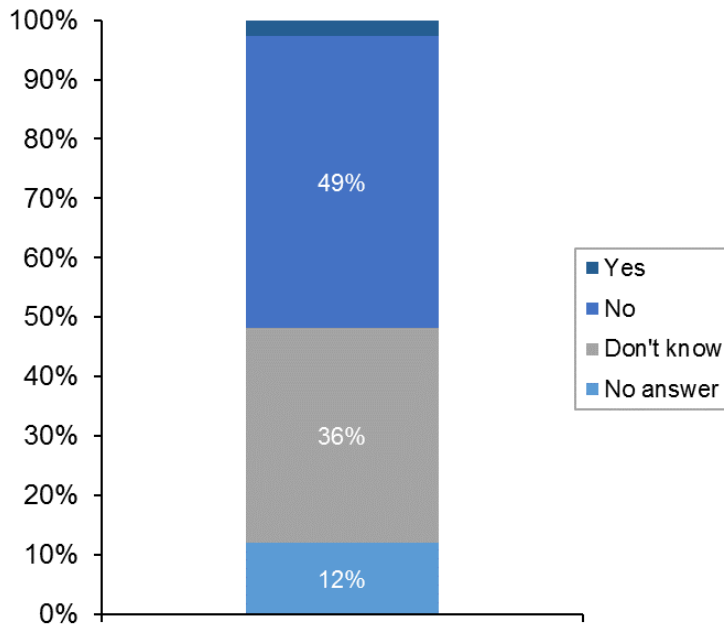
Figure 4.3: Answers to the question 'are you earning more than when you were in teaching in the state-funded sector?', dependent on citing lack of progression as a factor for leaving



85% of ex-teachers do not plan to or are undecided about returning to teaching

When asked whether they planned to return to teaching, 85% of respondents said they did not plan to return or were undecided. Only 3% of respondents said they were definitely planning to go back into teaching at some point.

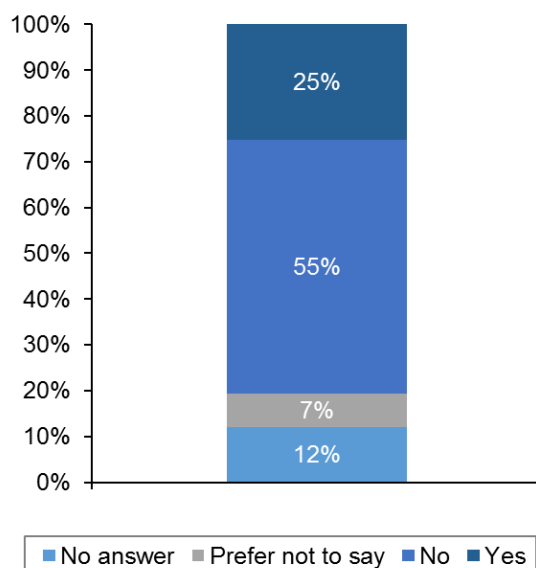
Figure 4.4: Proportion of respondents planning on returning to state-funded teaching



Over 50% of teachers left for a job that paid less than their teaching role

Figure 4.4 shows that over 50% of respondents left teaching for a job that paid less than their teaching job, which reinforces the findings in Figure 4.4, that salary was not a major driver of respondents' reasons for leaving.

Figure 4.5: Percentage of teachers that left for a higher paid job

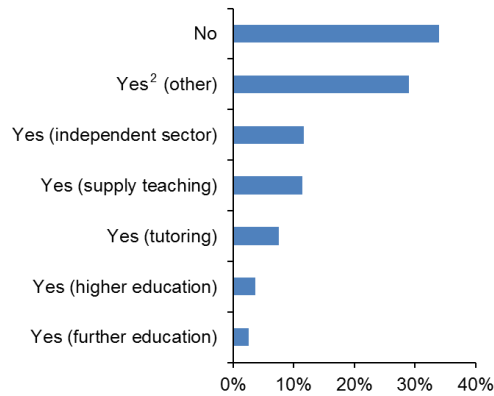


Over 60% of leavers remained in the education sector, but of those who did not, the destinations were hugely varied

In findings consistent with NFER's²⁰, over 60% of leavers remained in the education sector after leaving their state-funded teaching post. The largest group within the education sector was 'other', which encompassed a wide variety of roles, including TAs, educational consultants, academia and public sector employment. As destination, the independent education sector and supply teaching were the next largest defined groups, with 12% of respondents stating these were their next job sectors.

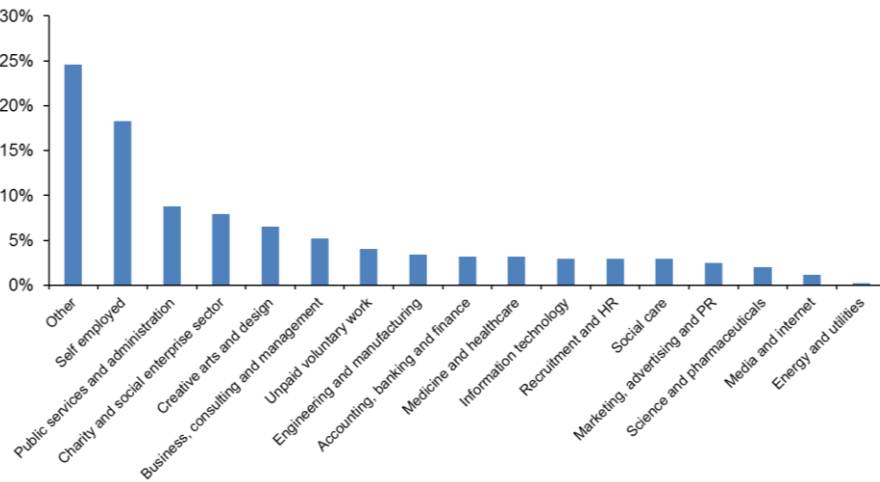
²⁰ *Should I stay or should I go?* National Foundation for Education Research, 2016. <https://www.nfer.ac.uk/publications/LFSA01/LFSA01.pdf>.

Figure 4.6: Destinations of leavers within the education sector



There was no standout sector outside education that respondents moved into. ‘Other’ and ‘self-employed’ were the highest group, which themselves comprise of a range of jobs. Of actual sectors, the public and third sector were the most popular, however only marginally, and the remaining sectors showed very little differentiation.

Figure 4.7: Destinations of leavers who did not stay within the education sector



5. Decomposition of teacher pay rises

To understand better how teachers' pay has changed in recent years, we can analyse trends that underlie the overall increases. Any change between two consecutive years can be decomposed into two effects: a progression effect, whereby teachers who are in service in consecutive years receive changes in pay, this includes promotions and responsibility allowances; and a workforce composition effect, whereby on average, higher-paid, older teachers leave and are replaced by lower-paid, younger teachers. The total change in the average salary is a combination of these two effects.

The progression effect has a positive effect on the overall change in pay while the workforce composition effect has a negative effect. This is explained below, and summarised in tables 5-7.

This is experimental analysis, as we do not have the pay data for every teacher so some weighting and grossing is used to match back to the published pay totals.

Progression effect: rises for teachers in service consecutive years

We can calculate total pay rise as the difference in the average gross pay between Year 1 and Year 2 for all individuals who were in service in both years²¹. This was £1,500 between 2014/15 and 2015/16, which is 3.9% as a percentage of 2014/15 gross pay for the subset of teachers who were in service in both years.

Composition effect: change due to leavers and joiners

The other major effect is the change to the total pay bill from teachers leaving the workforce and teachers entering the workforce.

We calculate the number of teachers leaving service and their average pay, giving the total spend that would have gone on these teachers, but does not as they leave between years. By multiplying the number of new teachers entering service and their average pay, we obtain the total spend added to the pay bill. The total composition effect is the new spend minus the spend on those that have left teaching.

Around 42,800 teachers left the profession through retirement, wastage or death between 2015/16 and 2016/17. Their average pay is estimated at £38,000²², which by

²¹ This only considers teachers that have pay data in consecutive School Workforce Censuses. Please note this excludes those whose salary has been misreported.

²² We find the average proportions of those leaving voluntarily by age/gender characteristics and apportion these to the average teacher salaries for those groups (SWC Tables 9a and Teacher Supply Model).

itself would lead to a reduction in the paybill of around £1.63 billion. Around 43,800 teachers joined in the same period, earning an average of roughly £27,500, adding around £1.20 billion to the overall pay bill. The net effect is to subtract some £420 million from the total, which as a proportion of the entire paybill (net of on-costs, i.e. employers' national insurance and pensions contributions) is 2.3%.

Combining the progression and composition effects gives the total average salary change.²³

Table 5.1: Change in teacher numbers and pay, 2015/16 to 2016/17

	2015/16	2016/17
Teachers in service ²⁴	456,900	457,300
Average gross pay ²⁵	£37,800	£38,400
Rise in average gross pay on previous year	£500	£600
Rise as % of gross pay in previous year	1.2%	1.6%

Table 5.2: Changes due to progression effect

	2014/15	2015/16	2016/17
Number of teachers present in this year and previous year	NA	411,500	414,100
Average gross pay of teachers in consecutive service in 2015/16	£37,400	£39,000	NA
Average gross pay of teachers in consecutive service in 2016/17	NA	£37,800	£39,600
Rise in gross pay of teachers in consecutive service	NA	£1,500	£1,800
Rise as % of gross pay	NA	3.9%	4.6%

²³ There is a small discrepancy owing to issues in the collection of the SWC and simplifying assumptions in the methodology.

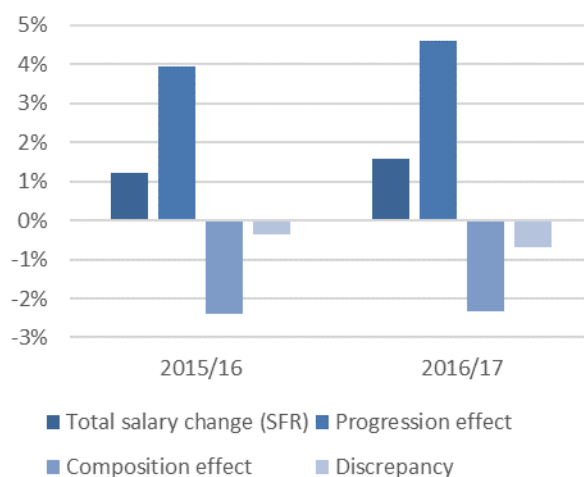
²⁴ Department for Education: School Workforce in England, Table 1, all state-funded schools.

²⁵ Department for Education: School Workforce in England, Table 9a, all state-funded schools. Salaries and changes rounded to nearest £100.

Table 5.3: Changes due to workforce composition effect

	2015/16	2016/17
Number leaving ²⁶	43,370	42,830
Average pay – leavers ²⁷	£38,000	£38,000
Number joining ²³	45,120	43,830
Average pay – joiners ²⁴	£27,000	£27,500
Net effect	-£430m	-£420m
% of paybill	-2.4%	-2.3%

Figure 5.1: Decomposition of changes to average teacher salary



We welcome comments on the experimental approach taken in this analysis, and any suggestions for how the approach could be improved. This will inform any future analysis including further breakdowns (such as the progression effect broken down between promotion and within pay band increases). Please send comments to the Teachers Analysis Mailbox: TeachersAnalysisUnit.MAILBOX@education.gov.uk.

²⁶ Department for Education: School Workforce in England, Table 7b, all state-funded schools. Teacher numbers rounded as published.

²⁷ Constructed from Department for Education: School Workforce in England, Table 9a, all state-funded schools.

Annex 1: 2016 Supply Index Maps

In order to understand any geographic patterns using the new supply index the data was mapped in R using Voronoi Polygons. This technique is designed to show how points, in this case schools, relate to each other. It is not intended to be an accurate geographic representation.

The advantage of this technique is that it allowed us to test the hypothesis about geographic patterns without becoming distracted by the geographic units themselves. **We simply looked at schools in relation to other schools, not to pre-defined geographic boundaries.**

The supply index has been mapped in four groups:

- Primary schools in London
- Primary schools in the Rest of England
- Secondary schools in London
- Secondary schools in the Rest of England

London is defined as the Government Office Region. For the Rest of England maps there is a grey space for London and it is marked as no data available.

For the purpose of the maps below, the 'supply index' is divided into bands. The overall index is comprised of 7 variables for primary schools and 8 variables for secondary schools. For each variable, a school receives a normalised score between 1 and 5 – a higher score indicating a characteristic of supply in that school which is more likely to cause a supply issue. These scores are then summed up and divided by the total possible score (35 for primary schools and 40 for secondary schools) to give a percentage. The higher 'supply index' scores correspond to a darker colour on the maps below.

The maps below represent the results of the 'supply index' for 2016.

Figure A1.1: Supply Index for London primary schools for 2016, mapped by individual school.

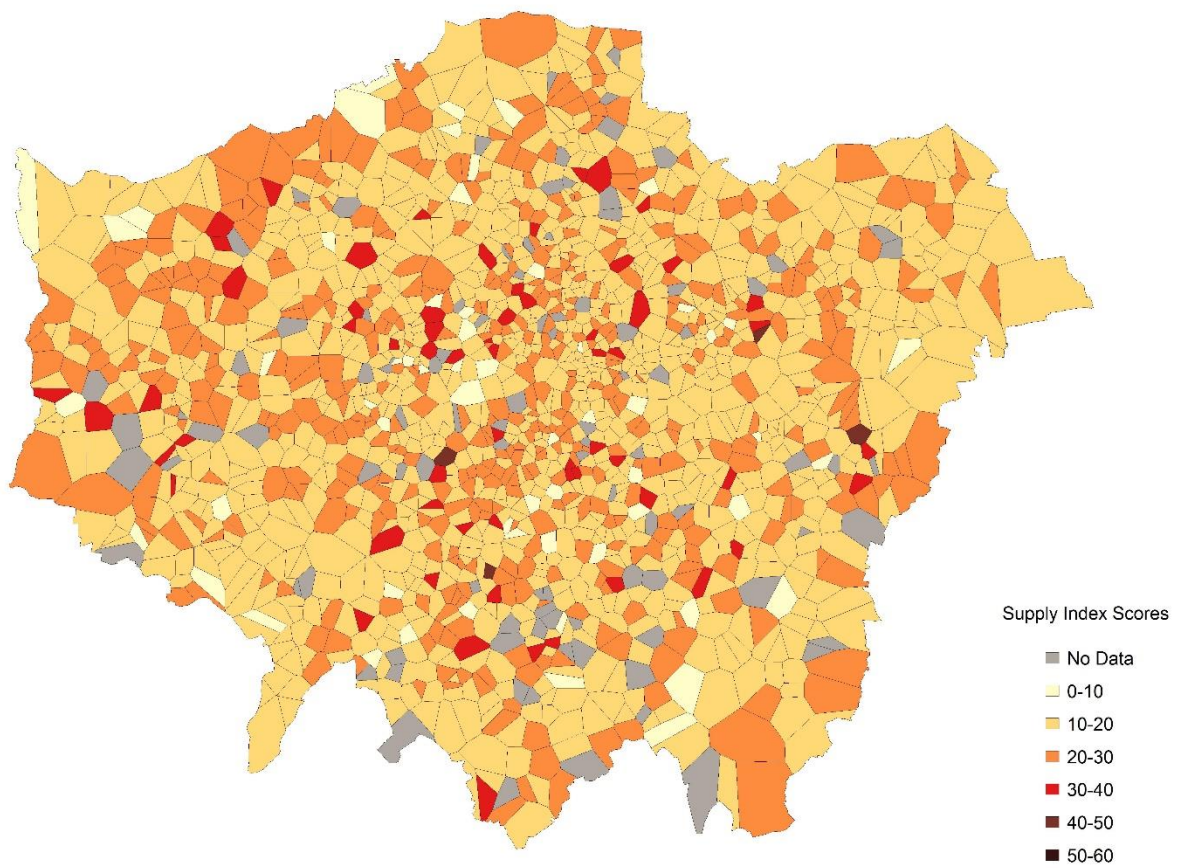


Figure A1.2: Supply Index for London secondary schools for 2016, mapped by individual school

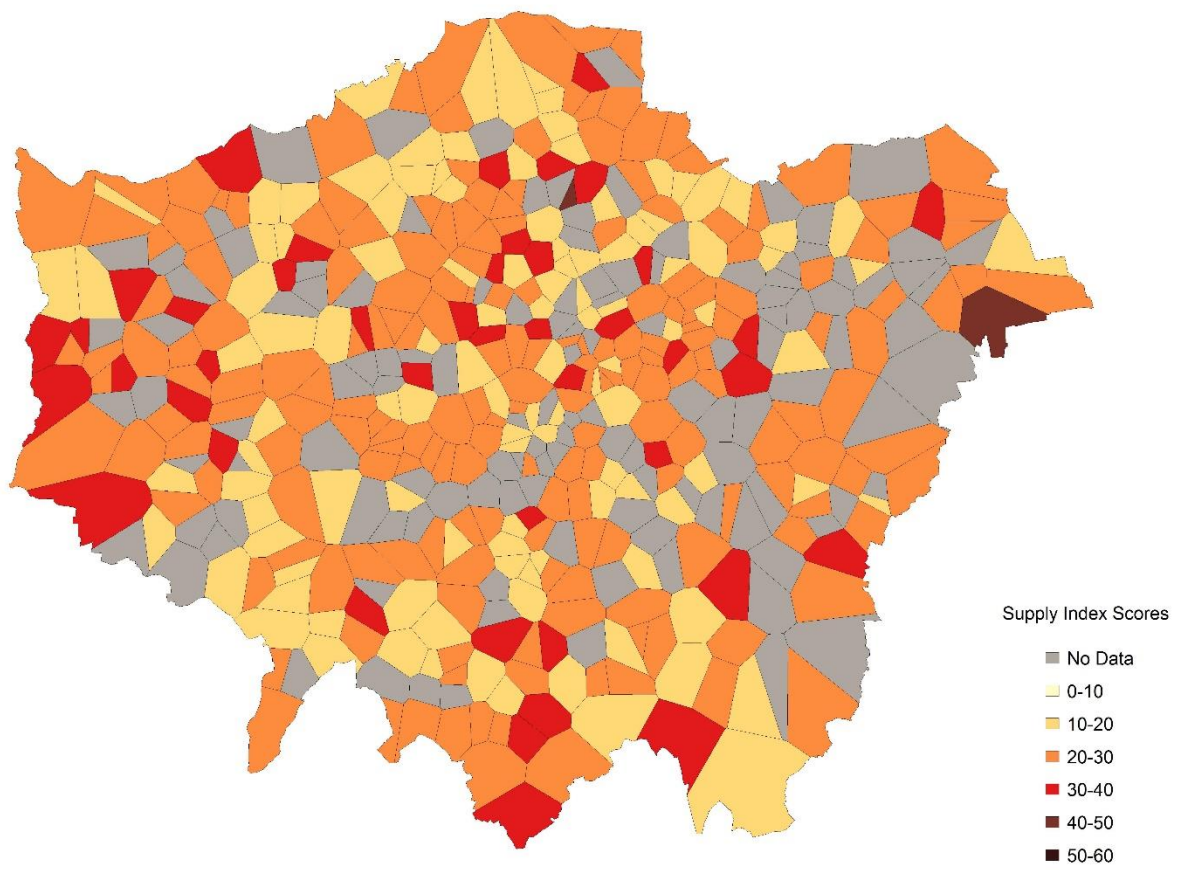


Figure A1.3: Supply Index for primary schools in the rest of England for 2016, mapped by individual school

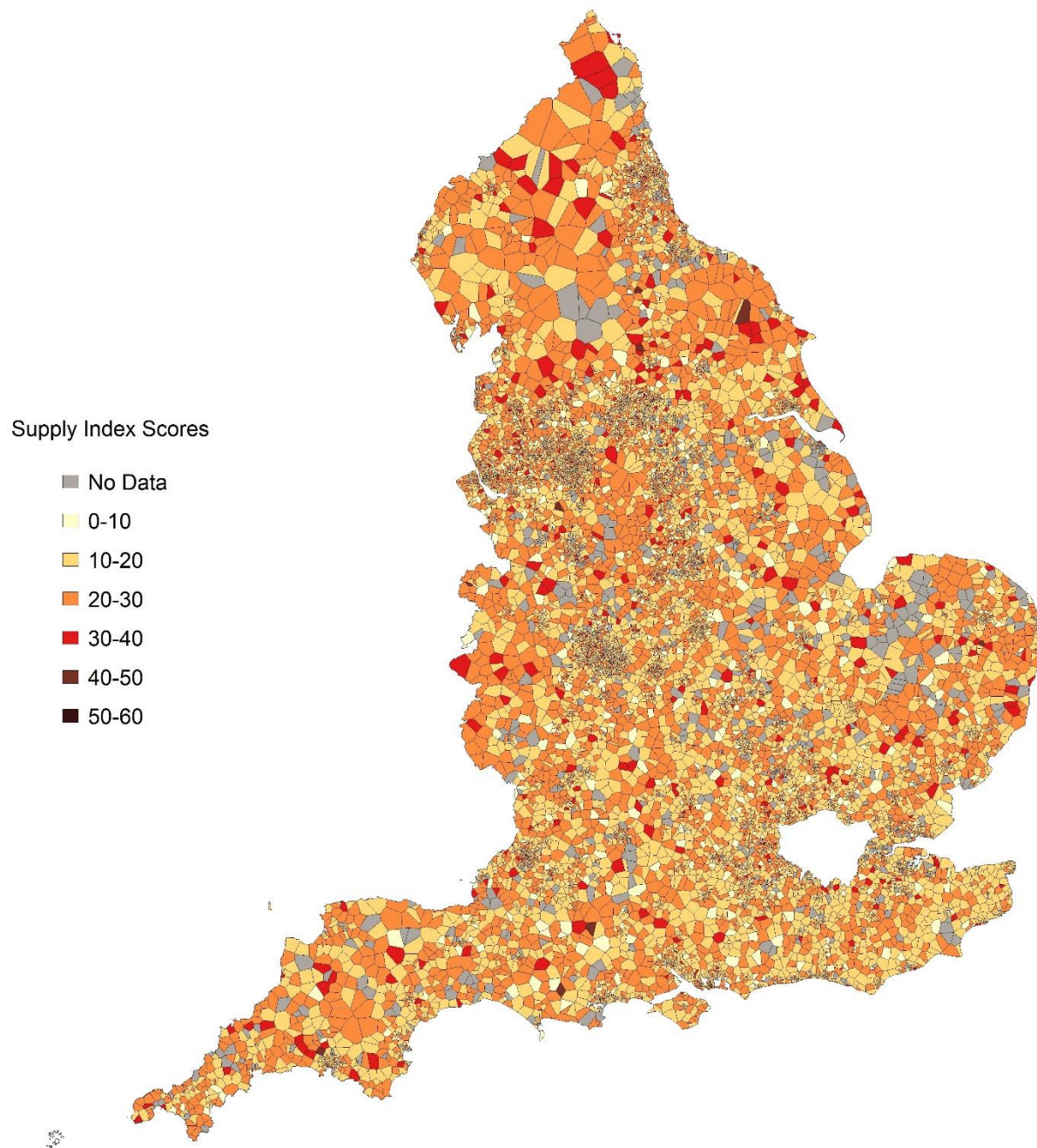
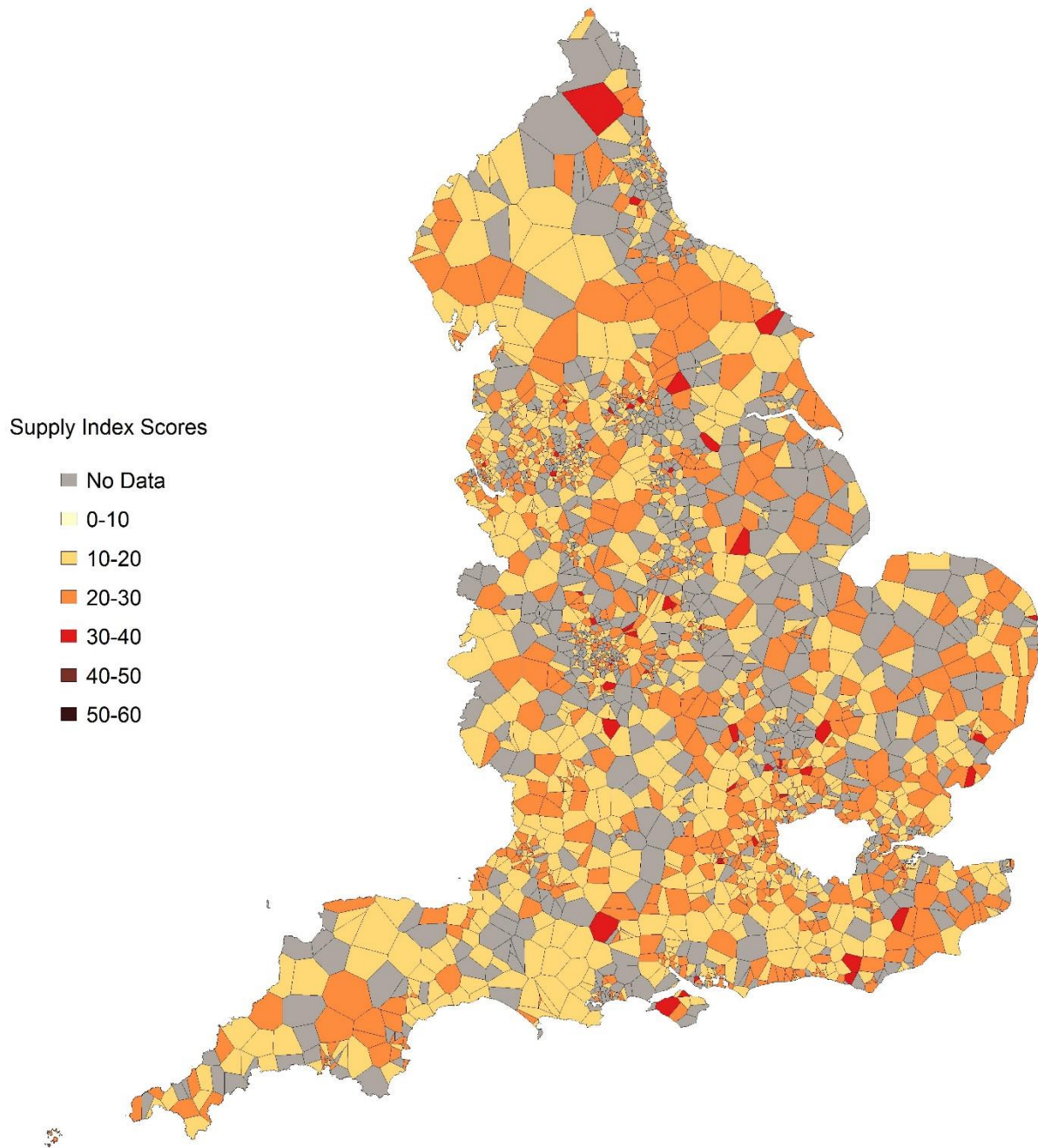


Figure A1.4: Supply Index for secondary schools in the rest of England for 2016, mapped by individual school



Annex 3: References and overview of the main studies from Section 5

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Table 6: Reported reasons contributing to teachers' decision to leave (findings from the main studies reviewed for this section)

Study	Country	Methods & sample	Reported reasons for leaving the profession²⁸
Buchanan, 2009	USA	Semi-structured telephone interviews with 22 ex-teachers on how and why they decided to leave or enter school teaching; whether their views have changed since making their decision to leave or enter teaching, if so, how and why	Interview themes: <ul style="list-style-type: none"> - Lack of collegiality / isolation; - Salary; - Workload and responsibility; - Working conditions including support; - Prestige; - Security/ career path
Hancock, 2016	USA	Survey of 270 music teachers who had not been teaching at their current school in the previous year (this included both teachers who moved schools and who left the profession); Data source: Nationally representative data from 2004–2005 Teacher Follow-up Survey and 2003–2004 Schools and Staffing Survey	REASON FOR LEAVING <ol style="list-style-type: none"> 1. Personal reasons (51%) (parenting/retirement/family/personal) 2. School staffing actions (11%) 3. Further education (9%), 4. Dissatisfaction with current post (8%) 5. Other work (6%) & better salary/benefits (5%) REASON FOR MOVING <ol style="list-style-type: none"> 1. Being laid off/involuntary transfer (21%) 2. Dissatisfied with admin support (21%) 3. Dissatisfied in general (14%)

²⁸ Where available from the sources, the reasons are ranked by reported importance (indicated by rankings or percentages of ex-teachers reporting the reason). Where no ranking exists, the order of reasons is not indicative of importance.

Study	Country	Methods & sample	Reported reasons for leaving the profession ²⁸
			4. Dissatisfied with workplace conditions (10%) 5. Better teaching assignment (10%) 6. Moving to a school near home (9%) 7. Salary/benefits (6%)
Howes, 2015	Australia	Online survey with 40 respondents (34 former teachers and 6 teachers currently in the process of changing their career); survey contained multiple choice and free response questions about their careers. In response to open-ended questions, participants were encouraged to provide 1-3 reasons.	Open-response question themes - Issues with teaching ²⁹ (63%) - Practical considerations ³⁰ (22%) - Need for change (14%)
Karsenti, 2013	Canada	Online questionnaires containing both closed and open-ended questions, asking for the main difficulties that leavers had to cope with in their former jobs. 34 ex-teachers replied	Main difficulties in former teaching job: 1. Too much work to be done at home 2. Workload 3. Difficult relations with school administration

²⁹ including day-to-day issues such as loss or lack of enjoyment, negative interactions with staff, poor workplace conditions, poor student behaviour, workload, and stress as well as poor leadership and dissatisfaction with administration in the form of a perceived lack of support

³⁰ Practical considerations included the perception of inadequate pay, a lack of job security, and difficulty of achieving work-life balance

Study	Country	Methods & sample	Reported reasons for leaving the profession ²⁸
		(& 167 current teachers who witnessed the events surrounding the teacher drop-outs) ³¹	4. Problematic relations with colleagues
Lindqvist & Nordänger, 2016	Sweden;	Case study of 5 ex-teachers who had been part of a longitudinal study that followed an entire cohort of 87 teachers from their graduation in 1993 and through their following 22 years in working life, up to the present	- Personal factors - Identity formation
Mäkelä et al., 2014	Finland	Questionnaire sent by post to PE teachers who graduated between the years 1980 and 2006 and moved out of PE teaching. 230 respondents rated prepared reasons for leaving the teaching profession according to how much they influenced their decision.	1. Need for a better use of abilities (70%) 2. Routinization of work (36%) 3. Lack of promotion possibility (32%) 4. Workload (25%) 5. Poor working conditions (23%), lack of facilities (23%) or equipment (20%) 6. Misbehaviour of pupils (21%) 7. Low salary (20%) 8. Lack of recognition (20%) 9. lack of respect from admin (18%) 10. poor status of the profession (16%)

³¹ The 167 current teachers' information are excluded in this note, as they were not self-reported by the former teachers (the additional participants were included in the study to compensate for lack of target participants)

Study	Country	Methods & sample	Reported reasons for leaving the profession²⁸
Smithers and Robinson, 2003	England	<p>Mixed methods study of 1,066 leavers. A three-layered approach was adopted with a schools survey followed by a leavers survey and interviews. In addition, a follow-up survey was conducted in January 2003 of those who had left in the spring and summer of 2002.</p> <p>In the survey of leavers, ex-teachers rated 16 possible reasons on how much they contributed to their decision to leave</p>	<p>Survey findings</p> <ol style="list-style-type: none"> 1. Workload was too heavy (45%), 2. Government initiatives (36%) 3. Stress (35%) 4. Wanted change (34%) 5. Personal circumstances (34%) 6. Wanted new challenge (28%) 7. Felt undervalued (27%) 8. Poor pupil behaviour (23%) 9. Attracted by another job (22%) 10. Way the school is run (20%) 11. Travel (18%) 12. Better career prospects (14%) 13. School salary too low (11%) 14. Poor resources/facilities (9%) 15. Offered higher salary (7%) 16. Difficult parents (4%)
Struyven & Vanthournout, 2014	Belgium	<p>Following telephone contact, an online/postal questionnaire survey asking for reasons for leaving was administered to 235 teaching graduates who did not teach five years after graduation (81 of them left after gaining their degree and before working as a teacher, so had limited teaching experience gained</p>	<ol style="list-style-type: none"> 1. Future prospect 2. Workload 3. Job satisfaction/ relations with pupils 4. School management and support 5. Relations with parents/carers

Study	Country	Methods & sample	Reported reasons for leaving the profession ²⁸
		during their three years of study)	
Tye & O'Brien, 2002	USA	Postal survey with responses from 114 current and former teachers who graduated from a university in California over a five-year period. Respondents question that asked respondents rank-order a list of reasons why they had already left the teaching profession or would consider leaving.	<p>REASON FOR LEAVING</p> <ol style="list-style-type: none"> 1. accountability 2. increased paperwork 3. student attitudes 4. no parent support 5. unresponsive administration 6. low status of the profession 7. salary considerations <p>REASON FOR CONSIDERING LEAVING</p> <ol style="list-style-type: none"> 1. salary considerations 2. increased paperwork 3. accountability 4. low status of the profession 5. unresponsive administration 6. student attitudes 7. no parent support

Annotations: ¹ There is no ranking of reasons provided for this study, because the authors did not specifically ask for reasons for leaving in their survey, but only found significant correlations between leaving / early retirement and the self-reported factors on the right-hand side



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