Teachers Working Longer Review: Interim Report

Produced by the Teachers Working Longer Review Steering Group

February 2017

Contents

Introduction

Context

1. Following discussions in the programme of talks between the Department for Education and teacher trade unions on policy implementation, which commenced in March 2014, the Secretary of State for Education commissioned a review into the health and deployment implications of teachers working longer as a result of the increase in normal pension age (NPA) in the Teachers' Pension Scheme.

2. The review commenced in October 2014 and is a tripartite review, involving teacher trade unions, employers and the Department for Education. The review is expected to take two years and report in Autumn 2016.

Aims

3. The aims of the review are:

   i.   to explore the health and deployment implications of teachers working longer; to consider possible options to mitigate these implications where necessary; and to make recommendations to the Secretary of State; and

   ii. to provide evidence that can be used by stakeholders to contribute to any Government reviews of the state pension age (SPA) and the link between NPA and SPA in public sector schemes.

Scope

4. The review covers all teachers who are eligible to be members of the Teachers' Pension Scheme and who are employed in state-funded and independent schools, and sixth form colleges. Members of the TPS working in Further or Higher Education are out of scope.

Structure

5. The review is overseen by a steering group made up of employers, unions and DfE officials. A full list of the organisations involved can be found in Appendix 4. In addition two sub-groups were formed to consider:-

   i.   The evidence about the impact of working longer, and how any issues/barriers identified could be addressed.

   ii. The employment practices which could support teachers working longer.

6. In order to effectively consider those issues and make well researched recommendations the review is looking at the following specific sub-issues/questions.

   i.   In respect of the impact of working longer:

a) the physical, mental and emotional demands of each role within the teaching profession, and an assessment of the impact of the ageing process on each of these roles, including how any particular issues caused by the ageing process could be addressed;

b) the medical conditions which underpin applications for ill-health pensions, and how these could be addressed;

c) the provision, availability and quality of occupational health support and other support and health services (e.g. to assist those with loss of mobility) and how suitable it is for providing appropriate support for teachers who are working longer; and

d) the current teachers' ill-health pensions provision; how suitable it is for teachers who are working longer and how well the provisions are understood by members and employers.

ii. In respect of the employment practices which could support teachers working longer:

e) the various career pathways which could support teachers working longer, and the extent to which teachers are prepared throughout their careers for moving on to alternative pathways;

f) what good employment practices look like which would support teachers to work longer, and how these practices could be developed, promoted and shared;

g) the extent to which and the reasons why older teachers drop out of the labour market, including the employment experience of older teachers;

h) the extent to which TPS flexibilities (e.g. phased retirement) are understood and utilised by employers and teachers to support working longer, and any barriers to their usage – reflecting that teachers and employers will have to understand the different provisions of the separate sections of the TPS; and

i) the extent of current flexible working within the teaching profession (e.g. managed re-deployments between schools, part-time working), the potential options for further flexible working, and how existing and new practice could be used to support teachers working longer.

7. In considering the issues and making recommendations the review is taking into account the Public Sector Equality Duty which requires that public bodies:

i. have due regard to the need to eliminate discrimination;

ii. advance equality of opportunity; and

iii. foster good relations between different people when carrying out their activities.

8. In considering these issues the review will:

    i.   analyse available evidence;

    ii.   issue a call for evidence and analyse what is submitted as a result;

    iii.   identify and commission potential research to address keys gaps and issues; and

    iv.   use the evidence to draw conclusions and make recommendations.

Purpose of this report

9. The review committed to produce an Interim Report at the end of the first year of its operation, in order to provide an update on progress and emerging themes.

10. This report, therefore, details the work undertaken by the review to date, and summarises the evidence identified along with the gaps in that evidence. It also sets out the conclusions which lead from the evidence considered so far and plans for the remainder of the review period, including further research which it is considered would be of value in identifying final recommendations - and within that whether any changes or additions need to be made to the interim conclusions.

11. This report includes the final reports of both rapid evidence assessments (REAs) completed on behalf of the review, these can be found in full at Annexes A and B. In addition, a summary of the documents submitted by unions, employers, and other stakeholders to the first (targeted group) and second (public) stage call for evidence undertaken as part of the review is at annex C. Further, a summary of the key themes emerging from responses to pre-set questions submitted by employers unions, teachers, headteachers and other stakeholders as part of stage 2 and the documents submitted at that stage can be found at Annex D

    N.B. Full details of how responses to both stages of the call for evidence were used can be found in the call for evidence section under paragraphs 16 and 18..

12. A final report will be completed during Autumn 2016 and submitted to the Secretary of State for Education. That report will cover the further research and analysis of evidence which will be undertaken following the interim report, and will set out the review's final conclusions and recommendations.

Research undertaken by the Review

Call for Evidence

13. In order to help build the evidence base for the Working Longer Review a two stage call for evidence was conducted.

14. The first stage of the call for evidence was launched in February 2015 and ran alongside two rapid evidence assessments (REAs) undertaken by researchers commissioned to assess available research evidence on the issues being looked at (full details of which can be found in the section below). This first stage of the call for evidence covered organisations which were members of the steering group and two other organisations selected by them, the Teachers' Support Network and the General Teaching Council for Wales. It invited organisations to submit any evidence that their organisation held or was aware of that would support the review and, in particular, details of any published research, published articles, grey literature or research studies currently underway that would be likely to address research questions derived from the objectives of the review.

15. A total of 4 responses were received, which included 13 documents. These submissions were then forwarded to researchers for use in the REAs.

16. A second stage, wider call for evidence was launched in September 2015. This was a public call for evidence run through the Teachers' Pensions website and further publicised by members of the steering group through their own communications channels. In addition to asking for details of published research, published articles, grey literature or research studies currently underway, this stage also included a set of questions designed to identify barriers/enablers to working longer and examples of employment practices which could support or hinder working longer.

17. A total of 18 documents were submitted and 122 respondents answered the additional questions. This information was analysed and used by the steering group to inform their thinking on further research requirements and identify initial conclusions. It will be further utilised to determine the review's final report and recommendations.

18. Details of the documents submitted in response to both stages of the call for evidence can be found in Annex C. Summaries of the responses to the questions posed at the second stage of the call for evidence and of the documents submitted at that point are also covered at Annex D.

Rapid Evidence Assessments (REAs)

19. Due to the two year timeframe for the completion of the Working Longer Review, REAs were deemed to be the most appropriate method for reviewing the existing evidence and identifying gaps. That is, they would ensure that a robust assessment of the evidence already available could be undertaken whilst also

allowing time for additional primary research to be done, once further issues and gaps in evidence had been identified.

20. In January 2015 the review, therefore, commissioned two REAs in order to provide an assessment of the academic and other evidence on the impact of working longer and on employment practices to support working longer. The contractors appointed, ICF Consulting Services (impact) and the Institute for Employment Studies/Pensions Policy Institute (employment practices), each reported to the relevant sub-group responsible for the strand of work under which their REA fell. Both REAs looked at literature published in English and other languages, from 1990 to the current time.

21. In considering the REAs, it became apparent that the dividing line between the two groups of issues (impact and employment practices) was often indistinguishable and that there was significant read across between the evidence and issues uncovered by each. It was, therefore, decided that the sub-groups should merge with the steering group to ensure fully joined up consideration of both reports and all the issues involved.

22. The findings from the REAs, and consideration of the other evidence submitted in response to the call for evidence, enabled the development of initial conclusions and an appropriate research design to fill key gaps/address key issues through additional primary research.

Summary of Evidence

Overview

23. The following sections summarise emerging themes in relation to working longer drawn from the evidence uncovered by the review so far and the gaps in evidence that exist.

24. The evidence that is available is limited in some areas, with some of it being several years old and some showing conflicting opinions. The review will seek to further address that in considering/commissioning additional research and undertaking further analysis.

Key Themes

25. In order to aid consideration of the issues/objectives covered by the review, themes/evidence are recorded against the main issue/objective to which they refer. However, as already set out, some will relate to more than one of the review's objectives and that needs to be remembered when considering the below.

Impact of Working Longer

a) Impact of ageing process on roles

26. Evidence suggests that the key cognitive skills needed for teaching do not deteriorate significantly before age 70, and age is not necessarily a key indicator of a teacher's ability to teach. Furthermore, that the age of teachers does not have a noticeable effect on student performance and therefore older teachers continue to play an equal part in improving student outcomes, with there being no evidence of a negative impact as a result of ageing.

27. There is a lack of evidence on how ageing impacts on specific teaching roles. What is available shows that whilst older teachers appear more likely to report health issues linked with their job, particularly musculoskeletal and other physical issues, they also report less stress than less experienced teachers.

28. The teaching profession appears to have a lower rate of sickness absence than other professional workers, though this levels out from age 55 upwards with levels being similar to other professionals at that stage.

b) Conditions that underpin applications for ill-health retirement

29. Physical conditions, such as musculoskeletal problems and cancers, are the most common reason for teachers being awarded an ill-health retirement pension with mental health/stress related illnesses being the next most likely cause of individuals being judged permanently unfit to teach.

30. The rate of ill-health retirements has remained constant over recent years, having previously been significantly higher until changes were made to the incapacity criteria, application process and benefit structure to ensure these benefits are

better targeted to need. Current rates are broadly consistent with those for other workforces.

31. Rates of ill health retirement are greatest amongst older age groups, with the highest rate being for those in the 55-59 age group. This indicates that older teachers are more likely to suffer from serious or chronic illnesses than younger ones, given that most of those who are judged eligible for ill-health retirement have illnesses/conditions which mean they are considered to be permanently incapable of undertaking any work, and receive additional total incapacity related benefits as a result.

c) The availability and quality of Occupational Health support

32. The evidence in relation to occupational health (OH) provision in the teaching profession suggests that the level of service available to support teachers, and the extent to which it is used, varies significantly. Some employers do offer/buy-in a comprehensive service, which is used within effective human resource management arrangements to pro-actively support health and well-being and offers consultations/interventions at an early stage. However, evidence points to it often being the case that interventions do not take place until the point that the teacher's illness has developed significantly and ill-health retirement is being considered.

d) How well do the current ill-health provisions support working longer and how well understood are they

33. There is a lack of evidence in relation to how well the current ill-health retirement provisions will support working longer, which is not surprising given the change to a higher pension age has only recently been implemented. In line with evidence on knowledge of pensions arrangements as a whole (see below under h) it is likely that the details of current arrangements are not widely known.

Employment Practices

e) Career pathways that could support working longer

34. Evidence on career pathways available to teachers shows that members of the leadership team are more likely to have access to a wider range of options when considering changes in career pathway than classroom teachers. For the latter, it would appear that the only two readily available options are promotion through the management chain and undertaking supply teaching. In contrast, teachers in the senior leadership team may have access to other options, which include working as local authority advisors, working across a number of schools in multi academy trusts or school federations, job sharing and co-headships. There is no evidence, however, of any difference in the options that are available to older and younger teachers, or of options that are used specifically to assist working longer.

f) Employment practices that would support teachers to work longer

35. Evidence suggests that supportive management practices, whereby there is a positive attitude/culture towards the value and managing the well-being of older teachers, and the use of alternative career pathways and flexible working, would all help to motivate teachers to work for longer. Feeling valued, having autonomy and support for well-being are cited as major factors which can motivate teachers to work longer, so management practices which support teachers and give them control over their work are key factors here.

g) The extent to which and why older teachers leave the workforce

36. The evidence on why teachers leave the profession is limited, with most of what is currently available focussing on early exits or the pension benefits taken (but not the reasons behind the retirement route involved).

37. Teachers themselves cite health and then workload as the two most likely reasons why they may leave the profession early. Here work-life balance concerns are seen as a significant issue during mid and late career phases in particular.

38. Failure to feel supported by management and the culture within the school/establishment towards older teachers and flexible working, are also cited as key factors in some older workers leaving the profession. Attitudes of other staff and parents, including colleagues' attitudes to working longer, are also important factors in teachers' decisions on whether to go on working to an older age.

39. Other 'pull' factors also influence the decision to leave early, these include financial well-being, family issues and the desire to pursue hobbies or travel plans.

h) The extent to which TPS flexibilities are understood and used

40. Although the amount of evidence about the level of understanding of the Teachers' Pension Scheme (TPS) and its flexibilities is limited, what is available suggests that understanding is low. Older teachers are more likely than younger ones to understand options, but that reflects that many do not see the TPS as a key part of their retirement decision making, with retirement planning and pension issues often only being considered towards the end of their careers. Evidence also shows that take up of phased retirement has been low, which would seem to reinforce findings that understanding is low given that evidence also shows that partial retirement in the years before full retirement is an attractive option for many.

i) The extent of current flexible working within the teaching profession

41. From the limited evidence that is available on the use of flexible working it is clear that the opportunity to do so varies enormously from school to school. The reasons cited include cultural issues in schools, school managers' attitude to the use of flexibilities and practical difficulties such as timetabling.

42. The opportunity to work part-time seems to be the most commonly available flexibility. There is little evidence to show what other options are used, for example, the chance to step down to a role of less responsibility or to no longer undertake additional management or other responsibilities.

43. It appears that options to take on a less demanding role or to work part-time are not routinely looked at in order to help teachers who are suffering from ill-health to stay in the profession longer. This is despite evidence that suggests if more opportunities to move to a role with less responsibility or to part-time working were available this would help some teachers to delay retirement – here the teachers involved tend to feel that they will struggle with the physical and other demands of teaching as they get older and thus the option of a partial retirement, possibly with reduced pay topped up by pension, is appealing.

Evidence Gaps

44. As set out above, and not unsurprisingly, several evidence gaps in relation to the Review's objectives have been identified and some of them are quite considerable. Much of this is because relatively few teachers currently work into their sixties and those who do, do so voluntarily.

45. This is particularly apparent in the lack of evidence regarding the impact of ageing on each teaching role and of the actual implications in practice of teachers working into their mid and late sixties, either from the UK or internationally. There is also no substantive evidence available on the effectiveness of current ill-health provisions within the TPS and evidence on OH provision is very limited.

46. Evidence gaps are also apparent in relation to the effectiveness of positive age management policies and practices, the extent of the use of flexible working arrangements and the level of understanding of TPS flexibilities following recent changes.

Initial Conclusions

47. After careful consideration of all evidence gathered the Review has drawn the following initial conclusions:-

Overarching Conclusions

I. Older/experienced teachers are a valuable part of the education workforce and that should be promoted, with negative perceptions/cultures about their impact being challenged.

II. All parties (including the Department, local authorities, academy trusts, Unions, local school leaders, governing bodies, proprietors and teachers themselves) have a part to play in: reinforcing the value of older/experienced teachers; promoting ways of best managing the whole workforce; and ensuring that the value of maintaining teacher health and well-being is reinforced from the point of initial teacher training onwards.

III. Due to the importance of ensuring teachers are supported appropriately, the complexity of the issues involved, and the gaps in the evidence that can only be addressed in the long term, there appears a strong case for the review to continue beyond the two years originally envisaged (i.e. there will be important work to be done beyond the 'final' report being produced).

Conclusions Relating To Specific Review Objectives/Issues

a) Impact of ageing process on roles

IV. Understanding the impacts of ageing on the full range of teaching roles and settings should be explored further. This could reveal opportunities to adjust roles and the physical environment to better support health and well-being (such as physical education teaching or classroom ergonomics).

b) Conditions that underpin applications for ill-health retirement

V. The majority of ill-health retirement pensions for teachers are as a result of musculoskeletal, cancer or mental health related issues. The data involved could be analysed further to consider whether there is any identifiable link between particular illnesses and specific teaching roles.

c) The availability and quality of Occupational Health support

VI. The value of proactive, timely and effective OH support should be emphasised with the aim of extending accessibility and take up. This could include persuading leaders and teachers to focus on the benefits rather than perceived risks, guiding managers how to use OH effectively as part of normal HR practices throughout teachers' careers, and potentially guidance on what service schools should be looking to procure along with how to identify potential providers.

d) How well do the current ill-health provisions within the TPS support working longer and how well understood are they

    VII. It is likely that the arrangements are not widely understood and therefore it may be beneficial to take steps to raise awareness. In addition, the ill-health pension arrangements in the TPS should be kept under review, to take account of changing trends as more teachers begin to work longer.

e) Career pathways that could support working longer

    VIII. Career progression routes, other than through the management team, are limited; nevertheless, there could be value in exploring examples of alternative practice, particularly for classroom teachers.

f) Employment practices that would support teachers to work longer

    IX. Examples of good human resource (HR)/management practices could be identified and promoted, in particular, effective ways of managing an age diverse workforce and whole career approaches to health and well-being.

    X. Local practices, culture, and school leaders' perception of the value of older/experienced teachers appear to be key factors in enabling working longer. Changing attitudes and promoting best practice are essential if there is to be a consistent and comprehensive solution/approach.

g) The extent to which and why older teachers drop out of the workforce

    XI. Health issues are cited as a prime reason for older teachers choosing to leave early. Steps to do more to promote health and well-being throughout teachers' whole career could be considered, therefore.

    XII. Workload is also cited as a major factor that could impact on decisions whether or not to work longer. Consequently, it is essential to ensure join-up between this review and the Department's workload challenge project, to ensure evidence and findings are shared and acted upon appropriately.

h) The extent to which TPS flexibilities are understood and used

    XIII. Knowledge of the TPS and its flexibilities, and how this can help in career/workforce management, remains limited amongst the workforce and school leaders. The communications and retirement journey work that Teachers' Pensions are currently undertaking is key to addressing this, with the need to personalise the message and delivery in order to support employers in using the scheme effectively and gain attention of members so they engage with the options available (this should also cover ill-health retirement arrangements effectively, in line with VII above).

i) The extent of current flexible working within the teaching profession

    XIV. Access to flexible working arrangements, including options to step down to roles of lesser responsibility or part-time, can help extend working lives and ways of promoting examples of good practice should be explored.

Potential Further Research

48. After careful consideration of the evidence presented to the Review thus far, it is considered that effort should be concentrated on seeking to answer/gather more evidence in respect of the following questions. N.B. It is recognised that there will be a need to prioritise what is done, given the timescales for completing the Review, and that work is going on elsewhere in respect of some of the issues faced by the Review, for example workload and moves to improve understanding of TPS arrangements.

ISSUE/EVIDENCE GAP	QUESTION
There is a lack of evidence on the impacts of ageing, particularly on specific teaching roles. (objective a)	What can existing administrative data tell us about the relationship between retirement age and different teaching roles and ill-health?
There is evidence that the level of OH support available/extent to which it is used varies significantly and the evidence on the effectiveness of what is available is very limited. (objective c)	Are there examples of good practice that can be shared where Occupational Health Services are used effectively in schools, i.e. to support individual's well-being and prevent ill-health within effective overall human resource management arrangements? Are there any lessons we can learn from other sectors' use of OH provision? (particularly the NHS and consideration of the Boorman review of health and well-being (2009)) What are the barriers that currently result in OH support not being available or accessed more widely?
Evidence suggests that access to alternative career pathways and flexible working could help extend working lives. It also suggests that examples of good practice may help make access more widely available by breaking down cultural and practical barriers. (objective e & i)	What examples are there of alternative career pathways or effective flexible working practices, being used in schools? Which schools are the most effective at managing flexible working and alternative career pathways? What lessons of good practice can we gain from them? What leads teachers to undertake supply work and are there any lessons that can be learnt from that?
Evidence suggests that supportive management practices and attitudes are important in decisions on whether to leave early or work longer. (objective f &g)	What do effective management/well-being practices look like? How do managers/school leaders enable their staff to stay on in the profession, particularly staff who are close to NPA? What retention practices are used?

ISSUE/EVIDENCE GAP	QUESTION
	How do management practices differ between different types/sizes/locations of schools (including schools in different sectors)? How do management practices differ between schools that have high/low proportions of older staff? What difference do differing practices make?
There is a lack of clear evidence on why teachers leave the profession early. (objective g)	What factors motivate/enable staff to stay in the profession beyond NPA? Is there any good practice which can be shared? What factors can help explain why teachers choose to draw their pension on actuarial adjusted terms or leave and defer drawing their pension? What more should be done to help understand why teachers leave the profession?

49. The Review group is working with analysts in DfE to understand how best to answer these questions within the review period and beyond. It is likely that a range of research methods will be required, including secondary data analyses, in-depth qualitative research with a small number of schools and possibly larger scale surveys of teachers and school leaders.

Proposed timeline for year 2 of the Review

Month	Action
February/March 2016	Commission research if required
March/August 2016	Research undertaken if required
September 2016	Final report sent to Secretary of State
October 2016	Final report published

Appendix 1: Methods, sift process and sift and review pro-forma

This appendix provides detail on the research methods used for the review.

Set-up phase

During the set-up phase, a draft protocol for the search process was agreed with the sub-group covering: the central and secondary research questions and thus relevant search terms, hierarchy of search terms[1] and likely combinations of search terms; inclusion and exclusion criteria, which defines the scope of the review; and search locations.

The sub-group was keen to include grey literature (i.e. materials published informally, difficult to trace via published journals, or not widely accessible, which may include technical reports from government agencies, working papers from research groups or white papers). Hence, in addition to searching traditional academic databases, additional databases were searched, as well as the websites of relevant experts (researchers, policy-makers, lobbyists and commentators).

A key challenge for this phase of the research was to develop a realistic approach to scale and avoid excessive numbers of spurious results, by defining appropriate boundaries for the search. Therefore it was initially decided to:

- Limit the search to evidence which is readily accessible online.
- Limit the search to key databases, websites and publications by focusing on a restricted number of relevant databases, as there are diminishing returns to searching a large number of databases, which are likely to cover the same sources; and searching a limited number of government departments and agencies', academic departments', and research institutes' websites.
- Primarily target English-language evidence to maximise applicability of findings, but look for appropriate international and/or comparative examples from a selected number of relevant international sources such as the European Commission, OECD, and Cedefop; where extending beyond articles in English, the aim was to look for examples of innovative employment practices for teacher retention that had the potential to be applied in the UK.
- Initially prioritise teachers to develop the evidence base specific to the teaching profession – primary, middle and secondary school (not nursery), all subjects, all school environments (including state funded schools, independent schools and sixth form colleges) with the potential to broaden the search to cover related occupations and sectors if few references were generated; hence the keyword 'teacher' (and equivalent terminology) was to be included, and this filter was only

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[1] The distinction between primary and secondary search terms allows the research team to construct tailored search strings and proceed in a systematic way.

to be removed if the searches failed to produce sufficient numbers of high-quality results.

- Set a date limited period for review, from 1990 to the present time (this was an extensive period and could require adjustment if a huge array of evidence was generated).

In scope were issues/evidence relating to retention, later stages of career paths, older workers and employment practices. Out of scope were issues relating to general turnover, recruitment, pedagogy or learning and teaching practices.

An inception meeting between the research team and the Department helped to further refine the scope of the study and to establish relevant definitions:

- **What is meant by 'older teachers' (review question 3).** It was confirmed that the review was interested in experience as well as age, and thus potential loss of experienced teachers. There is a particular interest in those leaving a teaching career after some time (those who had stayed in post for more than 5 years) and therefore retention initiatives are appropriate throughout teachers' (complex) careers rather than just at the end of careers. However the retention of early career teachers was not a primary concern of the Review. No definition of older was established but the sift took account of 'experience' rather than exclusively 'age'.

- **Alternative terminology for teacher.** Alternative terms for 'teacher' were discussed to ensure that the review would capture all eligible members of the Teachers' Pension Scheme (TPS), the complexity of pathways in and out of teaching careers, cover all organisational structures, and cover equivalent posts in other countries. This was particularly important as 'teacher' was to be used as the primary search term or filter. The search terms for the primary filter were amended accordingly (see below for search terms).

- **Potential to reduce the period for the review.** The range of the review was discussed and the potential to restrict the time period to reduce the likely volume of material while increasing the relevance of the materials identified. Key milestones were identified by the Department including: 1997 when the arrangements for premature and ill-health retirement were changed; and 2000 when the Treasury undertook a review of ill-health in the public sector as a whole. It was felt that these milestone events would have stimulated research and thus should be included in the review period. The period was amended to capture materials from 1997 onwards.

- **Potential comparable occupations and countries.** Comparable occupations identified were: lecturers in higher and further education; social work and local government professionals; and, more broadly, professional groups and professional graduate groups (the latter was used in research into executive salaries). Comparable countries suggested were European countries (excluding

Eastern Europe), New Zealand, Australia, Canada and the USA. These were deemed to be countries with similar structure and regulation of labour markets, country demographics and teacher policy history to England and the UK. Research focused on countries outside this list was excluded in the sift process (see below).

To supplement the search stage and help uncover grey literature, the Review group issued a **call for evidence** to key stakeholders including teachers' unions, employers, the Teachers Support Network, and the General Teaching Council in Wales. An initial call asked for details of published and on-going research and for internal documents. The materials provided by the 20 stakeholders were added to those generated by the search.

Searching

Search locations

A number of databases and websites were identified as priority search locations that would enable exploration of a multidisciplinary evidence base, spanning academic specialisms (see Table 2).

Table 1: Details of databases used in the search phase

Name of database	Description
Google Scholar	Search tool for scholarly literature including theses, books, abstracts and articles.
Education Resources Information Center (ERIC)	ERIC, the Education Resource Information Center, provides access to education literature and resources. The database contains more than 1.3 million records and provides access to information from journals included in the Current Index of Journals in Education and Resources in Education Index.
British Education Index	The British Education Index provides information on research, policy and practice in education and training in the UK. Strengths include aspects of educational policy and administration. Sources include education and training journals, mostly published in the UK. Some international literature is included.
Teacher Reference Center	Teacher Reference Center provides indexing and abstracts for 280 periodicals, 96% of which are peer-reviewed. Topics include: Assessment, Best Practices, Continuing Education, Current Pedagogical Research, Curriculum Development, Elementary Education, Higher Education, Instructional Media, Language Arts, Literacy Standards, School Administration, Science & Mathematics, and Teacher Education.
PsychINFO	The PsycINFO®, database is the largest resource devoted to peer-reviewed literature in behavioural science and mental health. It contains over three million records and summaries.

Name of database	Description
Educational Administration Abstracts	Educational Administration Abstracts includes more than 190,000 bibliographic records covering areas related to educational administration, including educational leadership, educational management, educational research, and other areas of key relevance to the discipline.

<div align="right">Source: IES and PPI, 2015</div>

The agreed search terms

An initial filter was applied to focus the research on teaching. The terms used in this filter were: 'teacher', classroom teacher, senior teacher, headteacher, school leader, lecturer, and instructor. This filter was applied to ALL searches.

Additional terms agreed with the Review group and the employment practice sub-group are presented in the table below. The primary terms were used alone but also in combination with the corresponding secondary terms[2].

<div align="center">Table 3: Agreed search terms</div>

Primary search terms	Secondary search terms
Employment, human resources management, HRM, HR, human resources, personnel, (retention/retain)	Policies, practices, initiatives, processes, interventions, projects, experience, support
Career, stepping down	Trajector*, pathway, progression, bridge, route, ladder, third, encore, change, planning, promotion, demotion, role, deployment
Flexible, part-time	Working, schedule, hours, job, pattern, job share
Retention, retain, drop-out, redeployment, wastage, attrition, leavers,	Challenge, problem, issues, career break, sabbatical
Retirement, pension, working longer, post-retirement employment	Phased, early, decision, transition, terms, ill-health, premature, options, retirement planning, support, prepar*, flexibility
Ageing, old*, ageism, discrimination	Performance, productivity, stress, burnout, coping, capability

<div align="right">Source: IES and PPI, 2015</div>

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[2] Terms with an asterisk (*) denote a truncation which allows researchers to pick up all words with this root, broadening the literature collected and ensuring plurals were picked up.

The search results

The initial search generated 14,308 references (with duplicates removed), an extremely large number of references, and was one of the key challenges identified for the research.

The most productive search terms (after the teacher or equivalent filter was used) were found to be:

- career AND (trajector* OR pathway OR progression OR bridge OR route OR ladder OR encore OR change OR planning OR promotion OR demotion OR role OR deployment)

- (retention OR retain) AND (challenge OR problem OR issues OR career break OR sabbatical)

- employment AND (policies OR practices OR interventions OR initiatives OR processes OR projects OR experience OR support)

The search results from Google Scholar and Web of Knowledge combined provided fewer than 2,000 items, which was lower than expected from past experiences of using Google Scholar. The largest volume of references was generated by searches in education focused databases, the combined total from the ERIC, BEI, EAA and TRC search was 9,061 references. Psychinfo also produced a large volume, 2,372 references.
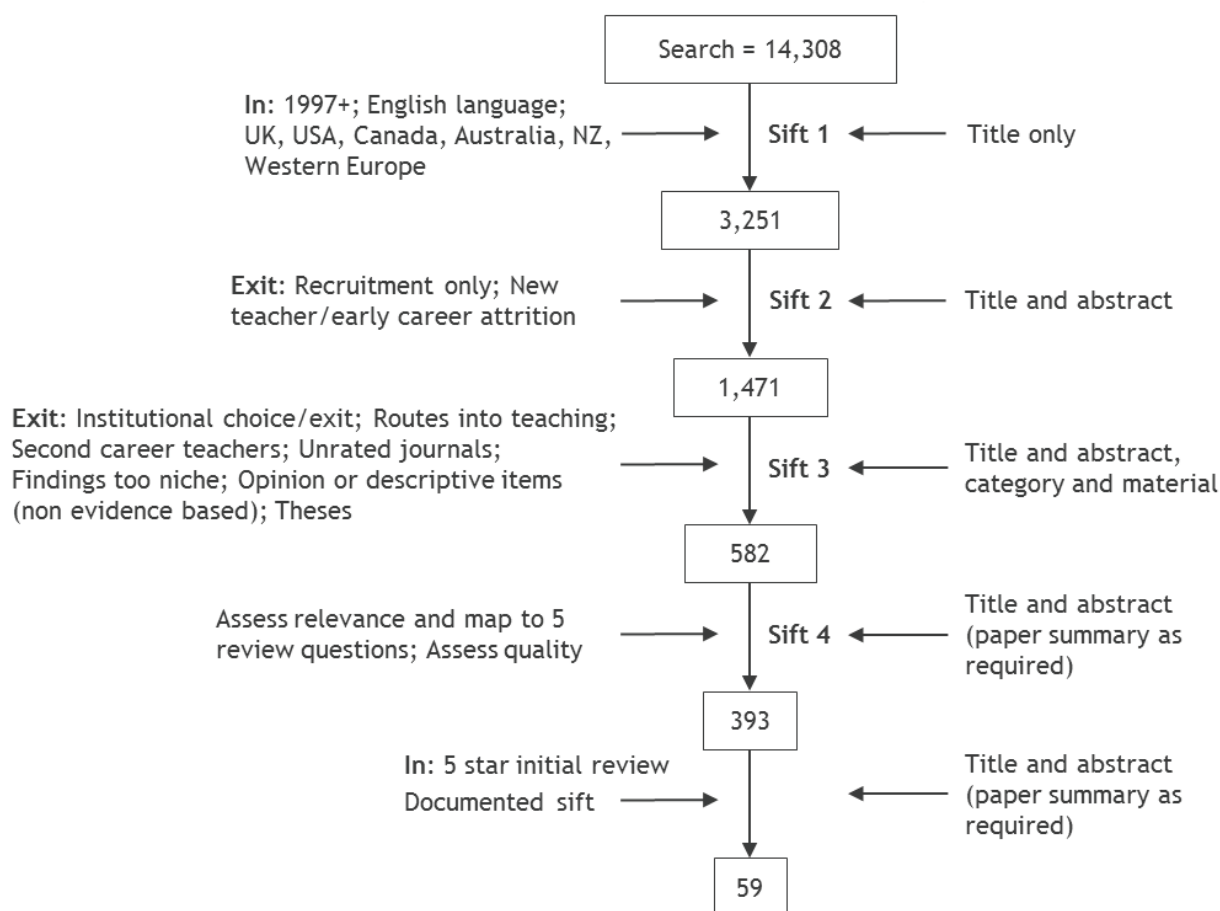
Added to the references were documents resulting from the Review group's call for evidence. A total of 21 documents were received from National Association of Schoolmasters and Union of Women Teachers (NASUWT), National Union of Teachers (NUT), National Association of Headteachers (NAHT), and Teachers' Support Network (TSN) in April 2015.

Given the volume of material it was not deemed necessary to broaden the search to comparable occupations or to general reviews, or to broaden out to the original time period suggested, but instead to focus on the more recent evidence directly relating to teachers.

Sifting

As the initial search identified a large volume of materials, a series of sift criteria were applied to apply a successively finer mesh, to ensure only the most relevant, informative studies were retained and reviewed in full. At each stage, materials meeting the inclusion criteria were put through to the next stage, and items which fell outside of the review focus were recorded together with reasons for exclusion. This resulted in an iterative sifting process comprising five distinct stages. The sift process and results it produced are shown in Figure 2 below.

Figure 2: Summary of the sift process

```
                                          Search = 14,308

In: 1997+; English language;
UK, USA, Canada, Australia, NZ,  ──────►   Sift 1  ◄──────  Title only
Western Europe

                                          3,251

Exit: Recruitment only; New
teacher/early career attrition  ──────►    Sift 2  ◄──────  Title and abstract

                                          1,471

Exit: Institutional choice/exit; Routes into teaching;
Second career teachers; Unrated journals;              Title and abstract,
Findings too niche; Opinion or descriptive items ──►  Sift 3  ◄──  category and material
(non evidence based); Theses

                                           582

Assess relevance and map to 5                         Title and abstract
review questions; Assess quality ──────►   Sift 4  ◄──  (paper summary as
                                                       required)

                                           393

In: 5 star initial review                             Title and abstract
Documented sift            ──────►                 ◄──  (paper summary as
                                                       required)

                                            59
```

The **first sift** applied the fairly broad exclusion criteria initially agreed with the Department and the employment practice sub-group: a) excluding references before 1997; b) (largely) excluding documents not published in English; and c) excluding documents concerning countries other than Western Europe, USA, Canada, Australia and New Zealand. In this first sift, researchers also scanned the titles of documents to eliminate those that were clearly not relevant. At this stage, an inclusive 'better-in-than-out' strategy was adopted, so where titles or their relevance to the review questions were unclear the items were retained for further review. The first sift was strict enough to allow for a substantial reduction in the volume of material but loose enough to be confident that relevant items would not be lost. It notably excluded material concerning career education, teaching practices, and student drop-out/retention. It also identified that a large proportion of material was from the USA, and that the literature was spread right across the date range (and not weighted towards the early part of the date span), which had been highlighted as a potential challenge for the review. The first sift resulted in 3,251 references to go forward to the next stage.

The **second sift** involved the application of stricter exclusion criteria and a scan of abstracts rather than titles alone. The additional exclusion criteria were: a) excluding references referring solely to teacher recruitment; and b) excluding references focused on attrition among early-career teachers (or new or beginning teachers). As a quality

assurance mechanism, materials were sifted by a different member of the research team. The second sift resulted in 1,471 references to go forward to the next stage.

The **third sift**, again based on title and abstract (or quick scan of the paper if no abstract was provided) involved applying further exclusion criteria. The additional criteria involved: a) excluding items focused on the problems of teachers leaving particular types of schools (rather than leaving the profession altogether); and b) excluding references relating to alternative routes into teaching. The material was categorised into 4 types and different inclusion criteria were applied to each of the 4 categories:

- For **research reports and policy/strategy documents**, only those that were evidence-based, and focused on the UK or had findings applicable to UK settings were included.

- For **journal articles**, only those from highly rated journals were included. The 2013 Social Sciences Citation Index (SSCI) impact factor ratings[3] was used as the criterion for inclusion. Articles in non-SSCI rated journals were initially excluded, but those which were particularly relevant were retained following a further review of items excluded on this criterion.

- For **news articles**, only those that referenced sources and statistics were included (thus excluding those that merely contained opinion or descriptions of current policy).

- The decision was made to exclude **theses**, on the assumption that those with a relevant focus and of sufficient quality should result in peer-reviewed publications.

The third sift resulted in 582 references to go forward to the next stage.

The **fourth sift** and mapping exercise again used titles and abstracts, and mapped the references against the five review questions (taking into account that some references mapped against multiple questions due to their coverage/focus). Material that failed to map onto any of the review questions was then excluded.

In this final sift stage, materials identified for review were mapped against the research questions and assessed for quality using an initial quality rating based on: relevance to the review questions, breadth of research (niche coverage or wider generalisability), and quality of approach (robust methodology, sound findings etc.). The ratings applied were: 1 star (for the least relevant documents characterised by low generalisability and under-specified or limited methodology, often USA based highly specific and small scale

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[3] The SSCI is an interdisciplinary citation index developed by the Institute for Scientific Information (ISI) from the Science Citation Index. It covers approximately 2,500 world leading journals of which 229 journals cover the whole spectrum of education research. The criteria for inclusion of journals are based on publishing standards and editorial content and number of citations, and a Journal Ranking based on 'impact factor' which is the average number of citations received in a year by papers in that year and the preceding years. In addition, specialised journals relevant to the research questions which received lower-ranked journals were included.

qualitative studies which were too niche for wider applicability), 3 star (of some relevance/broader coverage and of reasonable quality) and 5 star (for the best and most relevant materials). The materials mapped to the review question focused on the role of pensions were also assessed for quality and relevance by the PPI researchers. The country of focus for the research was also recorded, and a note was made of any references that could also have relevance to the other REA[4]. This resulted in 393 references: 118 rated as 1 star, 206 rated as 3 star and 69 rated as 5 star.

The sift process was managed using EndNote (a research and reference management software tool). This allowed the research team to define criteria for exclusion at each stage and to document the reasons why and points at which individual items had been excluded. It also allowed for easy searching of the databases from previous stages of the sift in order to control for whether relevant items had been excluded.

Table 4 shows that the largest volume of materials was found for the review theme of employment practices, with 143 materials. This theme was interpreted very broadly (as described below) and could include any aspects relating to working environment, working conditions and working practices. The second largest volume of materials was found for the review theme of career pathways (112). However for both these themes, a relatively small proportion of material was deemed to be strongly relevant and robust (i.e. 5 star). This reflects the fact that a large proportion of the material in these areas consisted of guidance material for practitioners or USA reports on practices in individual states or school districts. There were fewer references found for the theme of retention and attrition (96) but a large proportion of these were felt to be of sufficient quality and relevance to warrant further consideration. Finally there were few references relating to the role of pensions (62) and even fewer on flexible working (16), although again a higher proportion of these materials tended to be considered relevant.

Table 4: Volume of materials by review theme and initial quality rating after sift 4

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[4] This separate REA literature explores: the impacts of ageing on the physical, mental and emotional demands on teachers (particularly the medical health conditions affecting the schools workforce); evidence-based suggestions to address including access to occupational health and other support/health services and use of pension scheme ill-health provisions.

Theme (review question)	Total Number	Initial rating		
		1 star	3 star	5 star
Career (exit) pathways	112	40	61	11 (9%)
Employment practices	143	48	73	22 (15%)
Retention and attrition	96	13	52	31 (32%)
Role of Pensions	62	17	30	15 (24%)
Flexible working	16	3	5	8 (50%)
Call for evidence	21	6	11	4 (19%)
Total (including duplicates)	**450**	**127**	**232**	**91 (20%)**
Total (excluding duplicates)	**393**	**118**	**206**	**69 (18%)**

Source: IES/PPI, 2015

Table 5 maps the geographical location of the research evidence against the review themes. This illustrates that overall most evidence assessed during the final sift comes from the USA and/or Canada (179 items or 46%). However there was a substantial volume of evidence from the UK (131 or 33%). The UK evidence was particularly marked among the material on pensions, the small set of items around flexible working, and among the sources recommended by stakeholders during the call for evidence. Evidence from North America particularly dominated the review themes of career pathways and employment practices, where there were twice as many references from the USA/Canada as there were from the UK.

Table 5: Volume of materials by review theme and country of focus after sift 4

Theme (review question)	Total Number	Country of focus				
		UK	USA Canada	Other*	Comparative or theoretical	Unclear
Career (exit) pathways	112	27	55	10	3	17
Employment practices	143	33	82	4	11	14
Retention and attrition	96	33	27	15	7	14
Role of Pensions	62	38	22	0	0	2
Flexible working	16	11	2	2	1	0
Call for evidence	21	17	4	0	0	0
Total (including duplicates)	**450**	**159**	**192**	**31**	**22**	**46**
Total (excluding duplicates)	393	131	179	27	20	36

*Note: other includes Australia and New Zealand, and Western Europe. Materials from other countries were screened out during earlier sifts.

After rating the materials, all those rated 5 star were put through a **final documented sift** process. Any 3 star materials resulting from the call for evidence were also included, in order to ensure that materials considered relevant by UK stakeholders were given due consideration. In total, 80 items were assessed (see below for the sift and review pro-forma). The documented sift was undertaken to record for each document: the type of evidence represented; the methodology used; the contribution to the review and relevance to the core questions (including sub-themes); and final recommendation for or against full review with reasons for the decision. At this stage, a screen was also undertaken to eliminate multiple items based on the same study; generally, the most detailed and/or most recent piece was selected, or if relevant the version published in a peer-reviewed journal. A final shortlist of 59 papers was put forward for approval by the Department and the employment practice sub-group. This list is provided as appendix 2[5].

Review, analysis and synthesis

As part of the full review, the selected materials were reviewed in detail against a standard pro-forma (see below). Outcomes, findings and conclusions relevant to each of the five review questions guiding the review was extracted. The recommendations made by the research, either policy-based, actions for key stakeholders, or recommendations for further research, were documented in the pro-forma. As part of the review process, the materials were also subjected to a detailed assessment of:

- The methodological approach taken including validity of the conceptualisation, operationalisation, quality of the underlying data, reliability, whether the analysis supports the conclusions drawn, likely limitations including applicability to the central research themes or ability to draw firm conclusions based on the method adopted and whether any limitations identified are adequately addressed in the analysis.

- The scope of research including the populations covered (i.e. any specific teacher characteristics, sub-groups or school settings), and the geographies and date range involved; and thus likely applicability/transferability of findings and recommendations to UK issues and settings.

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[5] The list provided in Appendix 2 reflects the fact that some additional source were added subsequently based on the suggestions of the sub-group, and some were excluded based on the in-depth review as part of the final stage of the REA. The final list below hence encompasses 58 items. The references added were: Aegon (2015), Aegon UK (2015), and Wilson et al. (2006). For exclusions, cf. footnote 5 below. The initial list agreed with the sub-group is available in the interim report.

- The research context and aims and how these may influence the findings and conclusions drawn (including research commissioner, key questions to be addressed and target audience).

- Whether a seminal study provides confirmatory or contrary evidence.

Based on this detailed critique and assessment of the validity of the research, the research team assigned materials a weighting (-,+,++). This was used to indicate what final weight should be placed on their findings, especially where different sources had contradictory conclusions. A summary of the extracted data in tabular form (bibliographical information, brief overview of method, weighting) is provided as Appendix 3. However a number of the materials were subsequently excluded from the initial shortlist agreed with the sub-group at the full review and analysis stage, as the in-depth review revealed them to be less relevant than suggested by the initial review, or showed them to be insufficiently methodologically robust.[6]

Sift and review documentation

The following proforma was used to document the sift results.

Figure 3: Review proforma

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[6] The papers excluded were: Brown (2010), CIPD (2004), Foster (2010), Kimball et al. (2005), NASUWT (2013), and OECD (2005). Day (2008) was substituted with the more general report, Day et al. (2008).

Documented sift	
Paper/Report Reference Full bibliographic ref incl author date, title.	
Weblink	
Source Search or call for evidence	
Evidence type Delete those that do not apply, and add categories if these are not suitable	Research report Statistical data (i.e. SFR) Literature review (e.g. review of reviews) Academic journal article/book chapter Conference paper Other journal/commentary/think piece Policy document (including consultations and responses) Policy impact assessment Other – please specify
Methodology (if research) a) Qualitative, quantitative or mixed methods. b) Literature review approach: systematic, rapid, critical c) Brief details of coverage: number and characteristics of individuals researched i.e. role, gender , location, age**.** **To include type of organisational setting – school type, sector type for other organisations etc.)**	
Contribution to this study (relevance to core Qs) Delete those that do not apply.	**Career (exit) pathways:** The various career pathways which could support teachers working longer, and the extent to which teachers are prepared throughout their careers for moving on to alternative pathways. **Employment practices**: What good employment practices look like, which would support teachers to work longer, and how these practices could be developed/promoted/shared. **Retention and attrition**: The extent to which and the reasons why older teachers drop out of the labour market, including the employment experience of older teachers. **Role of pensions**: The extent to which TPS flexibilities (e.g. phased retirement) are understood and utilised by employers and teachers to support working longer, and any barriers to their usage. **Flexible working:** The extent of current flexible working within the teaching profession (e.g. managed re-deployments between schools, part-time working), the potential options for further flexible working, and how existing and new practice could be used to support teachers working longer.
Recommendation: Would you recommend that we include this paper in the review?	**Include for Full Review** **Exclude for Full Review** **Not sure (second opinion required)**
Paper of relevance to Working Longer Impact REA? (tick if yes)	

Second stage – full review
Research agenda/context: *(incl. Research funder/commission, and author interest in the subject, policy context)*
Scope: *Focus of the research (which ages, disciplines, and school types covered; what teacher characteristics explored)*
Methodology (quality of approach): *Brief description of methods used (incl: sample size, sampling strategy, response rates, non-participation bias, weakness in data and whether this is addressed in analysis).*
Findings/key conclusions: *Please include page numbers for data and quotes* **1: Summary of evidence on teachers' career pathways (progression and exit points) and employment experiences of older teachers** **2: Summary of evidence on the causes of retention problems and drop-out, and the size of attrition in the teaching workforce** **3: Summary of evidence on employment practices and retention initiatives** **4: Summary of evidence on the awareness, understanding and take-up of Teachers' Pension Scheme flexibilities (e.g. phased retirement) and barriers to their usage** **5: Summary of evidence about flexible working practices in the teaching profession (e.g. re-deployment between schools, part-time working, job sharing)**
Recommendations (if appropriate):
Useful citations and references (i.e. potential additional materials):
Critique (reviewer assessment): *Assessment of the validity of the research (what is it measuring, what is missing, is it reliable). Does analysis support conclusions drawn? What weight should be placed on the findings? Seminal, novel confirmatory, or contrary?*
Reviewer initials: **Date:**

Appendix 2: List of publications reviewed

Initial shortlist

A number of publications from the initial shortlist agreed with the sub-group was excluded at the full review stage, as they were revealed on detailed reading to be irrelevant or of low quality. Some were substituted with alternative publications, i.e. where more relevant versions of a report were identified. A number were also added following requests from the sub-group.

1.   Aegon UK (2015). Aegon UK Readiness Survey. Available at: https://www.aegon.co.uk/content/dam/ukpaw/documents/Third-UK-Readiness-Report.pdf

2.   Aegon (2015). Inspiring a World of Habitual Savers. The Aegon Retirement Readiness Survey 2015. Available at: http://www.aegon.com/Documents/aegon-com/Research/2015-Retirement-Survey/Aegon-Retirement-Readiness-Survey-2015-Global-Report.pdf

3.   Avanzi, L., Cortini, M., & Crocetti, E. (2012). When age matters: The role of teacher aging on job identity and organisational citizenship behaviours. Revue Internationale de Psychologie Sociale, 25(3-4), 179-210.

4.   Bal, P. M., & Visser, M. S. (2011). When Are Teachers Motivated to Work beyond Retirement Age? The Importance of Support, Change of Work Role and Money. Educational Management Administration & Leadership, 39(5), 590-602.

5.   Barmby, P. (2006). Improving Teacher Recruitment and Retention: The Importance of Workload and Pupil Behaviour. Educational Research, 48(3), 247-265.

6.   Borman, G. D., & Dowling, N. M. (2008). Teacher Attrition and Retention: A Meta-Analytic and Narrative Review of the Research. Review of Educational Research, 78(3), 367-409.

7.   Bowers, T. (2001). Teacher Absenteeism and Ill-health Retirement: a review. Cambridge Journal of Education, 31(2), 135-157. doi:10.1080/0305764012006119

8.   Brown, J., Gilmour, W.H., & Macdonald, E.B. (2006a). Return to work after ill-health retirement in Scottish NHS staff and teachers. Occupational Medicine-Oxford, 56(7), 480-484.

9.   Brown, J., Gilmour, W. H., & Macdonald, E. B. (2006b). Ill-health retirement in Scottish teachers: process, outcomes and re-employment. Int Arch Occup Environ Health, 79(5), 433-440. doi:10.1007/s00420-005-0060-9

10.   Brown, K. M. (2013). The link between pensions and retirement timing: Lessons from California teachers. Journal of Public Economics, 98, 1-14. doi:10.1016/j.jpubeco.2012.10.007

11.   Buchanan, J. (2009). The Use of Teachers' Expertise in Subsequent Careers: Brain Drain, Skill Spill? Education & Society, 27(1), 25-50.

12.   Cleal, N., Curry, C., Carrera, L., Adams, J., & Redwood, D. (2013). The implications of the Coalition Government's public service pension reforms. London: Pensions Policy Institute.

13.   Costrell, R. M., & McGee, J. B. (2010). Teacher Pension Incentives, Retirement Behavior, and Potential for Reform in Arkansas. Education Finance and Policy, 5(4), 492-518.

14.   Dauksas, L., & White, J. (2010). Should I Stay or Should I Go? How Teacher Leadership Can Improve Teacher Retention. AASA Journal of Scholarship & Practice, 7(2), 27-32.

15.   Day, C., Stobart, G., Sammons, P., Kington, A., Gu, Q., Smees, R., & Mujtaba, T. (2008). Variations in Teachers' Work, Lives and Effectiveness. Research Report RR743. Department for Education and Skills.

16.   Day, C., Elliot, B., & Kington, A. (2005). Reform, Standards and Teacher Identity: Challenges of Sustaining Commitment. Teaching and Teacher Education: An International Journal of Research and Studies, 21(5), 563-577.

17.   Day, C., & Gu, Q. (2007). Variations in the conditions for teachers' professional learning and development: sustaining commitment and effectiveness over a career. Oxford Review of Education, 33(4), 423-443. doi:10.1080/03054980701450746

18.   Day, C., & Gu, Q. (2009). Veteran teachers: commitment, resilience and quality retention. Teachers and Teaching, 15(4), 441-457. doi:10.1080/13540600903057211

19.   DeArmond, M., & Goldhaber, D. (2010). Scrambling the nest egg: How well do teachers understand their pensions, and what do they think about alternative pension structures? Education Finance and Policy, 5(4), 558-586. doi:10.1162/EDFP_a_00010

20.   Disney, R., Emmerson, C., & Tetlow, G. (2010). The Value of Teachers' Pensions in England and Wales. Fiscal Studies, 31(1), 121-150.

21.   Friedberg, L., & Turner, S. (2010). Labor Market Effects of Pensions and Implications for Teachers. Education Finance and Policy, 5(4), 463-491.

22.   Friedberg, L., & Turner, S. (2011). Pensions and public school teacher retirement: An analysis using national teacher data. Research Dialogue Issue, 99.

23.   Fuller, C., Goodwyn, A., & Francis-Brophy, E. (2013). Advanced skills teachers: professional identity and status. Teachers and Teaching, 19(4), 463-474. doi:10.1080/13540602.2013.770228

24.   Furgeson, J., Strauss, R. P., & Vogt, W. B. (2006). The Effects of Defined Benefit Pension Incentives and Working Conditions on Teacher Retirement Decisions. Education Finance and Policy, 1(3), 316-348.

25.   Gaikhorst, L., Beishuizen, J.J., Zijlstra, B.J.H., & Volman, M.L.L. (2014). Contribution of a professional development programme to the quality and retention of teachers in an urban environment. European Journal of Teacher Education, 38(1), 41-57. doi:10.1080/02619768.2014.902439

26.   Gilpin, G. A. (2011). Reevaluating the effect of non-teaching wages on teacher attrition. Economics of Education Review, 30(4), 598-616. doi:10.1016/j.econedurev.2011.03.003

27.   Goldhaber, D., Grout, C., & Holden, K. (2015). Teacher Pension Systems and Mobility Decisions: Evidence from Washington State. Washington, D.C.: American Institutes for Research.

28.   Gu, Q. (2014). The role of relational resilience in teachers' career-long commitment and effectiveness. Teachers and Teaching, 20(5), 502-529. doi:10.1080/13540602.2014.937961

29.   Guarino, C. M., Santibanez, L., & Daley, G. A. (2006). Teacher Recruitment and Retention: A Review of the Recent Empirical Literature. Review of Educational Research, 76(2), 173-208. doi:10.3102/00346543076002173

30.   Hancock, C.B. (2009). National Estimates of Retention, Migration, and Attrition: A Multiyear Comparison of Music and Non-Music Teachers. Journal of Research in Music Education, 57(2), 92-107.

31.   Hansez, I., Bertrand, F., De Keyser, V., & Peree, F. (2005). Career end for teachers: Towards a better understanding of stress and early retirement. Travail Humain, 68(3), 193-223.

32.   Hughes, G.D. (2012). Teacher Retention: Teacher Characteristics, School Characteristics, Organizational Characteristics, and Teacher Efficacy. The Journal of Educational Research, 105(4), 245-255. doi:10.1080/00220671.2011.584922

33.   Hutchings, M. (2010). What impact does the wider economic situation have on teachers' career decisions? A literature review. London: Department for Education.

34.   Hutchings, M., Smart, S., & Minty, S. (2008). To what extent can pension scheme changes increase retention of older teachers? Paper presented at the BERA Conference, Heriot Watt University, Edinburgh.

35.   Kirkman, S. (1997). Too exhausted to carry on in post? TES: Times Educational Supplement (4212), 18.

36.   Kirkman, S. (2001). Escape from the great classroom burn-out. TES: Times Educational Supplement (4413), 29.

37.   Kirkman, S. (2003). Why not a 3-day week? TES: Times Educational Supplement (4555), 2-2.

38.   Koedel, C., Podgursky, M., & Shi, S. (2013). Teacher Pension Systems, the Composition of the Teaching Workforce, and Teacher Quality. Journal of Policy Analysis and Management, 32(3), pp. 574-596.

39.   Macdonald, D. (1999). Teacher attrition: a review of literature. Teaching and Teacher Education, 15(8), 835-848. doi:10.1016/s0742-051x(99)00031-1

40.   Mackenzie, S. (2012). 'I can't imagine doing anything else': why do teachers of children with SEN remain in the profession? Resilience, rewards and realism over time.

Journal of Research in Special Educational Needs, 12(3), 151-161. doi:10.1111/j.1471-3802.2011.01221.x

41.   NASUWT (2001). Age Discrimination in Employment. Evidence submitted to the House of Commons Employment Sub-Committee. Birmingham: NASUWT.

42.   NASUWT (2014). Teachers' satisfaction and wellbeing in the workplace – 2014. Research in Brief. Birmingham: NASUWT.

43.   National Union of Teachers. (2011). NUT Pensions Survey November 2011. London: National Union of Teachers.

44.   National Union of Teachers. (2013). Misuse of Capability Survey. London: National Union of Teachers.

45.   Ni, S., & Podgursky, M. (2011). Teacher Pension Incentives and the Timing of Retirement. Unpublished manuscript.

46.   Ni, S., Podgursky, M., & Ehlert, M. (2009). Pension Incentives and Labor Market Behavior: Evidence from Missouri Administrative Teacher Data. Paper presented at the Vanderbilt University: National Center on Performance Incentives. Conference Paper.

47.   Peters, M., Hutchings, M., Edwards, G., Minty, S., Seeds. K., & Smart, S. (2008). Behavioural Impact of Changes in the Teachers' Pension Scheme. Research Report DCSF-RR024. London: Department for Children, Schools and Families.

48.   Shen, J. (1997). Teacher Retention and Attrition in Public Schools: Evidence from SASS91. The Journal of Educational Research, 91(2), 81-88. doi:10.1080/00220679709597525

49.   Stinebrickner, T.R. (1998). An empirical investigation of teacher attrition. Economics of Education Review, 17(2), 127-136. doi:10.1016/s0272-7757(97)00023-x

50.   Strauss, R.P., & Liu, J. (2009). Patterns of Retirement and Return Employment of Pennsylvania's Professional School Personnel: 1984-2006. Conference Paper 2009-07. Nashville: National Center on Performance Incentives.

51.   Teacher Support Network (2014). Education Staff Health Survey 2014 report. London: Teacher Support Network. http://teachersupport.info/research-policy/research-reports/education-staff-health-survey-2014

52.   Tye, B. B., & O'Brien, L. (2002). Why Are Experienced Teachers Leaving the Profession? Phi Delta Kappa, 84(1), 24.

53.   U.S. Department of Education, International Affairs Office, and National Council on Teacher Quality (2004). Attracting, Developing, and Retaining Effective Teachers: Background Report for the United States. Washington D.C.: U.S. Department of Education.

54.   Van Droogenbroeck, F., & Spruyt, B. (2014). To stop or not to stop: an empirical assessment of the determinants of early retirement among active and retired senior teachers. Res Aging, 36(6), 753-777. doi:10.1177/0164027513519449

55.   Whitener, S. D., Gruber, K. J., Lynch, H., Tingos, K., Perona, M., & Fondelier, S. (1997). Characteristics of Stayers, Movers, and Leavers: Results from the Teacher Followup Survey: 1994-95. US Department of Education, National Center for Education Statistics. Available at: http://nces.ed.gov/pubs97/97450.pdf

56.   Wilson, V., Powney, J., Hall, S., &Davidson, J. (2006). Who Gets Ahead? The Effect of Age, Disability, Ethnicity and Gender on Teachers' Careers and Implications for School Leaders. Educational Management, Administration & Leadership, 34(2), 239-255.

57.   Worth, J., Bamford, S. and Durbin, B. (2015). Should I Stay or Should I Go? NFER Analysis of Teachers Joining and Leaving the Profession. Slough: NFER.

Literature included during later stages of the process

Literature in this list was found through a search of the references in the fully reviewed papers (listed above) or was incorporated to provide wider context or other findings from sectors/occupations outside of school teaching. The full papers would have failed to meet the inclusion criteria, but specific findings drawn from these papers have been cited and are included where relevant.

1. Allen, R., Burgess, S., & Mayo, J. (2012). The teacher labour market, teacher turnover and disadvantaged schools: new evidence for England. Working Paper No. 12/294. Bristol: Centre for Market and Public Organisation, Bristol Institute of Public Affairs. Available at: http://www.bristol.ac.uk/media-library/sites/cmpo/migrated/documents/wp294.pdf

2. Banks, J., and Tetlow, G. (2008). ‚Extending Working Lives'. In Banks, J., Breeze, E., Lessof, C., & Nazroo, J. Living in the 21st century: older people in England. London: Institute for Fiscal Studies. Available at: http://www.ifs.org.uk/elsa/report08/ch2.pdf

3. Berry, B., Byrd, A., & Wieder, A. (2013). Teacherpreneurs: Innovative Teachers Who Lead But Don't Leave. Jossey-Bass.

4. Buck, R., Porteous, C., Wynne-Jones, G., Marsh, K., Phillips, C.J., & Main, C.J. (2011). Challenges to remaining at work with common health problems: what helps and what influence do organisational policies have? Journal of occupational rehabilitation, 21(4), 501-512.

5. Centre for Diversity Policy Research and Practice (2011). Managing Flexible Retirement and Extended Working Lives. A resource guide. Oxford: Oxford Brookes University, Centre for Diversity Policy Research and Practice.

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Appendix 3: Weighting and methodological details of literature reviewed

Table 6: Key source materials and further details of the methodology used and researcher assessed weighting

Bibliographic details	Peer review?	Brief description of methodology	Weight
Aegon UK (2015). *Aegon UK Readiness Survey*.	No	Quantitative: the report presents the results from the 4th Annual Retirement Readiness Survey, an online survey of 14,400 employees and 1,600 fully retired people in 15 countries (Australia, Brazil, Canada, China, France, Germany, Hungary, India, Japan, Netherlands, Poland, Spain, Turkey, United Kingdom, United States). The survey was conducted in February 2015. The Aegon Retirement Readiness Index is calculated based on the correlation between 6 predictor variables (personal responsibility for income in retirement, level of awareness of need for planning, financial capability and understanding, retirement planning, financial preparedness, level of projected income replacement) and the dependent variable (approaches to saving). The mean scores of the predictor variables are computed and each mean score is multiplied by its 'R' value. The results are summed and then divided by the sum of all correlations to arrive at the ARRI score.	+
Aegon (2015). *Inspiring a World of Habitual Savers. The Aegon Retirement Readiness Survey 2015*.	No	Quanititative: a report based on a survey of over 4000 individuals in the UK. It contains no information on the sampling strategy or sample composition. The Retirement Readiness Index comprises items on financial readiness (financial situation and expectations), awareness of funding requirements of desired retirement lifestyle, and pensions-related behaviours. It is scored as marks out of 100.	+
Aldeman, C., & Rotherham, A.J. (2010). Better Benefits: Reforming Teacher Pensions for a Changing Work Force. Education Sector Reports. Washington D.C.: Education Sector.		Contextual: not cited in report	
Avanzi, L., Cortini, M., & Crocetti, E. (2012). When age matters: The role of teacher aging on job identity and organizational citizenship behaviours. *Revue Internationale de Psychologie Sociale, 25*(3-4), 179-210.	Yes	Quantitative: survey of 515 teachers (85.4% women) divided into settling-in adults (aged 24-39 years), prime working years (aged 40-54 years), and approaching retirement employees (aged 55-64 years). Results were analysed using analysis of variance (ANOVA) and regression to test for statistical significance. The geographic location of the sample is unclear. No funding details were given.	++

Bal, P. M., & Visser, M. S. (2011). When Are Teachers Motivated to Work beyond Retirement Age? The Importance of Support, Change of Work Role and Money. *Educational Management Administration & Leadership, 39*(5), 590-602.	Yes	Quantitative: survey of 123 teaching staff at Roman-Catholic secondary schools in 4 locations in mid-sized cities in the Netherlands. The response rate was 44% (out of 281 teachers in total). The sample was demographically representative of the school. The survey comprised 5-point Likert-type items. The reliability of the scales employed was found to be at acceptable levels (Cronbach's alpha > 0.84 in all cases).Gender, age, tenure in the current organisation, and job satisfaction were captured as control variables. The research hypotheses were tested using moderated hierarchical regression analysis.	++
Barmby, P. (2006). Improving Teacher Recruitment and Retention: The Importance of Workload and Pupil Behaviour. *Educational Research, 48*(3), 247-265	Yes	Mixed: Literature review: quasi-systematic literature review, involving a search of the British Education Index database using specified search terms in January 2004. It excluded literature not concerned with the UK, and articles published before 1999. Additional references identified as important sources for the included publications were included, and irrelevant search results excluded. Overall, the review covered 41 sources. Full details in Barmby and Coe, 2004. Quantitative: a telephone survey (January-June 2004) with 246 teachers in England in Wales, teaching English, maths and science, identified as shortage subjects by the Teacher Training Agency. A random sample of participants in the Repayment of Teachers' Loans Scheme teaching the relevant subjects, stratified by region. The response rate was 39%. Sample selected for 25% working in London, and 75% working in the rest of England and Wales to achieve sample numbers for meaningful comparisons. The sample was representative of the original population in terms of gender.	++
Borman, G. D., & Dowling, N.M. (2008). Teacher Attrition and Retention: A Meta-Analytic and Narrative Review of the Research. *Review of Educational Research, 78*(3), 367-409	Yes	Quantitative: meta-analysis of 34 studies on teachers' career trajectories and attrition/retention. Examines 63 attrition moderators. Literature for the analysis was identified using a keyword search of reference databases (Education Resources Information Clearinghouse; PsychINFO; JSTOR; The Scholarly Journal Archive; Social Sciences Full Text; Academic Search; and Education Full Text), the internet and citations in key (review) articles. Quantitative articles or research reports published between 1980 and 2005 only. Articles were sifted to identify those providing data on the probability of attrition. Final study included 34 articles, each based on independent data sets or samples and with varying sample sizes. Effect sizes were calculated for each study. Statistical analyses were conducted on the log odds ratios of attrition, using weights equal to the inverse of the sampling error variance of the effect sizes, such that the contribution of each effect size was proportionate to its reliability. Significant results, effect sizes as odd ratio, logged odds ratio values and z-values were reported.	++

Bowers, T. (2001). Teacher Absenteeism and Ill-health Retirement: a review. *Cambridge Journal of Education, 31*(2), 135-157	Yes	This paper reviews research into teacher illness and absenteeism. Includes studies from Europe and North America. It examines the definition and measurement of absenteeism, its cost, and the relationship between absenteeism and student attendance and school performance. It examines research comparing teacher absenteeism data with figures for other public employees. It reviews approaches to managing absenteeism, including policy development and implementation, and considers possible causes of teachers' early retirement because of disability in a context of management practice, educational reform and making best use of 'older' employees.	++
Brown, J., Gilmour, W.H., & Macdonald, E.B. (2006a). Return to work after ill-health retirement in Scottish NHS staff and teachers. *Occupational Medicine-Oxford, 56*(7), 480-484		Supplemented by later report below	++
Brown, J., Gilmour, W. H., & Macdonald, E. B. (2006b). Ill-health retirement in Scottish teachers: process, outcomes and re-employment. *Int Arch Occup Environ Health, 79*(5), 433-440	Yes	Quantitative: 537 teacher ill-health retirees in Scotland between April 1998 and March 2000 were randomly selected by the Scottish Public Pensions Agency to receive a postal or telephone questionnaire in January 2002. 282 participants returned the survey (response rate 53%). 38% of participants were male and 62% were female. 42% taught in secondary education, 37% in primary, 9% in further, 7% special needs, 3% nursery and 2% in independent schools. The research investigated the likelihood of taking up employment after IHR. The survey data was analysed using tests of statistical significance including chi-squared, unadjusted odds ratios and multiple logistic regression models. There may be issues with non-response bias and under-reporting, due to the sensitive nature of the issues covered.	++
Buchanan, J. (2009). The Use of Teachers' Expertise in Subsequent Careers: Brain Drain, Skill Spill? *Education & Society, 27*(1), 25-50	Yes	Qualitative and Literature Review. Qualitative: semi-structured telephone interviews with twenty ex-teachers (fifteen females, seven males) who had left school teaching mid-career to take up non-teaching positions. Their experience ranged from a few months to more than 20 years. The sample excluded ex-teachers who had moved into professions involving a significant teaching role, like academics. The sample was recruited via snowball sampling starting from suggestions by the author's colleagues. Literature review: the article includes a short overview of the literature to motivate the qualitative research. The review methodology is not described.	++

Cleal, N., Curry, C., Carrera, L., Adams, J., & Redwood, D. (2013). The implications of the Coalition Government's public service pension reforms. London: Pensions Policy Institute	No	Quantitative: in order to provide comparisons of the value of the benefits offered by alternative Defined Benefit pension schemes, such as a final salary scheme and a career average scheme, the PPI calculated the Effective Employee Benefit Rate (EEBR) of different schemes for scheme members with different characteristics. The EEBR translates the value of the pension benefit offered into an equivalent percentage of salary that the scheme member would need to be given to compensate for the loss of the pension scheme. The modelling in this project assumes increases in SPA approximating a combination of current legislation and announced Government policy. The PPI has used this measure in a previous assessment of the implications of the Labour Government's reforms to public service schemes (PPI 2008).The PPI has also used this measure in analysis conducted for the Independent Public Service Pension Commission (IPSPC) on the implications of different reform options.	++
Costrell, R. M., & McGee, J. B. (2010). Teacher Pension Incentives, Retirement Behavior, and Potential for Reform in Arkansas. *Education Finance and Policy, 5*(4), 492-518	Yes	Quantitative: uses a longitudinal data set linking administrative data on teachers with pension system data for period 2000/01-2007/08. The data set covers 36,657 teachers, for a total of 209,721 person-year observations, of which 8,194 were separations. The teachers in the data set were 80.5% female, 89.6% white, with mean average age 42.4. The research calculates how teachers accumulate pension wealth with each year of employment, and assumes salary increases at 2.5% inflation, a 5% interest rate and use the most current female mortality tables from the Center for Disease Control and Prevention. The analysis tests for statistical significance using a multivariate regression model.	++
Dauksas, L., & White, J. (2010). Should I Stay or Should I Go? How Teacher Leadership Can Improve Teacher Retention. *AASA Journal of Scholarship & Practice, 7*(2), 27-32	Yes	Literature review: explores attributes of teacher leaders and conditions that affect teacher retention. It compares characteristics of teacher leaders with the opportunities and conditions that reportedly have a positive influence on teacher retention. Suggestions are provided for principals to cultivate teacher leaders, thus positively impacting teacher retention and student learning. The review methodology is not described.	++

Day, C., Stobart, G., Sammons, P., Kington, A., Gu, Q., Smees, R., & Mujtaba, T. (2008). *Variations in Teachers' Work, Lives and Effectiveness*. Research Report RR743. Department for Education and Skills.	No	Mixed: Sample of 300 teachers, drawn from seven nationally and geographically representative local authorities. An initial survey led to the selection of one hundred schools and three hundred case study teachers. Half of the sample were primary teachers from seventy five primary schools, half secondary teachers of maths or English from twenty five schools. The schools were representative in terms of phase, SES, size, and overall attainment, and the teachers were broadly representative of the profession in terms of age/gender/experience. The sample overrepresented deprived schools on the assumption that they would experience higher mobility/drop-out. Teachers in Years 2, 6 and 9 were selected so that the key stage national curriculum test results could be used as pupil outcome measures. Effectiveness was measured by teachers' perceptions of their own effectiveness and their impact on pupils' educational outcomes. Qualitative: semi-structured recorded interviews conducted twice-yearly with teachers to monitor perceptions of effectiveness and the positive and negative influences upon these. Quantitative: multi-level analyses of value-added to pupils' progress and attainment and an annual pupil attitude survey to measure pupil outcomes and explore differences between classes and teaching groups. Qualitative and quantitative data were used to create profiles of teachers to identify patterns in terms of perceived and relative (value-added) effectiveness.	++
Day, C., Elliot, B., & Kington, A. (2005). Reform, Standards and Teacher Identity: Challenges of Sustaining Commitment. *Teaching and Teacher Education: An International Journal of Research and Studies, 21*(5), 563-577	Yes	Qualitative: an exploratory study involving 20 experienced teachers aged 45-55, selected on an opportunistic basis from groups engaged in professional development at the authors' universities. Among the Australian participants, six were primary and six secondary teachers. Among the English sample, four were primary, three secondary, one headteachers, and two LEA advisers. Data was collected via open qualitative interviews. They were coded in line with the principles of grounded theory.	++
Day, C., & Gu, Q. (2007). Variations in the conditions for teachers' professional learning and development: sustaining commitment and effectiveness over a career. *Oxford Review of Education, 33*(4), 423-443	Yes	Mixed: The data is drawn from a four-year large scale, mixed methods research project on variations in teachers' work, lives and effectiveness (VITAE) involving three hundred teachers in one hundred primary and secondary schools in 7 Local Authorities (LAs) (Day et al., 2006a). All were broadly representative of the national age, experience and gender profile of teachers and of the SES/attainment profile of schools. Qualitative: data on teachers' perceived effectiveness were collected through twice yearly semi-structured, face-to-face interviews with teachers, and supplemented by document analysis and interviews with school leaders and groups of pupils. Quantitative: improvements in pupils' progress and attainment were collected through matching baseline test results at the beginning of the year, with pupils' national curriculum results at the end. This article presents 2 case studies and presents counts for various comparison groups with an N <100. No statistical tests for significance are used.	++

Day, C., & Gu, Q. (2009). Veteran teachers: commitment, resilience and quality retention. *Teachers and Teaching, 15*(4), 441-457	Yes	Mixed – but appears more qualitative. Drawing upon a range of research, this paper seeks to investigate how and why teachers in the third and fourth decades of their professional lives sustain or do not sustain their beliefs and sense of commitment to teaching at its best. This paper sees retention as a process rather than a result. It thus addresses the conditions which help teachers to sustain their commitment to high quality teaching over time.	++
DeArmond, M., & Goldhaber, D. (2010). Scrambling the nest egg: How well do teachers understand their pensions, and what do they think about alternative pension structures? *Education Finance and Policy, 5*(4), 558-586	Yes	Mixed – although appears largely quantitative. In this article the authors focus on2 questions: How well do teachers understand their current pension plans, and what do they think about alternative plan structures? The data come from administrative records and a 2006 survey of teachers in Washington State	++
Disney, R., Emmerson, C., & Tetlow, G. (2010). The Value of Teachers' Pensions in England and Wales. *Fiscal Studies, 31*(1), 121-150	Yes	Quantitative: The paper calculates the value of the pension right accrued by members of the TPS under the pre- and post-reform rules, and calculates the additional value of incremental accrued rights as a fraction of salary on an annual basis. It also compares these rights with those under2 defined contribution pension schemes, taking into account differences in typical age-earnings profiles. Coverage: full- and part-time primary and secondary school teachers employed in local authority maintained schools, as recorded in the Database of Teacher Records (DTR), who were aged between 23 and 59 (inclusive) as of March 2007. '87% of primary school teachers and 61% of secondary school teachers are women. On average (looking at both the mean and median ages), teachers are in their early 40s, with half of teachers being aged between their early 30s and their early 50s. The distribution of female teachers' ages is slightly younger than that of male teachers' ages.' (128-129)	++
Friedberg, L., & Turner, S. (2010). Labor Market Effects of Pensions and Implications for Teachers. *Education Finance and Policy, 5*(4), 463-491	Yes	Literature review	-
Friedberg, L., & Turner, S. (2011). Pensions and public school teacher retirement: An analysis using national teacher data. *Research Dialogue Issue*, 99	Yes	Quantitative: Analysis of the impact on state school teachers' retirement decisions of the incentives embedded in public defined benefit pensions plans (the way they accumulate pension wealth as a function of workers' age, tenure and earnings) Based on a nationally representative sample of teachers from the Schools and Staffing Survey (SASS) and Teacher Follow-up Survey (TFS).	++

Fuller, C., Goodwyn, A., & Francis-Brophy, E. (2013). Advanced skills teachers: professional identity and status. *Teachers and Teaching, 19*(4), 463-474	Yes	Mixed: Using survey data from 849 ASTs (Advanced Skills teachers) and in depth interviews with 31, this paper seeks to explores the ways that the AST designation impacts or not on teachers' perceptions of their professional identity. – examines how this affects teacher status and retention	++
Furgeson, J., Strauss, R. P., & Vogt, W. B. (2006). The Effects of Defined Benefit Pension Incentives and Working Conditions on Teacher Retirement Decisions. *Education Finance and Policy, 1*(3), 316-348	Yes	Quantitative: The retirement behaviour of Pennsylvania public school teachers in 1997-98 and 1998-99, a period when state early retirement incentives were temporarily increased, is modelled using a choice framework that emphasises both pecuniary and non-pecuniary factors of the retirement decision under a defined benefit retirement plan. We find each to have large and statistically significant effects on the decision to retire.	++
Gaikhorst, L., Beishuizen, J.J., Zijlstra, B.J.H., & Volman, M.L.L. (2014). Contribution of a professional development programme to the quality and retention of teachers in an urban environment. *European Journal of Teacher Education, 38*(1), 41-57	Yes	The quantitative element of the study uses a quasi-experimental design (N=133 – 66 treatment, 67 control): The contribution of participation was measured using a knowledge test and questionnaires to assess professional orientation, self-efficacy, motivation, and career choices prior to and after the intervention. The treatment group was formed of all teachers who wanted to participate in the programme. Participants were matched to members of the control group on several variables: work environment (major city), potential (control group also participated in development programme), years of experience, gender. Multilevel modelling was used to analyse the data, with measurement occasions being treated as nested in teachers. To understand teachers' perspectives on the programme, semi-structured telephone interviews were conducted (N=42 – equal proportion of teachers/principals). The results were analysed using CAQDA. Limitations: It is not clear whether the matching compensates for the self-selection bias of the experimental part of the study. Competences are operationalized as knowledge, which the authors themselves recognise as problematic. Career choices are measured using questions about career plans and actual steps taken to leave the sector.	++
Gilpin, G. A. (2011). Reevaluating the effect of non-teaching wages on teacher attrition. *Economics of Education Review, 30*(4), 598-616	Yes	Quantitative: In this paper, we use non-teaching wages of former teachers to estimate the determinants of teacher attrition, including the wage differential between teaching and non-teaching occupations, as well as the teacher work environment. This study follows the careers of around 5000 public school teachers employed in U.S. public schools between 1999–2000 and 2004–2005 school years. The data come from a sample of public school teachers contained in the restricted-access version of the Teacher Follow-up Survey (TFS) for school years 2000–2001 and 2004–2005 along with school characteristics from the Schools and Staffing Survey (SASS) for school years 1999-2000 and 2003-2004.	++

Goldhaber, D., Grout, C., & Holden, K. (2015). Teacher Pension Systems and Mobility Decisions: Evidence from Washington State. Washington, D.C.: American Institutes for Research	Yes	The data is drawn from the Washington State teacher retirement data, which includes information on plan enrolment, mandatory/voluntary enrolment, contribution rate choice for the hybrid scheme, and retirement dates up to January 2010. These data were merged with administrative record from the Washington State Office of the Superintendent of Public Instruction (OSPI) S-275 personnel reporting system, which provides information on teacher demographics, assignment type (duty codes identify teaching staff and activity codes identify positions involving direct instruction), school system and school of employment, salary, experience level, and subject areas in which a teaching endorsement is held; based on this data, a panel of observations can be constructed for each year in which an individual is employed as a public school teacher in Washington state during the school years ending between 1985 and 2014. The sample consists of 72,085 unique teacher observations and 757,339 person-year observations. The teachers in the DB plan tend to be older and are more likely to be female. The paper first compares the quit rates for a 1987 worker cohort that is mandated into traditional pension plans to a 1996 worker cohort that is mandated into hybrid plans; this is shown to be sensitive to extraneous cohort and contextual differences. The paper then draws comparisons using alternative methods that limit the time difference between cohorts, comparing one-year quit rates for teachers hired before 1996 who are mandated into the traditional pension plan to teachers hired after 1996 who are mandated into the hybrid plan. Finally, it compared quit rates among a cohort of teachers hired after 2007, who are allowed to choose their pension plan. The model uses discrete-time hazard models to estimate the likelihood of quitting in each year of service. The models control for the observable characteristics of teachers on some specifications, to test for whether selection on observable characteristics is responsible for some part of the higher quit propensities of the hybrid plan, or whether selection is correlated with teachers'	+
Gu, Q. (2014). The role of relational resilience in teachers' career-long commitment and effectiveness. *Teachers and Teaching, 20*(5), 502-529	Yes	Quantitative: The empirical basis of the paper draws upon analyses of twice yearly semi-structured face-to-face interview data from 300 teachers in different phases of their careers in 100 primary and secondary schools in England over a consecutive three-year period. Through these analyses, the paper contributes additional empirical evidence to the emerging but still limited literature on the factors which influence teachers' capacity to be resilient.	++

Guarino, C. M., Santibanez, L., & Daley, G. A. (2006). Teacher Recruitment and Retention: A Review of the Recent Empirical Literature. *Review of Educational Research, 76*(2), 173-208	Yes	The literature review included all studies meeting criteria of relevance to teacher recruitment/retention in the USA (published in 2004 at the latest and covering data reaching to 1990 or later), scholarship (articles published in peer-reviewed journals as well as books/chapter of empirical nature), empirical nature (no review of reviews – included publications must be based on qualitative or quantitative research and analysis) and quality (reliability/validity, warranted interpretations). The search strategy relied on electronic searches of relevant databases and table-of-contents searches of recognised education journals, as well as recommendations from experts in the field. The total number of papers reviewed was 46. The article adopts a rational choice model of teacher recruitment and retention (p. 174-177). The review recognises that its conclusions may be affected by 'publication bias' against publishing no-effect results. It notes limitations in the quality of individual studies included in the review throughout.	++
Hancock, C.B. (2009). National Estimates of Retention, Migration, and Attrition: A Multiyear Comparison of Music and Non-Music Teachers. *Journal of Research in Music Education, 57*(2), 92-107	Yes	Quantitative: Estimates the magnitude of retention, migration, and attrition of music teachers; the transfer destinations of those who migrated; the career path status of those who left; and the likelihood that former music teachers would return to teaching. Analyses data on music (n = 881) and non-music teachers (n = 17,376). Data from 1988-1989, 1991-1992, 1993-1994, and 2000-2001 waves of the National Centre for Education Statistics' Teacher Follow-up Survey, a USA national survey designed to compile comprehensive data concerning changes in the teacher labour force.	++
Hansez, I., Bertrand, F., De Keyser, V., & Peree, F. (2005). Career end for teachers: Towards a better understanding of stress and early retirement. *Travail Humain, 68*(3), 193-223	Yes	Quantitative: Statistical analyses of survey among teachers and results from subjective stress measure.	++

Hughes, G.D. (2012). Teacher Retention: Teacher Characteristics, School Characteristics, Organisational Characteristics, and Teacher Efficacy. *The Journal of Educational Research, 105*(4), 245-255	Yes	The data for this research are the results of an online survey administered to teachers at 70 schools, recruited from a random stratified sample of 400 schools in the state obtained from the Department of Education's website (response rate 17.5%). Principals were asked to invite teachers to participate in an online survey. 789 teachers completed the survey (response rate unknown). Participants were based in elementary (41% of participants), middle/intermediate/junior (34%), high (25%), and other public schools. The participants were 86% female, with an average age of 44 years, and almost exclusively Caucasian. Close to a third each had less than 10 years and between ten and twenty years of experience, and more than a third had more than 20 years of experience (p. 249). The potential issues relating to non-response bias arising from this sampling strategy, both at the school and teacher level, were not addressed in the analysis. The author further noted potential biases arising from the overrepresentation of schools with students on free school meals and that of teachers from large schools relative to the population of the state. Finally, the article attempts to draw conclusions about retention/attrition based on a survey of teachers who remain in the profession. The survey comprised sixty items designed for the study and subjected to peer validation and tests of internal consistency reliability. The data were analysed using block-entry logistic regression.	++
Hutchings, M. (2010). *What impact does the wider economic situation have on teachers' career decisions? A literature review*. London: Department for Education	No	The review draws on literature from labour economics (patterns of supply/demand, wages, employment levels etc. – based on longitudinal or cohort data sets – often focused on UK due to availability of data) and education research (focusing on teachers' own explanations for their career decisions). It considers the limitations of research from a labour economics perspective, notably its narrow focus on economic determinants of career decision making and its neglect of factors like workload, stress, pupil behaviour etc. It also considers the variety of measures of pay differences used, and considers the role of government policy in determining exit and entry. With regard to the education research literature, the review considers the limitations arising from limited survey evidence and the biases potentially arising from survey questions.	+
Hutchings, M., Smart, S., & Minty, S. (2008). *To what extent can pension scheme changes increase retention of older teachers?* Paper presented at the BERA Conference, Heriot Watt University, Edinburgh	No	The research (reported in full in Peters et al., 2008, also reviewed) involved • Surveys of local authorities, headteachers in their role as employers (N=672), and teachers aged 49-60 who were members of the Teachers' Pension Scheme (including headteachers in their role as employees; N=3865). • Case studies in twelve schools: qualitative interviews with headteachers, teachers, and governors. Qualitative interviews with individuals who had indicated on the survey that they planned to take advantage of the new provisions (N=91).	++

Kirkman, S. (1997). Too exhausted to carry on in post? *TES: Times Educational Supplement* (4212), 18	No	N/A – Newspaper Article	++
Kirkman, S. (2001). Escape from the great classroom burn-out. *TES: Times Educational Supplement* (4413), 29	No	N/A – Newspaper Article	++
Kirkman, S. (2003). Why not a 3-day week? *TES: Times Educational Supplement* (4555), 2-2	No	N/A – Newspaper Article	++
Koedel, C., Podgursky, M., & Shi, S. (2013). Teacher Pension Systems, the Composition of the Teaching Workforce, and Teacher Quality. *Journal of Policy Analysis and Management, 32*(3), pp. 574-596	Yes	The research relies on longitudinal administrative microdata from Missouri. It comprised a sample of 7275 teachers across 942 schools, as well as over 200,000 unique students. It measures classroom effectiveness in terms of value added, based on student test scores in maths and reading linked to classroom-teacher assignments from the school years 2008/09, 2009/10, and 2010/11 as well as prior test scores. All test scores are standardised by subject, grade, and year. It identifies three groups of retirees based on when in the incentive structure of the system they retired, based on personnel data from 2011-2012. The regression model uses year t information about students, school characteristics, and teachers, year t-1 information about students' test scores, and the classification of teachers and then devises a model of student achievement designed to distinguish performance differences across teachers observed as retiring on different segments of the incentive structure. The findings are shown to be robust to changing the way that students are linked to teachers and to changing definitions of the retiree groups. To control for the possibility that unobserved differences in the working conditions for teachers could contribute to the observed retirement behaviours as well as to student achievement, which would make the retirement variables endogenous, a secondary regression analysis is conducted, which indicates that no such bias is present.	+

Macdonald, D. (1999). Teacher attrition: a review of literature. *Teaching and Teacher Education, 15*(8), 835-848	Yes	Literature Review	++
Mackenzie, S. (2012). 'I can't imagine doing anything else': why do teachers of children with SEN remain in the profession? Resilience, rewards and realism over time. *Journal of Research in Special Educational Needs, 12*(3), 151-161	Yes	The sample was of nineteen teachers, all of whom have been working for fifteen years or more. All were SENCOs or former SENCOs still working in education in some capacity. Ten teachers were from the primary sector and nine from secondary schools. All, but one, were female. Six had been teaching for fifteen years, five for sixteen to nineteen years and eight for more than twenty years (three in the primary sector, five in the secondary sector). The sample was drawn from a wider study of SENCOs, TAs and teachers (n = 44). All participants were interviewed using a life history/narrative approach.	++
NASUWT (2001). *Age Discrimination in Employment. Evidence submitted to the House of Commons Employment Sub-Committee*. Birmingham: NASUWT	No	Policy recommendations. Very brief with little evidence in report.	-
NASUWT (2014). *Teachers' satisfaction and wellbeing in the workplace – 2014. Research in Brief.* Birmingham: NASUWT	No	Weighted survey of 505 teachers in England, November 2014	++
National Union of Teachers. (2011). *NUT Pensions Survey November 2011*. London: National Union of Teachers	No	Quantitative: Results of survey on teachers' attitudes to working longer and their views on the fairness of the Government's proposals Sample: 6,433 NUT members	++
National Union of Teachers. (2013). *Misuse of Capability Survey*. London: National Union of Teachers	No	Quantitative: Results of survey of division secretaries with a view to finding out the extent to which capability procedures, both formal and informal, were being misused in schools Sample: 54 division secretaries	-

Ni, S., & Podgursky, M. (2011). Teacher Pension Incentives and the Timing of Retirement. Unpublished manuscript	No	Quantitative: Estimates an option-value model of individual teacher retirement using an administrative data set for Missouri teachers, and then uses estimated structural parameters to simulate retirement behaviour under alternative pensions rules.	+
Ni, S., Podgursky, M., & Ehlert, M. (2009). *Pension Incentives and Labor Market Behavior: Evidence from Missouri Administrative Teacher Data.* Paper presented at the Vanderbilt University: National Center on Performance Incentives. Conference Paper	No	Quantitative: Based on a new longitudinal state data set linking longitudinal SEA data records to state pension records, for all teachers employed in Missouri public school districts covered by the PSRS scheme between 1991/92 and 2007/08.	++
Peters, M., Hutchings, M., Edwards, G., Minty, S., Seeds. K., & Smart, S. (2008). *Behavioural Impact of Changes in the Teachers' Pension Scheme*. Research Report DCSF-RR024. London: Department for Children, Schools and Families	No	Mixed methods Survey with local authorities pensions staff (N=67, response rate 48%) and HR staff (N=39, 28%) Survey with headteachers in their role as employers (N=672, 34%). Survey with employees aged 49-60 who were members of TPS (3865 responses in total – N=939 for headteachers, 47%; N=2926 for other teachers, 44%) Case studies of twelve schools and qualitative follow-up interviews Literature review	++
Shen, J. (1997). Teacher Retention and Attrition in Public Schools: Evidence from SASS91. *The Journal of Educational Research, 91*(2), 81-88	Yes	Quantitative: Discriminant function analyses on data gathered from the 1990–1991 Schools and Staffing Survey and the 1991–1992 Teacher Follow-up Survey Sample: 3,612 individuals	++
Stinebrickner, T.R. (1998). An empirical investigation of teacher attrition. *Economics of Education Review, 17*(2), 127-136	Yes	Quantitative: Current duration analysis techniques used to examine the first spell in teaching for a sample of certified elementary and secondary school teachers Sample: 341 individuals who became certified to teach at some point between 1975 and 1985, based on NLS-72 and follow-up surveys in 1973, 1974, 1976, 1979, and 1986	++

Strauss, R.P., & Liu, J. (2009). *Patterns of Retirement and Return Employment of Pennsylvania's Professional School Personnel: 1984-2006*. Conference Paper 2009-07. Nashville: National Center on Performance Incentives	Yes	Quantitative; statistical modelling Retiring and returning teachers in the Pennsylvania school system	+
Teacher Support Network (2014). *Education Staff Health Survey 2014 report*. London: Teacher Support Network	No	Quantitative Survey of education staff (teachers, lecturers, support staff, admin staff)	++
Tye, B. B., & O'Brien, L. (2002). Why Are Experienced Teachers Leaving the Profession? *Phi Delta Kappa, 84*(1), 24	No	Quantitative: Results of survey of experienced graduates Sample: 114 graduates of Chapman Uni. who had completed a teaching credential in the five years between 1990-91 and 1994-95, and who had presumably been teaching from six to ten years	++
US Department of Education, International Affairs Office, and National Council on Teacher Quality (2004). *Attracting, Developing, and Retaining Effective Teachers: Background Report for the United States*. Washington D.C.: US Department of Education	No	Literature Review	+
Van Droogenbroeck, F., & Spruyt, B. (2014). To stop or not to stop: an empirical assessment of the determinants of early retirement among active and retired senior teachers. *Res Aging, 36*(6), 753-777	Yes	Quantitative analysis of survey data	++

Whitener, S. D., Gruber, K. J., Lynch, H., Tingos, K., Perona, M., & Fondelier, S. (1997). *Characteristics of Stayers, Movers, and Leavers: Results from the Teacher Followup Survey: 1994-95.* US Department of Education, National Center for Education Statistics	No	Quantitative: Results of US Teacher Follow-up Survey: 1994-95. Schools and Staffing Survey concerning characteristics of stayers, movers, leavers; descriptive	++
Wilson, V., Powney, J., Hall, S., & Davidson, J. (2006). Who Gets Ahead? The Effect of Age, Disability, Ethnicity and Gender on Teachers' Careers and Implications for School Leaders. *Educational Management, Administration & Leadership, 34*(2), 239-255	Yes	Qualitative; analysis of survey responses and case study interviews	++
Worth, J., Bamford, S. and Durbin, B. (2015). *Should I Stay or Should I Go? NFER Analysis of Teachers Joining and Leaving the Profession.* Slough: NFER.	No	Representative survey of teachers in England using School Workforce Survey analysis. Analysis of Labour Force Survey using a sample of 6,896 teachers, including 936 that left teaching and 774 that joined teaching over a fourteen year period (2001-2015).	++

Appendix 4: Organisations represented on the steering group

The following organisations have representatives on the review's steering group:

- The Department for Education
- The Welsh Government
- Teacher trade unions:
    - Association of School and College Leaders (ASCL)
    - Association of Teachers and Lecturers (ATL)
    - National Association of Head Teachers (NAHT)
    - National Association of Schoolmasters Union of Women Teachers (NASUWT)
    - National Union of Teachers (NUT)
    - Undeb Cenedlaethol Athrawon Cymru (UCAC)
    - Voice
- Employer representatives:
    - The Local Government Association (LGA)
    - The Welsh Local Government Association (WLGA)
    - The National Governors' Association (NGA)
    - The Freedom and Autonomy for Schools National Association (FASNA)
    - United Learning
    - The Independent Schools Council (ISC)
    - The Girls' Day School Trust (GDST)
    - Sixth Form Colleges Association (SFCA)

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