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# Incentives to recruit and retain teachers in Wales

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November 2024

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## Acknowledgements

This report has been commissioned by the Welsh Government. We would like to acknowledge the invaluable support of Tom Smithson, Rebecca Janczewski, Max White, and Daniel Burley at the Welsh Government.

# Contents

Introduction .....	4
The teacher labour market in Wales.....	6
Teacher and pupil numbers.....	6
Recruitment .....	8
Retention .....	13
Summary.....	16
Approach to literature review.....	17
Non-financial incentives .....	17
Financial incentives.....	18
Non-financial incentives.....	20
Scope and themes.....	21
Initial teacher education.....	24
Job marketing .....	28
Alternative initial teacher education.....	31
Mentoring and induction for novice teachers.....	39
Financial incentives .....	44
Effects on recruitment.....	44
Effects on retention .....	46
Pupil outcomes .....	48
Summary: financial incentives.....	48
Conclusions and policy implications .....	50
Recommendations.....	52
References.....	54
Appendix A: List of studies.....	62

## Executive summary

This research, commissioned by the Welsh Government, aims to identify potential policies that could be used to attract and retain teachers in challenging schools in Wales, with a particular focus on schools with a high share of pupils facing socio-economic disadvantage, but also those in more isolated, rural areas. It has three parts:

- A summary of the existing data on teacher supply difficulties in Wales.
- A literature review of the evidence on non-financial approaches to encouraging teachers to work, and remain, in challenging circumstances.
- A literature review of the impact of financial incentives on recruitment and retention.

We focused the literature reviews on similar contexts in OECD nations, and particularly on places where there are multiple official languages in use.

### The state of teacher supply in Wales

- Primary school teacher recruitment is buoyant in Wales. Entrants to Initial Teacher Education have increased over the pandemic and numbers were higher in 2021 than at any point over the last decade, including those training to teach in Welsh. There are high number of applications per post and vacancies are mostly filled in primary schools.
- Entrants to secondary ITE have declined over time, and numbers training to teach in Welsh have hardly changed at all over time. There are also fewer applications per post and vacancies are less likely to get filled, with problems even worse in Welsh-medium schools.
- Over the long-term (at least up to 2030), the number of pupils is expected to decline, with a 15 per cent decline in primary school pupil numbers and a net 5 per cent decline in secondary school pupil numbers between 2020 and 2030. This will ease pressure on teacher recruitment in the long-term. However, in the short-run, secondary school pupil numbers will continue to grow until 2025, placing further pressure on the part of the system that has faced the biggest recruitment and challenges to date.
- Despite existing programmes and incentives, there is consistent evidence of greater problems in some secondary school subjects, including maths, physics, chemistry, science, Welsh, modern foreign languages, and IT.
- Teacher attrition in Wales is low with about four per cent of teachers leaving their jobs each year. This is significantly lower than the 9-10 per cent seen in England. This may be partly explained by the fact that the teacher workforce is older and more attached to the profession.
- There are more problems recruiting secondary school teachers in rural areas across North and West Wales, and in urban areas outside of Cardiff and Swansea, such as Newport, Caerphilly, Wrexham, and Neath Port Talbot. The areas seeing the least problems tend to be more affluent areas or big cities, such as Cardiff, Swansea, and the Vale of Glamorgan.

### Non-financial incentives

The evidence on non-financial approaches to recruiting and retaining teachers is much sparser and less methodologically robust for demonstrating effectiveness than is the case for financial incentives. Our review found four non-financial approaches that paid consideration to understanding how the supply of

teachers could be improved in disadvantaged, rural, or in Welsh-medium schools. In most cases, the studies did not quantify the effectiveness of the programmes.

### Initial teacher education

- Qualitative studies in contexts that have features in common with Wales have suggested improving the diversity of recruitment by embedding social justice content into the curriculum, and using high quality school placements during training and collaborative partnerships between training providers and the schools they supply with new teachers to improve trainee teachers' preparation for teaching as preventative measures against early career teacher attrition (leaving the profession).

### Job marketing

- Marketing materials for teaching posts should highlight both material and non-material incentives and support retention by providing transparent and accurate information about the benefits and challenges associated with working in hard-to-staff schools.
- Realistic job profiles aim to provide a balanced view of the role by highlighting both the positive and negative aspects. There is evidence that they are an effective web-based marketing tool that increases the retention of recruited individuals through better matching of recruits to vacancies in other industries. However, evidence from the education sector is limited.

### Alternatives to traditional ITE

- There is a good evidence base on Teach First-style graduate placement schemes from many countries. It generally finds positive impacts on pupil attainment, though schemes are often characterised by elevated levels of teacher attrition and mobility between schools.
- There is limited evidence on the effectiveness of grow-your-own programmes, which support members of local communities to become teachers in their local schools. Some of the weaknesses in these studies, and their findings of high attrition during teacher training, may be a result of the more localised nature of school policies and school funding in the US, where the model has emerged. It is unclear whether these weaknesses would follow through into a different policy context.

### Mentoring and induction

- The evidence on teacher mentoring and induction is inconclusive and there appears to be no single best model of novice teacher induction. Many programmes show evidence of promise, but the evaluation is not sufficient to provide evidence of the effectiveness of the programme.

### Financial incentives

There is a well-developed academic literature linking financial incentives to teacher retention that yields causal evidence across a range of countries and contexts. It finds that:

- Schemes have normally provided incentives worth 5-10 per cent of base salary. Small incentives of 1-3 per cent seem to have little effect.
- They have generally been focused on early career teachers in shortage subjects, and disadvantaged schools or areas.
- On average, they find that a 10 per cent salary supplement would be expected to reduce teacher attrition by about 30 per cent.

There is less evidence of an effect on recruitment and it is less consistent. It indicates that:

- Financial incentives to attract teachers to socio-economically disadvantaged schools will probably have a positive effect, but there is uncertainty in predicting the likely effects. Existing evidence relates largely to schemes targeted high-performing or high-potential teachers and there is only one paper with reasonably sized incentives focuses on rural areas, though this does suggest positive effects.

## Recommendations

### Improvements to data and evidence:

- We recommend publishing data on retention levels by individual years of teacher experience to show how many teachers are leaving early in their career.
- We recommend publishing data on how teacher recruitment and retention outcomes vary across schools by overall levels of socio-economic disadvantage (e.g., groups defined by the share of pupils eligible for FSM).

### Use of non-financial incentives

- We recommend the Welsh Government develop a well-designed, funded and supported Grow Your Own (GYO) pilot scheme. GYO schemes have significant promise for the Welsh context. They have often focused on hard-to-staff schools in disadvantaged and rural areas. Unfortunately, however, there is not enough high-quality literature on the effectiveness of GYO programmes to guide a decision on whether to adopt this model based purely on current evidence.
- We recommend that the Welsh Government trial 'Realistic Job Profiles' with individual schools and contexts to see if they can be made to work well in education contexts. These approaches should highlight both material and non-material incentives to attract qualified teachers, and support retention by providing transparent and accurate information about the benefits and challenges associated with working in hard-to-staff schools.
- We recommend further research on the best ways to support teachers during Initial Teacher Education, and through mentoring and induction of new teachers. There appears to be no single best model of novice teacher induction. It is likely to remain a question for policy makers of selecting what appears to be the best options according to the local school, policy and societal context. Further study of the experience of graduates in the first five years of their career could also help to identify subject areas and locations that are experiencing higher levels of attrition to support context-specific teacher preparation.

### Use of financial incentives

- We recommend that the Welsh Government introduce salary supplements worth 5-10 per cent of base salary for early career teachers in shortage subjects in secondary schools. The set of subjects covered would need to be defined, but would likely need to cover maths, science, languages and Welsh-medium teachers. It would probably be best focused on teachers in the first five years of their teaching career. There would also be significant merits in providing higher incentives for teachers in hard-to-staff areas, particularly disadvantaged schools or areas.

## Introduction

At the heart of the Welsh Government's education policy is a commitment to tackling the impact of poverty on educational attainment.<sup>1</sup> In particular, the Minister for Education and the Welsh Language set out his vision in an Oral Statement to the Senedd on 22 March 2022 and in a keynote speech to the Bevan Foundation on 16 June 2022.<sup>2</sup> This highlighted that schools who faced the most serious socio-economic challenges often find it difficult to recruit and retain teachers. Given that high-quality teaching is revealed by research evidence to be the most important within-school influence on the attainment of learners from low-income backgrounds, this is a matter of concern.

The Minister therefore made the following commitment:

*“I want to look at how we can incentivise teachers- including those who are recently qualified- to teach in the schools which serve our most disadvantaged learners, so I am commissioning some initial research on this, with a view to then launching a pilot scheme to test some approaches”.*

The Welsh Government therefore commissioned a piece of research based on the following research questions:

- What approaches can incentivise teacher to work in schools in challenging socio-economic circumstances?
- How effective are these incentivisation approaches for teacher recruitment and retention respectively in schools in challenging socio-economic circumstances?
- What are the impacts of these incentive schemes? This could include the negative consequences such as on practitioners who would not qualify for these incentives.
- What options might be taken up by the Welsh Government in a pilot programme? What would be the potential costs be of any approaches considered? Should incentive be offered to teach in particular areas of Wales such as rural areas, the South Wales valleys etc.
- What are the views of key stakeholders about the potential impacts of promising schemes identified in the literature on the Welsh education system?
- How could these incentivisation approaches be piloted? How would the proposed pilot be evaluated?

This research report seeks to address these research questions with the following sets of analysis:

- A review of the existing data on recruitment in challenging schools in Wales to establish what characterises the areas with the greatest needs.
- A narrative review of the evidence on non-financial approaches to encouraging teachers to work in challenging circumstances, and to stay there.
- A more quantitative review of the impact of financial incentives on recruitment and retention in challenging circumstances.
- A follow up round table to explore the views of stakeholders.

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<sup>1</sup> Welsh Government, ‘Our National Mission’.

<sup>2</sup> Jeremy Miles MS, Minister for Education and Welsh Language, ‘Oral Statement’; Jeremy Miles, Minister for Education and Welsh Language., ‘Bevan Foundation’.

The review of the current situation on teacher recruitment and retention makes use of data already published by Welsh Government and the Education Workforce Council. It also makes recommendations on how existing data could be improved. The reviews of financial incentives and non-financial approaches are based on reviews of existing high-quality and relevant studies. The search strategies used for these reviews (and references to the underlying papers) are included in the appendix.

Most of the causal, empirical evidence on recruitment and retention incentives relates to financial incentives, largely because they are more straightforward to measure and evaluate. There is less high-quality quantification of the impact of non-financial programmes, perhaps because they vary more in their approach, implementation, and are more difficult to evaluate. However, that does not necessarily mean the programmes are ineffective, only that good evidence of their impact is lacking.

The broad aim of this research is to identify potential policies that could be used to attract and retain teachers in challenging schools in Wales. It is important that the approaches identified have credible evidence of success elsewhere, could work in Wales, and could be piloted in Welsh schools. With this broad aim in mind, the final section of the report ends with conclusions and recommendations for policy and the trialling of promising approaches.

## The teacher labour market in Wales

In this section, we analyse the state of the teacher labour market in Wales, including how it has changed over time and where problems are likely to be most acute.

This analysis is based on statistics published by the Welsh Government and Education Workforce Council.<sup>3</sup> We use this data to look at total teacher numbers (and how this compares with overall pupil numbers), recruitment to Initial Teacher Education (ITE), the number of applicants to teaching posts advertised by schools, the extent to which schools can fill vacancies, teacher exit rates and the share of teachers with relevant qualifications in the subjects they teach. Where possible, we analyse differences by sector, subject taught in secondary school, medium of education, and differences across local authorities.

We conclude this section with consideration of the greatest challenges facing schools and policymakers on teacher recruitment and retention, as well as how published statistics could be improved.

### Teacher and pupil numbers

Overall pupil and teacher numbers have both been falling over the last two decades, with pupil numbers expected to decline again up to 2030.<sup>4</sup> This is illustrated in Figure 1, which shows overall pupil and teacher numbers over time relative to their level just before the pandemic in 2019-20. This is shown separately for primary, secondary, and special schools, with solid lines showing trends for teachers and dashed lines showing trends for pupils. Pupil numbers beyond 2022 are all based on forecasts produced by Welsh Government, which in turn are based on ONS population projections. These forecasts extend to 2038, but we only show through to 2030 for brevity's sake and because forecasts far into the future are subject to very high levels of uncertainty. Throughout, we focus on relative changes in both teacher and pupil numbers.

Between 2003-04 and 2019-20, there were significant falls in both teacher and pupil numbers in primary and secondary schools, with the falls in teacher numbers tending to be larger. The changes were largest in secondary schools, with secondary teacher numbers falling by over 22 per cent and secondary pupil numbers falling by more than 16 per cent. In primary schools, teacher numbers fell by 6.5 per cent between 2003-04 and 2019-20, slightly more than the 4.5 per cent fall in primary school pupil numbers.

As illustrated in Figure 2, these trends have led a slight increase in pupil:teacher ratios. Whilst there is no optimal or target class size, these trends are indicative of challenges recruiting teachers stretching back to 2003.

Looking at the period since the pandemic, there has been a slight uptick in teacher numbers with a rise of 4-5 per cent between 2019-20 and 2021-22. It is possible this is a temporary effect of the pandemic reducing outside labour market opportunities, a subject we return to in the next sub-section on recruitment.

Looking forwards, the number of primary school pupils is forecast to drop significantly over this decade, with an expected fall of 15 per cent between 2019-20 and 2029-30. Secondary school pupil number are

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<sup>3</sup> StatsWales, 'Teachers and Support Staff'; Education Workforce Council, 'EWC Annual Education Workforce Statistics for Wales 2023'.

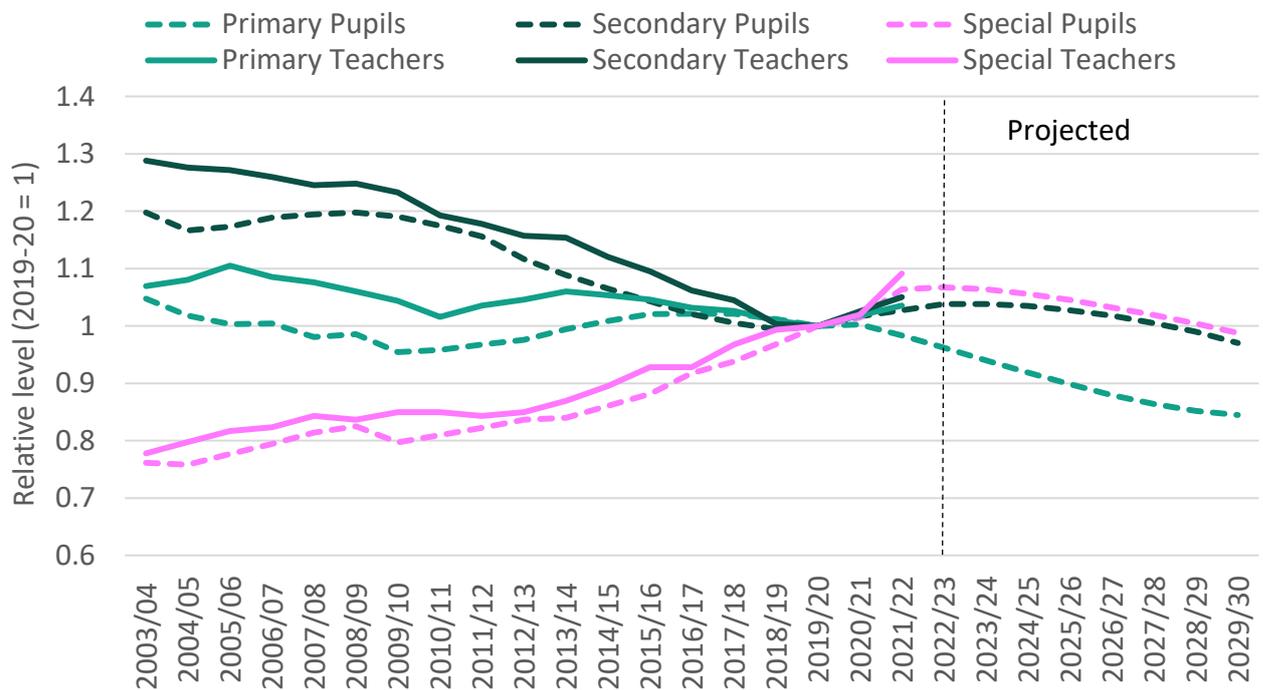
<sup>4</sup> StatsWales, 'Pupil Projections'.

expected to continue to rise until 2024-25, before declining to be about 5 per cent lower than in 2019-20.

In special schools, there has been significant growth in both pupil and teacher numbers over time, with growth of about 30 per cent between 2003-04 and 2019-20. Like with mainstream schools, special school pupil numbers are expected to fall up to 2029-30.

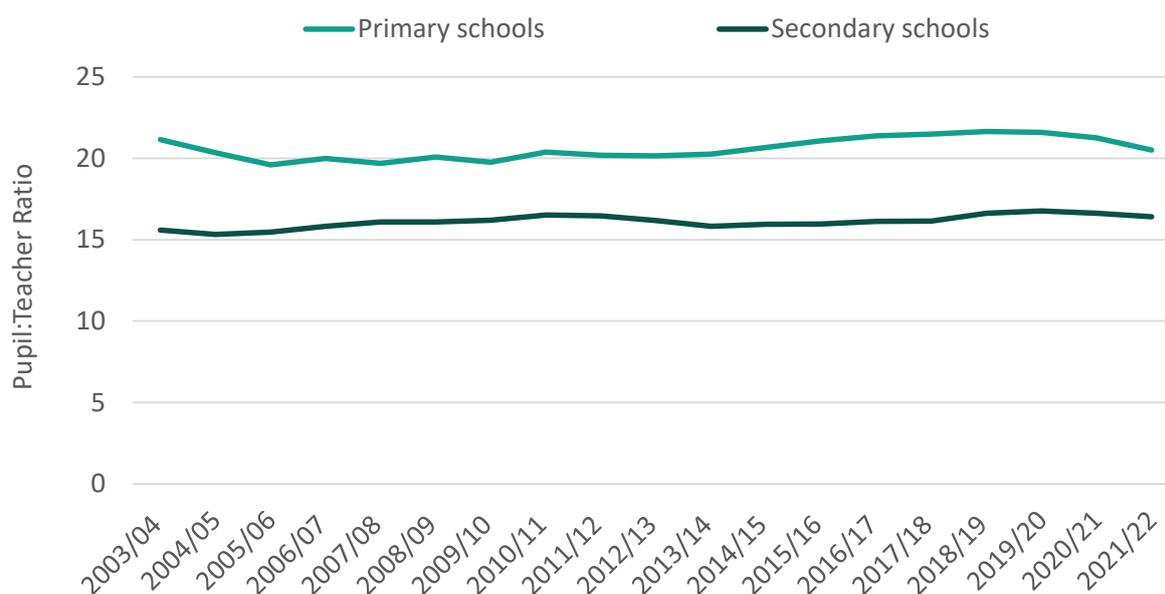
This all points to declining demands for teachers up to at least 2030. However, rising secondary school pupil numbers is likely to create a more immediate need for the next few years, which, as we shall see, is the part of the school sector that has struggled more with recruitment and retention over the recent past.

Figure 1: Overall teacher and pupil numbers relative to their level in 2019-20



Sources and Notes: Primary schools includes maintained nurseries; Pupil Census Results (various years); Stats Wales, School staff, PLASC, Pupil Projections

Figure 2: Pupil:teacher ratios over time



Sources and Notes: See Figure 1.

## Recruitment

In this sub-section, we focus on recruitment levels and challenges, before then discussing retention in the next sub-section.

In Figure 3, we show the number of first year entrants to ITE across Wales by language-medium of education and school sector. In the period up to 2019-20, there was a large decline in primary and secondary school ITE entrants training to teach in English, with a 25 per cent decline in ITE entrants for primary schools and a more than 60 per cent decline in secondary school trainees. This was partly intentional and managed, reflecting the declines in pupil numbers.

The number of ITE entrants training to teach in Welsh changed little over the period between 2010-11 and 2019-20, with around 150-200 trainees in the primary sector and 100-150 in the secondary sector each year.

In 2020-21, there was an increase in ITE entrants across all school sectors, and in both English and Welsh-medium. This is likely to have reflected the effects of the pandemic and the resultant declining labour market opportunities outside of teaching.<sup>5</sup> Some of the increase has clearly been maintained into 2021-22 too. Indeed, primary school ITE entrants training to teach in English remained close to 650, their highest level since at least 2010-11. Primary ITE entrants training to teacher in Welsh further increased to about 200 in 2021-22, about the same level as their most recent high point in 2012-13.

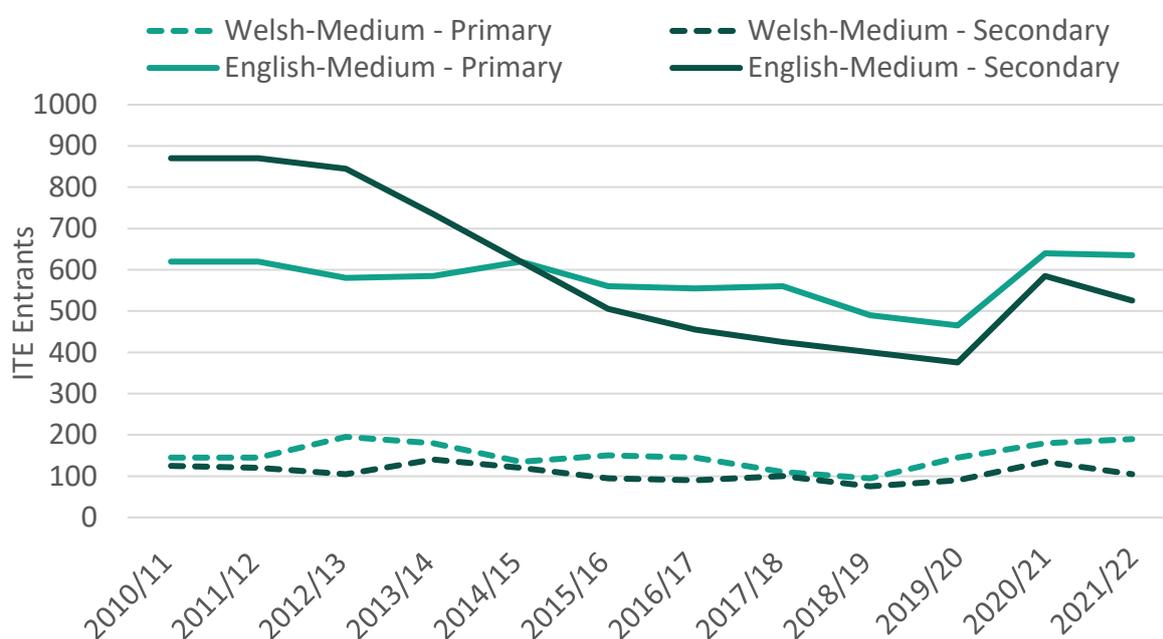
Secondary school ITE entrants training to teach in English fell back slightly in 2021-22 but were still significantly higher than before the pandemic in 2019-20. Those training to teach in Welsh have, however, fallen back to about 100 per year, about the same as the level throughout the last decade.

<sup>5</sup> Francis-Devine, 'What Happened to Wages in the Coronavirus Pandemic?'

The increase in ITE entrants during the pandemic was also seen in England, where total new entrants increased from 34,000 in 2019-20 to 40,000 in 2020-21, an increase of nearly 20 per cent. New entrants also remained high in England in 2021-22, at about 36,000 or 9 per cent higher than in 2019-20. They have since fallen back substantially to about 29,000 in 2022-23, lower than any point since at least 2015-16. The pattern by phase up to 2021-22 is similar to Wales, with primary school ITE entrants remaining high in England in 2021-22 and a drop off in secondary school ITE entrants in 2021-22. There were then large drop offs in trainee numbers for both primary and secondary schools in 2022-23.<sup>6</sup>

The percentage increases in total ITE entrants were notably larger in Wales, with a 43 per cent rise in 2020-21 and the number of ITE new entrants remained about 35 per cent higher in 2021-22 compared with 2019-20. It remains to be seen whether these increases were sustained into 2022-23, or whether numbers dropped off to a similar degree to that seen in England.

Figure 3: Initial teacher education entrants over time by school sector and medium of education



Sources and notes: ITE entrants exclude OU and are taken from Stats Wales, ITE Entrants

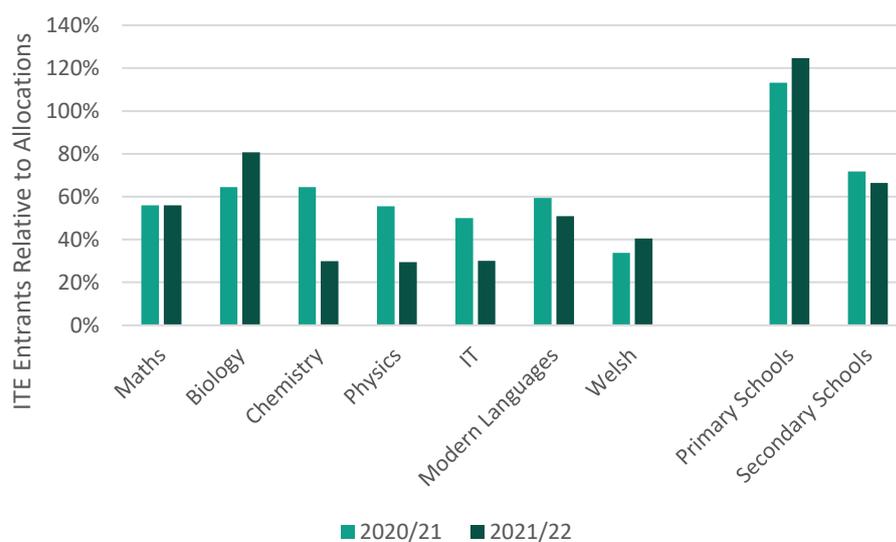
Whilst the overall number of ITE entrants remained buoyant in Wales, there are significant differences by school sector and subject. Figure 4 shows that ITE targets were more than exceeded for primary schools, with new entrants at about 120 per cent of their target levels in 2020-21 and 2021-22. However, targets were missed for secondary school teachers, with about 70 per cent of the target achieved in 2020-21 and 66 per cent in 2021-22.

The picture was even worse for some subjects within secondary schools, with 56 per cent of the target achieved in maths, about 40-50 per cent in Welsh and foreign languages, and only about 30 per cent of the target achieved in chemistry and physics.

Therefore, the challenges in teacher trainee recruitment appear worse in secondary schools, particularly for maths, science, and language subjects. This will be a recurring theme in this analysis.

<sup>6</sup> Department for Education, 'Initial Teacher Training Census, Academic Year 2022/23'.

**Figure 4: Initial teacher education entrants relative to target in selected subjects**



Sources and notes: ITE entrants exclude OU and are taken from Stats Wales, ITE Entrants; Education Workforce Council, ITE Allocations

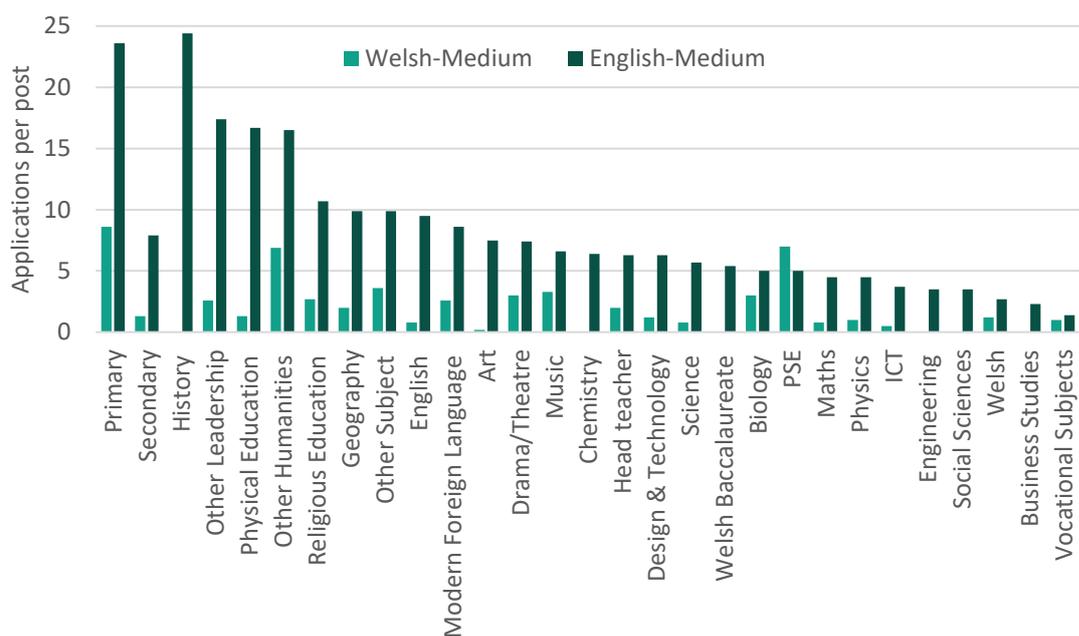
Analysis examining the number of applications per teaching post advertised provides further insight into the state of teacher recruitment. Figure 5 shows the number of applications per post by school sector, subject area, and by language-medium of education. Applications per post are notably higher in primary schools (9 for Welsh-medium posts and 24 for English-medium posts) than in secondary schools (1 for Welsh-medium posts and 8 for English-medium posts). Across almost all secondary school subject areas, there are also higher applications per post for English-medium posts (ranging from about 4 to 24 per post) than for Welsh-medium posts (ranging from about 1 to 3 applications per post).

There are also specific subjects with much lower applications per post. This includes maths, physics, ICT and Welsh, where ITE recruitment was also quite low. However, despite relatively low ITE recruitment, applications per post in chemistry and modern foreign languages are closer to average levels across secondary schools.

Figure 6 shows the picture across different local authorities. Focusing on secondary schools, where the challenges appear to be largest, the lowest number of applications per post appear to be in more rural local authorities, such as Gwynedd, Carmarthenshire, Powys, Ceredigion, and Pembrokeshire, as well as Torfaen that showed the lowest level of applications. The highest number of applications per post appear to be in South Wales, particularly Cardiff, Swansea, Bridgend, and the Vale of Glamorgan, as well as Flintshire in North Wales.

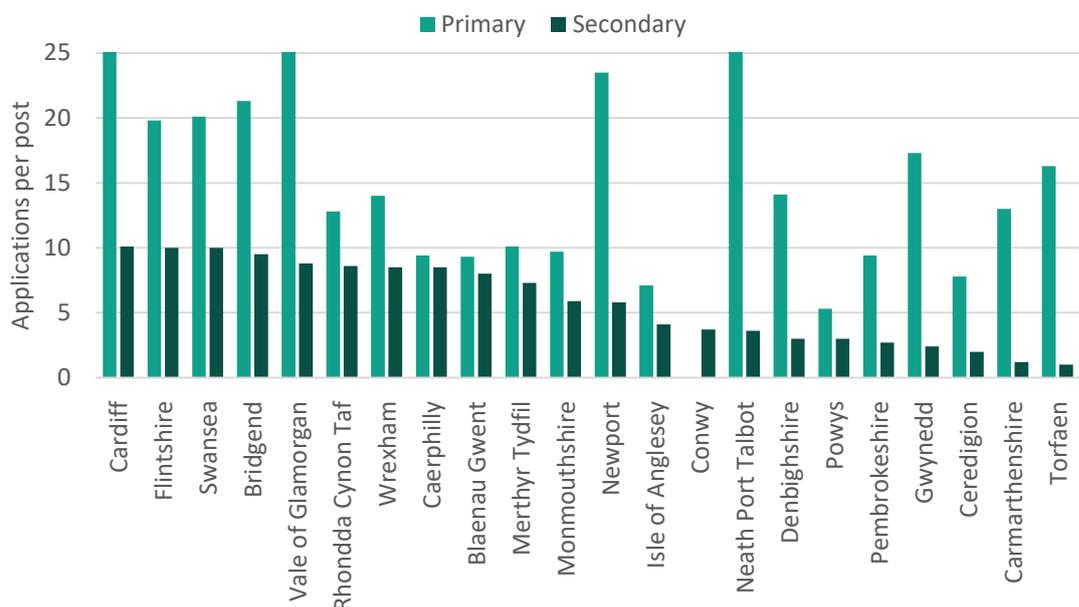
Looking at primary schools, where applications are generally much higher, we again see comparatively lower numbers of applications per post in some rural areas (Powys, Ceredigion, Anglesey, and Pembrokeshire), but also comparatively low application numbers in some areas in the valleys (e.g., Caerphilly, Merthyr Tydfil and Blaenau Gwent).

Figure 5: Number of applicants per teaching post by subject and medium of education



Sources and Notes: All figures related to 2020/21; Applications per post taken from Stats Wales, Teachers (SWAC)

Figure 6: Number of applicants per teaching post by local authority and school sector

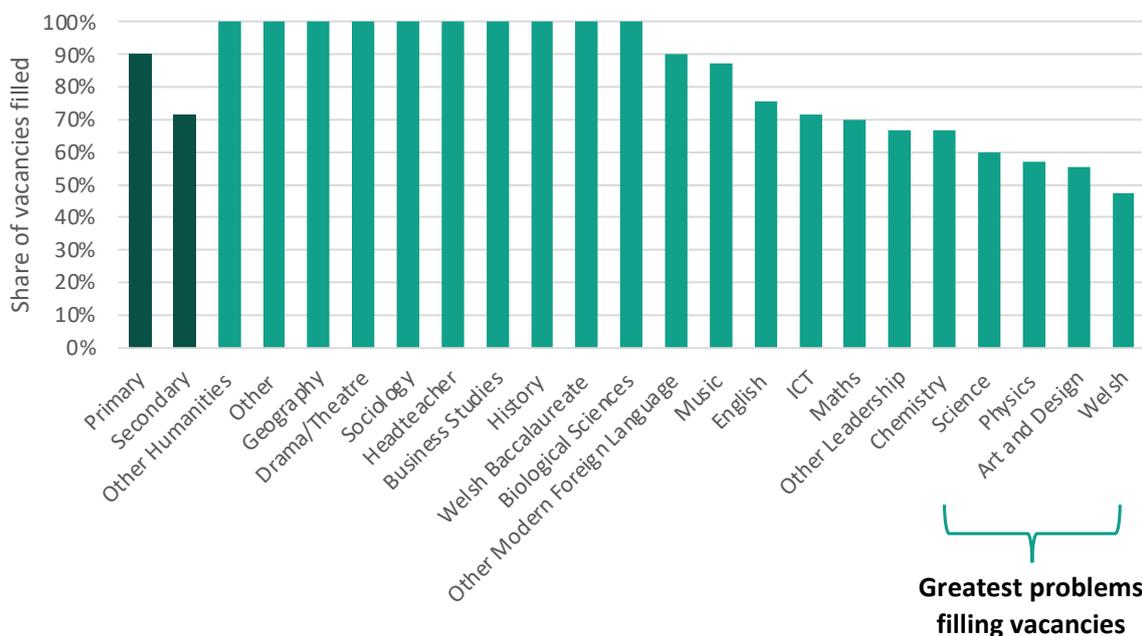


Sources and Notes: All figures related to 2020/21; Applications per post taken from Stats Wales, Teachers (SWAC)

Finally on recruitment, Figure 7 shows the share of vacancies filled by school sector and subject, and then by local authority in Figure 8. As is familiar, there appears to be a higher share of vacancies filled in primary schools (90 per cent) than in secondary schools (70 per cent). There also appears to be greater difficulty in filling vacancies in specific subject areas in secondary schools. This includes chemistry, physics, science, art and design, and Welsh, and to a lesser extent in maths and ICT.

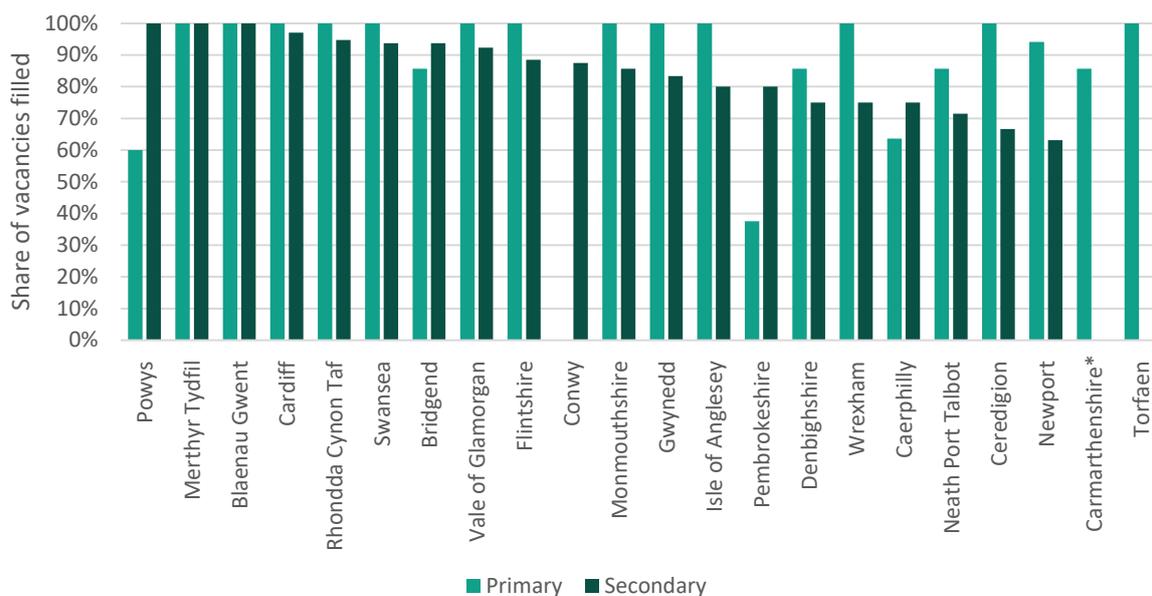
Across most areas, there appears little difficulty in filling primary school vacancies, though there appears to be a low share of vacancies filled in Powys and Pembrokeshire. Across secondary schools, the areas finding it most difficult to fill vacancies include Newport, Ceredigion, Neath Port Talbot, Caerphilly, Wrexham and Denbighshire.

Figure 7: Share of teaching vacancies filled by subject



Sources and Notes: All figures relate to 2020/21; Primary schools includes maintained nurseries; Teacher numbers taken from Stats Wales, Teachers (SWAC),

Figure 8: Share of teaching vacancies filled by local authority and school sector

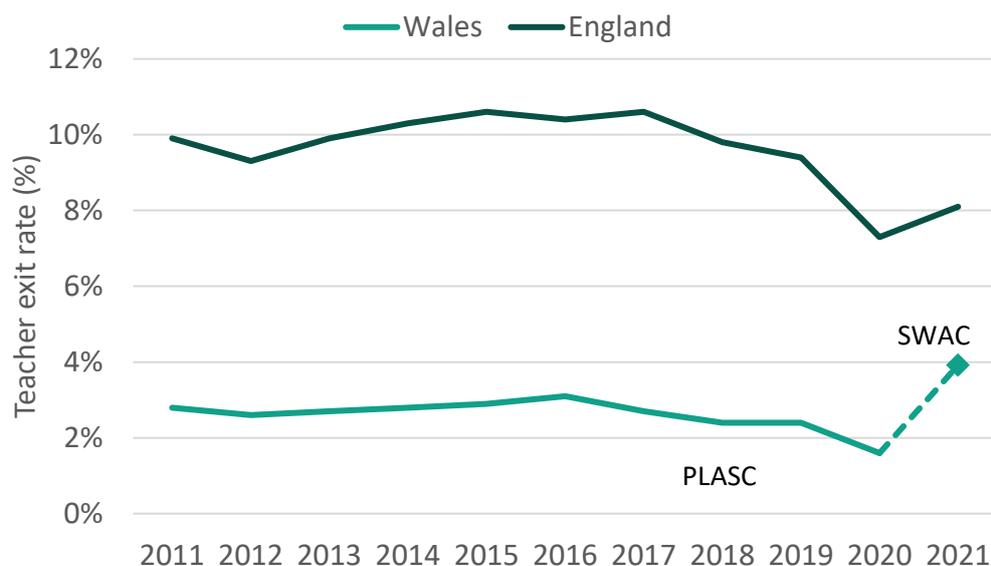


Sources and Notes: All figures related to 2020/21; Primary schools includes maintained nurseries; Teacher numbers taken from Stats Wales, Teachers (SWAC), Data for Carmarthenshire, Conwy and Torfaen is not shown due to implausible values or small sample sizes.

## Retention

In Figure 9, we show the share of teachers leaving the profession across England and Wales over time. In England, about 10 per cent left the profession each year. This dipped to around 7-8 per cent during the pandemic. In Wales, teacher exit rates can only be captured using PLASC data up to 2020, which indicate a much lower exit rate of about 3 per cent over time. Data captured through the new School Workforce Annual Census is potentially more comparable with England. This still gives a much lower teacher exit rate in Wales for 2021 (4 per cent) than in England for the same year (8 per cent).

Figure 9: Teacher exit rates across Wales and England over time



Sources and Notes: Exit rates for Wales from 2011-2020 taken from IWPRB 4th Report; Exit rates for 2021 taken from Stats Wales and excludes school-to-school moves Teachers (SWAC); School Workforce Census Statistics for England.

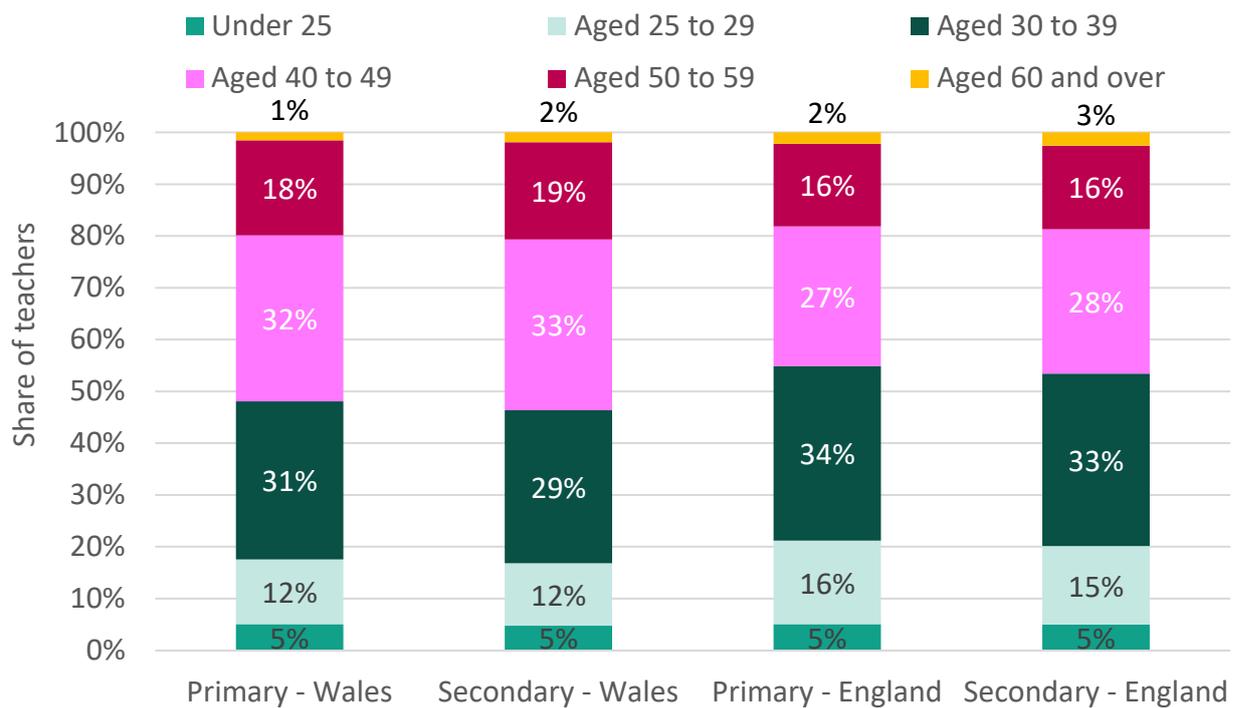
One of the potential reasons why teacher exit rates in Wales are lower than in England is because the teaching workforce is older, on average. Figure 10 shows that about 17 per cent of teachers in Wales are under 30 and about 46-47 per cent are under 40. In England, a larger share of teachers are under 30 (20-21 per cent) and under 40 (about 54-55 per cent). In contrast, a much larger share are aged 40 or over in Wales (52-53 per cent) than in England (45-46 per cent). Age and experience are not perfectly linked, but they are strongly connected, and it seems reasonable to assume that the teaching workforce in Wales is also more experienced, on average. Furthermore, a similar proportion of entrants to postgraduate ITE courses across both nations are under 25 (about 50-60 per cent in both cases).<sup>7</sup>

Evidence from England shows teachers with low levels of experience are much more likely to leave the profession, particularly during their first five years of teaching. Indeed, the evidence shows that only about 60 per cent of teachers in England remain in the profession five years after completing their training.<sup>8</sup> Unfortunately, Welsh government statistics do not show the level of teacher exit rates by individual years of experience. However, given this evidence, it seems reasonable to assume that one of the reasons for lower teacher exit rates in Wales is down to the workforce being older, and probably more experienced, on average.

<sup>7</sup> Department for Education; Welsh Government, 'First Years on ITE Courses in Wales by Age and Degree Type'.

<sup>8</sup> Department for Education, 'School Workforce in England, Reporting Year 2022'.

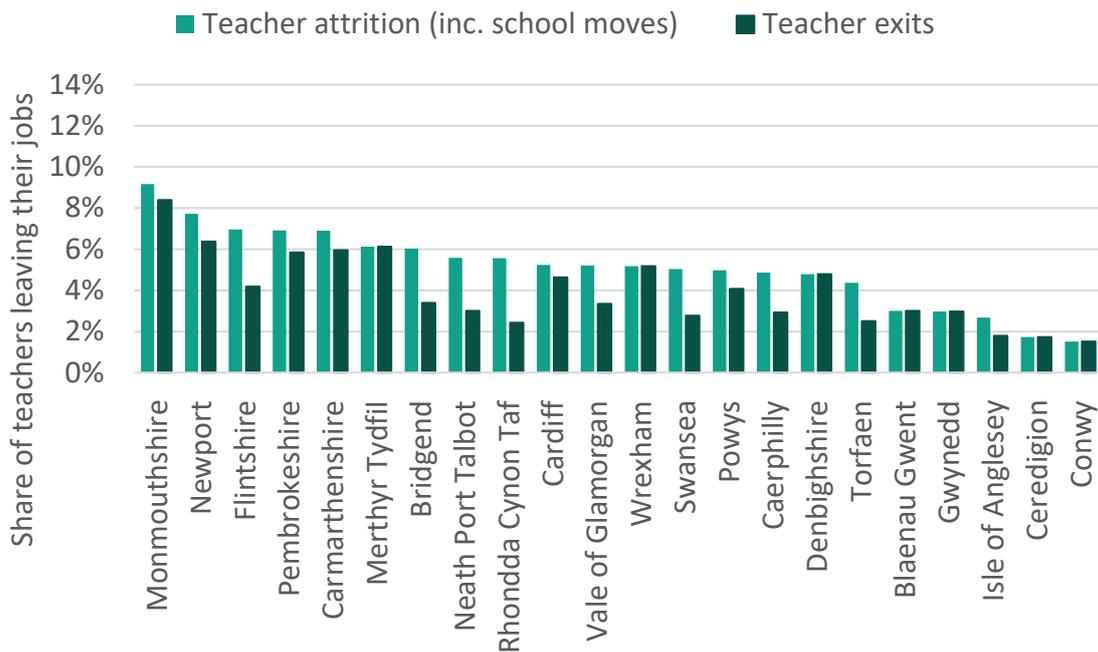
Figure 10: Age profile of teachers in Wales and England



Sources and Notes: Primary schools includes maintained nurseries; Figures relate to 2020-21; Teacher numbers taken from Stats Wales, Teachers (SWAC); School Workforce Census Statistics for England.

Figure 11 shows the level of teacher exit rates (leaving the profession entirely) and teacher attrition rates (including school-to-school moves) across local authorities in Wales. This shows that the highest teacher exit rates are in South-East Wales (Monmouthshire and Newport), Merthyr Tydfil, and West Wales (Carmarthenshire and Pembrokeshire). When we include school-to-school moves, we also see high attrition rates in Flintshire. The lowest attrition and exit rates tend to be in North Wales and more rural areas (Gwynedd, Anglesey, Ceredigion, and Conwy).

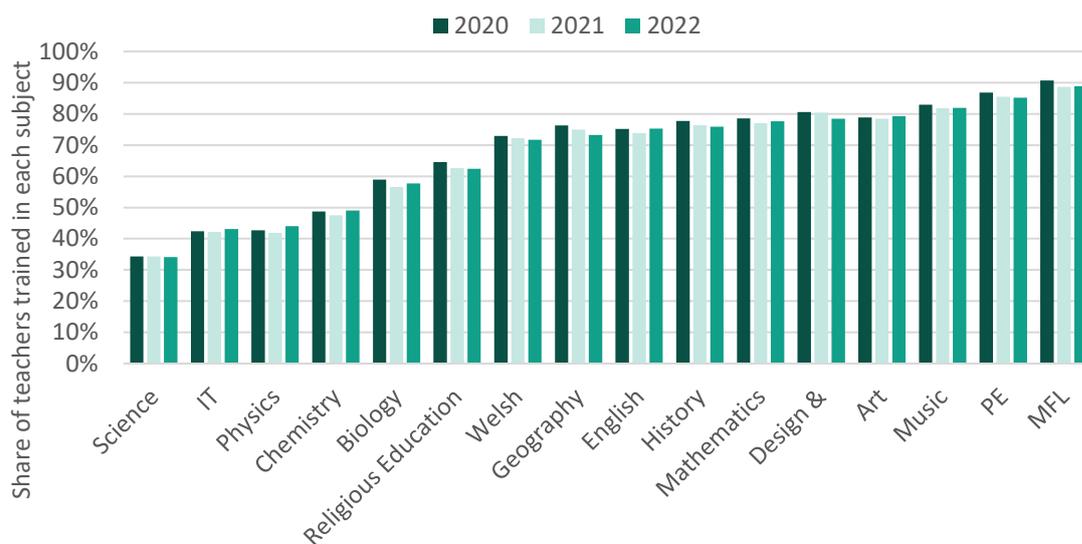
Figure 11: Teacher exit rates across local authorities in Wales



Sources and notes: Figures relate to 2020-21; Teacher numbers taken from Stats Wales, Teachers (SWAC)

Finally, Figure 12 shows the net result of the differences in recruitment and retention by subject by illustrating the share of secondary school teachers trained in the subject they teach. This shows large variation. In Art, Music, PE and Modern Foreign Language, the vast majority (over 80 per cent) are trained in the subject they teach. In contrast, in many science subjects (particularly Physics and Chemistry), less than 50 per cent of teachers are trained in the subject they teach.

Figure 12: Share of teachers trained in the subject they teach



Sources and Notes: EWC, Annual Education Workforce Statistics 2022

## Summary

Over the past 20 years, there has been a fall in teacher numbers in Wales. This has mostly reflected falls in pupil numbers. However, in secondary schools, there have been larger relative falls in teacher numbers than in pupil numbers, which is likely to have pushed up class sizes. Further falls in primary school pupil numbers are expected through to at least 2030. Secondary school pupil numbers are expected to rise soon, before starting to fall from about 2025/2026 onwards. This is likely to create some immediate pressures as it is secondary schools that have seen the biggest challenges on recruitment and retention.

Primary school teacher recruitment appears relatively buoyant in Wales. Entrants to ITE have increased over the pandemic and numbers were higher in 2021 than at any point over the last decade, including those training to teach in Welsh. There are high number of applications per post and vacancies are mostly filled in primary schools.

There are much bigger challenges in secondary schools. Overall entrants to ITE have declined over time, and numbers training to teach in Welsh have hardly changed at all over time. There are also fewer applications per post and vacancies are less likely to get filled, with problems even worse in Welsh-medium schools. There are also specific subjects where there is consistent evidence of greater problems, including maths, physics, chemistry, science, Welsh, modern foreign languages, and IT. The net result is that a lower share of secondary school teachers who teach these subjects are trained in them.

Interestingly, teacher exit rates in Wales are relatively low (4 per cent) compared with England in 2021 (8 per cent). This may be partly explained by the fact that the teacher workforce is older, and thus likely to be more experienced, and evidence suggests that more experienced teachers are less likely to leave the profession.

The pattern of challenges by local authority is relatively complex. There appears to be consistent evidence of problems recruiting secondary school teachers in rural areas across North and West Wales. However, there also appear to be some specific recruitment and retention challenges in some urban areas outside of the major cities of Cardiff and Swansea, such as Newport, Caerphilly, Wrexham, and Neath Port Talbot. The areas seeing the least problems tend to be more affluent areas or big cities, such as Cardiff, Swansea, and the Vale of Glamorgan.

Unfortunately, we are only able to examine trends in recruitment and retention by local authority in official statistics. This may hide a large amount of school-to-school variation within local authority. We therefore make the following recommendations on the publication of additional statistics:

We recommend that the Welsh Government publish statistics examining teacher recruitment and retention by levels of socio-economic disadvantage (such as quintiles defined by the share of pupils eligible for FSM or area-level measures like IDACI).

We recommend that the Welsh Government publish statistics on the level of teacher retention by individual years of experience. This would allow for interrogation of teacher retention challenges for new and inexperienced teachers, especially given other evidence showing this is the major pinch-point.

# Approach to literature review

## Non-financial incentives

Our initial plan for the review was to use Boolean text string searches defining our search focus and then snowball further studies from forward and backward citations. The initial search strings focused on defining the outcomes of interest, which were terms synonymous with 'teacher recruitment', 'teacher retention', 'teacher attrition', 'teacher satisfaction' and 'teacher efficacy'. We later added 'pupil attainment' to the outcome strings after reviewing the initial search results. We also included search terms for disadvantaged contexts and schools or geographic areas with teacher shortages using terms synonymous with 'deprived/deprivation', 'rural/isolated' and 'minority/first language'.

Searches were conducted on google scholar and the initial results were captured in a purpose-made excel spreadsheet to assist with screening and review. We screened the results to ensure that the studies included in our review related to teacher recruitment and retention in mainstream schools for teachers of compulsory school aged children. We included only studies from OECD countries in order to ensure literature was relevant to the Welsh context.

Qualitative-only studies with narrative reports about small and hyper-local programmes, often undertaken as PhD dissertations, were also screened out of our review as the number of these whose sample sizes were too small to provide any generalisable insights even where the school context was a reasonable fit for Wales was unmanageable and would not provide enough evidential value to the review.

The initial search results for non-financial approaches to improving teacher recruitment and retention using our search strings were too sparse and did not sufficiently address the question of how effective the studied incentives were in promoting teacher recruitment, retention, or related outcomes. We therefore added search terms based around research methodologies we wanted to include in the review, including 'meta-analyses(/es)', 'review', 'synthesis(/es)', 'experiment', 'control' and 'counter-factual', and also added new search terms focused on categories of intervention, such as terms synonymous with 'induction', 'ITE', 'Teach for America', 'Teach First', 'Teach for All', 'grow-your-own', 'mentor', etc.

The new intervention search terms were sourced from the strongest studies found in the original search strings to build up the strongest pools of studies with particular foci that we could within the limitations of this review. Quality and fit of studies were assessed by considering what methodological approach they took, how large their samples of schools or teachers were, and the nature of the data used or collected. Our eventual list of studies included in the review sections below is categorised by the approach taken to improving recruitment and retention, and a summary of how many studies we included under different methodological categories is provided before the results are discussed for each category.

We also include some background literature which did not meet the methodological criteria described above but which was nevertheless useful in setting out the scope of the evidence base immediately below the methodology described here and in the introduction to each category of non-financial incentive. This literature was identified from the searches described above. In some cases, none of the studies found in our search met the methodological criteria for the review but we provide a shorter overview of the themes that are discussed for completeness. For each non-financial incentive

categories, we stipulate what the strength of the evidence reviewed was in the introductory and concluding comments for that category.

## Financial incentives

The overall focus of this part of the review was on financial incentives that could lead to improvements in recruitment and retention outcomes, and ultimately pupil outcomes. The type of financial incentive schemes we focused on were salary supplements for teachers in socio-economically disadvantaged schools, hard-to-staff and rural schools, as well as teachers in shortage subjects like maths and sciences. The schemes we reviewed often combined these features, e.g., focusing on shortage subjects in disadvantaged schools. As the focus was on incentives to attract teachers to particular schools, the review did not examine incentives within ITE, such as bursaries and scholarships.

To ensure a robust evidence base, we preferred studies that employed causal methods, including Randomised Controlled Trials (RCTs), natural experiments and other quasi-experimental designs. To maintain quality, we also focused on studies that were peer-reviewed or published in academic journals. The only exceptions to this are working papers that are included in existing reviews on this topic and one very recent working paper for England that is of high relevance.

To maintain the relevance of the evidence, we focused on OECD or high-income countries. We also analysed the specific context of each scheme to determine its relevance to the Welsh context. We draw on two further papers from South America purely for comparative purpose and to add extra information.

Fortunately, there are already several high-quality, published reviews on this topic.<sup>9</sup> Our review of the evidence draws on these reviews and the papers contained within them. To this, we have added additional and linked papers we are aware of. We conducted further formal searches based around the above criteria and following a very similar approach to that used for non-financial incentives. We used the following search terms: teacher recruitment; teacher retention; teacher attrition; teacher exits; financial incentives; salary supplements; targeted incentives. These searches yielded a very high number of papers, which were further refined based on our quality criteria. But this process yielded no additional papers beyond existing reviews and our initial informal approaches.

This review strategy yielded a total of 15 papers, which are summarised in Table 3. This includes 10 papers from the US, 1 from Norway, 1 from France and 1 from England. It also includes two papers from South America.

In terms of the focus of the incentive schemes in these papers, 11 were focused on disadvantaged or deprived schools/areas. 4 were focused on teachers in shortage subjects, including maths, science and special educational needs. Only 2 were focused on rural areas. About 5 of the papers focused incentives on “effective teachers” as measured by the average value-added of pupils taught by such teachers; for example, the top 10 or 20 per cent of teachers as defined by average pupil value-added scores. Such schemes seem less relevant to the Welsh policy context as pupil value-added scores are not formally used in teacher appraisals. However, they can still yield valuable information on the role and effects of financial incentives.

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<sup>9</sup> See, Morris, Gorard, and Soufi, ‘What Works in Attracting and Retaining Teachers in Challenging Schools and Areas?’; Sims, ‘What Happens When You Pay Shortage-Subject Teachers More Money? Simulating the Effect of Early- Career Salary Supplements on Teacher Supply in England’.

Most of the papers reviewed focused on retention outcomes (13 out of the 15), with less focus on recruitment outcomes (8 out of the 15). Only 4 papers tracked the effects through to pupil outcomes.

The recruitment and retention outcomes used across these different papers can often be quite different, and the measured effect on these outcomes can reflect the context and level of that outcome in the area question. For comparability, we therefore often focus on the 'elasticity' of outcomes with respect to salary changes or financial incentives. This is the expected percentage change in a particular outcome, given a 1 per cent change in salary. For example, an elasticity of 3 for teacher attrition with respect to financial incentives implies that a 10 per cent salary supplement is expected to deliver a 30 per cent reduction in teacher attrition (note this is not a 30 percentage point reduction in teacher attrition).

## Non-financial incentives

In this part of the report, we discuss the evidence for alternatives to financial incentives for attracting and retaining teachers in schools generally, and in disadvantaged or rural contexts. The evidence base for these types of approach is much sparser and less methodologically robust for the purpose of demonstrating effectiveness than is the case for financial incentives and is made up of a patchwork of studies within several different non-financial categories. By 'effectiveness', we mean demonstrated impact on the outcomes of recruitment or retention, or on leading indicators which are likely to influence these outcomes and/or are valued in their own right, such as pupil attainment or teacher satisfaction. The categories of approach we have reviewed are as follows:

- ITE in relation to language-minority teachers and rural contexts.
- Job marketing for teacher vacancies.
- Alternative ITE programmes: graduate placement and community 'grow-your-own'.
- Mentoring and induction of novice teachers.

We selected these themes for review after screening studies generated by our initial searches that were targeted at outcomes for teachers or pupils. We then built up each approach category with further searches and snowballing targeted on those types of teacher incentive that had generated the strongest studies during the initial search. These were the approaches that paid most consideration to the review's aims of understanding how the supply of teachers in disadvantaged, rural, or Welsh-language contexts could be improved.

It is to be noted that unfortunately we did not find a literature on recruitment and retention of Welsh-medium teachers or teachers in Wales specifically, so we have searched the literature from other countries where there are dual official languages or significant language minorities in the population to find the best available suggestions from the research.

Although always weaker than for financial incentives, the quantity and quality of evidence varies between and within these broad approaches to managing teacher sufficiency. The evidence we reviewed for ITE programmes that are designed for rural and language-minority teachers was often of a narrative form without clear comparisons between the programmes considered and a counterfactual control condition.

We felt it to be nevertheless useful to provide a summary of the themes within this subset of the ITE literature to guide policymakers' thinking about where there is some evidence of promise as a basis to trial and evaluate approaches for addressing shortages of Welsh language medium teachers and shortages in rural isolated communities.

Similarly, for job marketing approaches based around realistic job previews, there has been a fair amount of policy in this space in rural US communities and much narrative literature, backed by stronger evidence for the application of this approach beyond the teaching profession. Again, we provide a summary of the themes that have arisen in this literature, but it is not yet evidence of effectiveness in the teaching context.

Alternative ITE programmes provide some stronger evidence from studies of the Teach for America and Teach First programmes, which can be considered as an emerging causal evidence base, but not a comprehensive one. We therefore review the findings of these studies in more detail and consider the

pros and cons of this approach to teacher recruitment, since there is a trade-off between recruitment and retention documented within the research literature.

'Grow-your-own community teacher pipeline' schemes in the US are schemes designed to support local people to enter teacher training and progress to become teachers in local schools, and are promising from the standpoint that they are a good context-fit for the Welsh school system, as they are strongly focused on addressing inequalities and teacher shortages in marginalised communities. However, the evidence base is much weaker than for graduate placement schemes, largely because they have often been implemented and studied with precarious or insufficient funding. There are some quantified estimates of teacher retention at different time points, which we review in detail since this approach is one with potential for piloting and evaluating a well-designed and funded scheme in isolated or rural UK contexts.

The literature on induction and mentoring of novice teachers is a rich one, with a good selection of quantitative studies, but not yet a well-developed literature on effectiveness, with only a single causal study found in this review. There are, however, some useful studies that unpick aspects of induction such as comprehensiveness (how many components the programme consists of) and theory-based studies that suggest different components of induction are associated with different teacher outcomes.

Due to the wide variation in methodology and depth of the research literature we have chosen to present ITE and job marketing studies as summaries of themes, and alternative ITE schemes and induction and mentoring as more detailed proto-effectiveness reviews. In the latter cases we also include some thematic studies intended for setting the context of the effectiveness literature in an introductory narrative before the review of results.

## Scope and themes

The research literature provides a wealth of description of efforts to recruit and retain teachers and maximise the quality of those retained in the profession, and is often presented prescriptively, but much of it simply assumes that particular approaches work on important factors that influence teacher retention and quality, without providing evidence that this is the case. This has resulted from a theoretically driven approach to both policy and evidence that seeks to solve the problem of teachers' shortages.

For example, Cooper & Alvarado (2006) provide a narrative review of research findings and policy implications on teacher preparation, recruitment, and retention that simply begins from the proposition that these three things are interrelated.<sup>10</sup> It is certainly an intuitively attractive assumption. However, the authors' call for a policy framework linking ITE, recruitment, and retention proceeds largely from the fact that, in the United States, the solutions that have been proposed and tested to solve shortages of teachers have followed a particular order of development.

These first began by considering ways to modify the supply of new teachers entering the profession either with financial support or rewards, or by introducing new ITE pathways that shorten the time that must be committed before beginning employment as a teacher. Later, efforts broadened out from recruitment to encompass retention of in-service teachers, by considering the context-fit of ITE programmes to harder-to-staff school contexts and by extending professional development through

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<sup>10</sup> Cooper and Alvarado, *Preparation, Recruitment, and Retention of Teachers*.

induction programmes. Finally, to a lesser extent, policy development has considered working conditions and the creation of professional whole-career learning communities for teachers.

Research seems to have followed policy, inverting the evidence-based policy model to become one of policy-based-evidence. Similarly, those countries outside the United States that have also experienced teacher shortages, including the United Kingdom, have generally followed in the wake of policy and evidence development in the US, but with much less breadth and depth of home-grown evidence production.

Ideas that have underpinned the policy and evidence development have included, variously:

- Creating multiple initial training pathways and ‘casting a wide net’ for teaching recruits, such as ‘up-training’ paraprofessionals or other people considering a career change into teaching in teacher shortage locations.
- Reflecting the diversity of hard-to-staff school contexts with a parallel diversity of initial training programmes.
- Developing subject-specialist or need-specialist recruitment and training programmes to fill specific shortages.
- Maintaining high standards for the selection of recruits into initial training to maximise the benefits of teacher recruitment and retention efforts for schools in highly challenging contexts.

This theoretical framework for policy and evidence underpins one of the most wide-ranging studies among the correlational evidence on novice teacher induction in the UK. A study by Hulme & Wood (2022) analyses the interplay of ITE, induction, and school context on proxies for teacher retention, specifically: job satisfaction, continuing development needs, and career intentions.<sup>11</sup> This study compares novice teachers in Scotland and the North West (NW) of England using a sample of data collected from a survey of all novice teachers registered for induction in the NW England (13 local authorities and 1,636 beginning teachers) and in Scotland (32 local authorities and 3,087 probationary teachers). Participation in the survey was voluntary and achieved 226 teachers in NW England (14 per cent) and 156 teachers in Scotland (5 per cent).

The strongest factors predicting teacher job satisfaction in this study were at the school level; these were having a supportive head teacher and having joint planning time timetabled with more senior teachers. The next strongest association was with the level of mentor support individual teachers reported receiving, followed by teachers’ own perceptions of how well their initial training prepared them to teach. The quantity of time spent individually with teacher mentors was not associated with job satisfaction, however. The authors further found that school contextual factors such as the school location and size, the proportion of novice teachers in the school and the proportion of pupils who were eligible for free school meals was not associated with either job satisfaction or career intentions in this sample.

When considering the outcome of teachers’ own perceived professional learning needs, only the teachers’ perceptions of how well their initial training prepared them was associated with this. Some differences in perceptions were found between NW England and Scotland, with novice teachers in NW England more likely to report somewhat higher job satisfaction and preparedness for teaching from initial training, but teachers in Scotland more likely to report spending more hours individually with their mentors.

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<sup>11</sup> Hulme and Wood, ‘The Importance of Starting Well’.

Further analysis revealed that it was Scottish teachers who undertook postgraduate university training courses who accounted for the lower reported level of preparation for teaching in Scotland, faring less well than undergraduate trained teachers in Scotland. There were no differences between training routes, including non-university school-led routes, for NW England in this sample.

Protected time for professional development, reported supportiveness of head teachers, and joint planning time with senior teachers did not differ between the Scottish and NW England teachers. However, among the sample, there were more teachers in Scotland who reported not having a mentor.

Taken together, these findings suggest that at least so far as teachers reported, deprivation and community context were not what made a difference to teachers' satisfaction with their jobs or perceptions of being prepared to teach. Rather, teachers identified factors within the quality of ITE and the ways in which schools were managed and led as the key drivers of their satisfaction and intention to remain in teaching.

This study is based on reported beliefs of novice teachers and may have been affected by different expectations of training, induction and mentoring in Scotland versus England. The response rates were also low which raises the possibility that the sample who responded to the survey may not represent the whole population, and the study only includes the North West of England. The available data could not shed any light on differences in training course content for ITE nor on the type of higher education institutions represented among the sub-sample who were higher education trained.

Hulme & Wood's analysis provides a jumping off point to demonstrate the factors that may be important to the retention of teachers in the early career phase, but it is not clear how or whether these findings would generalise to the Welsh context, and further research would be required to address this. The main conclusions the authors take from their findings were that many factors including induction efforts affected teacher job satisfaction in the early career phase, but that perceptions of how well ITE prepares teachers appear much more significant when it comes to the ongoing needs of teachers for professional support and development.

Schaefer et al. (2012) approach the problem of teacher retention without a pre-existing theoretical framework and used existing research literature to inform the factors on which they would study. They conducted a survey enumerating the factors that have been demonstrated, at least to a correlational level of evidence, to be associated with teacher retention, and conversely, attrition.<sup>12</sup> Reviewing the literature from 1999 to 2010, Schaefer then categorises the factors associated with the problem of teacher attrition as either 'individual factors', including age, personal and demographic characteristics among teachers, or as 'contextual factors', such as initial training, career support and school climate, and teaching salaries.

The survey of individual factors in teacher retention provides insights such as gender differences in local or national teacher retention rates, and the observation that older recruits are more likely to remain in the teaching profession for longer periods than younger recruits arriving straight from higher education. On reviewing the contextual factors associated with teacher retention, the authors bring forward further insight that local and locally-trained teachers are more likely to remain teaching in shortage locations than those who are attracted to the area through graduate placement schemes. The authors proceed to outline a third category of studies that conceptualise teacher attrition as a complex identity-

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<sup>12</sup> Schaefer, Long, and Clandinin, 'Questioning the Research on Early Career Teacher Attrition and Retention'.

making process through which both individual and contextual factors are weighed in the balance and traded off against one another.

Finally, they argue for a further shift in the conceptual framework of the research on teacher retention towards a focus on sustaining as well as retaining teachers, which runs through the career from attraction and initial training to induction and professional development, and continuing deeper into the careers of veteran teachers. The endpoint of this focus on sustaining teachers is the creation of professional learning communities that knit together the support needs of both novice and veteran teachers, and enable them to benefit mutually from belonging in a professional community together.

Taken together, these findings suggest that all teacher recruits are not equal in terms of their likelihood of being retained in the profession and continuing to teach in areas of teacher shortage. Local recruitment into local initial teacher training providers, targeting older individuals as well as younger school and university leavers, may provide advantages in terms of teacher retention and recruitment.

### Initial teacher education

For many teachers, ITE is their first contact with the teaching profession since they themselves attended school. ITE acts as the bridge between pupil/student and teacher identities and traditional ITE is an important gateway to the teaching profession in Wales. It is therefore an obvious place to locate efforts to improve the recruitment and retention of teachers, and an important research field. In this report, we do not have the capacity to review the full evidence base on ITE, but we have searched specifically for studies that shed light on the particular contextual problems of Welsh teacher shortages, including disadvantaged and isolated rural localities and the demand for Welsh-medium teachers.

ITE programmes offer an important opportunity to expose preservice teachers to challenging situations. Quality training can support recruitment and retention by creating a workforce that is well equipped with the skills needed to work in schools that face a greater level of challenge, however ITE programs can vary significantly depending on context, and research recommends taking a multifaceted approach towards preparing preservice teachers for entering the school workforce.<sup>13</sup> Methods reviewed include allowing for diversity and specialism in ITE curriculum design and bridging the theory-practice divide for which ITE programs have often been criticised through site-based experiences and school-university partnerships.<sup>14</sup>

### ITE curriculum design

Donaldson (2009) conducted a descriptive review summarising the available evidence on the state of teacher education in Scotland, finding that many teachers felt their training had left them with significant skills and knowledge gaps.<sup>15</sup> The evidence indicated that many teachers felt under-prepared for their induction year and that there was a lack of continuity within and beyond ITE programmes. Donaldson (2011) suggested that programmes could be strengthened by allowing for diversity and specialism in terms of content and design, taking a more rigorous approach when selecting students who are applying for teacher training and greater consistency when assessing student progress.

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<sup>13</sup> Cuervo and Acquaro, 'Exploring Metropolitan University Pre-Service Teacher Motivations and Barriers to Teaching in Rural Schools'. Martin, 'Persistent rural educators: An extensive literature review of factors which influence rural teacher retention'; Owen, Kos and McKenzie, 'Staff in Australia's Schools: Teacher Workforce Data and Planning Processes in Australia'.

<sup>14</sup> Green, Tindall-Ford, and Eady, 'School-University Partnerships in Australia'.

<sup>15</sup> Donaldson, Teaching Scotland's Future Report of a Review of Teacher Education in Scotland, The Scottish Government.

An example of this in practice is the Australian National Exceptional Teaching for Disadvantaged Schools (NETDS) program. Burnett and Lampert's (2019) correlational study evaluated the NETDS program using de-identified graduate employment data from 2007-2010.<sup>16</sup> They observed a positive impact on the recruitment and retention of high-performing teachers in schools with a significantly disadvantaged intake relating to high-poverty. The programme prepared preservice teachers by selecting participants based on multi-dimensional criteria, including prior experience with cultural diversity, diverse backgrounds, orientations towards social justice, and high academic achievement as well as introducing preservice teachers to social justice theories and offering practical and scaffolded exposure to teaching and working within high-poverty school settings. The success of the model has been noted in the Australian Teacher Education Ministerial Advisory Group report and the high-profile *From Growth to Achievement: Report of the Review to Achieve Educational Excellence in Australian Schools*.<sup>17</sup>

Designing an effective ITE curriculum is a significant challenge given the breadth of learning that takes place in becoming a teacher. Induction, mentoring and professional development programmes allow learning to continue past ITE however retention can be increased if teachers feel confident and prepared for entering the early stages of their career. This is significant given that in England it has been estimated that 30% of teachers leave within the first five years.<sup>18</sup> Evidence from Scotland and Australia recommends improving ITE by taking a more rigorous approach when selecting trainee teachers, being more consistent in terms of assessment and allowing for diversity and specialism in ITE curriculum content and design. While there are some core elements that should be intrinsic to any ITE programme, diversity and specialism could support retention by allowing ITE programmes to target specific skills and knowledge gaps, thereby aligning courses to contextual challenges and the needs of preservice teachers depending on individual career trajectories.

### Site-based experience

Site-based experiences (SBEs) provide preservice teachers who are completing ITE with the opportunity to experience teaching in a hard-to-staff context such as in a regional, remote or high-poverty school, to both motivate and prepare them. There is empirical evidence that providing teachers with the opportunity to experience challenging situations during their training can improve their attitude towards applying for placements in hard-to-staff areas and accelerate personal and professional growth, thereby improving their confidence to meet those challenges. SBEs are typically shorter experiences and have been broadly cited in the literature as a means of bridging the theory-practice divide for which ITE programs have often been criticised.<sup>19</sup>

Young, Grainger and James (2018) found that providing teachers with the opportunity to experience challenging situations through SBEs can create positive attitudinal changes towards applying for school placements in challenging areas upon graduation.<sup>20</sup> The descriptive study evaluated the Coast to Country project, an initiative supported by the Queensland Department of Employment and Training that has offered Australian, preservice teachers the opportunity to participate in a five-day experience teaching in rural and remote schools and communities since 2011. Despite positive findings the results

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<sup>16</sup> Burnett and Lampert, 'The Australian National Exceptional Teaching for Disadvantaged Schools Programme'.

<sup>17</sup> Craven et al., 'Action Now: Classroom Ready Teachers'; Gonski et al., 'Through Growth to Achievement'.

<sup>18</sup> Long and Danechi, 'Teacher Recruitment and Retention in England'.

<sup>19</sup> Green, Tindall-Ford, and Eady, 'School-University Partnerships in Australia'.

<sup>20</sup> Young, Grainger, and James, 'Attracting Preservice Teachers to Remote Locations'.

are limited by the small sample and self-reported data that could be susceptible to social desirability bias.

Fitzgerald's (2020) correlational study offers a better indicator of the effectiveness of SBEs for attitude change and confidence, finding that SBEs have a statistically significant impact on the personal and professional growth of preservice teachers.<sup>21</sup> A limitation however is that Fitzgerald (2020) did not explore how positive attitudinal changes and increased confidence translated into actual recruitment and retention figures and the positive impact is not therefore guaranteed.

Evidence from the Australian context indicates that there is merit to implementing SBEs. Placements can improve attitudes towards working in hard-to-staff areas and increase the confidence and competence of preservice teachers which is likely to contribute to increased retention rates following graduation. These findings however are somewhat speculative and further research is needed to ascertain the effectiveness of this approach in improving teacher recruitment and retention figures.

### School-university partnerships

SUPs are another strategy used to bridge the theory-practice divide. SUPs involve building ongoing relationships between schools and universities so that trainee teachers can be supported to develop their practice by spending extended periods of time on a placement. University staff can also benefit from the relationship as partnerships often involve a research element to provide evidence of effective practice and develop project theories. In Ireland and Australia the responsibility for ITE programme design and implementation lies solely with ITE providers in HEIs while Scotland, England and Wales has placed a greater emphasis on school autonomy, and a consequence is that significant responsibilities for ITE have been transferred to schools.<sup>22</sup>

In 2011, the Irish Teaching Council (TC) developed the 'Policy on the Continuum of Teacher Education' (2011) to reconceptualise ITE including the development of new innovative school placement models where HEIs and schools actively collaborate as partners in the organization of the placement.<sup>23</sup> ITE providers maintained their responsibilities but in order to increase equity of experience for student teachers, negotiations between HEIs and schools were facilitated and resulted in the publication of the TC's (2013) 'School Placement Guidelines'.<sup>24</sup>

Young, O'Neil and Simmie (2015) presented findings from a case study involving a researcher-in-residence based on the TC's recommendations.<sup>25</sup> The partnership model resulted in positive and consistent interaction, improved support for student teachers and cooperating teachers, and enabled the building of relationships and sharing of information. The successful outcomes of the pilot study led to the appointment of School Placement Development Officers to continue the project.

Rowley, Weldon, Kleinhenz and Ingvarson (2013) conducted a larger and more comprehensive evaluation of SUPs in the Australian context.<sup>26</sup> Their evaluation assessed the effectiveness and efficiency of the delivery of The School Centres for Teaching Excellence (SCTE) Initiative. Strong qualitative and quantitative evidence was produced during three stages across a longitudinal timeframe. The third stage was a comparative follow-up study that included teachers who had been in the profession for 6-18

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<sup>21</sup> Fitzgerald, 'Out in the Field'.

<sup>22</sup> Heinz and Fleming, 'Leading Change in Teacher Education'.

<sup>23</sup> The Teaching Council, 'Policy on the Continuum of Teacher Education'.

<sup>24</sup> The Teaching Council, 'Guidelines on School Placement'.

<sup>25</sup> Young, O'Neill, and Simmie, 'Partnership in Learning between University and School'.

<sup>26</sup> Weldon et al., 'Teach for Australia Pathway'.

months, comparing the experience of SCTE graduates with graduates from other programmes at the same universities. The findings demonstrated that graduates from SCTE programmes rated their preparation as more effective on almost all measures.

Following the Donaldson Review (2011) TSF In Scotland a greater emphasis has been placed on school autonomy with the intention of creating relationships that are collaborative rather than complementary, involving shared responsibility between HEIs, schools, Local Authorities (LAs) and government agencies.<sup>27</sup> Black et al. (2016) used a mixed method study design to evaluate the implementation and impact of Donaldson's recommendations.<sup>28</sup> The report found that partnerships between LAs, schools and universities had been developed and support for students on placement and probationary teachers had improved but that the development of teachers would be enhanced by further clarification and agreement of the respective roles of the school and the university in relation to joint assessment; improved communication between the university and the school on aspects of student placements; and the provision of additional support for probationers to further develop key pedagogical skills.

The evidence from Scotland, Ireland and Australia indicates that successful SUPs benefit from establishing clear roles and responsibilities for staff including having a staff member in a coordinating role, who has strong links and a presence in both the university and the school. Partnerships can also benefit from creating clear structures for student placements, professional development, and assessment of trainee teachers so that there is a shared vision between stakeholders. Establishing clear roles and structures can improve leadership, support and communication and these recommendations can be implemented to bridge the theory-practice divide in teacher education to support retention, however further research is needed to ascertain effectiveness.

### Summary: ITE

The literature on approaches to making ITE context-specific and supportive of communities with teacher shortages is suggestive rather than conclusive, with studies mostly focusing on teacher perceptions of ITE or of jobs in rural locations rather than quantified recruitment and retention effects assessed through robust methods. However, as a body of learning from locations where efforts have been made to address these location-based challenges, there are some interesting narrative insights into features of ITE programmes that have been perceived to be important to their success.

ITE programs often incorporate several approaches and measuring the effectiveness of each approach is therefore a challenge. For this reason, the review was unable to uncover any causal evidence revealing the impact ITE programs had on recruitment and retention figures, however authors who have studied attempts to improve teacher recruitment in contexts that have features in common with Wales have recommended improving ITE by taking a more rigorous approach when selecting trainee teachers, being more consistent in terms of assessment and allowing for diversity and specialism in ITE curriculum content and design. The evidence also highlights the value of professional experience placements and creating supportive school-university partnerships to bridge the theory-practice divide in teacher education. Further study of the experience of graduates in the first five years of their career could help

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<sup>27</sup> Donaldson, Teaching Scotland's Future Report of a Review of Teacher Education in Scotland, The Scottish Government.

<sup>28</sup> Black et al., 'Evaluation of the Impact of the Implementation of Teaching Scotland's Future'.

to identify subject areas and locations that are experiencing higher levels of attrition to support context-specific teacher preparation.<sup>29</sup>,

## Job marketing

Marketing is a recruitment and retention strategy that is sometimes considered to supplement other policies to ensure that accurate information is easily accessible to prospective teachers. The scope of this evidence covers a range of initiatives that aim to attract qualified teachers to hard-to-staff schools and increase the number of applicants to teacher education programs and alternative teaching routes. Common themes that arise across the initiatives are that marketing approaches should assist by highlighting both material and non-material incentives to attract students and qualified teachers, and can support teacher retention by providing transparent and accurate information about the benefits and challenges associated with working in hard-to-staff schools.

## Digital marketing

Digital marketing may be a useful method for providing accurate information to prospective teachers. Quasi-experimental research has been conducted in England assessing the effectiveness of digital marketing using econometric modelling and cost effectiveness analysis. The results suggested that marketing activities were effective for increasing website sessions and website registrations for UCAS applications, which is the process by which prospective teachers apply for teacher training.<sup>30</sup> The marketing campaign drove approximately 4.8 million additional website visits and 62,000 website registrations. Of this total amount, approximately 24,000 were for core shortage subjects. The results relating to the increased number of website registrations suggest that marketing activities could have led to approximately 67,000 additional UCAS applications, of which approximately 17,000 were in core shortage subjects. This in turn resulted in roughly 14,000 UCAS 25 acceptances and about 13,000 entries to Initial Teacher Training, of which approximately 6,000 were in shortage subject areas.

Realistic job previews (RJPs) are a common digital marketing strategy used in other sectors to support recruitment and retention.<sup>31</sup> While traditional recruitment strategies usually attempt to "sell" an organisation to potential recruits, RJPs aim to provide a balanced view by highlighting both the positive and negative aspects of the role. Gardner et al. (2009) conducted a mixed two factor experimental study finding that RJPs produce lower levels of organisational attraction compared to traditional recruitment strategies, but their use can facilitate a process of self-selection, where recruits will opt out of an undesirable position, and thereby increase the chances of recruiting a candidate that is compatible with the school's context, culture, and values.<sup>32</sup>

A descriptive study conducted by Tran et al. (2020) suggests that rural schools should deploy RJPs to increase the chances of recruiting teachers that are compatible with rural teaching environments.<sup>33</sup> To implement RJPs effectively, Tran et al. (2020) suggest using an employee perspective/tone; highlighting the positive and negative aspects of the job, field, and employer, which can be accomplished by utilising experience-based information, being forthcoming with job data such as turnover, burnout, longevity and

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<sup>29</sup> See et al., 'Teacher Recruitment and Retention'.

<sup>30</sup> Lane et al., 'Your Future | Their Future: Impact of the Department for Education's Marketing Campaign'; Battiston and Conlon, 'Your Future | Their Future: Impact of Department for Education's Marketing Campaign'.

<sup>31</sup> Liu, Keeling, and Papamichail, 'Maximising the Credibility of Realistic Job Preview Messages'.

<sup>32</sup> Gardner et al., 'Attraction to Organizational Culture Profiles'.

<sup>33</sup> Tran et al., 'Leveraging the Perspectives of Rural Educators to Develop Realistic Job Previews for Rural Teacher Recruitment and Retention'.

describing the culture of the organisation; ensuring information sources are credible and that the information source is perceived to be knowledgeable, for example by including professional and personal background information to enhance persuasiveness.<sup>34</sup>

Marketing efforts should also highlight both material and non-material incentives that appeal to several 'spheres of influence' including family/personal factors, community level activities, whole school level activities and within classroom activities. Ulferts' (2016) comparative study found that the family/personal and whole school spheres had the most significant influence on attracting teachers to accept rural assignments, while the community and within classroom spheres later became the most significant in retaining those teachers.<sup>35</sup> Overall, Ulferts found that all four 'spheres of influence' had a statistically significant impact on the decision-making of teachers that chose to accept and stay in rural teaching assignments, and a high internal consistency reliability when recruitment and retention factors were tested together.

Quasi-experimental research conducted in England shows that TV, Social Media and paid Search have been the strongest drivers of website sessions, but that Display and Social Media advertising are the most cost-effective at achieving website sessions and registrations.<sup>36</sup> Considering the robust methodology these marketing strategies should be considered to supplement a broader teacher recruitment and retention policy package. By highlighting both the benefits and challenges of working in hard-to-staff schools, and appealing to material and non-material incentives, research from the US further indicates that digital in the form of RPJs can support preservice teachers to make better employment decisions, and support retention to rural areas by increasing the chances of a good employment fit.<sup>37</sup> Hiring schools should consider using RPJs to provide accurate information to prospective teachers however the evidence for this is weaker.

### Large-scale initiatives at the national and regional level

Large-scale initiatives aim to promote the education profession through robust marketing campaigns that leverage several media forms, and this is a strategy recommended by several US and Australian states.<sup>38</sup> Similarly to RPJs the marketing campaigns reviewed here that operate at the national and regional level aim to facilitate a process of selection and self-selection to increase the chance of hiring a compatible candidate.<sup>39</sup> A robust marketing campaign could be used in the Welsh context to target teachers with desirable qualities such as Welsh-medium language teachers, however the evidence is not robust and further research is needed to ascertain effectiveness.

The Quality Remote Teaching Service was a large-scale initiative that took a rigorous and targeted recruitment approach to staff the 82 remote schools in the Northern Territory, Australia.<sup>40</sup> Following a widespread campaign across several media outlets that resulted in 375 applications, the second stage of the recruitment process involved triangulated personality profiling that incorporated group assessment

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<sup>34</sup> Tran et al.; Liu, Keeling, and Papamichail, 'Maximising the Credibility of Realistic Job Preview Messages'; Gardner et al., 'Attraction to Organizational Culture Profiles'.

<sup>35</sup> Ulferts, 'A Brief Summary of Teacher Recruitment and Retention in the Smallest Illinois Rural Schools'.

<sup>36</sup> Battiston and Conlon, 'Your Future | Their Future: Impact of Department for Education's Marketing Campaign'; Lane et al., 'Your Future | Their Future: Impact of the Department for Education's Marketing Campaign'.

<sup>37</sup> Allread, 'The Current and Future Teacher Shortage: Teacher Recruitment and Retention Policy for Oklahoma's Rural Schools'; Maranto and Shuls, 'How Do We Get Them on the Farm?'; Ulferts, 'A Brief Summary of Teacher Recruitment and Retention in the Smallest Illinois Rural Schools'.

<sup>38</sup> Aragon, 'Teacher Shortages'; Miller et al., 'Best Practices Article'.

<sup>40</sup> Brasche and Harrington, 'Promoting Teacher Quality and Continuity'.

activities to evaluate interaction, negotiation and problem-solving skills, as well as psychometric testing of personal characteristics and values, to ensure individuals were being matched with a school context that was appropriate for their disposition.

Self-reflection was also encouraged so that participants could explore their own motivations for engaging in remote teaching considering specific community requirements. Remote communities can vary significantly in degrees of isolation, resources, population, cultural orientation, and other aspects and to maximise retention, the Quality Remote Teaching Service aimed to match the aptitudes, experiences and expectations of successful applicants against the communities they would serve. Brasche and Harrington's (2012) descriptive study suggests that a rigorous and targeted approach may be more effective in recruiting and retaining quality teachers in remote Indigenous communities however the article does not provide evidence on the overall effectiveness of the Quality Remote Teaching Service.

Buckskin (2016) found that increased representation of Aboriginal and Torres Strait Islander teachers in Australian schools can improve outcomes for Indigenous students.<sup>41</sup> The More Aboriginal and Torres Strait Islander Teachers Initiative (MATSITI) Project was a four-year national scheme that aimed to increase representation by improving recruitment and retention and developing strategies that enhance the professional and leadership capabilities of experienced Aboriginal and Torres Strait Islander teachers.<sup>42</sup> The project included a national community engagement and marketing strategy to promote teaching as a career option for secondary students and adults that was informed by the National Teacher Workforce Dataset (NTWD).<sup>43</sup>

A broad range of communication strategies were adopted including student career workshops, marketing campaigns in the Indigenous press, social media presence through Twitter and Facebook and an Indigenous events calendar distributed to all Australian schools and universities. In the evaluation of the project Baskin (2016) contends that a national strategy for promoting teaching should provide inducements for the people it attracts, such as scholarships and other support while completing a qualification; guaranteed employment upon meeting requirements; articulate both the tangible and intangible rewards of becoming a teacher; emphasise support structures for newly appointed teachers including location allowances and other incentives, mentoring and professional development; and provide nationally consistent pathways for Aboriginal and Torres Strait Islander peoples, in particular Australian and Islander Education Workers , to train as teachers.<sup>44</sup>

Johnson, Cherednichenko and Rose (2016) produced qualitative and quantitative evidence to show that the 57 MATSITI-funded projects increased the number of Aboriginal and Torres Strait Islander students in ITE and developed strategies that enhanced professional and leadership capabilities by including strong project management and the involvement of Aboriginal and Torres Strait Islander peoples in project design, implementation and evaluation processes. Despite these positive results, the specific strategies that led to an overall increase in representation within ITE were not evaluated and further

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<sup>41</sup> Buckskin, Buckskin, 'How to Attract and Retain Aboriginal or Torres Strait Islander Teachers at Your School'.

<sup>42</sup> University of South Australia, 'More Aboriginal and Torres Strait Islander Teachers Initiative: MATSITI Project Plan 2012–15'.

<sup>43</sup> Buckskin, 'Aboriginal and Torres Strait Islander Teacher 2015 Workforce Analysis'.

<sup>44</sup> Johnson, Cherednichenko, and Rose, 'Evaluation of the More Aboriginal and Torres Strait Islander Teachers Initiative Project: Final Report | VOCEdplus, the International Tertiary Education and Research Database'.

causal research is needed measure effectiveness.<sup>45</sup> Further to this, the size of the indigenous teaching workforce was found to have fallen by around 30 per cent over the life of the project, indicating that improvements in ITE recruitment do not immediately feed through into more teachers in-service.<sup>46</sup>

### Summary: job marketing

The evidence base on the effectiveness of teacher job marketing is at an early stage in its development. Studies have been largely narrative with some correlational quantitative evidence for larger programmes in Australia, and the results of this have been mixed, with some suggestion that concerted efforts may improve recruitment to ITE, but not necessarily feeding through to the number of in-service teachers. Narrative evidence provides suggestions for future programmes designed to improve recruitment in hard-to-staff contexts, but this cannot be seen as an effectiveness literature; it is rather a source of inspiration for possible future programmes, with a strong need for these to be evaluated robustly in order to progress the evidence base.

Studies suggest that marketing approaches might usefully focus on highlighting both material and non-material incentives to attract qualified teachers, and support retention by providing transparent and accurate information about the benefits and challenges associated with working in hard-to-staff schools. Creating a dataset on the teaching workforce in hard-to-staff contexts can support the development of a targeted marketing strategy to inform large-scale initiatives, so that funding can be channelled to where it is needed most.

### Alternative initial teacher education

Alternative ITE pathways have been developed in several countries that face teacher shortages generally or in particular contexts such as rural, disadvantaged or language minority communities. Two distinct models have been researched sufficiently for research reviews to have been undertaken; these are 'grow your own' (GYO) teacher programmes, and elite graduate placement schemes modelled after Teach for America (TFA).

GYO programmes aim to support members of local communities, such as parents, para-professional support staff in schools, and secondary school pupils to develop and follow through the ambition of becoming teachers in their local schools. The components of GYO programmes vary but typically may include recruitment, ITE, social support of the cohort of community teacher trainees, and continuing professional development.

The original GYO schemes that originated in the United States typically involve consecutive university or college-based ITE whereby teachers are trained and prepared prior to entering employment as teachers. Although individual schools in England are known to use a GYO type model to develop their own future teaching staff through school-based or university ITE, we found no formal schemes identified as GYO that have been the subject of research identifying recruitment, retention, or pupil attainment outcomes in the UK.

Teach for America was founded in 1989 with the central goal of selecting elite university graduates who may not otherwise have considered teaching and placing them quickly into schools in challenging and disadvantaged contexts, with their ITE run concurrently with starting a salaried teaching post. After just

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<sup>45</sup> Buckskin, 'How to Attract and Retain Aboriginal or Torres Strait Islander Teachers at Your School'; Johnson, Cherednichenko, and Rose, 'Evaluation of the More Aboriginal and Torres Strait Islander Teachers Initiative Project: Final Report | VOEDplus, the International Tertiary Education and Research Database'.

<sup>46</sup> Buckskin, 'Aboriginal and Torres Strait Islander Teacher 2015 Workforce Analysis'.

6 weeks of intensive ‘summer school’ preparation, each TFA cohort begins to teach in what has been characterised as a ‘sink or swim’ approach to ITE, although classroom timetables are built up incrementally to allow for teacher preparation activities and mentoring.<sup>47</sup>

Teach First was launched in England in 2006, initially in London schools but later spreading to become a national scheme. There are now over 60 countries with graduate placements schemes under the ‘Teach for All’ umbrella that evolved out of Teach for America.

The quantity and quality of evidence available about these two models of alternative ITE is uneven and leans heavily in favour of the TFA model. The level of robustness of studies that report outcomes such as pupil attainment and teacher retention is still very limited, with only two of 14 studies of the US Teach for America scheme reviewed by Backes & Hansen (2023) that provided causal evidence, and just one study of the English Teach First scheme by Allen et al. (2016) that provided correlational evidence of retention outcomes.<sup>48</sup>

A review of GYO teacher recruitment schemes by Gist et al. (2019) divided these into two types: those that were local community pipeline schemes and those that were middle and high school pipeline schemes focusing on pupils as future school teachers.<sup>49</sup> Gist’s review included 14 empirical studies on community schemes and nine empirical studies on middle or high school schemes, but none of these empirical studies provided clear comparisons of outcomes between GYO schemes and alternative types of ITE recruitment; rather, they documented the retention (and other) outcomes of the GYO schemes without giving a counterfactual.

As the studies GYO schemes tended to be small, local, and sometimes short-lived, it is not possible to gain a clear sense of the value added by these schemes to teacher retention or any other quantified outcome given the methodology of the studies, which was likely limited by budgetary considerations. Alongside the empirical studies, larger numbers of narrative studies were also included in the review describing the aims and perceived outcomes of the GYO schemes. We do not focus on the narrative studies of GYO since the empirical studies provide a better sense of the outcomes from these recruitment schemes, albeit a methodologically weak one.

All the GYO studies were from the United States, where this teacher recruitment model was developed in response to both teacher shortages in hard-pressed communities, but also equity and diversity concerns about the representation of the local communities in the teaching profession. Initially, a response to racial inequalities in the US teaching profession, the concept then spread to encompass other underrepresented backgrounds including social class, language minorities, mature and part-time career changers.

Although the GYO evidence base is extremely rudimentary and does not provide any confidence about the outcomes to be expected from such teacher recruitment schemes, it is likely a better cultural and policy fit for the Welsh context. In particular, the GYO model has been used to address rural and other high-poverty contexts, and the recruitment of teachers from language minorities, which suggests a potential fit with the problem of securing enough Welsh-language teachers, and enough teachers willing to make their careers in isolated rural communities.

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<sup>47</sup> Morrison, ‘How Teach For America Is Sparking A Revolution’.

<sup>48</sup> Backes and Hansen, ‘Teach For America Is Shrinking—Is This Cause for Celebration?’; Allen, Parameshwaran, and Nye, ‘The Careers of Teach First Ambassadors Who Remain in Teaching: Job Choices, Promotion and School Quality’.

<sup>49</sup> Gist, Bianco, and Lynn, ‘Examining Grow Your Own Programs Across the Teacher Development Continuum’.

## GYO teacher recruitment

For GYO we found:

- 24 empirical studies
- No causal studies

Perona (2015) focused on community pipeline GYO schemes and identified problems of high attrition within the ITE teacher preparation phase of the schemes as common and provided an estimate of 40-50 per cent of trainees lost before they entered the teaching profession.<sup>50</sup> This was viewed as a feature of the economic precarity of the communities from which trainees were recruited and a key challenge identified by Perona was juggling teacher training with work and family commitments. Community pipeline GYO trainees often need to financially support partners and children, as well as supporting themselves through training, due to their stage of life.

Some GYO schemes attempted to mitigate the high rates of trainee attrition, but since they typically lacked the budget to provide financial support to trainees, this usually took the form of increasing the relevance of the training with curriculum content focused on the local context, and boosting the morale and social support of the trainees by establishing networks across different providers of ITE that focus on GYO pipelines, and celebrating the success of GYO teachers who complete ITE successfully.

Estimates of teacher retention for GYO community pipeline schemes for those trainees who completed training and started work as teachers were better than for ITE completion, perhaps because of the substantial winnowing of the GYO cohort that takes place during ITE. Abramovitz & D'Amico (2011) found 60 per cent of GYO community pipeline teachers were retained in service locally after 6 years, while Lau et al. (2007) reported retention within the teaching profession of 95 per cent after ten years.<sup>51</sup> Ross & Ahmed (2016) found lower retention within the profession of 62 per cent after ten years, and attributed variation in the rate of retention to the selection criteria used by different GYO schemes to recruit trainees.<sup>52</sup>

Empirical studies of middle and high school pipeline GYO schemes did not provide retention estimates, so we do not know how these compare with the community pipeline schemes that focused on later life stages. These studies sometimes provided numbers of trainees recruited by school pipeline schemes, but since there were no counterfactuals provided the interpretation of those recruitment numbers relies on knowledge of the local community contexts to understand the size of the schools and communities and the level of need in terms of teacher shortage and vacancy-filling challenges. We do not cite these figures here since they are not informative when seeking to understand the potential of GYO type schemes in a Welsh context.

In general, the GYO schemes that had been studied empirically were financially precarious, often relying on charitable grants for funding, and this limited the extent to which they could offer continuing professional development for GYO teachers, since funding was often time-limited, and even those schemes with state funding were often subject to closure. Gist (2019) comments that there was typically no commitment from local school districts to provide teaching jobs for all trainees that completed the ITE phase, which may also have contributed to attrition, since if one stimulates the ambition to become

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<sup>50</sup> Perona, LaSota, and Haefelle, 'Illinois Grow Your Own Teacher Education Initiative 2014 Policy and Program Recommendations'.

<sup>51</sup> Abramovitz and D'Amico, 'Triple Payoff: The Leap to Teacher Program.'; Lau, Dandy, and Hoffman, 'The Pathways Program: A Model for Increasing the Number of Teachers of Color on JSTOR'.

<sup>52</sup> Ross and Ahmed, 'Fostering Globalism'.

a local community teacher, then those recruited are less likely to wish to relocate to take up a teaching position.<sup>53</sup>

Further context for the GYO teacher recruitment model is provided by a correlational study of teacher retention in New York State by Boyd et al. (2003) that analysed descriptive statistics from administrative data, then developed a behavioural model to predict the location of first teaching jobs taken up by novice teachers.<sup>54</sup> The database used covered every new teacher hired in a New York State public school from 1999 to 2002, providing a sample of 33,465 first-time teachers. Data used in the modelling included information about school districts, communities and local labour markets, and the study found that teachers prefer to work where they grew up or in contextually similar locations, so they are more likely to be retained in service if they take up a first teaching post in those locations.

These findings suggest that GYO schemes can support teacher retention and contribute towards the diversity of teachers and the distribution of teachers in areas of shortage, which are all objectives that are relevant to the Welsh context. However, there are some gaps in the evidence including the absence of any clear comparisons between GYO schemes and traditional teacher training routes, and there is an opportunity to research whether long-term funding of GYO schemes and financial support during teacher training could improve the retention of trainees during ITE, thus providing larger numbers of teaching recruits.

### ‘Elite’ graduate placement schemes

For graduate placement schemes we found:

- 14 empirical studies
- 2 causal studies

Backes & Hansen (2023) conducted a narrative review of two causal studies and 12 empirical studies of Teach for America that considered outcomes of pupil attainment and teacher retention.<sup>55</sup> The review concluded that outcomes were generally positive such that the authors were concerned about a downturn in the size of the TFA programme over the last decade, and the consequences this might have for schools that have made use of the scheme to fill vacancies. The two experimental studies identified by the review focused chiefly on pupil attainment as a proxy for the quality of TFA teachers and compared this with that of other comparable novice teachers.

Many studies have focused on pupil attainment outcomes because they are inherently valuable outcomes, but also because they may influence teacher retention in the long term, since teachers' performance management often considers pupil attainment as a measure of successful job performance. As areas of teacher shortage are also often areas with poorer pupil attainment associated with deprivation and other challenges in the school context, the quality of teachers recruited is also a key concern of policymakers, alongside ensuring an adequate supply of teachers.

Clark et al. (2017) studied the reading and maths scores of primary-aged pupils taught by TFA teachers and compared these with pupils taught by other teachers in the same disadvantaged schools as the TFA teachers.<sup>56</sup> The TFA programme involves a commitment of a minimum of two years to teaching from its novice teachers, and the pupil attainment scores related to these two initial years. Attainment of pupils

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<sup>53</sup> Gist, Bianco, and Lynn, 'Examining Grow Your Own Programs Across the Teacher Development Continuum'.

<sup>54</sup> Boyd, Lankford, and Loeb, 'The Draw of Home'.

<sup>55</sup> Backes and Hansen, 'Teach For America Is Shrinking—Is This Cause for Celebration?'

<sup>56</sup> Clark et al., 'Impacts of the Teach for America Investing in Innovation Scale-Up. Revised Final Report'.

taught by the TFA teachers was no worse than that of the comparison group overall, and small positive effects for TFA teachers were found on the reading of pupils in grades 1 and 2 (effect size: 0.12).

An earlier experimental study by Glazerman et al. (2006) found a small positive effect on maths attainment (effect size: 0.15) of TFA teachers that was consistent across different sub-groups of teachers and pupils.<sup>57</sup> However, there were no effects on reading attainment in this study. Interestingly, this study also found that TFA teachers were more likely to report problems with pupil behaviour than the comparison group of teachers.

A correlational study by Dobbie (2011) studied the recruitment assessments of TFA teachers linked to the attainment records of pupils taught by them.<sup>58</sup> The recruitment assessments used to select candidates to become TFA teachers were found to be associated with pupil maths attainment, but not reading attainment. The factors assessed in TFA recruitment that were associated with gains in maths scores for the pupils of TFA teachers were those teachers' prior educational attainment, their leadership experience, and their level of perseverance. This suggests that the selective nature of TFA recruitment, which is unashamedly characterised as an opportunity for 'elite' graduates, is a potential driver of any positive effects of the programme on pupil attainment.

A recent correlational study of changes in the effectiveness of TFA teacher cohorts over time by Penner (2021) found that there have been improvements in the attainment of pupils taught by TFA teachers in more recent cohorts.<sup>59</sup> These are described as a gradual patchwork of improvement, and the study assessed whether this was associated with reforms to the selection criteria used in TFA recruitment in 2005. However, Penner was not able to explain the pupil attainment improvements by association with measured facets of teacher quality.

A correlational study by Kane et al. (2008) attempted to balance the gains for pupil attainment from the recruitment of 'elite' graduates as TFA teachers against the adverse effects of worse rates of retention that result in high 'churn' of teachers, and therefore pupils being more frequently taught by novice teachers as a result of the programme.<sup>60</sup> In this study, the gains for pupil maths attainment associated with TFA teachers were positive but negligibly small (effect size: 0.02) but the losses in pupil maths attainment due to higher teacher turnover and the presence of many novice teachers were also negligibly small (effect size: -0.02). This resulted in the two effects cancelling one another out to leave pupil attainment no better and no worse than for traditionally recruited teachers from higher education training programmes.

Kane concluded that high-turnover teachers such as those from TFA and other alternative ITE schemes are not a concern since they only need to be marginally more effective teachers while in-post to offset the adverse effects of teacher turnover. Another correlational study by Xu et al. (2011) reached a similar conclusion about the effect of less accumulated teaching experience among TFA teachers than other teachers, by studying within-pupil differences (between different curriculum subjects) in the attainment of high school pupils.<sup>61</sup>

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<sup>57</sup> Glazerman, Mayer, and Decker, 'Alternative Routes to Teaching'.

<sup>58</sup> Dobbie, 'Teacher Characteristics and Student Achievement: Evidence from Teach For America'.

<sup>59</sup> Penner, 'Teach For America and Teacher Quality'.

<sup>60</sup> Kane, Rockoff, and Staiger, 'What Does Certification Tell Us about Teacher Effectiveness?'

<sup>61</sup> Xu, Hannaway, and Taylor, 'Making a Difference?'

Donaldson et al.'s (2011) correlational study quantified the elevated turnover of TFA teachers after two years elapsed (the initial commitment period for TFA) and after five years.<sup>62</sup> Overall retention in any public school after the programme was completed was 60.5 per cent, and within the placement school was 43.6 per cent. After five years, retention in the initial placement school had fallen to 14.8 per cent and retention in any public school was 27.8 per cent. This study highlights the limits of the scheme's contribution in terms of teacher sufficiency since once one embarks on this approach to teacher recruitment, it creates its own future demand for more new recruitment to replace the TFA teachers that have left.

A review of correlational evidence by Simon & Johnson (2015) focused on the factors associated with raised teacher turnover in disadvantaged school contexts.<sup>63</sup> The main conclusion of this review was that the most likely drivers of raised teacher turnover were not the preferences of teachers not to work with disadvantaged pupils but instead were the prevailing working conditions in those schools. Quality of school leadership, collegial relationships with other school staff, and elements of school culture were highlighted as most associated with levels of teacher turnover.

Turnover and retention have also been studied for the Teach First (TF) programme in England. Allen et al. (2016) used a matched groups quasi-experimental methodology to investigate the careers of TF recruits from 2008 to 2012.<sup>64</sup> TF recruits were matched to PGCE-route teachers with similar gender, ethnicity, age, and teaching subject profiles.

It was not possible for the authors to match the TF and PGCE teachers on undergraduate degree class results, which is an important limitation since these are highly relevant to the recruitment selection of the TF scheme. Overall, the study found a mixture of benefits and costs to using TF recruitment. It was not possible to study the pupil attainment outcomes of TF teachers due to a policy that prevents these data from being linked to the records of individual teachers, hence the study focused on retention and career development.

The percentage of recruits who achieved qualified teacher status was similar for TF and PGCE recruitment routes (around 90 per cent). In year 2, which is the 2nd year of the two-year commitment and 2nd year in classrooms for TF recruits but the year of entry to classroom teaching for PGCE recruits, TF teachers had higher retention (80-85 per cent depending on cohort) whereas a lower proportion of PGCE graduates took up teaching posts (55-72 per cent depending on cohort and undergraduate versus postgraduate PGCE).

By 2014, which was 3-7 years since beginning the PGCE or the TF programme depending on the cohort they belonged to, TF recruits were seven times as likely to have reached a senior school leadership position. TF teachers were also found to earn an extra £3,000 per year by year 3, and an extra £6,000 per year by year 5, compared with PGCE teachers. These salary differentials suggest that TF teachers had taken on more middle leadership responsibilities than their PGCE counterparts.

It is important to acknowledge that these career advantages for the TF teachers only apply to the subset of TF teachers who remained in service after the two-year commitment of the programme was

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<sup>62</sup> Donaldson and Johnson, 'Teach For America Teachers'.

<sup>63</sup> Simon and Johnson, 'Teacher Turnover in High-Poverty Schools'.

<sup>64</sup> Allen, Parameshwaran, and Nye, 'The Careers of Teach First Ambassadors Who Remain in Teaching: Job Choices, Promotion and School Quality'.

completed. Since many TF teachers move onto other careers, those that stay are likely to be those best-suited to teaching careers.

TF recruitment also comes with short-term distributional benefits for the school system, since TF recruits are placed in more deprived schools than PGCE teachers, although this effect was found to decline considerably between years 3 and 5. In spite of the fade-out as some TF recruits left teaching or moved to different schools, TF teachers who remained in service at year 5 were still more likely to be teaching in a disadvantaged school than PGCE teachers. Another distributional benefit of TF recruitment is that TF teachers are initially posted in schools across England according to need, which assists in balancing recruitment shortages in the short term. In year 3, most of the TF recruits who remained in teaching stayed in their initial placement region (at least 64 per cent in each region compared with at least 59 per cent of PGCE teachers).

Allen's study also reported similar disadvantages to TF teacher recruitment to those found in the US studies. The trade-off between recruitment and longer-term teacher retention was evident in the English scheme with a rapid shift in the retention advantage from TF to PGCE teachers from year 3 onwards, after the TF commitment was completed. By year 3, post-graduate PGCE teachers had higher retention (70-77 per cent) than TF teachers (57-63 per cent), and by year 5, the differential had increased, with post-graduate PGCE teachers at 65-68 per cent retention, undergrad PGCE teachers at 57-64 per cent, and TF teachers at 44-49 per cent.

The distributional advantages of the TF scheme also degrade after the programme's 2-year commitment. TF recruits are initially more likely to be placed in a school with a lower Ofsted grade ("requires improvement", or "inadequate") indicating a challenging context, but those who remain in teaching often migrate to schools with "good" or "outstanding" ratings and by year 5 it is PGCE teachers who are more likely to be working in schools with lower ratings. The divergence between retention in deprived schools and retention in lower-rated schools is explained by the prevalence of highly deprived schools in London and other major cities that nevertheless have strong Ofsted grades.

Similarly, the initial advantage in regional placements fades considerably over time. By year 5, 67 per cent of remaining TF teachers had left the East of England (38 per cent PGCE), 50 per cent had left the East Midlands (45 per cent PGCE) and 48 per cent had left Yorkshire & the Humber (40 per cent PGCE). There were insufficient remaining TF teachers in NE, SE, and SW England to compute a statistic (36 per cent or less of remaining PGCE teachers had left).

In a recent follow-up study using a similar methodology of comparisons with similar 'matched' teachers from traditional routes, McLean & Worth (2023)<sup>65</sup> confirmed Allen et al.'s finding that TF teachers in their first five years in the profession have a substantial advantage in terms of increased progression to middle and senior leadership roles compared with higher education trained recruits, and revisited the findings with respect to retention of TF teachers for more recent cohorts of TF recruits.

Retention of TF recruits was found to have improved over time but remained at least 10 percentage points lower than for teachers trained through higher education or school and employment-based routes. Comparison with matched teachers in similar schools for all cohorts from 2008/09 to 2018/19 confirmed that across the period from one to seven years after qualification, TF teachers had retention

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<sup>65</sup> McLean and Worth, 'The Progression and Retention of Teach First Teachers'.

that remained around 20 percentage points lower than that of higher education or school-based training trained teachers.

McLean & Worth (2023) also confirmed that younger TF recruits experienced the biggest reductions in retention compared with teachers from alternative training routes, while older TF recruits had a smaller retention gap when compared with other training routes.

A similar recent quasi-experimental study from the US by Reyes & Alexander (2022) analysed a cohort of over 14,000 certified teachers from higher education certification pathways (49 per cent) and alternative certification pathways of which TFA was one (51 per cent) from 2010 to 2019.<sup>66</sup> The matched groups analysis revealed that university-certified teachers stayed longer in the field than alternatively certified teachers. University-certified teachers were retained at a 73 per cent rate during a nine-year period, while only 59 per cent of alternatively certified teachers remained.

### Summary: alternative ITE

The empirical literature we have reviewed for Teach for America and Teach First is considerably more methodologically convincing than that which we found for Grow-Your-Own teacher recruitment schemes. This reflects the greater resources that have been channelled towards the elite graduate placement schemes and their persistence over time, in addition to large cohort sizes that have used comparable recruitment processes over numbers of years and across different locations within each national scheme.

To say that the evidence is stronger for graduate placement than community recruitment is not to say that this is necessarily the better approach, but rather that GYO has not been tested using methods that enable us to have confidence in its potential as a tool for improving teacher recruitment and retention in disadvantaged contexts. Some of the weaknesses in the GYO studies, and their findings of high attrition during teacher training, may be a result of the more localised nature of school policies and school funding in the US, where the GYO model has emerged. It is not known whether these weaknesses would follow through into a different policy context that could create a larger, more systematised, and better-funded scheme.

Despite the weakness of the evidence on GYO, there is a discernible pattern to the studies reviewed, and to those of the TF and TFA schemes. There is a trade-off between approaches that favour initial recruitment outcomes, regionally balanced recruitment in the short-term and pupil attainment (Teach First type schemes) and those that favour later retention and long-term distribution of teachers across the system, including regions of shortage (traditional entry routes, including GYO programmes).

Traditional entry routes have a clear advantage in terms of retention after the 2-year commitment in both the US and England, and in the regional distribution of retention across England. Much weaker evidence suggests that GYO recruitment in the US (which piggybacks on traditional ITE) may be better for retention after qualification, but that completion of training may be more problematic due to the financial and family constraints faced by GYO trainees versus other traditional trainees.

Ultimately, there is not enough high-quality literature on effectiveness of GYO programmes to guide a decision on whether to adopt this model based purely on evidence, so the context-fit for Wales may need to be a deciding factor in whether to consider piloting such a scheme and evaluating the results. The context-fit is promising in terms of the purposes for which GYO has developed, which include hard-

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<sup>66</sup> Reyes et al., 'Texas Educator Preparation Pathways Study. Policy Brief'.

to-staff schools in disadvantaged and rural areas and minority contexts which may be analogous to the need for Welsh-language medium teachers.

While over 60 countries have Teach First type schemes, others such as Scotland choose not to adopt this approach because they do not want unqualified teachers in classrooms after 6 weeks of training. The Teach First experience in England and the Teach for America experience in the US were both born from contexts that are less similar to Wales. They are essentially models designed around inner-city deprivation rather than rural isolation and treat the problem of teacher shortages as issues of volume and scale, and of quality. Locations that can be characterised as 'left behind' by economic change are the most likely to also be left behind by TF teachers as they sort themselves into preferred locations after the initial placement has ended.

### Mentoring and induction for novice teachers

There is a large literature concerning the induction of novice teachers into the profession and in particular the use of more experienced teachers as mentors to novice teachers in order to guide them and provide advice and feedback as they begin to practice and encounter challenges in the classroom. This literature provides a wealth of description and is often presented prescriptively, but much of it simply assumes that induction is an important factor that influences teacher retention, without providing evidence that this is the case.

As an illustration of the rich and detailed evidence that has been produced that relates to contexts relevant to Welsh schools, but so far falls significantly short of causal or even correlational evidence, an example of one UK-based empirical study that addresses the factors that are important in teacher retention and was located in a region of England with similarities with the Welsh context, including a rural context is outlined here. The closest policy model that we could identify to Schaefer's professional learning community was a pilot study of a programme in Cornwall titled 'Retain Early Career Retention Programme', which mainly focused on the needs of novice, in-service teachers.<sup>67</sup> This pilot study tests the feasibility and acceptability of the Retain model with 11 early career teachers in their first three years of service based in ten disadvantaged primary schools in Cornwall in the South West of England, and teaching Key Stage 1 (Years 1-2). It further provides some evidence of promise for the Retain model's theory of change.

The Retain model of early career support consisted of two one-day regional workshops and three taught professional development modules each involving 10-12 hours of learning. The modules focused on understanding and mitigating disadvantage, pedagogy and literacy, and professional teaching processes, structures, and career pathways. This learning took place within a wrapper of support including peer collaboration through learning exchange visits to other participants' schools, coaching provided by 6-8 visits from a professional instructional coach, an in-school veteran teacher designated as the programme champion, and additional learning resources and community communication channels.

There was no comparison group for this pilot study, but the programme participants demonstrated measured increases in pedagogical knowledge, self-efficacy, and research use; some of these improvements may have occurred anyway without the Retain programme due to maturation effects and/or support provided by the individual schools employing the early career teachers. This is therefore evidence of promise that the programme addresses factors important to teacher development which may in turn support teacher retention, but not evidence of the effectiveness in supporting teacher

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<sup>67</sup> Maxwell et al., 'Retain: CPD for Early Career Teachers of KS1'.

retention. Participant early career teachers also perceived that the programme was beneficial to their professional and career development, helped them to support the learning of disadvantaged pupils, and none of the participants left the teaching profession during the pilot.

The programme was positively received by the host schools, although some identified that improvements could be made in communication with them about the programme, and there was some variation in how well the early career teachers were able to put their learning into practice in schools that used more prescriptive teaching and learning policies or were less open to trying out new approaches. The final point of development for the programme was that recruitment fell slightly short of the target, suggesting that scaling-up of the approach could be challenging, which would have knock-on effects on programme costs; these were £13,879 per early career teacher in the pilot, but with potential for economies of scale across larger cohorts of teachers. The programme was considered suitable for impact evaluation by its independent pilot evaluators.

This example illustrates how useful insights for policy makers looking for approaches to trial in their local contexts exist outside of the studies we have reviewed below, which provide evidence of outcome comparisons for induction and mentoring efforts.

## Mentoring and induction

For mentoring and induction, we found:

- 4 narrative reviews
- 4 meta-analyses
- 1 causal study

The outcomes studied in the literature on induction and mentoring of novice teachers have primarily been those of pupil attainment, teacher retention and proxies for future retention such as teacher satisfaction and self-efficacy (confidence in one's ability to teach effectively). There have been four attempts to undertake meta-analysis of studies with these outcomes as well as one prominent causal experimental study of the effects on pupil attainment and teacher retention.

The earliest meta-analysis of induction and mentoring by Strong (2005) found positive effects on teacher retention but cautioned about the quality of the evidence reviewed which revealed a dearth of quasi-experimental and causal studies.<sup>68</sup> Correlational evidence often did not present any convincing counterfactual comparison for the induction practices that were studied. In a subsequent review of 20 correlational studies focused on special education teachers, Griffin (2010) also found positive effects of induction efforts on teacher retention.<sup>69</sup>

Following this early correlational evidence, Glazerman (2010) provided the first experimental study (and to date the only one found) which considered the comprehensiveness of teacher induction programmes and their effects of teacher retention and pupil outcomes.<sup>70</sup> Induction was classified into either 'comprehensive induction programme' or 'basic induction support', the latter signifying a 'mentor only' induction. The features of the 'comprehensive' programme were a duration of 1-2 years, mentors who were trained for this function and employed full-time on mentoring, observation of experienced

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<sup>68</sup> Strong, 'Teacher Induction, Mentoring, and Retention'.

<sup>69</sup> Griffin, 'A Summary of Research for Educational Leaders on the Induction of Beginning Special Educators'.

<sup>70</sup> Glazerman et al., 'Impacts of Comprehensive Teacher Induction'.

teachers in the classroom, monthly professional development activities, and summative training at the end of the year.

The experiment was large in scale, spanning thirteen US states and teachers were allocated randomly to either the comprehensive induction programme or the basic mentoring group that was more typical of 'business as usual' teacher induction. The results of this trial were mixed, finding no effect on teacher retention or job satisfaction, and no effect on pupil attainment during the first two years of teaching in which induction activities took place, but small positive effects on pupil reading and maths attainment in year 3 after the induction had completed (effect size: 0.11 reading and 0.20 maths).

Kraft et al. (2018) conducted a further meta-analysis of 60 studies that focused on primary school teachers' instructional outcomes and pupil attainment in literacy.<sup>71</sup> This review found small to medium effects of mentoring for novice teachers but did not consider teacher retention and noted a need for larger studies to improve the quality of the evidence on mentoring. The most recent meta-analytic review by Keese et al. (2022) set itself the task of reviewing studies conducted since (and including) the 2010 Glazerman experiment to update the evidence on the effects of induction on pupil and teacher outcomes.<sup>72</sup>

The Keese review found 6 studies of induction 'interventions' and 11 correlational studies which were capable of yielding effect sizes for their meta-analysis. Overall, 14 of these studies were from the US, 2 from the Netherlands and 1 from Israel. Small positive effects of induction averaged across three categories of outcome were found for the intervention studies (pooled effect size: 0.17) and the correlational studies (pooled effect size: 0.27). The three categories of outcome studied were teacher retention, other teacher outcomes such as satisfaction and efficacy or quality of instruction, and pupil outcomes. The effects of induction were found not to differ according to these three outcome types.

The finding from Glazerman that outcomes were not different for mentoring versus comprehensive induction comprising multiple components still held among the newer studies. However, it's important to note that in the US context that dominated the studies in the review, some components of comprehensive induction were rarely found. For example, Ingersoll & Smith (2004) reported that only 1 in 10 novice teachers received reduced teaching timetables compared with more experienced colleagues, and fewer than 1 in 3 novice teachers had a teaching assistant to work with in their classrooms.<sup>73</sup>

Keese et al. (2022) reported that within the studies they reviewed, those that focused on novice teachers with the fewest years of teaching experience provided the largest effects of induction.<sup>74</sup> This makes sense in that the need for support and development is most acute when teachers first enter the classroom. The authors also noted that the control groups in the studies they reviewed rarely provided no support at all to novice teachers, so the effects measured were not of 'no induction' versus 'induction', but rather of 'more support' versus 'less support'. Common practice in schools and ethical considerations stood in the way of measuring the full effects of induction.

Keese also noted that some otherwise useful studies were not able to be incorporated into their meta-analysis because they did not report all the information needed to compute effect sizes for induction on a consistent basis. This resulted in some 'missing effects' in the analysis. Examples cited of insights from

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<sup>71</sup> Kraft, Blazar, and Hogan, 'The Effect of Teacher Coaching on Instruction and Achievement'.

<sup>72</sup> Keese et al., 'A Worthwhile Endeavor?'; Glazerman et al., 'Impacts of Comprehensive Teacher Induction'.

<sup>73</sup> Ingersoll and Smith, 'Do Teacher Induction and Mentoring Matter?'

<sup>74</sup> Keese et al., 'A Worthwhile Endeavor?'

these excluded studies included positive effects of common planning time for novice teachers and their more experienced colleagues, and of extra classroom assistance from teaching support staff (Kang & Berliner, 2012).<sup>75</sup> Positive effects on the delivery of mentoring for novice teachers when financial stipends were offered to mentors were reported by Freemyer (2010); these effects were measured by how often mentors met with their novice mentees.<sup>76</sup>

Bickmore & Bickmore (2010) found effects on various outcomes for different specific components of induction, including initial orientation to the recruiting school, administrative support for novice teachers, and contact with a range of experienced peer teachers of the same subject or year group.<sup>77</sup> The author concluded that different components of induction met different needs of novice teachers. Finally, Keese noted that qualitative (narrative) studies that were excluded from their review raised further issues such as the importance of the quality of mentors and of structured observation and feedback sessions to the success of mentoring programmes (Grossman, 2012).<sup>78</sup>

Other narrative evidence reviewed for this report focused on perceptions of what contributes to successful induction programmes. For example, Anthony (2009) describes recommendations including sessions aimed at assisting novice teachers with classroom management; opportunities for cooperative activities with other teachers during program sessions; and yearly opportunities for feedback by teachers about the program and its components.<sup>79</sup> Helfeldt et al. (2009) describes the stages of development that are included in comprehensive induction programmes, beginning with building understanding of the rationale for teaching practices included and their theoretical underpinning, and progressing to observation of experienced teachers modelling and demonstrating these instructional practices, and finally to working with peer coaches or mentor to apply and generalise new teaching knowledge and skills.<sup>80</sup>

Overall, these studies have produced a mixed picture of the effects of induction, and stronger evidence for the use of mentoring, which will require further causal studies to resolve into a clear understanding of the potential of these approaches to supporting teacher development and retention. The highest quality study to date contradicted earlier and subsequent correlational evidence.

## Summary: mentoring and induction

The complex and mixed picture emerging from research into induction and mentoring outcomes is summarised by See et al. (2020) who concluded that since induction and mentoring programmes are (or at least can be) complex multi-faceted programmes of activity with multiple aims, it is highly challenging for researchers to disentangle the effects of individual components of induction, such as its duration and intensity, the training and time allocated to mentors, and provision of professional development activities.<sup>81</sup> It is for this reason that the studies reviewed have not been successful so far in understanding which mechanisms (if any) are effective in improving the retention of novice teachers.

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<sup>75</sup> Kang and Berliner, 'Characteristics of Teacher Induction Programs and Turnover Rates of Beginning Teachers'.

<sup>76</sup> Freemyer et al., 'Report Card on the Unfunded Mentoring Program in Indiana'.

<sup>77</sup> Bickmore and Bickmore, 'A Multifaceted Approach to Teacher Induction'.

<sup>78</sup> Grossman et al., 'Learning to Teach in New York City'.

<sup>79</sup> Anthony, 'Teacher Retention'.

<sup>80</sup> Helfeldt et al., 'An Urban Schools–University Partnership That Prepares and Retains Quality Teachers for "High Need" Schools'.

<sup>81</sup> See et al., 'Teacher Recruitment and Retention'.

In addition to this uncompleted task of unpicking the effects on retention, there were not any studies that clearly identified effects of induction and mentoring offers on teacher recruitment. This has been particularly relevant to recent policy in England which seeks to combine an early career induction and professional development offer for novice teachers during their first two years in the classroom with other policies such as workload reduction and greater job flexibility in teaching to tackle longstanding and stubborn problems of teacher recruitment and retention shortages. It is too soon for this policy evolution to provide any clear learning that could be useful in the Welsh context and indeed unclear to what extent some other aspects of the strategy have even been implemented, as noted by See et al. in their review of the highest quality studies on strategies to improve teacher attraction and retention.

A further conclusion from the studies reviewed here is that no single best model of novice teacher induction has emerged, and it seems unlikely that one best approach is waiting to be uncovered, given the multi-faceted aims and components noted above. Rather, it is likely to remain a question for policy makers of selecting what appears to be the best options according to the local school and societal context, within the available budgetary envelope, and considering the particular policy aims and challenges in hand.

It is not at all clear, for example, that one would select the same options from amongst the current evidence base in the Welsh context where ITE is primarily consecutive and provided by higher education institutions that one might select in the English or American context where ITE is much more fragmented and varied. It is also not clear from the evidence that one would select the same options for induction of novice teachers in deprived and densely populated inner-city contexts as one would select in isolated rural contexts where physical attendance at induction activities organised across different schools would be much more challenging to deliver. Nor is it clear that one would select the same induction options for smaller more specialised cohorts of novice teachers such as Welsh language teachers or secondary maths and science teachers as one would select for larger more general cohorts such as English-medium primary teacher cohorts.

Unfortunately, the evidence base on induction remains some distance from being capable of guiding policy makers towards one approach rather than another in each context. It is further from this goal than was the case for alternative ITE pathways. We are left with the familiar - but somewhat unhelpful to policy-makers – conclusion that a significant breadth of further quasi-experimental or experimental studies are needed to settle these questions. In the meantime, policy makers are best advised to proceed with caution and to develop pilots of their preferred approaches, which should be evaluated to make decisions about national-scale policy. We know that design and implementation are important for securing improved outcomes but disappointingly little about how to achieve this.

## Financial incentives

In this chapter, we review the empirical evidence on the effect of financial incentives on improving recruitment and retention outcomes. Considering the particular challenges faced in Wales, we place particular emphasis on efforts to improve recruitment and retention at disadvantaged schools and in rural areas. We also analyse the relevance of this evidence to the specific Welsh context.

The recruitment and retention outcomes used across these different papers can often be quite different, and the measured effect on these outcomes can reflect the context and level of that outcome in the area question. For comparability, we therefore often focus on the 'elasticity' of particular outcomes with respect to salary changes or financial incentives. This is the expected percentage change in a particular outcome, given a 1 per cent change in salary. For example, an elasticity of 3 for teacher attrition with respect to financial incentives implies that a 10 per cent salary supplement is expected to deliver a 30 per cent reduction in teacher attrition (note this is not a 30 percentage point reduction in teacher attrition).

The full details of the literature review approach and papers included are detailed within the Appendix.

### Effects on recruitment

The evidence on recruitment can be broadly separated out into papers that examine the effectiveness of financial incentives to attract teachers to high-poverty or disadvantaged schools (6 papers) and financial incentives to attract teachers to more rural areas (2 papers).

### Disadvantaged schools

The most widely cited paper relates to the California Graduate Teacher Fellowship scheme.<sup>82</sup> Graduates were invited to apply to the scheme, with successful applicants determined by academic achievements and successful potential. It was highly selective and there was large amount of prestige associated with being selected. If successful, teachers were eligible for a total \$20,000 or 15 per cent salary bonus if they taught in high-poverty schools for a period of 4 years after graduating, with the bonus withdrawn pro-rata if they taught in other schools during that period. Empirical evaluations of this have shown that it increased willingness to teacher in disadvantaged schools by 28 percentage points during the bonus period. This equates to a relatively high elasticity of 3.6 for teacher recruitment relative to salary levels. This evaluation also found that retention of teachers on this scheme was similar to that of other teachers. This is encouraging as it suggests that teachers on the scheme did not suddenly exit high-poverty schools after the bonus period.

Another scheme in California sought to provide higher increases in overall teacher salaries, as well as bonuses worth about 10 per cent of annual salaries to teach in more disadvantaged schools. Evidence shows that the increases in teacher salaries improved the number and quality of applicants to teaching posts, but the bonuses of about \$2,000 (4-5 per cent of salary) to teach in more disadvantaged schools were not that effective.<sup>83</sup> However, this study was conducted in the context of the Great Recession (2008-2009) when retention rates were generally high across the teaching profession.

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<sup>82</sup> Steele, Murnane, and Willett, 'Do Financial Incentives Help Low-Performing Schools Attract and Keep Academically Talented Teachers?'

<sup>83</sup> Hough and Loeb, 'Can a District-Level Teacher Salary Incentive Policy Improve Teacher Recruitment and Retention?'

In France, small bonuses worth about 2-2.5 per cent were offered to teachers in high-poverty areas in the early 1990s. However, there is no evidence that these improved recruitment or retention levels.<sup>84</sup> There were some small reductions in teacher turnover amongst less experienced teachers, but there were some increases amongst more experienced teachers. This evidence points to some caution in using relatively small bonuses, but maybe also greater sensitivity of younger and less experienced teachers to financial incentives.

In Washington, policymakers offered teachers in high-poverty schools a \$5,000 bonus (equivalent to 7 per cent of annual salary) if they became “board-certified.” Achieving a National Board Certification is a significant professional achievement for teachers in the US and is potentially available to all teachers during their career. It requires teachers to go through specific training and assessment modules. Evidence shows that these incentives increased hires and board-certifications rates, and reduced turnover.<sup>85</sup> Indeed, the elasticity of turnover with respect to the size of the bonus (relative to base salary) is relatively high at about 4.3-5.7. However, there is little evidence that the programme improved pupil attainment. Whilst there is no real equivalent for this scheme in Wales, it is notable that a relatively small bonus for achieving a respected professional standard acted as a significant incentive for teachers in this scheme.

A multi-site Randomised Controlled Trial across the US sought to attract existing “highly effective” teachers to high-poverty and hard-to-staff schools. In particular, the Talent Transfer Initiative (TTI) offered \$20,000 to the 20 per cent most effective teachers in school districts (as defined by average pupil value-added) if they moved and stayed at low test-score schools. The evidence on this scheme is mostly positive.<sup>86</sup> About 90 per cent of targeted vacancies were filled with teachers on the TTI scheme. These vacancies would have been much harder to fill without these additional teachers. As with the California Graduate Teacher Fellowship, retention rates also looked similar to those of existing teachers. There is also evidence of significant effects on maths and reading scores (ranging from effects between 0.1 and 0.25 standard deviations).

## Rural areas

Our search only yielded two papers examining incentives to teach in rural areas. This included one paper from Norway where teachers were offered 10 per cent salary supplements for teaching in northern parts of the country. This has been shown to have improved recruitment by about 30 per cent.<sup>87</sup>

In a very different scheme in South Carolina, rural school districts were given extra funding and autonomy to improve recruitment and retention. However, this only delivered a 1 percentage point reduction in teacher turnover.<sup>88</sup> This may be explained by the small level and uncertainty of funding levels each year. Partly because of this uncertainty, most districts ended up spending funding on short-term fixes, e.g., international teachers and branding materials. This does not necessarily imply that local autonomy is a bad thing, but it does imply that devolving low amounts of uncertain funding is likely to be an ineffective strategy.

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<sup>84</sup> Prost, ‘Teacher Mobility’.

<sup>85</sup> Cowan and Goldhaber, ‘Do Bonuses Affect Teacher Staffing and Student Achievement in High Poverty Schools?’

<sup>86</sup> Glazerman et al., ‘Transfer Incentives for High-Performing Teachers’.

<sup>87</sup> Falch, ‘Wages and Recruitment’.

<sup>88</sup> Tran, Babaei-Balderlou, and Smith, ‘The Promises and Pitfalls of Government-Funded Teacher Staffing Initiatives on Teacher Employment in Hard-to-Staff Schools’.

## Summary

In summary, there is quite a lot of heterogeneity in the implementation and design of incentive schemes targeted at recruitment outcomes in disadvantaged schools or areas. There are three papers showing positive effects on recruitment outcomes, with all of these relating to schemes targeted existing high-performing or high-potential teachers, including high-achieving graduates, highly effective teachers and those seeking board certification. Schemes with smaller bonuses also seemed to have little effect.

There is much thinner evidence on attracting teachers to rural areas, with one encouraging paper on recruitment incentives in Norway. However, there is also cautionary evidence from South Carolina on the pitfalls of small schemes with high levels of funding uncertainty.

Finally, it is possible that targeted financial incentives could have negative effects on morale amongst teachers who don't receive incentives, particularly if there are differences within school. Unfortunately, this is not an issue that has been investigated with any robustness within the literature to date.

## Effects on retention

There is a wider and more consistent literature on the effects of financial incentives on retention outcomes, both in terms of consistent design and consistent effects. This literature is also already well summarised in two recent reviews. Sims (2018) reviews the literature (including 4 papers listed in Table 3 and finds that the elasticity of exits with respect to salary ranges from 2.5 to 3.4, with a mean effect of 3.1).<sup>89</sup> This implies that a 10 per cent salary supplement would be expected to reduce teacher attrition by about 30 per cent. See et al undertook a systematic review of financial incentives to improve retention outcomes.<sup>90</sup> They found that most studies show positive effects of financial incentives on retention outcomes whilst the incentives are in place. They found no evidence of a lasting effect once incentives are removed, but expecting such an effect would be a strong test of effectiveness.

The specific papers listed in Table 3 (in the appendix) are consistent with these summaries of the evidence in these two reviews. This is largely because almost all these papers are included as part of these reviews. However, it is worth expanding slightly on the overall effects to gain greater insights on the mechanisms driving the effects and relevance to the Welsh context.

The most widely cited paper relates to the North Carolina scheme offering incentives worth 4-5 per cent of salaries to teachers in shortage subjects (maths, science, and special educational needs) who taught in high poverty schools. This has been found to reduce turnover by about 17 per cent, equating to an elasticity of turnover to salary of about 3.8.<sup>91</sup>

A scheme in Florida in the early 2000s offered bonuses and student loan forgiveness to teachers in shortage subjects (maths and science). These bonuses, worth about 3-3.5 per cent of salary, have been found to reduce attrition by about 10 per cent, equating to an elasticity of attrition between 2.5 and 3.4.<sup>92</sup> A similar scheme in Georgia paid bonuses worth about 10 per cent of salary to maths and science teachers. This has been found to reduce attrition by more than 30 per cent, equating to an elasticity of attrition to salary of 3.5.

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<sup>89</sup> Sims, 'What Happens When You Pay Shortage-Subject Teachers More Money? Simulating the Effect of Early-Career Salary Supplements on Teacher Supply in England'.

<sup>90</sup> See, Morris, Gorard, and El Soufi, 'What Works in Attracting and Retaining Teachers in Challenging Schools and Areas?'

<sup>91</sup> Clotfelter et al., 'Would Higher Salaries Keep Teachers in High-Poverty Schools?'

<sup>92</sup> Feng and Sass, 'The Impact of Incentives to Recruit and Retain Teachers in "Hard-to-Staff" Subjects'.

In Tennessee, policymakers offered highly effective teachers 10 per cent salary supplements if they taught in high-poverty schools. This has been found to reduce attrition by about 20 per cent, equating to an elasticity of about 2.<sup>93</sup> This is the lowest elasticity found across studies focused on retention but is still sizeable.

In England, policymakers have also recently implemented financial incentives to improve retention amongst early-career teachers in shortage subjects in disadvantaged areas. In 2018-19 and 2019-20, physics and maths early-career teachers (less than 5 years of experience) were offered payments of £2,000 after tax (or 8 per cent of salary) if they taught these subjects in one of 39 disadvantaged local authorities (mainly in the North East of England and Yorkshire). In a recent working paper, evidence shows that these payments reduced attrition amongst eligible teachers by about 23 per cent, equating to an elasticity of attrition to salary of about 3.<sup>94</sup>

More recently, policymakers in England have extended this scheme. Maths teachers who completed their teacher training in 2019 or 2020 were eligible to receive payments worth £5,000 if they remained teaching in a state-funded school in England in their 3rd and 5th years after training. This was increased to £7,500 if they were teaching in one of 39 disadvantaged areas. These payments have since been decreased to £2,000, but also now apply to maths, physics, chemistry, and language teachers, with £3,000 payments in disadvantaged areas. As this scheme is new and still ongoing, there is not yet any evidence on effectiveness.

By way of comparison, there is also evidence from a similar scheme in Brazil, which offered wage increases of 24-36 per cent for teachers in high-poverty schools. This scheme was found to have smaller effects, with implied elasticities of less than one for attrition with respect to salary.<sup>95</sup>

As noted above, several schemes focused on recruitment also examined retention outcomes, with mostly positive results where incentives schemes were substantive (more than 5 per cent of salary). In Washington, financial incentives for board certified teachers led to reduced turnover, with implied elasticities of more than 4.<sup>96</sup> In the California and multi-state TTI schemes, there was no evidence of high attrition of eligible teachers once the incentives ended.<sup>97</sup> In cases of much smaller incentives in France and South Carolina (less than 3 per cent), there was little evidence of improvements in retention outcomes.<sup>98</sup>

In summary, there is convincing evidence showing that financial incentives can improve retention outcomes. The range of evidence suggests an elasticity of reduced turnover and attrition with respect to salary ranging from about 2 to 4, with a central range of about 3-3.5. These are sizeable effects, given that an elasticity of 3 would imply that a 10 per cent incentive would deliver a 30 per cent reduction in teacher turnover or attrition. Most of the evidence is US-based. However, a recent working paper for England comes to extremely similar conclusions, with an implied elasticity of 3.1. This is highly relevant to the Welsh context given the similarity in institutional structures. The main caveat is that small

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<sup>93</sup> Springer, Swain, and Rodriguez, 'Effective Teacher Retention Bonuses'; Swain, Rodriguez, and Springer, 'Selective Retention Bonuses for Highly Effective Teachers in High Poverty Schools'.

<sup>94</sup> Sims and Benhenda, 'The Effect of Financial Incentives on the Retention of Shortage-Subject Teachers'.

<sup>95</sup> Camelo and Ponczek, 'Teacher Turnover and Financial Incentives in Underprivileged Schools'.

<sup>96</sup> Cowan and Goldhaber, 'Do Bonuses Affect Teacher Staffing and Student Achievement in High Poverty Schools?'

<sup>97</sup> Glazer et al., 'Transfer Incentives for High-Performing Teachers'; Steele, Murnane, and Willett, 'Do Financial Incentives Help Low-Performing Schools Attract and Keep Academically Talented Teachers?'

<sup>98</sup> Prost, 'Teacher Mobility'; Tran, Babaei-Balderlou, and Smith, 'The Promises and Pitfalls of Government-Funded Teacher Staffing Initiatives on Teacher Employment in Hard-to-Staff Schools'.

incentives (of about 1-3 per cent) seem to have little effect. Most of the effect schemes use incentives worth about 5-10 per cent of base salary.

## Pupil outcomes

A small number of studies trace the impact of financial incentives all the way through to their impact on pupil attainment. In Tennessee, financial incentives for highly effective teachers were found to improve maths and reading scores by between 0.06 and 0.12 standard deviations.<sup>99</sup> The Talent Transfer Initiative improved test scores by 0.1-0.25 standard deviations.<sup>100</sup> However, in the case of the board-certification incentives in Washington, there was little evidence of an effect of the financial incentives on pupil attainment.<sup>101</sup> The study for Brazil found no evidence of an effect of financial incentives on average attainment, but did find positive effects on pupil attainment amongst low-income families.<sup>102</sup>

## Summary: financial incentives

There appears to be a consistent and robust body of evidence pointing to the effectiveness of financial incentives as a means to improve retention outcomes. The elasticity of retention outcomes with respect to financial incentives varies from about 2 to 4, with a central range of about 3-3.5. This is seen across multiple contexts, including a highly relevant recent scheme in England. Indeed, the estimated elasticity of 3 for England closes matches the US evidence.

The level of financial incentives in these successful schemes has generally been about 5-10 per cent of gross salary. They have often been targeted at teachers in shortage subjects, and sometimes specifically focused on disadvantaged schools or areas. They are also often targeted at less experienced teachers, which ties in with other evidence showing that younger and less experienced teachers are generally more sensitive to financial incentives.<sup>103</sup>

This body of evidence therefore suggests there could be benefits to introducing similar financial incentives in Wales. There are sustained problems recruiting and retaining enough teachers in maths, science, languages and Welsh-medium teachers, and generally greater problems in more disadvantaged areas. There is also a natural comparison with England, given the existence of financial payments for early career teachers in shortage subjects and higher payments in disadvantaged areas. Focusing incentives on early career teachers (e.g., in the first 5 years of teaching) would also make such a policy relatively inexpensive. A scheme focused on shortage subjects and on more disadvantaged areas would also be relatively easy to evaluate. The existing study for England shows how this can be done using differences across subjects, years, areas, and specific teachers over time.

Unfortunately, the evidence of effects on teacher recruitment is not as strong or consistent. There are not as many studies, those that do exist sometimes find relatively small effects and there is less consistency in implementation. The evidence that does exist suggests there would probably be a positive effect of financial incentives to attract more teachers to disadvantaged schools, but there is quite a bit of uncertainty. The evidence on using financial incentives to attract teachers to rural areas is even less developed. This is unfortunate given the evidence of problems in more rural areas of Wales.

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<sup>99</sup> Swain, Rodriguez, and Springer, 'Selective Retention Bonuses for Highly Effective Teachers in High Poverty Schools'.

<sup>100</sup> Glazerman et al., 'Transfer Incentives for High-Performing Teachers'.

<sup>101</sup> Cowan and Goldhaber, 'Do Bonuses Affect Teacher Staffing and Student Achievement in High Poverty Schools?'

<sup>102</sup> Camelo and Ponczek, 'Teacher Turnover and Financial Incentives in Underprivileged Schools'.

<sup>103</sup> Hendricks, 'Does It Pay to Pay Teachers More?'

Whilst the evidence on the desirability of financial incentives to improve retention outcomes is strong and positive, it is also important to be upfront that the potential effects are likely to be modest in the context of the overall teacher labour market. Effects would be concentrated on a relatively small groups of teachers. This creates a natural interest in how financial incentives could be combined with wider sets of incentives and policies.

## Conclusions and policy implications

The aim of this report was to review the potential for policymakers to use financial incentives and wider forms of support to recruit and retain teachers in hard-to-staff areas in Wales. This was particularly focused on disadvantaged schools and areas as part of the national mission to reduce the attainment gap between rich and poor, but it was also focused on hard-to-staff areas in a broader sense, such as rural areas, shortage subjects and Welsh-medium posts. At the end of this section, we list our specific recommendations.

Our brief review of the data on the state of the teacher labour market in Wales illustrated some positive, as well as some worrying trends. On the positive side, teacher attrition is relatively low at the national level, with about four per cent of teachers leaving their jobs each year. This is significantly lower than the 9-10 per cent seen in England. This may be partly explained by the teaching workforce being younger and less experienced in England. There is also a buoyant labour market for primary school teachers in Wales. Recruitment has risen, including Welsh-medium teachers, and there is not much evidence of difficulties filling posts.

The picture is more worrying in secondary schools, with missed recruitment targets and particular difficulties recruiting and retaining maths, science, languages, and Welsh-medium teachers. These problems appear more acute in disadvantaged areas in the Valleys, but also parts of North Wales and in more rural, isolated areas.

As part of this brief review, we recommend some improvements in published data to enable greater insights into the state and variation in the teacher labour market across Wales. We recommend publishing data on retention levels by individual years of teacher experience to show how many teachers are leaving early in their career. This may help illustrate any problems and aid the targeting of policy. We also recommend publishing data on how teacher recruitment and retention outcomes vary across schools by overall levels of socio-economic disadvantage (e.g., groups defined by the share of pupils eligible for FSM). This will contribute towards understanding the potential effects of difficulties recruiting and retaining teachers on the disadvantage gap.

One of the most natural policy responses to difficulties recruiting and retaining teachers in particular areas and subjects is the provision of targeted salary supplements or financial incentives. Fortunately, there is now a well-developed academic literature on this topic. This shows that targeted salary supplements can lead to significant improvements in teacher retention. Successful schemes in this area have been seen across a range of country contexts. They have normally provided incentives worth 5-10 per cent of base salary and have generally been focused on early career teachers in shortage subjects, which links to wider evidence suggesting that teachers are more sensitive to financial incentives early in their career. They have also often been focused on disadvantaged schools or areas.

The evidence on recruitment effects is thinner and there is less consistency, both in the design of schemes and their estimated effects. What evidence there is suggests that financial incentives to attract teachers to disadvantaged schools will probably have a positive effect, but there is uncertainty in predicting the likely effects. The evidence on recruiting more teachers to rural areas is even thinner, with only one paper with reasonably sized incentives, though this does suggest positive effects.

Based on this evidence on financial incentives, we recommend that the Welsh Government introduce salary supplements worth 5-10 per cent of base salary for early career teachers in shortage subjects in

secondary schools. The set of subjects covered would need to be defined, but would likely need to cover maths, science, languages, and Welsh-medium teachers. It would probably be best focused on teachers in the first five years of their teaching career. There would also be significant merits in providing higher incentives for teachers in hard-to-staff areas, particularly disadvantaged schools, or areas. Based on the evidence, such a scheme is highly likely to have positive effects on retention outcomes, and maybe recruitment too. It will be relatively inexpensive and would represent significant value-for-money. There is also a natural comparator scheme in England, which could already be affecting the teacher labour market in Wales. Such a scheme with targeting on areas, subjects and early career teachers would also be easy to evaluate, with many examples in the academic literature.

Whilst there are likely to be significant merits to targeted financial incentives, the impacts are still likely to be modest in the context of the overall teacher labour market in Wales. There is also a need to consider wider ways to improve recruitment, particularly in disadvantaged and more rural areas. We therefore also reviewed the literature on wider forms of support and incentives, with a particular focus on ways to encourage and support more teacher during their training and early in their career. Unfortunately, the evidence is not as robust or well-developed as on financial incentives, with fewer papers with good quality research designs and much less consistency in implementation. There are still clear conclusions on policy packages that would be fruitful to trial in a Welsh context. The evidence reviewed covered ITE programmes, marketing approaches, alternative forms of ITE and mentoring/induction.

ITE programs often incorporate several approaches and measuring the effectiveness of each approach is therefore a challenge. For this reason, the review was unable to uncover any causal evidence revealing the impact ITE programs had on recruitment and retention figures. However, authors who have studied attempts to improve teacher recruitment in contexts that have features in common with Wales have recommended embedding social justice content into the curriculum, the value of professional experience placements, and creating supportive cross-institutional partnerships. Further study of the experience of graduates in the first five years of their career could help to identify subject areas and locations that are experiencing higher levels of attrition to support context-specific teacher preparation.

Marketing approaches should focus on highlighting both material and non-material incentives to attract qualified teachers, and support retention by providing transparent and accurate information about the benefits and challenges associated with working in hard-to-staff schools. Small-scale initiatives are useful for ensuring accurate information is available and there is strong evidence that realistic job profiles (RJPs) are an effective web-based marketing tool across other industries. However, the evidence from the education sector is thin and further trials to get this right would be needed.

There are generally two approaches for alternative forms of ITE: top-down placement schemes, like Teach First and Teach for America, and bottom-up community and place-based approaches referred to as “grow your own” schemes. The evidence is much more well developed and methodologically convincing for Teach First type schemes. This reflects the greater resources that have been channelled towards the elite graduate placement schemes and their persistence over time, in addition to large cohort sizes that have used comparable recruitment processes over numbers of years and across different locations within each national scheme. This evidence generally finds positive impacts on pupil attainment, though schemes are often characterised by high levels of teacher attrition and mobility too. These findings mean that a placement scheme may be helpful in filling short-term teacher shortages quickly, but in order to tackle the problem of unequal shortages in different parts of Wales, it is likely

that other strategies would be needed, focusing on improving traditional HE-based teacher training, and "grow your own" schemes to address this different aspect of the shortages, and to improve teacher retention. There is no reason that both approaches could not be used together to address different aspects of the problem.

GYO schemes have significant promise for the Welsh context. They have often focused on hard-to-staff schools in disadvantaged and rural areas. Unfortunately, however, there is not enough high-quality literature on the effectiveness of GYO programmes to guide a decision on whether to adopt this model based purely on current evidence. This mainly reflects the fact that GYO schemes have not yet been tested using methods that enable us to have confidence in its potential as a tool for improving teacher recruitment and retention in disadvantaged contexts. Some of the weaknesses in the GYO studies, and their findings of high attrition during teacher training, may be a result of the more localised nature of school policies and school funding in the US, where the GYO model has emerged. It is not known whether these weaknesses would follow through into a different policy context that could create a larger, more systematised, and better-funded scheme.

The evidence is also relatively inconclusive on teacher mentoring and induction. Based on the studies we reviewed, there appears to be no single best model of novice teacher induction. Furthermore, it seems unlikely that one best approach is waiting to be uncovered, given the multi-faceted aims and components noted above. Rather, it is likely to remain a question for policy makers of selecting what appears to be the best options according to the local school and societal context, within the available budgetary envelope, and considering the particular policy aims and challenges in hand.

When it comes to wider forms of support and incentives, the evidence base is not strong enough to guide policymakers to a single approach. We are instead left with the familiar conclusion that a significant breadth of further quasi-experimental or experimental studies are needed to settle these questions. In the meantime, policy makers are best advised to proceed with caution and to develop pilots of their preferred approaches, which should be evaluated to make decisions about national-scale policy. Our view is that focusing on a well-designed, funded, and supported GYO scheme would be a natural starting point, given the Welsh context. There is also significant merit in trialling RJs with individual schools and contexts to see if they can be made to work well in education contexts.

## Recommendations

### Improvements to data and evidence:

- We recommend publishing data on retention levels by individual years of teacher experience to show how many teachers are leaving early in their career.
- We recommend publishing data on how teacher recruitment and retention outcomes vary across schools by overall levels of socio-economic disadvantage (e.g., groups defined by the share of pupils eligible for FSM).

### Use of non-financial incentives

- We recommend the Welsh Government develop a well-designed, funded and supported Grow Your Own (GYO) pilot scheme. GYO schemes have significant promise for the Welsh context. They have often focused on hard-to-staff schools in disadvantaged and rural areas. Unfortunately, however, there is not enough high-quality literature on the effectiveness of GYO

programmes to guide a decision on whether to adopt this model based purely on current evidence.

- We recommend that the Welsh Government trial 'Realistic Job Profiles' with individual schools and contexts to see if they can be made to work well in education contexts. These approaches should highlight both material and non-material incentives to attract qualified teachers, and support retention by providing transparent and accurate information about the benefits and challenges associated with working in hard-to-staff schools.
- We recommend further research on the best ways to support teachers during ITE, and through mentoring and induction of new teachers. There appears to be no single best model of novice teacher induction. It is likely to remain a question for policy makers of selecting what appears to be the best options according to the local school, policy, and societal context. Further study of the experience of graduates in the first five years of their career could also help to identify subject areas and locations that are experiencing higher levels of attrition to support context-specific teacher preparation.

### Use of financial incentives

- We recommend that the Welsh Government introduce salary supplements worth 5-10 per cent of base salary for early career teachers in shortage subjects in secondary schools. The set of subjects covered would need to be defined, but would likely need to cover maths, science, languages, and Welsh-medium teachers. It would probably be best focused on teachers in the first five years of their teaching career. There would also be significant merits in providing higher incentives for teachers in hard-to-staff areas, particularly disadvantaged schools, or areas.

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## Appendix A: List of studies

Table 1: Summary of studies of background and themes for non-financial incentives

Paper (authors, year, place, publication)	Nature of study	Focus	Outcomes
Cooper & Alvarado (2006, various locations), IAE & IIEP	Policy-focused narrative review of teacher preparation, recruitment & retention	Shortage locations	Recruitment; Retention
Hulme & Wood (2022, NW England and Scotland), JFHE	Comparative survey of early career teachers on ITE, induction, working conditions and school context	Universal within the two regions	Job satisfaction; Development needs; Career Intentions
Schaefer et al. (2012, various locations), AJER	Narrative review of individual and contextual factors and their association with retaining and 'sustaining' teachers	Shortage locations	Retention; Social support; Professional development
Maxwell et al. (2018, Cornwall), EEF	Pilot evaluation of the Retain teacher professional development programme; no comparison group	Disadvantaged; Rural	Knowledge; Self-efficacy; Research use
Cuervo & Acquaro (2018, Australia), APJTE	Comparative study on the motivations and barriers to teaching in rural schools.	Rural;	Recruitment
Martin (2022, Australia), UW	Literature review on factors that influence rural teacher retention.	Rural	Retention
Owen, Kos & McKenzie (2008, Australia), AG	Report that forms part of the Australian School Teacher and Leader project that provides a detailed picture of the Australian teacher workforce.	Leadership	Recruitment; Retention
Green et al. (2020, Australia), APJTE	Systematic literature review on the implementation of Australian school-university partnerships and research gaps.	Rural; Cultural	ITE; Retention

Donaldson (2011, Scotland), SG	Descriptive review of available evidence on the state of teacher education in Scotland.	Leadership	ITE; Retention;
Burnett & Lampert (2019, Australia), JET	Correlational study on the Australian National Exceptional Teaching for Disadvantaged Schools programme	Disadvantaged; Rural	ITE; Recruitment
Craven et al. (2015, Canberra), TEMAG	Descriptive review of available evidence on how to improve teacher education in Australia.	Leadership	ITE Student outcomes;
Gonski et al. (2018, Canberra), DET	Descriptive review on how to improve student achievement and school performance.	Leadership	Student outcomes
Long and Danechi (2022, England), HCL	Briefing on the recruitment and retention of teachers in England.	Leadership	Recruitment; Retention
Young, Grainger & James (2018, Queensland), AJTE	Descriptive study evaluating the Coast to Country project; no comparison group.	Rural; Leadership	Recruitment; Retention
Fitzgerald (2020, Australia), IJSC	Correlational study on the impact of SEBs on the personal and professional growth of preservice teachers.	Leadership	Recruitment; Retention
Heinz & Fleming (2019, Ireland), EJER	Narrative evaluation of the NUI Galway partner school initiative; no comparison group	Leadership	Retention
The Irish Teaching Council (2011, Ireland), ITC	Policy document setting standards and best practice on the continuum of teachers' education	Leadership; Cultural	ITE
The Irish Teaching Council (2013, Ireland), ITC	Policy document setting out guidelines for school placement for ITE programmes.	School placement	ITE

Young, O'Neill & Simmie (2015, Ireland), IES	Case study on a school-university partnership involving a researcher-in-residence.	Leadership	ITE
Weldon et al. (2013, Australia), ACER	Comparative study on the effectiveness and efficiency of The School Centres for Teaching Excellence (SCTE) Initiative.	Leadership	Recruitment; Retention
Black et al. (2016, Scotland), SG	Mixed methods study evaluating the implementation and impact of 'Teaching Scotland's Future' recommendations.	Leadership	ITE
See et al. (2020 mainly US locations), Education Sciences	Review of causal evidence for various approaches to teacher recruitment and retention	Shortage locations	Recruitment; Retention
Allread (2016, Oklahoma), YC	Literature review on research and policy looking at recruitment and retention; Recommendations meant to serve as a foundation for future research.	Shortage subjects; Rural	Recruitment; Retention
Maranto & Shuls (2018, Arkansas), NREA	Content analysis of school district websites.	Disadvantage; Shortage locations; Rural	Recruitment
Ulfers (2016, Illinois), NREA	Comparative study consisting of Likert-type items measuring recruitment, retention and job satisfaction factors.	Rural	Recruitment; Retention; Job satisfaction
Liu et al. (2018, USA) IJHRM	Comparative study on how retail-jobseekers respond differently to experienced-based information.	Recruitment messages	Recruitment
Gardner et al. (2009, USA), MCQ	A mixed two factor experimental study on the effects of organisational culture, recruitment strategy	Recruitment messages	Recruitment; Retention

	and personality on attraction to Web-based profiles.		
Tran et al. (2020, South Carolina), RE	Descriptive research on the perceptions of teachers on rural teaching advantages and challenges.	Disadvantage; Rural; Cultural	Recruitment; Retention
Aragon (2016, US), ECS	Evaluative report on the teacher shortage dilemma.	Disadvantage; Shortage subjects; Rural; Leadership	Recruitment; Retention
Miller et al. (2016, US), ICHE	Report on how to attract high-achieving students to careers in education and to ensure their retention.	Leadership	Recruitment; Retention
Lane et al. (2019, England), DfE	Econometric modelling and cost effectiveness analysis on the impact and effectiveness of Your Future marketing campaign.	Marketing; Shortage subjects	Recruitment
Battiston & Conlon (2019, England), DfE	Econometric modelling and cost effectiveness analysis on the impact and effectiveness of Your Future marketing campaign.	Marketing; Shortage subjects	Recruitment
Brasche & Harrington (2012, Australia), AJE	Descriptive study evaluating the Quality Remote Teaching Service.	Rural; Cultural	Recruitment; Retention
Buckskin (2016, Australia), IEU	Systematic evaluation of the More Aboriginal and Torres Strait Islander Teachers Initiative.	Cultural; Leadership	Recruitment; Retention
University of South Australia (2011, Australia), USA	Project plan outlining the national strategy for the More Aboriginal and Torres Strait Islander Teachers Initiative.	Cultural; Leadership	Recruitment; Retention
Buckskin (2015, Australia), USA	Comparative study mapping the Aboriginal and Torres	Cultural; Leadership	Recruitment; Retention

	Strait Islander teacher workforce.		
Johnson et al (2016, Australia), USA	Systematic evaluation of the More Aboriginal and Torres Strait Islander Teachers Initiative.	Cultural; Leadership	Recruitment; Retention

**Table 2: Summary of studies of non-financial incentives and associated outcomes**

Paper (authors, year, place, publication)	Nature of incentive scheme	Focus of incentive schemes	Outcomes
Backes & Hansen (2023, USA various States), Brookings	Narrative review of quantitative studies of Teach for America	Disadvantaged; Shortage locations	Pupil attainment; Retention
Allen et al. (2016, England), Teach First / Education Datalab	Quantitative quasi-experimental study of Teach First	Disadvantaged; Shortage locations	Retention; Salary
Gist et al. (2019, various locations in USA), JTE	Narrative review of quantitative and qualitative studies of Grow-Your-Own community teacher schemes	Ethnic minorities; Disadvantaged; Shortage locations; Rural locations	Retention; Contextual ITE
Perona et al. (2015, Illinois), CSEP ISU	Survey yielding descriptive statistics for Grow-Your-Own cohort retention during ITE	Ethnic minorities; Disadvantaged; Shortage locations; Rural locations	ITE retention; Reasons for dropping out
Abramovitz & D'Amico (2011, New York City), CUNY	Survey of Leap To Teach (a paraprofessional GYO scheme) alumni yielding descriptive statistics	Ethnic minorities; Disadvantaged; Shortage locations	Retention in service; Reasons for enrolling in ITE; Reasons for leaving teaching
Lau et al. (2007, Savannah, Georgia) TEQ	Survey of Pathways Program (a paraprofessional GYO scheme) for AASU ITE trainees yielding descriptive statistics and factor analysis	Ethnic minorities; Disadvantaged; Shortage locations	Retention; Reasons for staying

Ross & Ahmed (2016, Portland, Maine), Sense publishers	Extended Teacher Education Program for immigrants and refugees, descriptive statistics	Immigrants; Refugees; Language minorities	Recruitment; Retention
Boyd et al. (2003, New York State), NBER	Exploited administrative data to model teachers' preferences for the location of their first teaching job relative to their hometown and training college	Urban; Suburban; Rural	Geographic distribution of employment
Clark et al. (2017, 10 US States), Mathematica	Experimental study of Teach for America (TFA) in elementary schools of the i3 Scale-Up programme which expanded the national scale	Disadvantaged; Shortage locations	Pupil attainment
Glazerman et al. (2006, USA national), JPAM	Experimental evaluation of the 2001-2004 cohorts of Teach for America	Disadvantaged; Shortage locations	Pupil attainment
Dobbie (2011, New York City), Harvard	Correlational study of administrative data on Teach for America recruits linked to pupil attainment	Disadvantaged; Shortage locations	Pupil attainment
Penner (2021, North Carolina), JREE	Correlational study of Teach for America effects on pupil attainment over time and recruitment selection factors	Disadvantaged; Shortage locations	Pupil attainment
Kane et al. (2006, New York City), NBER	A correlational study of administrative data comparing pupil attainment and teacher turnover across certification pathways to estimate net effects of Teach for America	Disadvantaged; Shortage locations	Pupil attainment; Teacher turnover
Donaldson et al. (2011, USA national), Phi Delta Kappan	A correlational study of the retention of Teach for America teachers and their length of service	Disadvantaged; Shortage locations	Teacher turnover
Simon & Johnson (2015, USA various), Teachers' College Record	Review of six correlational studies exploring factors associated with teacher turnover, with a focus on	Disadvantaged; Shortage locations	Teacher turnover

	school factors and working conditions		
Loeb et al. (2005, California), PJE	Correlational analysis of teacher survey data linked to administrative data focused on demographic versus school factors and working conditions	Disadvantaged; Ethnic minorities; Shortage locations	Teacher turnover
Allensworth et al. (2009, Chicago), University of Chicago	Correlational study of demographic and school factors associated with high turnover schools	Disadvantaged; Ethnic minorities; Shortage locations	Teacher mobility
Ladd (2011, North Carolina), EEPA	Correlational study of survey and administrative data on school leadership and working conditions associated with intention to leave	Disadvantaged; Ethnic minorities	Departure intention
Reyes et al. (2022, Texas), University of Texas	A quasi-experimental matched-groups study of traditionally versus alternatively certified teachers	Shortage locations	Pupil attainment; Retention
Strong (2005, USA various locations), The New Educator	A narrative review of studies on induction and mentoring programmes	Shortage locations	Retention
Griffin (2010, USA, various locations), Fort Valley State University	A narrative review of studies on induction and mentoring in a special education context	Special education; Shortage locations	Retention
Glazerman et al. (2010), USA, 13 States), IES	An experiment study of comprehensive induction versus mentoring-only induction	Urban; Disadvantaged; Shortage locations	Pupil attainment; Instructional practice; Retention; Job satisfaction
Kraft et al. (2018, mainly USA locations), RER	Meta-analysis of studies of teacher coaching, with focus on primary literacy	Shortage locations	Retention
Keese et al. (2022, mainly USA locations), ERR	Meta-analysis of studies of formalised induction since Glazerman (2010)	Shortage locations	Retention

Ingersoll & Smith (2004, mainly USA locations), University of Pennsylvania	Narrative review of studies of induction components	Shortage locations	Retention
Kang & Berliner (2012, USA national), The Teacher Educator	Correlational study of federal survey data focused on factors associated with retention, including induction components and working conditions	Shortage locations	Retention
Freemyer et al. (2010, Indiana), Non-journal	Natural experiment of withdrawal of stipends for teacher mentors when a programme was defunded	Shortage locations; Rural	Implementation of mentoring
Grossman et al. (2012, New York City), Teacher's College Record	Narrative review of components of mentoring programmes	Shortage locations; Urban	Implementation of mentoring
Bickmore & Bickmore (2010, South-Eastern USA), Teaching and Teacher Education	Qualitative study of perceptions of teachers, mentors and leaders concerning the components of an induction programme	Shortage locations; Rural	Implementation of mentoring
Anthony (2009, North Carolina), Gardner-Webb University	Qualitative study of components of a teacher induction programme	Shortage locations; Rural	Perceived usefulness
Helfeldt et al. (2009, USA), The Teacher Educator	Correlational study of outcomes of a mentoring and induction programme	Shortage locations; Urban	Retention; Self efficacy
See et al. (2020, mainly US locations), Education Sciences	Review of causal evidence for various approaches to teacher recruitment and retention	Shortage locations	Recruitment; Retention

**Table 3: Summary of evidence on financial incentives**

Paper (authors, year, place, publication)	Nature of incentive scheme	Focus of incentive schemes	Outcomes
Steele et al (2010, California), JPAM	\$20,000 to teach in high-poverty schools for 4 years (15 per cent of annual salary)	Disadvantaged schools	Recruitment

Prost (2013, France), Annals of Economics and Statistics	Salary supplements of 2-2.5 per cent of salary to teacher in high-poverty areas	Disadvantaged schools	Recruitment, Retention
Hough and Loeb (2013, California), Policy Analysis for California Education	Increase in overall salaries and 10 per cent bonus to teach in hard-to-staff schools	Disadvantaged schools	Recruitment, Retention
Glazerman et al (2013, USA), Peer-reviewed Report	\$20,000 for highly effective teachers to transfer to priority schools	Disadvantaged schools	Recruitment, Retention, Pupil Attainment
Cowan and Goldhaber (2018, Washington), EER	\$5,000 or 7 per cent annual bonus for achieving board certification and working in high poverty schools	Disadvantaged schools	Recruitment, Retention, Pupil Attainment
Elacqua et al (2022, Chile), JPAM	16 per cent boost to annual salary for high-performing teachers, with higher bonuses in deprived schools	Disadvantaged schools	Recruitment, Retention
Falch (2016, Norway), ILR Review	10 per cent wage supplement for working in Northern areas of Norway	Rural areas	Recruitment
Tran et al (2022, South Carolina), Policy Futures in Education	Extra funding for rural areas to improve teacher recruitment/retention	Rural areas	Recruitment, Retention
Clotfelter et al (2008, North Carolina), Journal of Public Economics	\$1,800 or 4-5 per cent pay rise to teachers in shortage subjects (maths, science, SEN) and high-poverty schools	Disadvantaged schools, shortage subjects	Retention
Feng and Sass (2018, Florida), JPAM	\$2-3,000 or in loan forgiveness or 3 per cent in net pay for teachers in shortage subjects (maths, science, languages)	Shortage subjects	Retention
Bueno and Sass (2018, Georgia), SSRN Electronic Journal	\$4,000 or 10 per cent in additional pay for maths and science teachers	Shortage subjects	Retention
Sims and Benhenda (2022, England), Working Paper	£2,000 or 8 per cent annual salary supplement to early career maths and physics teachers	Disadvantaged schools, shortage subjects	Retention

Springer et al (2016, Tennessee), Educational Evaluation and Policy Analysis	\$5,000 or 10 per cent bonus to highly effective teachers in high-poverty schools	Disadvantaged schools	Retention
Swain et al (2019, Tennessee), EER	\$5,000 or 10 per cent bonus to highly effective teachers in high-poverty schools	Disadvantaged schools	Retention, Pupil Attainment
Camelo and Ponzcek (2021, Brazil), EER	24-36 per cent wage increase for teachers in deprived schools	Disadvantaged schools	Retention, Pupil Attainment

Notes: JPAM refers to Journal of Policy Analysis and Management, EER refers to Economics of Education Review.