The Capacity and Impact of Education Research in the UK

Report to the Royal Society and British Academy Joint Enquiry on Educational Research

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Executive Summary

In March 2017, the Royal Society commissioned a team at the Department of Education at the University of Oxford to synthesise and analyse existing evidence on educational research capacity and impact in the UK, with particular focus on evidence from HESA and REF 2014 data. The purpose of the review was to feed into a Royal Society–British Academy joint project on educational research (chaired by Sir Alan Wilson), exploring how educational research could be 'harnessed' to inform and shape educational policy-making and practice. The review reported in June 2017.

This report analyses and synthesises evidence from a range of relevant datasets, building on previous work carried out by the team in this area (Oancea and Mills 2014, Christie *et al* 2012, Mills *et al* 2006). Work Package 1 brings together HESA, REF data, career trajectory data and doctoral thesis data to analyse current education research capacity within UK universities. Work Package 2 systematically analyses a sample of 2014 Education REF environment templates, impact statements and impact case studies to understand how and when educational research has impact, and how these impacts are reported. Work Package 3 is a desk-based review, supplemented with expert interviews, of the types of educational research and analysis conducted in non-university research organisations. It goes on to discuss the emergence of informal teacher-led networks as influential brokers of educational ideas with practitioners. The report concludes with recommendations for future research.

Our original brief was to explore the available data, in particular from HESA and REF 2014, in order to gather information and identify evidence gaps about:

- The existing capacity (staffing, PGRs and funding) for educational research in the UK.
- The deployment of that capacity with respect to particular research themes.
- The factors that may chiefly affect this capacity.
- How, where and what types of research have impact.
- The environmental factors that may be supporting impactful educational research.
- How impact is understood by different parts of the system (researchers, practitioners and policy makers).
- The involvement of non-university research organisations in generating and sharing educational research and analysis in the UK.
- The types of educational research, analysis and scholarship they carry out.
- The impact of this work and how it articulates with research conducted by higher education institutions.

A key outcome of this review has been increased clarity about the specific gaps in the current evidence base about educational research and areas for further investment. While the data we have gathered throw light on many of these questions, the datasets available have limited coverage of, for example, different stakeholders' understandings of impact, the environmental features of organisations that host impactful research, the career trajectories of educational researchers, inter- and multi-disciplinary research, the relative strength of research capacity across sub-fields of education, and the infrastructure and capacity for research in non-university organisations. All of these topics require further empirical

research, which was outside our brief, timeframe and resources, but which we highlight in our recommendations.

Key Findings

1. The total number of REF-eligible academic staff in Education in 2014 was 5255 FTE spread across 109 institutions (HESA 2014), while the total submitted to the REF exercise was 1442 FTE in 76 submissions. This makes the selection rate for Education in REF 2014 around 27% (or, using a different methodology, 31% - HEFCE, 2015). Additionally, there is significant applied research and analytic capacity within government, commercial and third-sector organisations.

2. The population of education academics employed on research-only contracts is declining, and is currently around 375 FTE staff (HESA 2015/16), of whom 270 are based in Russell Group universities.

3. The number of research-active staff submitted to REF 2014 by universities ranged from 5 to 249 (i.e. between 3.8 and 219 FTE), with 62% of institutions submitting less than 15 FTE, and 33% submitting less than 10 FTE.

4. Amongst the 5095 staff on teaching and research contracts in Education (HESA 2015/16), 40% hold a doctorate as their highest academic qualification, highlighting the diversity of professional and academic experience within the field. Around a quarter of a sample of REF 2014 research-active staff (n=101) have a background in teaching and/ or hold teaching qualifications.

5. There are pockets of education-related research expertise in other fields, including in particular Health, Psychology, Computer Science, Geography, Business and Management, Sociology, Social Work and Social Policy, Sport Sciences, History, Art and Design, and Music, Drama and Performing Arts, but they tend to focus on specialist sub-fields and do not represent a large proportion of overall educational research capacity.

6. There are currently around 6400 research students (FPE) studying for an Education doctorate (including both PhD or EdD), of whom less than 2000 are studying full-time. 70% of full-time PGR students are studying at Russell Group universities (HESA 2015/16). Total research student numbers grew steadily until about 2011, but have since remained relatively stable. Non-EU students make up 60% of all full-time PGR students and 24% of all PGR.

7. Research students make an important contribution to educational research capacity. Within this community, the EdD (professional doctorate) is growing rapidly in popularity. We estimate that between 1/3 and 1/2 of all doctoral students may be studying for an EdD.

8. At least two thirds of successful doctoral completers go into (or back to) careers in Education; over half of the completers go into education careers outside the HE sector. 25% of a sample of REF-submitted academic staff have teaching qualifications or experience.

9. Analysis of REF2014 Impact Case Studies points to a healthy research ecosystem, with educational research having significant impacts on both policy and professional practice. More than three quarters of the case studies analysed (n=101 out of the total of 218 case

studies submitted to the Education sub-panel) used a range of different pathways to engage with policy makers, practitioners, academics, and the wider public.

10. The most impactful research moved beyond disseminating findings through publication and took a multidimensional approach to impact, using combinations of strategies and working in partnership with others to generate significant benefits across wide sections of relevant population groups.

11. Features shared by impactful research environments include: coherence between the impact and research strategies; stability of funding; strategic investment in capacity building and professional development in research; a balance between mechanisms for intellectual continuity and discontinuity; strong support from the wider HEI; leadership; and productive engagement in networks and partnerships.

12. Like university departments, non-university research organisations carry out different types of educational research, including operational research, evidence-based synthesis, design research, international benchmarking and policy evaluations. The work of the Education Endowment Foundation in supporting evidence-based evaluation is strengthening research capacity within and beyond universities.

13. Non-university research organisations frequently work with individual academics and with teams based in higher education institutions (HEIs). However there is relatively little evidence of institutional-level research collaborations between university departments and non-university research organisations, and they are in competition for the same research contracts.

14. Practitioner-led collaborations and partnerships such as 'Research Schools' and 'University Schools' aim to reshape the educational landscape, by facilitating the uptake of research evidence in teaching practice.

15. Practitioner and teacher-led networks (such as ResearchEd and the Chartered College of Teaching) are increasingly visible research policy actors and mediators, using social media to share ideas and promote engagement with research. They are influential advocates of the movement for 'evidence-based' approaches to educational practice, and some researchers use these networks effectively. In the future, they may be important pathways to impact.

Historical background

There have been repeated attempts by funders and sector bodies to analyse and mobilise educational research capacity in the UK. These can be traced back to the creation, in 1946, of the National Foundation for Education Research, with a mandate to coordinate and supplement university-based research.

The current policy emphasis on evidence-based policy-making and practice in education and on implementing 'what works' can be traced back to New Labour's first administration in 1997-2001 and was preceded by critical reviews of educational research commissioned separately by the Department for Education and Employment and Ofsted (Tooley and Darby, 1998; Hillage et al, 1998). In the first three years of this administration, annual research expenditure by the Department of Education doubled from £5.4 to £10.5 million (Furlong 2013). The Department also supported several research centres in England, including the Centre for Research on the Wider Benefits of Learning at the IoE, the LSE Centre for the Economics of Education (Whitty et al 2016), and the Evidence for Policy and Practice Information and Co-ordination Centre (EPPI-Centre) at the UCL Institute of Education. The establishment of a ten-year £30 million *ESRC Teaching and Learning Research Programme* in 1998 funded research that sought to improve outcomes for learners across all of the UK. Its final evaluations (Baker et al, 2010; Parsons and Burkey, 2011) highlighted the challenges of sustaining and consolidating these innovations, building practitioner communities and developing accessible briefings and commentaries.

A short-lived **National Educational Research Forum** set up in 1999 sought to coordinate research efforts and to prioritise research that made a 'worthwhile contribution' to education. Accused of taking an overly instrumentalist approach to 'what works' in Education (Ball 2001), it was wound up in 2006. Whilst in existence, it highlighted the range of approaches to research in the sector, and the need to prioritise 'maximising impact', a concern since taken up in UK research policy more broadly.

The **Strategic Forum for Research on Education** (2008-2010) adopted a different approach in its effort to review educational research activity and facilitate dialogue among stakeholders across England, Northern Ireland, Scotland, and Wales. The outcome of three years of seminars and workshops, the SFRE Final report (Pollard and Oancea, 2010) proposed a synthetic model that sought to integrate what it described as six different elements (Origination, Creation, Assessment, Collection, Mediation and Impact) necessary for the development and mobilisation of knowledge in education. It also drew attention to resources that are no longer actively maintained (such as the Teacher Training Resource Bank, though its archive can be accessed via the CUREE site), illustrating the dangers of policy churn and of neglecting institutional memory.

Between 2010 and 2015, the **British Educational Research Association** (BERA) partnered up with the Universities Council for the Education of Teachers (UCET) and with the RSA to commission further reviews of the state of educational research. They included the BERA/UCET study of the impacts of RAE 2008 on education units, individual researchers, and

the field overall (Oancea, 2010); an assessment of the field's prospects for the future in condition of financial uncertainty and retrenchments (Christie *et al*, 2012); an observatory of education research that combined data from different sources to review research capacity and funding (Oancea and Mills, 2014); and the BERA/ RSA inquiry into research and teacher education (BERA, 2014a, b).

The **Coalition for Evidence-Based Education** (CEBE), an 'alliance' of researchers, policy-makers and practitioners, was initiated in 2009, originally with strong links with the University of York's Institute for Effective Education. It began life as one the first informal alliances of researchers, policy makers and practitioners that aimed to improve the way educational research evidence is used, and exchanged, across the sector[1]. It prepared an extensive position paper in 2010[2] that set out a vision for the future of a 'connected' evidence-using system in a decentralised and devolved educational landscape. Many of the predictions in the 2010 position paper are visible in the current organisational landscape described in this report.

Whilst the policy environment has continued to change, the reviews and reports noted in this section offer valuable baselines against which to compare the current educational research landscape within and beyond universities.

[1] http://cebenetwork.org/projects

[2] http://www.cebenetwork.org/sites/cebenetwork.org/files/CEBEPositionPaper_f_0.pdf

Work Package 1. The capacity for educational research within the UK: Understanding the research base

Summary. This section analyses the research 'capacity' of the educational research base within UK universities, focusing on staffing, students and the research finances of departments and research centres involved in educational research. We interpret this 'base' broadly to include all academic staff actively involved in research and all doctoral students (PhD and EdD).

The three sections discuss recent trends in staffing, PGR students and research funding. We describe how student and staff capacity is distributed by geography, age, sex, employment type and country of origin. We then explore routes into the doctorate, the significance of the growing popularity of the professional doctorate, and the content of doctoral training. Finally, we summarise available research funding data. The data did not provide us with reliable evidence on how capacity for education research is distributed across research themes and sub-fields; exploring this question requires more time and resource than that available to us.

1.1. Methods and data sources

This work package drew on a range of different data sources, as follows.

Staff and PGR students. HESA staff and student data sets from 2004-2016 were accessed via Heidi Plus and used to analyse staffing and PGR population trends. All HESA data were taken from the Education Cost Centre (Code 135), rounded by HESA to comply with DPA requirements[3]. In compliance with Heidi user agreements, no data on individual providers are provided, and data are always attributed to HESA where appropriate. We also drew on HESA's 'Contextual data' published for REF 2014,[4] and on individual institutional data provided in REF environment statements. We analysed data on staff by age, sex, employment contract, contract level, and employment function, and data on PGR students' age, domicile, mode of study, and institutional region and mission group. The data were cross-tabulated and complemented with historical data, to generate time series. We also collated figures on research funding provided by HESA and by the REF and RAE databases.

There are several important caveats to bear in mind when using HESA data, particularly in accurately estimating research capacity from the total number of academic staff within HEIs. Not all staff on teaching and research contracts may be actively involved in research, while in some years there are also inaccuracies in the reporting of research assistants. The figures for PGR may under-report the population of EdD students. Also, the ability to build

[3] HESA Heidi rounding methodology for staff data entails that: all numbers are rounded to the nearest multiple of 5; any number lower than 2.5 is rounded to 0; halves are always rounded upwards (e.g. 2.5 is rounded to 5). (https://www.hesa.ac.uk/support/definitions/staff).

[4] See https://www.hesa.ac.uk/news/18-12-2014/research-excellence-framework-data.

time series is affected by the fact that the Joint Academic Coding System (JACS), which is used to code academic subjects within cost-centres, was revised for the 2012/13 academic year to incorporate additional subjects and is not directly comparable to the previous years.

Career trajectories. In order to examine the flow of staff across educational institutions and the pathways into and out of academic educational research, we drew a systematic sample of 101 members of staff, taking every 16th name from a list of the 1606 individuals submitted to the Education sub-panel of REF2014 (UoA 25). For each individual included in the sample, we carried out an internet search to determine their previous qualifications, professional background (including school experience), whether they held teaching qualifications, and whether they had moved institutions after the REF2014.

Deployment of research capacity on substantive and methodological foci. In dialogue with the EThOS Repository Metadata Manager at the British Library, a tailored database of six years of doctoral theses and titles was created. This informs a discussion of the focus of PGR research. For the purposes of this research, a database of 6120 records from 2010-2016 was created by the EThOS metadata manager, based on a Dewey search, followed up by data cleaning to remove as many 'false positives' as possible. An additional database of 900 records from EThOS included other education-related theses, including work on health education. There are limited and variable metadata available. Abstract data and meta-data collected through the British Library's digital collection of theses (EThOS) were incomplete and so attempts to undertake detailed analysis on these were limited. However, corpus analysis of the title data was carried out using Voyant software.

To explore the substantive and methodological foci of staff research, we used data from the REF to examine keywords using word frequencies in the full dataset of output titles submitted to the Education Sub-panel of REF 2014, coupled with qualitative analysis of mentions of research expertise in a small sample (n=5) of impactful environment statements.

Education research capacity in other disciplines. The extent to which staff in other disciplines engage in education research is difficult to assess quantitatively, particularly within the time and resource constraints of this review. However, we were able to explore educational research submitted to REF 2014 units other than UoA 25 by extracting and analysing lists of outputs with "education" and its stemmed words in their titles or key descriptors. Some of these outputs only tangentially touched on education and many focused on specialist fields such as professional education in the respective discipline, however most were in some way relevant and we kept all in the counts. Relatively large numbers of outputs were also elicited by search terms such as 'school*' and 'learn*' but time constraints prevented us from analysing them systematically. Further work using this approach may prove fruitful. Finally, this report draws on existing publications by the team (e.g. Oancea and Mills 2014) and recent policy reports and publications.

1.2. Academic Staffing in Education

Historical trends. During the early 2000s, there was a gradual growth in academic staffing within the HESA Education (135) cost centre, as Table 1 and 2 demonstrate. Since 2010, this has been replaced by a slight decline in overall staffing. Table 1 charts Education staff FTE within all UK HEIs from 2004 to 2011/12, and demonstrates two notable trends. One is the steady rise in the use of teaching-only contracts, and the second is a nearly 30% drop in staff on research-only contracts. These trends were mirrored within Russell Group universities (Table 2), where the majority of staff on research-only contracts are based. A change in the way HESA codes disciplinary cost centres in 2012/3 makes a direct comparison with post 2012/13 data inappropriate.[5]

Table 1: Education (FTE) staff in all UK HEIs 2004-2012 (HESA)

	Teaching only	Research only	Teaching and Research	Total
2004-5	940	580	4280	5800
2005-6	1100	570	4440	6110
2006-7	1215	600	4600	6415
2007-8	1285	640	4825	6750
2008-9	1620	600	4745	6965
2009-10	1650	600	4750	7000
2010-11	1525	485	4815	6825
2011-12	1430	410	4650	6490

Table 2: Russell Group Education Staff by Employment Contract FTE 2004-2011 (HESA)

	Teaching only	Research only	Teaching and Research	Total
2007-8	275	300	965	1540
2008-9	280	280	945	1505
2009-10	285	270	900	1455
2010-11	340	240	820	1400
2011-12	345	210	790	1345

The size of the academic research community in Education There are several ways to try and estimate the size of the community of staff actively involved in educational research. For example, one proxy could be active membership of professional associations: in 2015, BERA had 1585 members. Another measure could be staff submitted to the research assessment exercises; Table 3 details the population of education academics submitted to

[5] The Joint Academic Coding System (JACS) is used to code subjects of academic disciplines. JACS was revised for the 2012/13 academic year to incorporate additional subjects and can not be directly compared with data from previous years.

the last four research assessment exercises. In 2014, 1606 individual category A and C staff (FPE) were submitted to the Education sub-panel in 2014. HESA's estimate of eligible staff for REF 2014 was 5255 FTE, spread across 109 institutions (HESA, 2016). As the total FTE actually submitted for REF 2014 was 1442 in 76 submissions, the selectivity rate for Education was 27%, deemed to be a 'relatively high' level by the 2014 REF sub-panel report (REF, 2015). Using a different methodology, a HEFCE issues paper estimates the selection rate for education at 31% - in fact, the lowest selection rate across all units of assessment (HEFCE, 2015).

Table 3: Staff (FTE) submitted to RAE/REF exercises 1996-2014 (source: HEFCE RAE and REF databases)

RAE/REF exercise year	1992	1996	2001	2008	2014
Education submissions	86	106	83	81	76
Submitted Staff (FTE)	2310	2790	2045	1696	1442

A large proportion of the research capacity captured by REF data is found in Russell Group universities. The REF submissions (together with HESA contextual data) highlight the small size of the research groupings in some universities, with 62% of institutions submitting less than 15 FTE, and 33% submitting less than 10 FTE. Several post-92 universities submitted less than 10% of their eligible staff (REF 2014). Overall, 30% of the research submitted in the Education UoA was classified 4*, while 8% of all submissions were rated 1* or unclassified. Around 40% of the submissions account for most of the research rated 1* or unclassified, and of these, only 3% were from pre-1992 universities, and a large proportion are post-2000.

Total Academic Staff (HESA 2015/16) Across the full range of both REF submitting and non-submitting institutions, data from the 2015/16 HESA Education cost-centre (the most recent year for which data are available) show that 9030 FPE (Full Person Equivalent[7]) academic staff were recorded as working within the HESA Education cost centre (135). This amounted to a total staff FTE (Full Time Equivalent) of 6850 (including atypical academic contracts), a figure that has remained largely stable since 2012. Within this staff FTE, in 2015/16, 4980 (or nearly 73%) had a research component as part of their employment function (Table 4a), compared to 4995 in 2013/14[8].

[6] The HESA scaled figures exclude FTEs in several universities, such as Cardiff, due to errors in the relevant HESA reporting. Eligible staff were staff who had research as part of an academic contract of at least 0.2 FTE at 31 October 2015 and who were not recorded as research assistants.

[7] FTE indicates the workload of an employee relative to the standard full-time, full year contract. FPE looks at how much of a (whole) person's working time is engaged in a particular activity on 1 December of the reporting year (see https://www.hesa.ac.uk/collection/c15025/fte_vs_fpe).

[8] The FTE figures used in this section are based on HESA Staff (excluding non-academic atypical) Full Time Equivalent (FTE) figures for the Education Cost Centre (135), 2015-16, excluding contracts that are neither teaching nor research, or those classed as not applicable/ not known. See note 3 for information on rounding, which imposes limitations to any overall estimates based on HESA data, particularly at finer levels of disaggregation.

Institution-level staffing data HESA contextual data for REF 2014 show that REF-eligible Education academics were employed in 89 different HEIs in England, plus another 20 in Scotland, Wales and Northern Ireland, to make a total of 109 HEIs[9]. According to these data, the largest employer is UCL's Institute of Education, with around 310 FTE staff eligible for REF 2014 in Education. Canterbury Christ Church, De Montfort, Edge Hill, Open University, Sheffield Hallam and Manchester Met also had more than 140 FTE REF-eligible staff, given their significant investment and staffing in teacher education. Russell Group universities tended to have between 50 and 100 REF-eligible staff. Apart from UCL, Cambridge and Manchester had the largest Education staffing at around 100 FTE (HESA 2014).

HESA data for 2015-16 highlights the relatively small size of the Education academic staff groupings in the devolved administrations. A total of 1225 FPE staff in 2015/16 are divided between 180 staff in Northern Ireland, 655 in Scotland and 390 in Wales), compared to 7830 FPE staff in England.

Current academic staffing by employment type Tables 4a/b compare staff FTE and staff FPE data. Table 4a indicates that the population of staff on research-only contracts is 400 FTE, highlighting that the total research-only staff FPE of 490 (4b) is made up of at least 200 staff on fractional contracts.

Table 4a. Academic staff FTE in Education Cost Centre (135) by employment function, terms and mode of employment (Source: HESA 2015-16)

	Open end/ permanent		Fixed term		Atypical	Total
	FT	PT	FT	PT		
Research only	105	40	150	70	10	**375**
Teaching and research	3605	615	225	95	65	**4605**
Teaching only	595	315	170	505	285	**1870**
Total	**4305**	**970**	**545**	**670**	**360**	**6850**

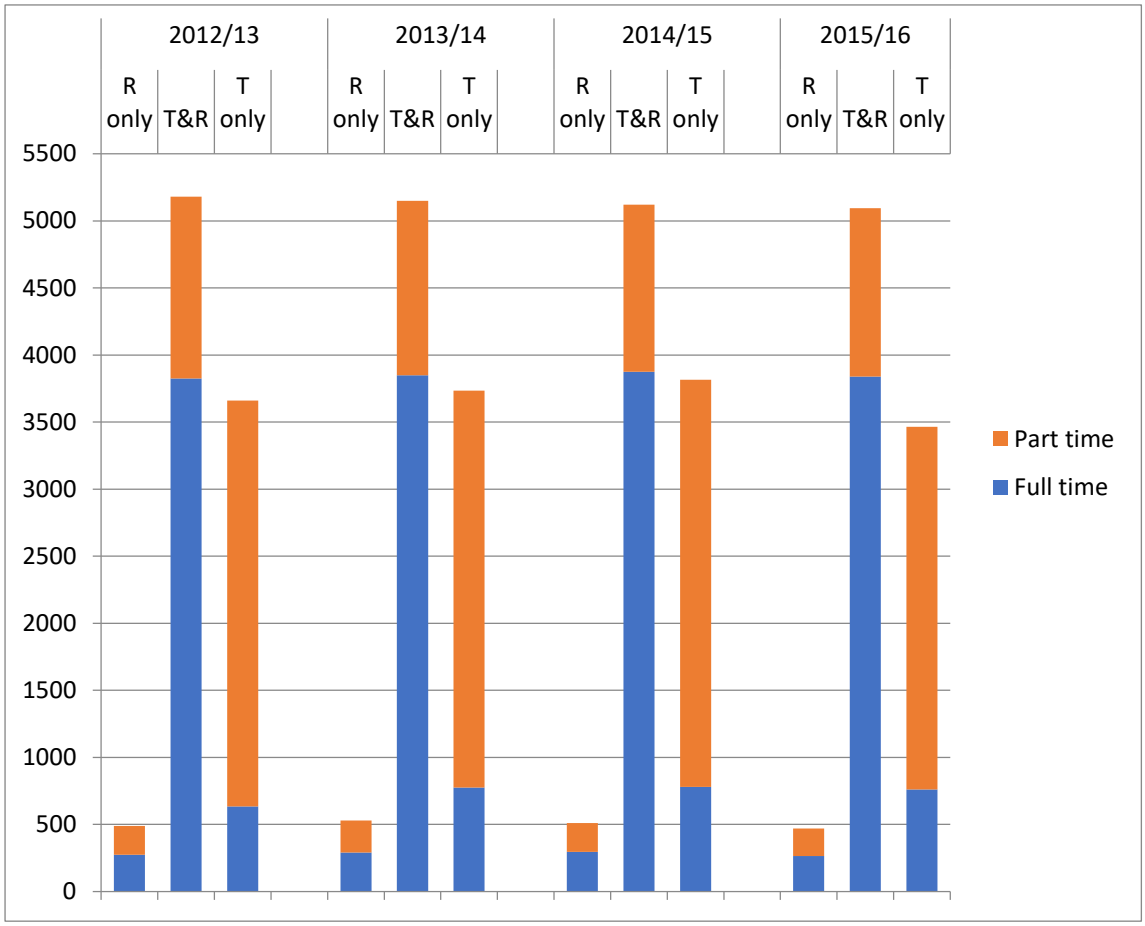
Table 4b: . Academic staff FPE in Education Cost Centre (135) by employment function, terms and mode of employment (Source: HESA 2015-16)

Employment function	**Fixed Term**		**Open-ended**		**Total**
	FT	PT	FT	PT	
Research only	155	130	110	75	**470**
Teaching and Research	235	220	3605	1035	**5095**
Teaching only	155	1820	605	885	**3465**
Totals	**545**	**2170**	**4320**	**1995**	**9030**

Figure 1 offers a visual representation of Table 4b FPE data, comparing it with data from the previous three years. It highlights the small proportion of all academic staff in Education on research-only contracts, and also shows that numbers of staff on either full-time or part-time teaching and research contracts have stayed broadly stable since 2012/13.

[9] These data are published at https://www.hesa.ac.uk/news/18-12-2014/research-excellence-framework-data

Figure 1: Academic Staff FPE by employment function 2012/13-2015/16 (HESA)



Highest qualification of academic staff Table 4c highlights that less than one third of academic staff FPE in Education hold a doctoral degree. This proportion is influenced by the high numbers of teaching-only staff employed within the Cost-centre; among staff with research as part of their employment function, the figure rises to 41%. For comparative purposes, around half of all academic staff in Business and Management hold doctoral level qualifications, and 70% of all staff in Politics and IR.

Table 4c: Academic staff FPE in Education Cost Centre (135) by employment function and highest qualification

Employment function	Doctoral degree	Other higher degree (eg MSc)	Other PG (eg PGCE)	First degree	Other UG	Unknown	**Totals**
Research only	255	85	30	30	0	70	**470**
Teaching and Research	2030	1695	685	420	50	215	**5095**
Teaching only	580	1045	765	565	165	345	**3465**
Totals	**2865**	**2825**	**1480**	**1015**	**215**	**630**	**9030**

Academic staffing by age and gender Table 5a highlights the unusual staffing age distribution in Education, primarily because of the proportion of staff employed on part-time teaching-only contracts in the area of initial teacher education. This reflects Education's need for ITE teaching expertise (Mills et al 2006, Furlong, 2013, Christie et al, 2012, Oancea and Mills 2014). 1870 staff FTE are employed on teaching-only fractional contracts, of whom 58% are aged 50 or over. Many of these staff work in those institutions listed above with large teacher-training profiles. The overall age-profile of staff who have research responsibilities in their contract (T&R and R Only) is similar to other professional fields in the social sciences, such as Social Work or Business. In contrast, fields such as Politics have greater proportions of early career academics on research-only contracts, and an overall age profile more similar to that of the sciences.

Table 5b shows that two-thirds (4515/6850) of all academic staff are female. Women make up 75% of research staff (280/375), 73% of all part-time staff, and 64% of staff on teaching and research contracts.

Table 5a. Academic staff FTE in Education by employment function and age at 31 August (source: HESA, 2015-16)

	34 years & under	35 - 49 years	50 - 65 years	66 years & over	**Total**
Research only	130	170	75	0	**375**
Teaching and research	295	1855	2355	100	**4605**
Teaching only	165	625	940	140	**1870**
Total	**590**	**2650**	**3370**	**240**	**6850**

Table 5b. Academic staff FTE in Education by employment function and sex (source: HESA, 2015-16)

	Female	Male	**Total**
Research only	280	95	**375**
Teaching and research	2950	1655	**4605**
Teaching only	1285	585	**1870**
Total	**4515**	**2335**	**6850**

Research-only contracts. The population of staff employed on research-only contracts offers an important indicator of institutional research activity and capacity, as well as success in gaining external research funding. Of the 375 Education staff FTE employed on research-only contracts in 2015/16, 270 (72%) were employed in the 24 Russell Group universities. In total, non-Russell Group universities employed only 105 research-only staff FTE in 2015/16. In the Million Plus Group of 17 universities there were less than 10 research staff FTE, and similarly small numbers employed in universities in the devolved administrations (less than 20 in Northern Ireland, 15 in Wales and 50 in Scotland).

What is the demographic profile of these research staff? 35% (130/375) of these researchers are aged less than 34, compared to a sector-average of 56%. Approximately 75% are female (280/375). Table 6 disaggregates the sex and age distribution of full-time and part-time research staff, highlighting that just under a third of these researchers are on part-time or fractional contracts. HESA data (not shown) on research-only contract type

reveals that 230/375 staff FTE are employed on fixed-term or atypical contracts, with only 145/375 FTE on permanent/open contracts.

Table 6. Research-only staff FTE by employment mode, sex and age (source: HESA 2015-16)

Mode of employment	Sex	34 years & under	35 - 49 years	50 - 65 years	66 years & over	**Total**
Full Time	Female	70	80	30	0	**180**
	Male	20	35	20	0	**75**
Part Time	Female	30	40	20	0	**90**
	Male	5	10	5	0	**20**
Atypical	Female	5	5	0	0	**10**
	Male	0	0	0	0	**0**
Total		**130**	**170**	**75**	**0**	**375**

Professorial appointments According to HESA data, 390 academic staff FTE were employed on professorial contracts in Education in 2015/16, of whom 220 were working in Russell Group universities. Table 7 provides data by contract level and university type (including senior managers, but not staff on non-academic atypical contracts, contracts that are neither teaching nor research, or those classed as not applicable/ not known in the HESA database)). It shows that 22% of academics on teaching and research contracts in Russell Group universities were on professorial grades (215/975), compared to just under 5% of staff on teaching and research contracts in non-Russell Group HEIs (170/3630). The gender promotion gap is still marked. Whilst similar numbers of women and men hold professorships in Russell Group universities (105 women and 110 men) and in non-Russell group HEIs (85 women and 85 men), only 19% (105/565) of all female staff on teaching and research contracts in Russell Group universities hold professorships, compared to 27% (110/410) of men. In non-Russell group HEIs, female professors make up 4% of all female teaching and research staff (85/2385), whereas male professors make up 7% of all male teaching and research staff (85/1245). It should be noted that in non-Russell Group HEIs, another 270 Education academics on teaching and research contract were employed in senior management positions.

Table 7. Academic staff (FTE) by contract level and sex in Russell Group and Non-Russell Group HEIs (source: HESA 2015-16)

		Russell Group		Non-Russell Group		Total
Employment function	Contract level	Female	Male	Female	Male	
Research only	Other contract level	205	65	75	30	**375**
	Professor	0	0	0	0	**0**
	Senior management	0	0	0	0	**0**
Teaching & research	Other contract level	455	285	2,140	1,050	**3930**
	Professor	105	110	85	85	**385**
	Senior management	5	15	160	110	**290**
Teaching only	Other contract level	300	160	970	420	**1850**
	Professor	5	0	0	0	**5**
	Senior management	0	0	10	5	**15**
Total		**1075**	**635**	**3440**	**1700**	**6850**

1.3. Postgraduate Research Students

This section of the report reviews the demographic composition and distribution of the Education Postgraduate Research (PGR) community in the UK. The total PGR FTE in 2015/16 was 4450, with a total FPE of 6415, because PT (part-time) students study on a half-time basis. As Table 8a shows, non-EU FT (full-time) students make up almost 60% (1135/1910) of all FT PGR students. Table 8b shows first year student recruitment by domicile, showing that EU and non-EU student recruitment has been broadly stable from 2012, though with an increase in 2015/16 that some have linked to concerns about EU student fees post-Brexit.

Table 8a: PGR FPE Education students by Domicile 2015-16 (HESA)

	Full Time (FT)	Part Time (PT)	Total
UK	670	3755	**4425**
EU	105	325	**430**
Non EU	1135	425	**1560**
TOTALS	**1910**	**4505**	**6415**

Table 8b First year PGR student (FPE) in Education 2012/13 - 2015/16 by domicile (HESA)

First year students	Non-EU	EU domicile	UK domicile	Total
2012-13	**360**	**75**	**685**	1120
2013-14	**360**	**75**	**655**	1090
2014-15	**380**	**65**	**715**	1160
2015-16	**405**	**85**	**750**	1240

Table 9 maps the distribution of this PGR population across the sector. More than 52% (3345/6415) of all research students (FPE) are registered at Russell Group institutions, a figure that rises to almost 70% of Full Time students. Research students make a significant contribution to research capacity within the field, as many will publish with their supervisors or within research teams. Numbers of non-EU research students in Education have remained stable at around 1500 students a year for the last ten years. As well as bringing a valuable source of income, these international students enable UK academics to sustain international research collaborations and networks.

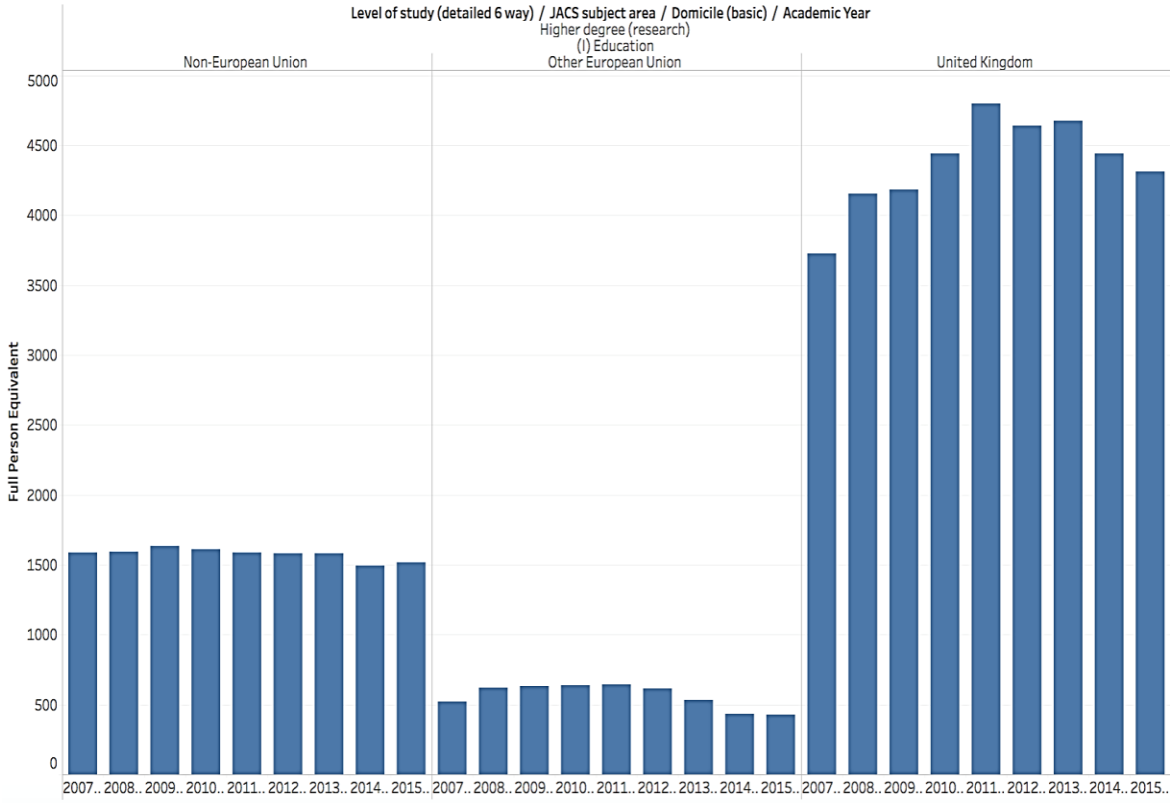
Table 9: PGR FPE Distribution by Mission Group 2015-16 (HESA)

	FT UK	FT EU	FT Non EU	FT Total	PT UK	PT EU	PT Non EU	PT Total	Total
Million Plus	45	0	25	70	455	45	55	555	**625**
Russell Group	390	80	850	1320	1595	205	225	2025	**3345**
University Alliance	90	10	60	160	635	10	15	660	**820**
Non aligned	145	15	200	360	1070	65	130	1265	**1625**
TOTALS	**670**	**105**	**1135**	**1910**	**3755**	**325**	**425**	**4505**	**6415**

Nationally, the population of Education PGR students reached a peak in 2011, but as Figure 2 shows, this number has gone down by 500 since then, mainly because of a decline in UK-domiciled PGR students studying part-time. However this graph reflects overall student numbers, and recent recruitment is stable (See Table 8a). With ITE and PGT student numbers in decline, universities have developed part-time EdD programmes, wich contribute to sustaining student income, as discussed below.

Several of the newer universities currently have large research student communities of at least 100 students, mostly studying for professional doctorates part-time. Around a dozen other universities, mostly Russell Group, each have more than 100 registered research students. A few institutions have very large research student communities. In its REF submission, the Institute of Education claims a total doctoral student community of 900 (14% of all UK doctoral students), with 84 completions recorded in 2012/13. Also in its REF submission to UoA 25, the University of Cambridge records a total community of 176 PhD and EdD students on roll, with 24 completions in 2012/13.

Figure 2: PGR FPE by domicile 2007- 2015 (HESA 2017)



As Table 10 shows, Scotland and the other devolved regions have small numbers of research student numbers. In 2015/16 Scottish Universities had 505 FPE registered research students in Education, with 100 in Wales and 155 in Northern Ireland. Across the UK, distribution is very uneven. Around thirty universities have less than twenty research students (FPE) in Education, the majority of whom will be studying part-time. Given that these students will be spread over 4 to 5 years of training, this raises questions about the sustainability and quality of doctoral training programmes in these small cohorts.

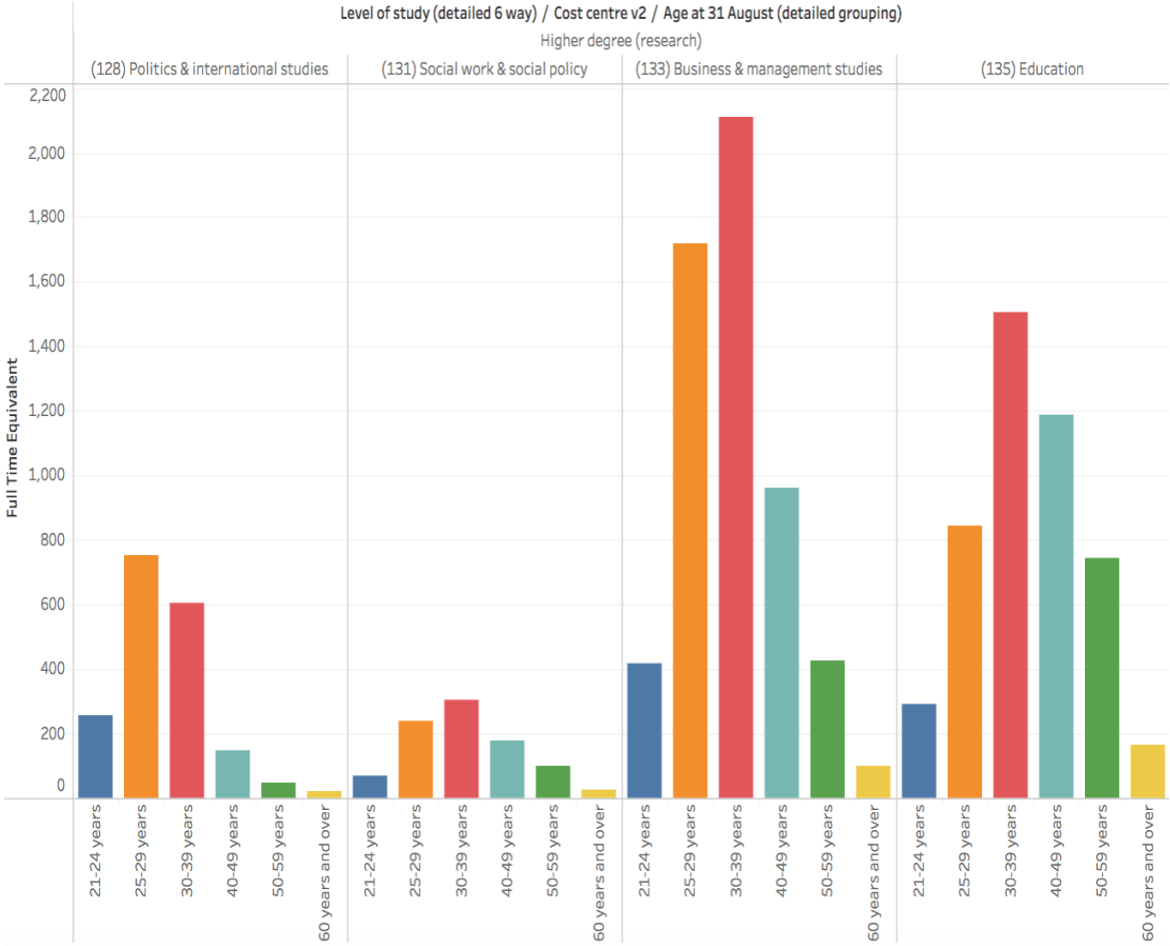
Table 10: PGR FPE By Age and Region 2015/16

	21-24	25-29	30-39	40-49	50-59	60 +	Total
England	215	650	1630	1715	1165	275	**5650**
Wales	10	10	20	40	20	5	**105**
Scotland	25	65	165	140	100	15	**510**
N Ireland	0	15	60	45	25	5	**150**
Total	**250**	**740**	**1875**	**1940**	**1310**	**300**	**6415**

Age and regional distribution of PGR students. Table 10 highlights the unusual PGR student age profile for the field, shaped by the significant numbers of UK-based career professionals pursuing doctoral degrees and professional doctorates on a part-time basis. It shows that 55% of PGR students are aged over 40 (3550/6415), with 25% (1610/6415) aged over 50. It

also highlights the small communities of postgraduate students in the devolved administrations, who make up only 12% of all PGR FPE (765/6415). Comparative data are provided in Figure 3 for two other professional fields (Business and Social Work), both of which have professional doctoral qualifications, and for Politics. Research students in Politics have a modal age of 25-29, and less than 15% are aged over 40.

Figure 3. PGR FTE Age profiles Education, Politics, Business, Social Work 2015/16 (HESA)



Professional Doctorates. In 1992 the first UK Professional Doctorate in Education (EdD) was launched at the University of Bristol. A recent review of these degrees (CRAC 2016) records 72 EdD programmes now on offer in 54 different universities, nearly double the number of programmes (38) that were available in 2009.

Based on CRAC's 2016 sample of 25 EdD programmes with 900 registered students (with an average 35 students per programme), the total number of current EdD students is likely to be at almost triple this, given that there are currently 72 EdD programmes across the UK. This means that there may be 2500 EdD students across the UK (possibly a conservative estimate), and thus EdD students may make up more than 1/3 of all PGR students. CRAC (2016) also note that HESA data may underestimate the total number of EdD students (because of universities not classifying some of these students as PGR). This population also

does not include post-graduates studying for professional doctorates in Educational Psychology.

Thesis completion data Tables 11a and b compare PGR submission data. Table 11a of PhDs and EdDs is from the British Library EThOS database of all UK doctoral theses (EThOS), primarily harvesting from institutional repositories. This included data on institution, year, thesis type (eg Ed.D, PhD, D. App Ed Pych. etc) and title, providing a useful basis for further analysis. The different professional doctoral awards were included in Table 11a under EdD. EThOS estimates that it now covers 95% of all recent UK PhD data, and this suggests that just under 1000 education doctorates may now be awarded each year. Table 11b is from REF 2014 data. Whilst the EThOS dataset may not be complete for earlier years, a comparison of the two tables for the years 2010 to 2013 reveals that around 85% of doctoral thesis awards each year are made by departments that made a submission to REF 2014.

Table 11a: PhD and EdD awards (British Library Ethos Database)

Year	2010	2011	2012	2013	2014	2015	2016	TOTAL
PhD awards	670	625	565	600	605	615	550	4230
EdD awards	250	240	270	275	310	300	245	1890
Totals	920	865	835	875	915	915	795	6120

Table 11b: Research degrees awarded (REF 2014 data)

Year	2008-09	2009-10	2010-11	2011-12	2012-13	TOTAL
PhD awards	533	747	776	716	832	3604

Destination data. Where do successful doctoral students go next? The HESA DLHE (Destinations of Leavers from HE) database records the career destinations of 900 UK and EU-domiciled Education doctoral students who completed their studies between 2012 to 2014 (approximately 20% of all completers). It shows that almost two thirds of doctoral completers (595 students) go into permanent employment within the education sector. Much smaller numbers (around 120) go into fixed-term posts. Very few (35) record being self-employed. Around 80 went into careers in other academic disciplines or the health professions.

The Research Councils continue to prioritise postdoctoral fellowship opportunities, and the new one-year ESRC postdoctoral awards being launched in 2018 are designed to support a transition into research-related and professional careers within *and* beyond the university sector. The organisations mapped in Work Package 3 highlight the diversity of postdoctoral educational career opportunities within the UK. The growth of professional doctorates strengthens these links, along with the fact that around half of Education doctoral students go into professional careers in Education outside of HE (VITAE 2011). This movement into (or back into) schools, policy careers settings or international careers strengthens the impact of educational research.

Postgraduate Funding. According to HESA data, more than 50% of research students in Education hold some form of funding or award, amounting to around 2055 out of 4155 student FTE in 2015/16 (Table 12), though there are a number of potential sources of inaccuracy in these data. Many of these students will only cover a small proportion of the total costs of their study. Roughly 15% of UK PT students receive funding from industry.

Table 12: Funding for PGR Students (FTE) by domicile and mode of study (HESA 2015/16)

Source of funding	FT Non EU	FT EU	FT UK	Non EU	PT Non-EU	PT UK	Total
No award	465	90	185	200	160	1000	**2100**
Overseas source	455	5	0	10	5	5	**480**
Other/Not known	60	35	95	5	5	105	**305**
Provider award	150	45	160	10	10	260	**635**
Research Councils	10	15	90	0	5	15	**135**
UK Govt	5	5	75	0	5	35	**125**
UK industry	55	15	40	10	15	240	**375**
TOTALS	**1200**	**210**	**645**	**235**	**205**	**1660**	**4155**

The ESRC has been a key funder of Education studentships. From 2006 to 2008 there were around 50 awards a year, and with the introduction of the DTCs in 2011, a notional benchmark of 8% of all studentships was agreed for Education (amounting to approximately 48 studentships each year). With a move away from disciplinary studentship allocations by the ESRC, the number of awards dropped during the period 2011-2015, as ESRC doctoral training centres implemented interdisciplinary competitions. Overall, Education has received around 6% of ESRC studentships in the period 2011-2016 (ESRC 2017).

Research Training. Since 1991, successive ESRC training guidelines have led to the gradual standardisation of research training across the social sciences. All research students are expected to have acquired core competencies in subject-specific and general social science research methods, including research design, qualitative and quantitative methods and ethics, along with training in professional skills. The creation in 2011 of 22 ESRC Doctoral Training Centres (and since 2017, 13 ESRC Doctoral Training Partnerships) has reinforced this process, with all Research Council students now expected to carry out a full training needs analysis. Accredited Education pathways within the 73 universities that are now part of the ESRC's Doctoral Training Network are required to offer their students a full suite of research methods and professional skills training that meet the ESRC's 2015 Postgraduate Training Guidelines. Many also offer additional advanced level quantitative and qualitative training. In addition the ESRC steers a number of awards to AQM (Advanced Quantitative Methods) studentships, a proportion of which are awarded to students in Education. The ESRC also encourages its funded students to engage in knowledge exchange activities during their doctorate, such as internships and placements, and actively promotes collaborative studentships. This is designed to promote employability and impactful research.

Pathways into (and out of) Educational Research. Where (in terms of academic or employment background) do new educational researchers come from? HESA data reveal that amongst the current UK PGR population, only 2-3% of students have a PGCE as their

highest qualification before starting research. Most have a Masters qualification, but many teachers are likely to have done a PGCE previously. A significant proportion of the students currently studying for educational doctorates are likely to be working in school leadership or policy roles, and so are in positions where they can carry out practitioner research or implement research-based policies.

Our internet searches on a systematic sample of 101 members of staff drawn from those submitted to the REF2014 revealed that just under a quarter (24 members of staff) of our sample had a background in school teaching, either by a record of a PGCE or QTS on their online profiles or by explicit description of teaching experience. Nearly all of these staff appeared to have completed their teaching qualification before going into academic research. The majority of these members of staff are currently involved in teacher education programmes. Other pathways into educational research are less clear, as the ways in which members of staff describe their background and experience on their web-profile and in public contexts varies significantly. However, 15 individuals explicitly refer to a background in psychology and 6 explicitly mention a background in economics, suggesting these may be feeder disciplines.

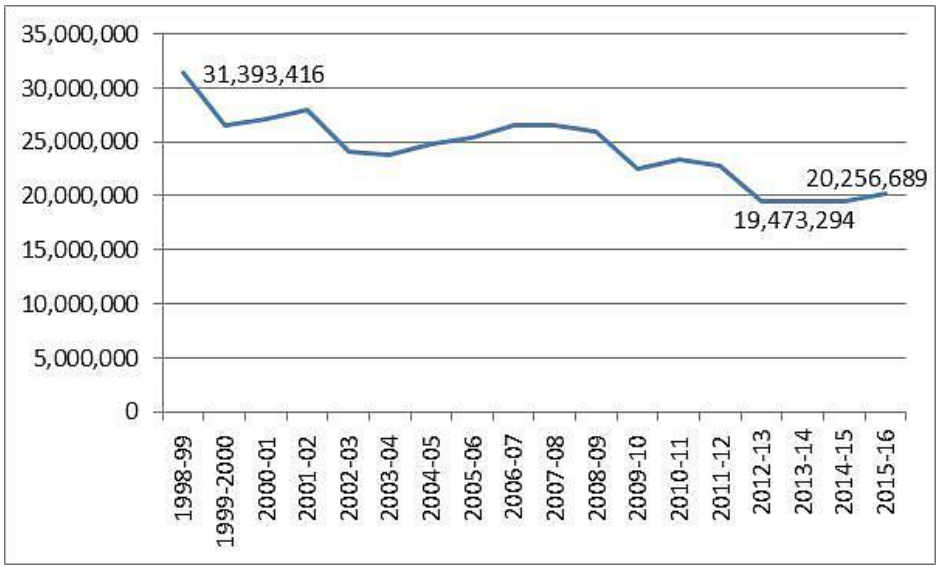
Only 13 members of staff in the sample have moved institutions since the REF, suggesting relatively little cross-institutional movement. Only 1 member of staff has moved disciplines, from education to sociology and only 1 member of staff appears to have left academia (although that individual seems to have sustained links with their previous institution). Based on the sample, the most consistent pathway out of educational research is through retirement, with 11 members of staff retiring since the REF submission. Given that only about one in three staff with research responsibilities in their contracts were submitted to the REF 2014, this appearance of stability may not be reflected in the broader community.

1.4. Research funding during the REF cycle

Thirteen years of Labour government from 1997 to 2009 marked significant investment in Educational research. Government research contracts generated between 40 to 50% of the annual research income of UK Education departments. Funding for an ambitious programme of school and curriculum reform was complemented by initiatives to strengthen educational research. In particular, the ESRC dedicated £30 million to a ten-year Teaching and Learning Research Project (TLRP) building research 'capacity' and quality in the field.

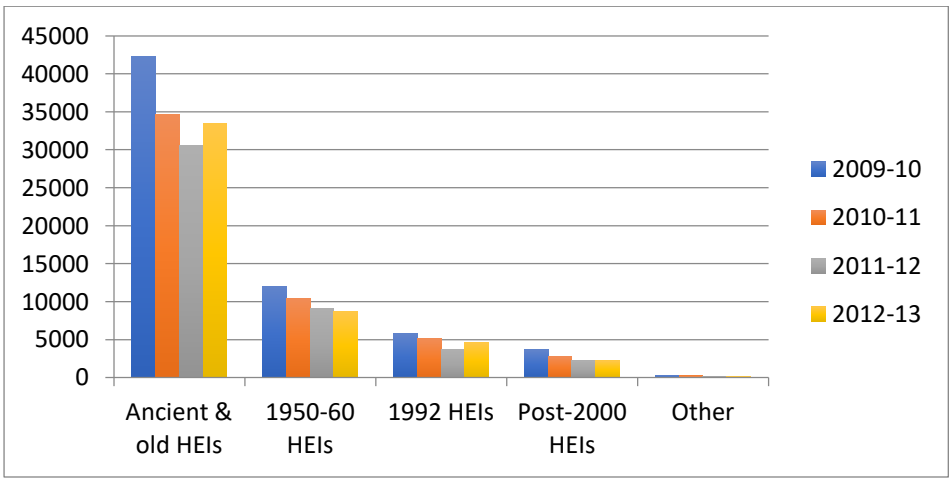
This situation changed dramatically after the global financial crisis and the election of a Conservative-led coalition government in 2010. Christie *et al* (2012) documented the first few years of that period, during which most government departments had to implement significant cuts or plan for 'flat-cash' settlements. Research Council funding was also pared down, along with changes to the HEFCE QR settlement for Education, which went down from over £30 million in 1998 to around £20 million by 2016) (Figure 4).

Figure 4: QR funding for Education UoA, 1998-2016 (updated from: Christie *et al*, 2012, using HEFCE allocation figures).



From 2009 to 2014, the total research funding awarded to education departments and faculties declined by almost 25%. According to HESA data, in 2009/10, Education departments received around £64 million, of which almost half (£28 million) came from government departments, with UK research councils providing another quarter (£16 million). Three years later the total figure had dropped to around £49 million, of which government funding, including the government-funded part of EEF grants, now made up only one third (£16.8 million): a drop of more than 40%. Charitable funding also declined from £9 million to around £7 million. Whilst funds from the EU and international sources increased during this period, such sources make up less than 10% of the total allocation, and do little to alleviate the overall decline in funding. These drops over the course of the 2014 REF cycle are shown in Figure 5, highlighting the ways in which they affected different historical types of institution.

Figure 5: Total annual research income to education departments 2009-2013 by historical type of institution (in thousands) (Source: Oancea and Mills 2014, using HESA data)



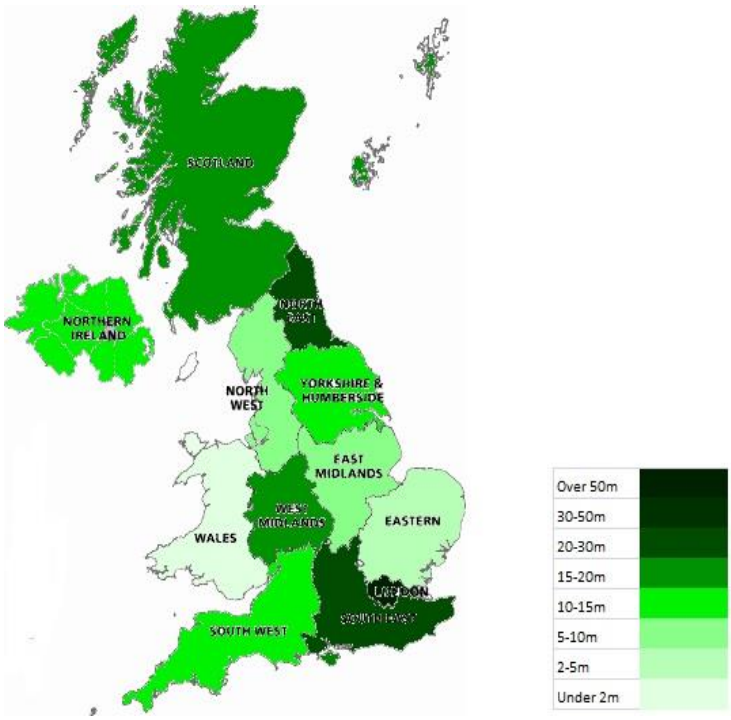
Key: Type = historical type of institution

Post-2000 HEIs = university status gained since 2000
1992 HEIs = university status gained in early 1990s after abolition of binary divide
1950-60 HEIs6 = universities created in the 1960s, many after the Robbins report
Old and ancient HEIs = universities created 1800s-1950s (civic universities) and earlier
Other = private institutions and/or colleges (with no university status)

Whilst one third of research funding goes to London institutions (and the majority of that to UCL's Institute of Education), the analysis of HESA data (Oancea and Mills 2014) revealed strong regional educational research capacity and funding profiles (Figure 6). Those universities with the highest research income were often leading large scale educational interventions, randomised controlled trials and meta-analyses, all of which require significant investment of time and resource.

As discussed elsewhere in this report, one of the most influential funders developing the evidence base around teaching and schooling is the **Education Endowment Foundation** (EEF). The EEF was set up in 2011 as an independent charity in partnership with the **Sutton Trust**, **Impetus Trust**, with an original grant of £125 million from the Department for Education to tackle the attainment gap in England. It both funds educational interventions (often carried out as randomized control trials) and independent evaluations of these trials. It has quickly acquired a high profile amongst teachers through its *Teaching and Learning Toolkit* and dashboard. EEF actively seeks to commission quasi-experimental studies and RCT-based educational evidence.

Figure 6: Total research income for education by region, 2009-13 (£ million) (Source Oancea and Mills 2014, based on HESA data)



Post-REF 2014 funding developments. Developments put in place at the end of the previous REF cycle have changed the funding situation, partly compensating for declines in government and research council funding. There are several new alternative sources of funding, in an increasingly differentiated and competitive research 'ecosystem'. In 2015/16

the Department of Education (DfE) spent £6.6 million on research, much of which is spent on international benchmarking (eg PISA, TIMSS) and longitudinal cohort studies (LSYPE), and on more than 100 smaller research commissions. By contrast, the Education Endowment Foundation (EEF) made grants totalling £14 million in 2015/16. Over the last six years it has leveraged £25 million in additional grants and pledges from banks and other commercial organisations. The Wellcome Trust has also begun to support education-related research.

Other UK philanthropies and charities that support educational research include the Nuffield Foundation, Joseph Rowntree, Esmee Fairbairn and the Templeton Foundation. The Leverhulme/British Academy Small Research Grants scheme receives large numbers of applications for funding from educational researchers. Work-package 3 highlights the diversity of organisations commissioning and conducting research. US and international philanthropies investing in educational research, such as the Spencer Foundation and the Qatar WISE foundation, are also making their mark in the UK funding landscape for education research. Many of the newer funders of educational research adopt a commissioning rather than responsive model of funding, driven by funding priorities (such as evidence-based syntheses), normative principles and values, areas of substantive interest, or policy and practical needs.

1.5. Deploying research capacity

Research expertise. The time and resource available for this study did not permit a comprehensive review of the way in which research capacity may be deployed across substantive and methodological areas. Our analysis of 11 impactful research environments (reported in Work Package 2) suggested that the research expertise of some universities is focused in particular areas, whereas others sustain a broad profile. This prompted us to look in detail at a small sample of submissions (top five most impactful) to see whether there were any similarities in the nature and scope of research. The analysis revealed a diverse picture, with the key feature shared between several institutions being a strong interest in advancing research methods and theory.

These institutions' research included:
- Deploying (advanced) quantitative methodologies in evaluation, monitoring, assessment and effectiveness research;
- Mixed methods approaches to the study of subject and technology enhanced learning, pedagogies and leadership in schools, vocational setting and higher education;
- An explicit focus on phases and sectors of education (early, years, secondary, higher, community, lifelong and professional), supported by insights from educational psychology and applied linguistics;
- Discourse analysis, corpus linguistics and theoretical research approaches to the study of religion, theology and culture; language; or public policy and service;
- Mixing advanced qualitative and quantitative methodologies, and philosophical and theoretical work to understand children's learning in family, care settings, school and digital environments; labour markets and higher education; or international trends in educational policy.

- Practice and policy-oriented research on teacher and professional education, subject pedagogies, curriculum and assessment.

Further diversity is highlighted by our analysis of the titles of the 5526 outputs submitted to UoA 25. Figure 7 shows the most frequent words (with length larger than 3 characters) in the output database.

Figure 7. Most frequent terms in the titles of UoA 25 outputs in REF 2014 (Source: REF submissions)

education (1119), learning (820), school (520), children (455), social (368), research (364), development (292), study (282), schools (272), teaching (264), educational (260), teacher (253), practice (251), young (247), higher (244), English (237), language (213), England (204), policy (204), professional (182), primary (169), science (164), students 162), people (161), work (160), teachers (159), analysis (157), early (156), student (156), based (154), knowledge (146), using (146), case (144), impact (137), mathematics (134), role (130), secondary (125), review (122), understanding (120), classroom (117), curriculum (117), assessment (116), evidence (115), developing (114), leadership (113), academic (112), theory (111), university (110), literacy (109), approach (107), identity (106), technology (102), critical (101), participation (100)

Doctoral research is a useful proxy of directions of interest in research. Around 800-1000 doctoral theses are awarded each year, a figure that has gradually increased since 2010. As shown above, the proportion of professional doctorates continues to increase, and now makes up more than one third of all theses awarded.

As indicated in Figure 8, the frequency of topic-related words suggests doctoral students have an equal focus on students (679 mentions) and teachers (670 mentions), suggesting an attention to both learning outcomes and teaching practice. Similarly, the data suggest roughly equal coverage of the different educational sectors.

Figure 8: Most frequent terms in EThOS PhD database (2010-2016)

education (1784); learning (1163); study (1104); school (1031); students (679); teachers (670); higher (607); schools (558); case (546); teaching (486); educational (485); primary(481); secondary (470); English (469); children (457); development (455); university (438); experiences (381); language (369); practice (348); teacher (345); exploration (325); investigation (323); perceptions (323); social (322); young (309); student (298); exploring (293); professional (288); based (280); impact (267); analysis (244); role (219); pupils (208); UK (203); policy (199); approach (198); context (196); support (196); using(190); use (184); evaluation (175); children's (174); England (174); classroom (173); perspectives (172); curriculum (170); people (169); Saudi (169); academic (165); critical (161); developing (161); experience (159); understanding (159); learners (158); research (152); knowledge (151); identity (150); practices (150)

Although thesis titles are limited in the amount of information they provide in relation to core topics and methodological approaches, their use of potentially paradigm-specific language may indicate a broad overview of the most common methodological approaches. This analysis suggested that a small majority of theses may be rooted in interpretivist

paradigms (as might be indicated by words like 'perceptions', 'experience', 'understanding', or 'exploration'), commonly employing interviews or ethnographic approaches for data collection.

Research capacity, research environments and 'critical mass'. HESA and REF data indicate that research expertise is located in institutions with very different staffing profiles and priorities. Analyses of institutional research intensity (proportions of staff submitted) and of research 'power' (size of submission x grade point average[10]) using REF data, highlight this diverse profile. In Work Package 2 we explore in depth the environment and impact outcomes of the highest scoring (in *THE* GPA terms) institutions for research impact, which together account for 101 of the 218 impact case studies submitted to UoA25 in REF 2014. The following table, assembled by the *Times Higher Education (THE)* in 2015, highlights the different volume of research staff in the top 23 REF 2014 submissions, with (rounded) FTE varying from 8 to 219 (note that the UCL IoE, with its 219 FTE of research-active staff affording a great diversity of topical interests, is a unique case).

Table 13: Times Higher Education ranking of top 23 Education REF submissions (Copyright Times Higher Education 2015)

2014 rank order by GPA	2008 GPA	Institution	Total number of FTE staff submitted	% of 4* research activity	GPA	Research power
25 Education						
1	2.90	Oxford	39	65	3.57	140
2	2.85	King's College London	36	54	3.42	124
3	2.40	Nottingham	25	55	3.37	83
4	2.40	Sheffield	15	38	3.32	48
=5	2.85	Cambridge	34	54	3.30	113
=5	2.60	Durham	25	50	3.30	81
=5	n/a	Cardiff	21	48	3.30	68
8	2.70	Exeter	26	44	3.28	85
9	2.35	Birmingham	24	47	3.26	77
10	2.75	Bristol	35	44	3.23	111
=11	n/a	UCL A: Institute of Education	219	48	3.21	703
=11	2.30	Edinburgh	40	43	3.21	128
=13	2.35	Queen's Belfast	23	35	3.20	73
=13	2.65	York	22	44	3.20	71
15	1.60	Loughborough	8	28	3.13	24
16	2.55	Manchester	33	36	3.11	103
17	2.25	Southampton	22	31	3.08	68
=18	2.65	Warwick	35	32	3.04	105
=18	2.00	Reading	16	29	3.04	47
20	2.40	Open	54	38	3.02	164
21	2.40	Lancaster	11	25	3.01	33
22	2.00	Glasgow	38	32	3.00	113
23	2.60	Stirling	14	22	2.99	42

The REF 2014 Sub-panel report also highlights that the higher REF scores were associated with larger submissions, raising questions about the sustainability of the research

[10] *THE* calculates an institution's GPA as follows: [(% of 4* research x 4) + (% of 3* research x 3) + (% of 2* research x 2) + (% of 1* research x 1)] / 100. The resulting score is between 0 and 4.

environment in some universities. The data we collected suggest that, while most high-rating Education submissions to REF 2014 included 15+ FTE, only 2 of the 76 submissions returned more than 50 FTE, and arguably both of them were unique cases (the UCL IoE, at 219 FTE, and the Open University, at 54.26 FTE). At the same time, some of the smaller submissions featured among the top 25 highest GPA submissions – for example, Loughborough (FTE 7.8), Lancaster (FTE 11) and Stirling (FTE 14).

However, our scrutiny of research capacity and REF data suggests that 'critical mass' arguments based exclusively on the number of staff may miss out important features of successful research environments, and may fail to account for diversity in the social organization of research in HEIs. Strong research environments may be best described not only by quantitative indicators of research active staff or volume of research funding and outputs, but also by qualitative descriptors of the social and intellectual organisation of research activity. Staffing numbers aside, more developed indicators of critical mass may include:

- A volume of outputs commensurate with capacity and resources;
- Continuity of funding over several cycles of assessment;
- Density of internal collaborations around coherent agendas;
- Centrality in cross-institutional networks and density of interactions in multi-institutional or multi-disciplinary systems (Kenna and Berche, 2011);
- Pedagogical continuity in doctoral education (Delamont, Parry and Atkinson, 1997);
- A balance between intellectual continuity (traditions, continued interests in particular areas of research, shared understandings of quality) and discontinuity (novelty, originality, change, critique).

In Work Package 2 we identify further possible characteristics. Our analysis of the environment statements of the 11 institutions with the highest impact scores in REF 2014's UoA 25 suggests that strong, impactful research environments combine several key elements of institutional practice, such as leadership capacity, reach and strength of networks, infrastructure etc. (see section 2.4).

Educational research capacity in other fields What research capacity exists in related social sciences, and indeed in other fields of research? The environment statements of the top 5 submissions in REF 2014's UoA 25 (Education) mention strengths from disciplinary areas as diverse as linguistics, theology, sociology, psychology, anthropology, economics, history, psychology, philosophy, and political science. Analysis of outputs submitted to the REF 2014 reveals pockets of educational research capacity in other UoAs, including Health, Psychology, Computer Science, Geography, Business and Management, Sociology, Social Work and Social Policy, Sport Sciences, History, Art and Design, and Music, Drama and Performing Arts. Many of these outputs focus on specialist sub-fields and do not represent a large proportion of overall educational research capacity; hence there were only 15 cross-referrals into Education.

Table 14 summarizes the number of outputs identified in each UoA by searching for the keyword 'educat*' (thus including stemmed words). The output titles were then analysed qualitatively and the key topical areas covered are highlighted in the table.

Table 14. Number of education-related outputs and key topics covered in all UoAs in REF 2014

Unit of Assessment	No of educat* outputs	Key substantive topics
01 Clinical Medicine	11	Health education, education interventions in health, mental health
02 Public Health, Health Services and Primary Care	47	Health education; educational interventions; sex education; medical education; emotional/ mental health; studies with education as a variable
03 Allied Health Professions, Dentistry, Nursing and Pharmacy	206	Health education; medical education and training; health and education/ health in school settings
04 Psychology, Psychiatry and Neuroscience	69	Psychology of education; SEN; ethnicity; gender; medical education; higher education; adolescence; reading; maths; bullying; attitudes and motivations; interpersonal relations; education as a variable
05 Biological Sciences	1	Undergraduate medical education
06 Agriculture, Veterinary and Food Science	6	Veterinary training/ education
07 Earth Systems and Environmental Sciences	1	Climate change education
08 Chemistry	0	--
09 Physics	0	--
10 Mathematical Sciences	2	Modelling education and social mobility; education and fertility
11 Computer Science and Informatics	88	Digital tools and educational software, learning programming; games; ICT in education; educational resources; digital literacy.
12 Aeronautical, Mechanical, Chemical and Manufacturing Engineering	1	Professional training
13 Electrical & Electronic Engineering, Metallurgy & Materials	0	--
14 Civil and Construction engineering	1	Environmental engineering education
15 General Engineering	6	Professional education; higher education (pedagogy)
16 Architecture, Built Environment and Planning	39	Architecture education; educational buildings; environmental education; higher education (e.g. pedagogy); assessment; gender; educational disadvantage
17 Geography, Environmental Studies and Archaeology	66	Geography education; gender; citizenship; correlation studies; migration and mobility; e-learning; technology, labour markets; higher education; inequalities, educational policy; research-teaching nexus; parental choice
18 Economics and Econometrics	45	Correlations; modelling; inequalities and mobility; language and identity; capital; attainment; higher education; labour markets; effects of education
19 Business and Management Studies	293	Management education; higher education (incl. pedagogy); educational attainment; learning networks; entrepreneurial education; business education; accounting education; labour markets and employability; assessment; leadership public spending on education; inequalities; returns on education; further education
20 Law	46	Legal education; religion and religious education; higher education (pedagogy)
21 Politics and International Studies	33	Political education; educational politics; policy; philosophy of education; equality, social capital
22 Social Work and Social Policy	235	social work education/ professional education; SEND; higher education (incl. pedagogy); educational participation; social work practice; practitioner research; race, ethnicity and migration; women's education; social justice and social mobility; schools; health education; child protection, family, parenting; education policy; gender and sex; probation education and criminology; theory etc.
23 Sociology	73	Higher education; inequalities; social mobility; race, ethnicity; migration; education as variable in sociological studies; gender and sex; employment and labour markets; educational attainment.
24 Anthropology and Development Studies	20	Poverty; inequality ; social mobility; community approaches; education in development contexts
25 Education	3,162	Full spectrum of topics summarized in REF (2015).
26 Sport and Exercise Sciences,	157	Physical education; teacher education; coach education; professional

Leisure and Tourism		development; PE and sport policy; gender, sex, body; sport participation; outdoor education; health and well-being; inequalities, intersectionality; theory; cultural values
27 Area Studies	19	Higher education; education in Japan; vocational education; development; ethnicity; inequalities
28 Modern Languages and Linguistics	44	Medium of instruction; language communities; heritage language learning; higher education (pedagogy); applied linguistics
29 English Language and Literature	41	Education in literary and philosophical works; children's literature; creative writing; higher education (pedagogy)
30 History	60	Education in different historical periods (especially 19th-20th C); religious education; science education; gender, women's education; nations and citizenship;
31 Classics	2	Childhood and education in the classical world
32 Philosophy	7	Virtue/ moral education; aims of education; higher education (pedagogy); women's education
33 Theology and Religious Studies	14	Religion and education; clergy and theological education; philosophy
34 Art and Design: History, Practice and Theory	132	Creative and professional practice; design education; higher education (pedagogy); craft education, art education, museum education; learning spaces and ergonomics; environmental education; teaching, learning and assessment strategies; historical and theoretical work
35 Music, Drama, Dance and Performing Arts	79	Music education; professional learning; (somatic) practice; performance; students' perceptions and experiences; dance education; film and theatre education; aesthetic education; creative industries
36 Communication, Cultural and Media Studies, Library and Information Management.	59	Media and entertainment education; higher education (pedagogy); learning technologies; cultural access and participation; citizenship; enterprise; library education; publishing;

As indicated in Table 11, a large proportion of the education-related outputs submitted to UoAs other than Education focus on discipline-specific pedagogic issues in professional education or higher education, along with work spanning different educational sectors and substantive topics. We investigated this further by reading the environment templates of the small number of institutions that submitted three or more education-related submissions to the Sociology, and to Social Work and Social Policy sub-panels.

Around 20 of the submissions to the Sociology UoA addressed educational issues related to schools. The majority of these addressed educational inequalities, labour markets and social mobility. The LSE and University of Oxford submissions reflect their traditions of applied social policy research in the field of Education and social mobility. Oxford's Sociology environment template names six staff working in this area, linked by a Network for Social Inequality Research. Around 50 of the Social Work and Social Policy UoA education-related submissions had some link to schooling, but these covered a diversity of topics, from discussions of neoliberal educational policy to sex education, from healthy eating interventions to citizenship classes. For example, LSE's Social Work and Social Policy environment template highlights strengths in financing education, research on school systems and equity. Birkbeck's submission included expertise on higher education financing. Bath's environment submission also lists staff with educational policy and political economy interests. Several newer universities – such as London South Bank and Middlesex - submitted education-related social work and social policy research, reflecting their interests in educational policy agendas.

Across the UoAs, the results of our searches included numerous outputs where the link to education was more tangential – in particular, outputs that focused on other substantive issues (such as health, crime, poverty, disability) and where education featured as one of the independent variables used in quantitative analyses. We conclude that there are pockets of educational expertise across the social sciences, but that they tend not to be foregrounded within REF submissions, possibly to avoid being cross-referenced to Education, and may not represent a major pool of educational research capacity.

Work Package 2. The range of educational research impacts and features of impact-conducive research environments

Summary. This work-package uses REF2014 Impact Case Studies, Impact Statements, and Environment Statements to describe the different types of impact research on education has, the ways in which impact is achieved, the areas in which impact takes place, and the relationship between impact and environmental factors. It highlights the complex relationship between impact, policy and practice and the ways in which policy-impact and practice-impact often co-occur[11].

The findings indicate that a dynamic research eco-system connects the key stakeholder groups in education and that research contributions reach across sectors and groups, and in particular among policy makers, practitioners, and learners. However, the analysis shows that relatively few of the REF2014 case studies focus on impact in higher education or in initial teacher education. While this may have been a by-product of the selection processes involved in preparing the submission, perhaps in the light of conservative interpretations of the REF guidance, we recommend that further research is undertaken to examine these areas of impact in more detail.

The findings also suggest, as illustrated in Work Package 3, an increasingly complex research eco-system that includes organisations and individuals generating, mediating and brokering educational research knowledges. The growing use of online networking to engage with research ideas may shape future pathways to, and types of, impact of educational research. The findings point to an urgent need to investigate this context in more depth to understand the relationship between policy and practice.Our analysis of the impact statements submitted by the eleven Education units with the strongest REF 2014 profiles for impact shows that the institutional infrastructure and mechanisms to enable impact in these institutions encompassed: management and leadership structures and processes; personnel policies, management and support; dedicated provision of training and capacity building; dedicated funding and funding support; research-informed ITE and CPD programmes; communications; co-location arrangements and internationalisation; strong university-wide strategy, infrastructure and services; and fit-for-purpose, flexible monitoring arrangements. More widely, the analysis of REF2014 Impact and Environment Statements highlights several key environmental factors that may be particularly favourable to impact activity, including: coherence between research strategy and impact strategy; scale of research (including impact-related) funding; infrastructure to support capacity building at all levels and professional development; support and investment from the HEI in which the unit is embedded; leadership; and networks and partnerships. Educational research that successfully secures high levels of impact seems to be generated in HEIs where these six different environmental factors are effectively aligned and combined.

[11] The scale and scope of this Work Package were refined through progress telephone calls with the funder, during which it was agreed to focus the REF analysis on the most impactful submissions (amounting to about half the case studies submitted).

2.1. Methods

Analysis of impact case studies. In order to examine how, where, and what types of research have impact and the ways in which impact is understood by different educational stakeholders, a detailed content analysis was undertaken of REF2014 Impact Case Studies from institutions rated highest for impact.

Impact case studies All REF2014 Impact Case Studies (218) from the Education Unit of Assessment were scraped from the REF website and data relating to institutional outputs and impact were merged with the *Times Higher Education* REF Ranking Table (*THE*, 2014). Time and financial limitations of the study meant that in-depth analysis of all impact case studies was not possible. In order to understand where and how research was having most impact, we decided, in consultation with the funder, to focus on high-impact case studies. Since the scores of individual case studies are not available in the public domain, case studies were taken from those institutions rated highest for impact, ensuring that individual case studies would be rated 3-4 stars. Therefore, a sample of the institutions ranked highest for impact was taken based on the *Times Higher Education* Impact GPA. Institutions with a GPA of 3.30 or higher were selected and all impact case studies from these institutions were downloaded for in depth analysis. The cut-off point of 3.30 was selected as the point that ensured all sampled case studies were of high quality, avoiding a long tail of low quality which begins to come in after that point, while providing a sample of approximately half all submitted case studies and covering approximately a third of all institutions. This approach produced a sample of 101 impact case studies out of the total 218 case studies submitted (46%). The sample represents 23 institutions out of a total of 76 (30%). The total FTE submitted by these institutions was 817. The total FTE submitted in all REF institutions was 1441.8. This suggests that the top 30% of high impact institutions employ 57% of FTEs submitted to the REF 2015 as research active and, given that the allowed quota of case studies submitted to the REF reflects eligible staff, offers some explanation for the higher proportion of case studies (47%) submitted by 30% of institutions.

The impact case studies were analysed by hand using NVivo to sort, display and explore the data. Following a phase of open coding, inductive codes were combined with a code-set developed through previous analyses of REF2014 impact case studies (Oancea and Djerasimovic, 2015) and refined using the categories identified in the REF 2014 sub-panel report for Education (REF, 2015). Coding focused on examining the relationship between impact and the kinds of educational research taking place, geographical dimensions, main categories of research, policy and practice, and the educational system as a whole. As such analysis focused on examining the following parent categories:

- Sector (early years, primary, secondary, further, higher etc)
- Substantive Issues
- Methodological Approach
- Type of Impact
- Pathways to Impact
- Users and Beneficiaries
- Funders
- Geographic Location of Impact.

This analytical work was then used to develop five short case studies highlighting the main kinds of impact achieved through educational research.

Analysis of impact and environment statements. The environment and impact statements of the 11 units with the strongest REF 2014 profiles for impact in UoA 25 Education were harvested from the REF website. The environment statements totalled 105 pages and the impact statements, 40; like the number of impact case studies, the length of both documents was dependent on the FTE submitted by the unit as research active.

The environment statements were coded line-by-line, with a focus on the following categories: research strategy; indicators of success; research governance and support arrangements; and specific areas of substantive and methodological expertise.

The impact statements were also coded line-by-line using the following categories: impact strategy; understanding of impact; key user and beneficiary groups; pathways to impact; domains of impact; support mechanism and infrastructure; monitoring impact; geographical coverage.

Themes from both types of analysis were then compared with a view to describing the infrastructure that may enable the achievement of research impact in high performing institutions; and identifying some of the environmental factors that describe highly impactful institutions.

2.2. Analysis of REF2014 Impact Case Studies

Types of Impact

Based on inductive and deductive coding, analysis of the 101 selected REF2014 Impact Case Studies showed educational research having impact in 18 key areas (see Appendix 2). These codes were then grouped under the following top level themes (ordered by frequency of occurrence) to provide a clearer overview:

- UK Government and Related Agencies Policy and Practice

- UK Government and Government Agencies' Policy and Practice
- UK Local Authority Policy and Practice
- Direction of Public Spending
- UK Government Legislation

- Teacher Practice, Education and Professional Development

- Teacher Practice and Pedagogy
- Curriculum and Assessment Design
- In-Service Teacher Professional Development
- Community and Capacity Building
- Senior Leadership Team Policy and Practice
- Initial Teacher Educational Policy and Practice

- Student Related Outcomes

- Learning
- Widening Participation
- Health and Wellbeing
- Community Cohesions and Respect

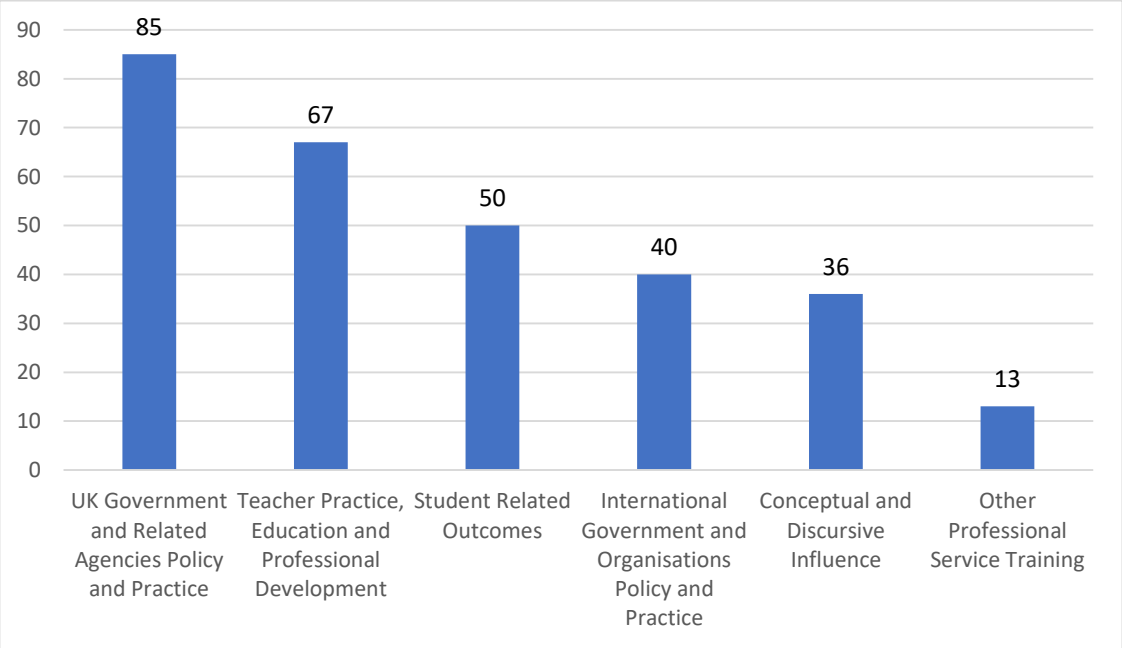
- International Government and Organisations Policy and Practice

- International Government Policy and Practice
- International Organisations' Policy and Practice

- Conceptual and Discursive Influence

- Other Professional Service Training

Figure 9: Grouped Types of Impact



Policy and Practice

As illustrated in Figure 9, which shows the grouped type of impact against the number of Impact Case Studies in the sample that show direct impact on each area, the most frequently cited type of impact is the influence research has on UK Government and Related Agencies' policy and practice (including devolved administrations). A total of 85 Impact Case Studies, four out of five of the samples cases, claimed to have direct impact in this area. In almost every instance (81 case studies) this impact relates to central UK Government educational policy and practice. However, many of these case studies showed additional influence on Local Authority policy and practice (38 case studies) illustrating both a national

and local focus in many cases. 40 case studies showed international influence, having impact on international government and international organisations' policy and practice.
While some case studies reach into other areas of policy (for example, 8 of the policy-focused case studies overlap with policy related to industry and 8 overlap with policy related to children's services and healthcare), a focus on educational policy is maintained throughout. This limited overlap with policy areas beyond education in the sampled case studies (only 16 case studies explicitly showed this) is perhaps surprising given the high impact and often interdisciplinary nature of much of the research included in these submissions. It is therefore likely that this focus on educational policy reflects the REF submission and evaluation process and the need to present research and impact in relation to single subjects and policy areas, even in cases where more varied impacts from more interdisciplinary research could also have been evidenced. Analysis of case studies from other units in the REF2014, Social Work and Social Policy for example, suggests a similarly focused approach to the presentation of policy impact. Where educational impact is highlighted in other disciplines, the focus is often on educational outreach and knowledge exchange rather than policy.

It is likely that the higher frequency of policy-focused case studies (showing impact in relation to UK Government and related agencies) is illustrative of the way in which impact from educational research may have been interpreted in the run up to the REF, with discursive importance placed on engaging with policy makers, but it may also signal submission decisions arising from perceptions of the relative ease and rigour of demonstrating the reach and significance of impact on policy versus professional practice. However, the second most frequently cited type of impact in the sample was the direct impact on teachers' practice, education, and professional development, with nearly three quarters of the selected case studies (67) claiming direct impact in these areas. This indicates that educational research is clearly having significant impacts on professional practice, education and development and that these areas are integral to the way in which impact is conceptualised in educational research and the REF exercise.

Further, many case studies (45) explicitly show the impact of research on both policy and professional practice, regardless of which of the two is fore fronted in the narrative, thus indicating a complex relationship between these two types of impact. These findings, therefore, suggest that there is wide and significant impact on both educational policy *and* professional practice and highlight the importance of avoiding narratives that conceptualise impact in dichotomous terms as influencing *either* policy *or* practice.

Policy and practice were most frequently linked by a shared area of curriculum and assessment design. This was the seventh most frequently cited kind of impact out if the 18 codes (see Appendix 2), highlighted in 32 case studies. The majority of these case studies (26) also showed impact on both policy and practice, with curriculum and assessment design being an important part of policy development. In addition, changes to curriculum and assessment were also described in the majority of these impact case studies as shaping professional practice through training programmes, practitioner publications, and resources associated with the curriculum developments.

Learning

While the impact case studies illustrate a complex relationship between impact, policy and practice, they also highlight the key group of stakeholders within the process – the learners. Half of the selected case studies (50) claimed direct impact on student outcomes, with improvements to pupil and student learning featuring in the majority of these (36). These learning outcomes were particularly related to curriculum and assessment redesign (e.g. through developing the Geography curriculum), pedagogic developments (e.g. by trialling new literacy pedagogies), and structural and technological innovations (e.g. via interventions related to widening participation or integrating new educational technologies into the classroom). The importance placed on learner outcomes within the impact case studies illustrates the depth of the impact educational research can achieve at a student level and the important place of learning outcomes in the conceptualisation of impact across the REF submissions. The co-presence in the same case studies of claims to impacts on the work of policy makers and practitioners, on learning environments and learner outcomes- suggests that educational research reaches across key educational stakeholders and engages with them in nuanced, textured and relevant ways.

Conceptual and Discursive Influence

Sitting slightly outside this cross-stakeholder relationship is important impact type, conceptual and discursive influence. This featured explicitly in 36 case studies and was primarily focused on three main areas: practice and policy-based conceptual shifts (e.g. redefining the ways in which teachers think about assessment; shifting discourses around the measurement of pupil performance, or around the quality of early years education); technological and social change (e.g. harnessing the disruptive potential of mobile technologies for opening access to learning); and redefining academic constructs and methodological discourses (e.g. redefining understandings of evidence; reconceptualising the relationships between funders and research). Such impacts are typically incremental over a long period of time and demonstrating them is challenging. Nonetheless, with over a third of the case studies analysed offering thoughtful evidence of conceptual and discursive impact, this analysis indicates that, across sectors and substantive subject areas, educational researchers are frequently engaging in generative and critical work that has the potential to transform the conceptual and discursive fabric of policy and practice.

Gaps in Reporting Impact

The wide range of types of impact featured in the REF2014 impact case studies provides an important illustration of the breadth of impact achieved through educational research. The most frequently cited types of impact clearly illustrate the depth of impact achieved across national and local policy, professional practice, learners, and conceptual and discursive change.

However, the analysis shows that relatively few of the REF2014 case studies included in the sample focus on impact in higher education or in initial teacher education. We could reasonably suggest that this finding may be a by-product of the selection processes involved in preparing the submission, perhaps in the light of conservative interpretations of the REF

guidance and of the boundaries around what counted as impacts on and through HE teaching, on own institution, or on academic practice. Given the nature of our sample, the lower level of reporting ITE impacts may also reflect the fluid and politically charged nature of ITE in the context immediately prior to 2014, as well as wider systemic issues within the academic field of education (such as the relationship between the provision of teacher education and of large-scale funded research, particularly in the light of evidence about an increasing bifurcation in staffing, reflected in different types of contracts – see WP 2). It is of course impossible to determine the reasons for this from the REF data. We recommend therefore that further research is undertaken to examine in more detail these areas of impact.

How is Educational Research Having Impact?

Across the selected Impact Case Studies a variety of pathways to impact were described. These were coded using 18 codes (see Appendix 3) and grouped together in the following way (ordered by frequency of occurrence):

- Publications and Reports

- Publication by Primary Academics
- Stakeholder- Commissioned Research, Evaluation and Analysis

- Training, Education and CPD

- Dedicated Education and Training Activities
- Continuing Professional Development
- Developing or Co-Developing Tools and Resources
- Networks and Professional Communities
- Co-Design and Co-Production of Research

- Advisory Meetings and Briefings

- Stakeholder Advisory Roles
- High Level Meetings and Conferences
- Evidence Submissions and Policy Briefings
- Campaigning
- Contributing to Spending Decisions

- Tools and Resources

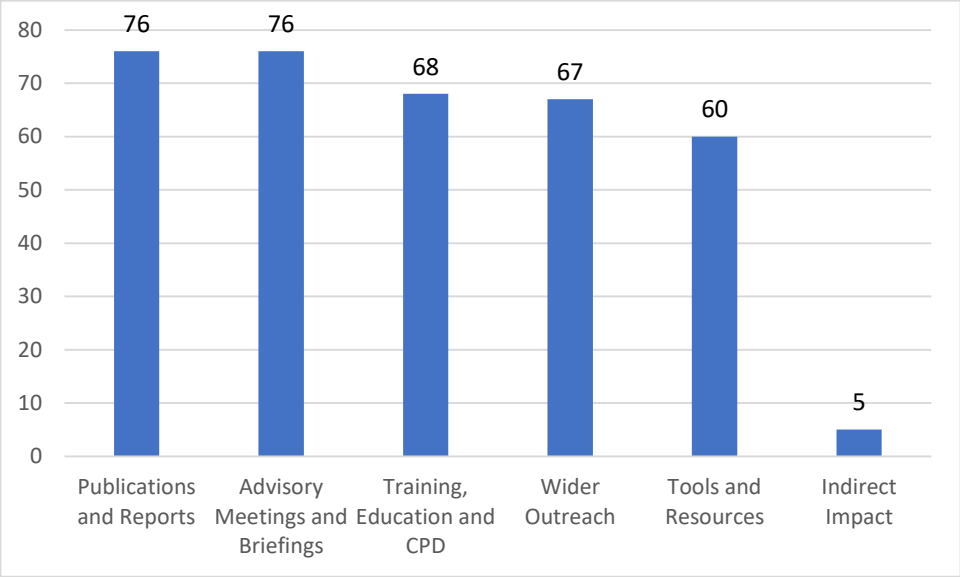
- Practitioner Focused Publications
- Commercialisation

- Wider Outreach

- Social Media and Other Web Presence
- Community Engagement and Public Engagement Activities
- Knowledge Exchange Workshops, Forums and By-invitation events
- Press and Media

- Indirect Impact

Figure 10: Pathways to Impact



The large number of impact case studies in the sample showing relatively similar use of a wide range of pathways to impact suggest a well-developed eco-system of productive interactions between research, policy and practice, and reflects the complex relationship between these areas. As shown in Figure 10, the most commonly described pathway to impact was through publications and reports by the primary researchers. 76 case studies explicitly highlighted formal publications as a method for facilitating impact. This is perhaps unsurprising given the nature of the REF assessment that included a minimum of two-star publication quality as an eligibility threshold for the impact case studies. However, it was possible to see a consistent relationship in the impact case studies between academic publications and policy impact (publications being cited by MPs, for example, or being used in formal governmental reports and reviews, or at different points in the development of new legislation and guidance).

However, it was clear that researchers were facilitating impact by going beyond simply publishing their work. An equal number of the selected case studies (76) also highlighted a variety of advisory meetings and briefings with policy makers and key policy stakeholders as an essential pathway to impact. The combination of both publications and advisory meetings and briefings was the most commonly quoted set of strategies for having direct impact on policy areas and policy makers. This highlights the importance placed on research evidence, personal relationships and face-to-face meetings in relation to policy impact across the selected impact case studies.

In contrast, the set of strategies claimed in the selected case studies to facilitate the impact of research on teachers' professional practice (and consequently on learning outcomes) was the combination of dedicated education and training activities (68 case studies) and with the creation of practitioner-focused tools, resources, and publications (e.g. web resources, articles in the TES, staff room posters, 'glossy brochures') (60 case studies). At the same time, 67 of the selected impact case studies described undertaking wider outreach work

through a combination of community engagement and knowledge exchange events, social media activity, and engaging with the press.

The co-occurrence of all of these top four pathways to impact across nearly two thirds of the impact case studies in the sample shows how educational research is engaging with a range of different audiences: academics, policy makers, practitioners, and the general public. This suggests a view, embedded in the case studies, that for research to have meaningful impact, it must go beyond the traditional publications route and work with a variety of different stakeholders using different strategies and pathways to impact in combination with each other.

Analysis also highlighted the importance of translation and mediation as a pathway to impacts on educational practice and practitioners. Work Package 3 highlights a significant and competitive growth in research brokers offering research translation and mediation services (for example, through CPD, training, or specific practitioner oriented publications). Investigations into practitioners' engagement with research (e.g. Oancea and Mills 2014; Royal Society of Edinburgh 2015) have suggested that relatively few practitioners engage with academic publications directly. In the context of a renewed emphasis on the value of teachers' research engagement and research literacy, the work of formal research mediating organisations, the growth of practitioner networks (such as ResearchEd), as well as the activity of educational bloggers and social media users have created a very complex field. More work is needed to understand this new and developing network of individuals and organisations that mediate and translate research for practitioners if the ways in which educational research is likely to yield further practical benefits are to be understood in the future.

Where is Educational Research Having Impact?

The REF2014 Impact Case Studies were analysed further to examine where educational research is having impact, both in terms of the geographical reach of the cases, and of impact across the system of UK education as a whole (conceptualised as the educational sectors research projects engaged with and the substantive focus of the research).

Geographical Impact

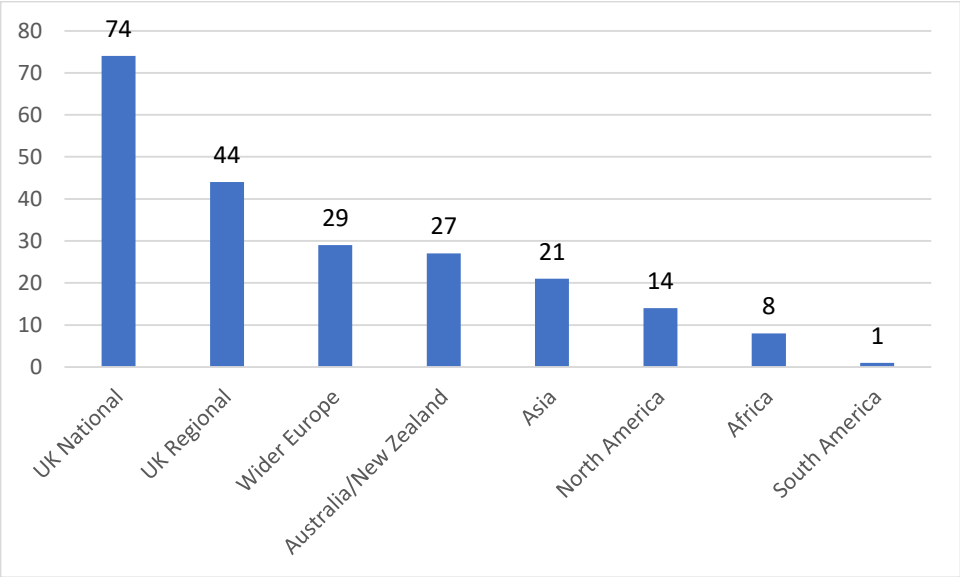
As is clear from Figure 11, an overwhelming majority of the case studies analysed showed impact in the UK as a whole. 74 cases displayed this kind of national impact, including impact in devolved administrative contexts. Where national impact was not described it was because the core focus of the research projects was on international contexts (educational international development work, for example), or because research had addressed specific local or regional issues or the distinctive educational challenges in the devolved administrations. For example, a main focus of the case studies submitted by institutions in Northern Ireland was on issues of community cohesions within the Northern Ireland context. Similarly, many of the case studies from Scottish institutions had a research focus on the Scottish context and impact was generally felt within the Scottish education system. Across all countries of the UK, local and regional impacts occurred fairly evenly and were

often linked with the locations of the institutions leading the research projects and collaborators' institutions.

There was a great deal of overlap between cases that reported regional impact and national impact (be it UK-wide or within a devolved administration). A common model was for interventions to be piloted within specific regions or local authorities before being scaled up to national training programmes, policy developments, or changes to curricula and assessment design at a national level.

Few trends could be discerned in the international context, other than European neighbours and English speaking nations (such as Australia, New Zealand, USA etc.) being highlighted more frequently than other nations.

Figure 11: Geographical Location of Impact

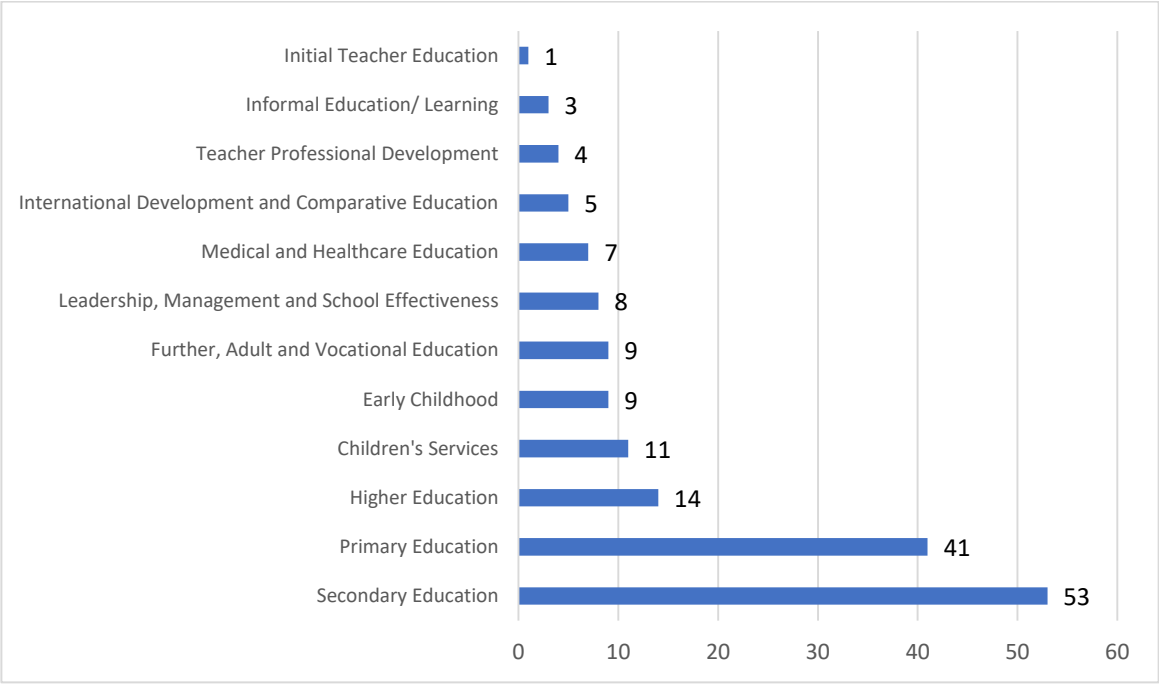


Sector and Substantive Focus of Research

The REF2014 Impact Case Studies were coded according to the educational sector the research projects engaged with and the main substantive areas of research focus. The educational sectors listed broadly follow a traditional delineation of the different sectors across the UK educational landscape (Early Years, Primary, Secondary, Further/ Adult/ Vocational, and Higher Education). However, inductive coding highlighted other sectors that researchers in the selected case studies were working in that we felt were sufficiently distinctive to be included as separate codes. These included: Leadership, Management and School Effectiveness; Medical and Healthcare Education; International Development and Comparative Education; Teacher Professional Development and CPD; Initial Teacher Education; and Informal Education/ Learning. While the substantive area of focus overlaps with the sector codes, these also represent the specific focus of the research projects from the impact case studies and so provide more detail on the actual research.

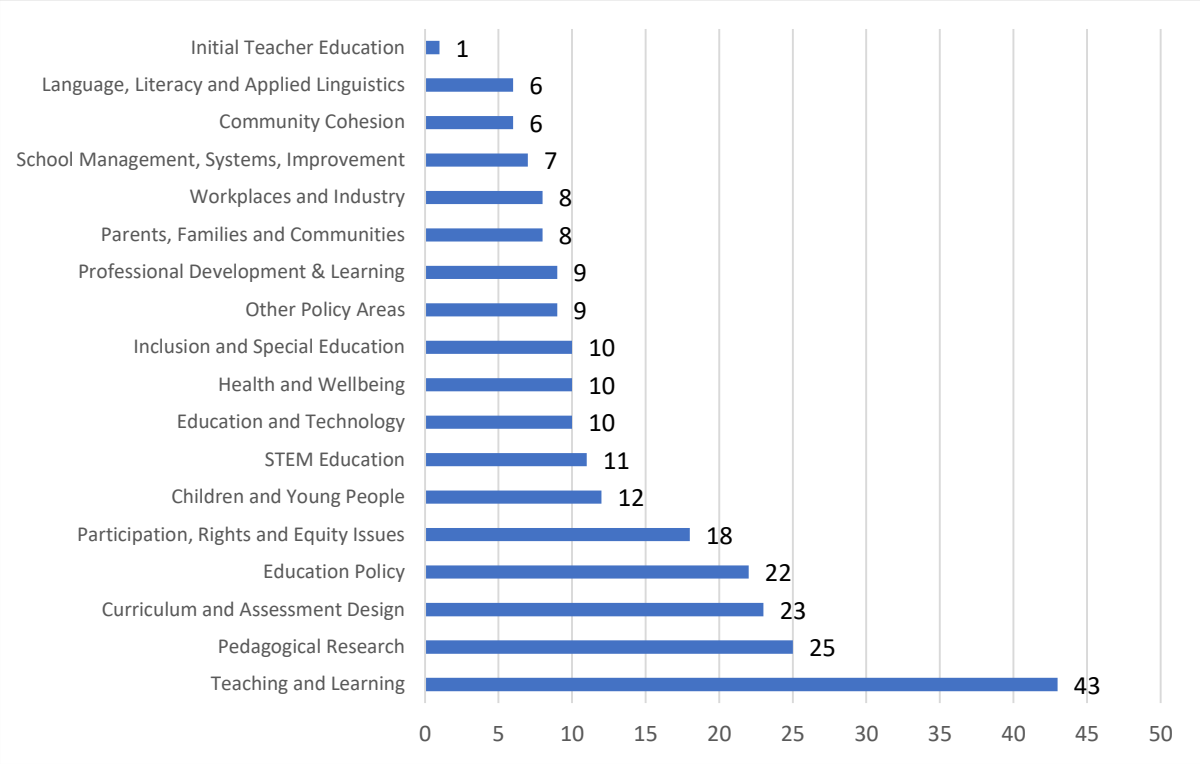
Analysis of educational sectors showed a reasonably even distribution between focuses on primary education (featured in 41 cases studies) and secondary education (featured in 53 cases studies). However, as seen in Figure 12 and highlighted above, relatively little work focused specifically on ITE was recorded in the impact case studies analysed. It was also notable that comparatively few case studies (14) focused explicitly on Higher Education (HE) or Further, Adult or Vocational Education. There may be several reasons for this anomaly. It may be an artefact of the coding process, where only programmes of research that explicitly had these sectors as core research foci were included. For example, research where HE was a secondary focus has not been included in the count. As explained in the "types of impact" section above, while the low number of case studies focusing on these sectors may reflect the funding landscape, it may also be an artefact of the REF2014 process, where particular interpretations of eligible impacts may have made it difficult to include HE, FE, VET and adult education case studies. More research is needed to explore this issue in more depth.

Figure 12: Educational Sector



As illustrated in Figure 13, it is notable that research on teaching and learning, pedagogy, and curriculum and assessment design all featured as the three most commonly cited areas of research in the sample of case studies. Although a wide range of substantive subject areas are the focus of the research, this highlights the importance placed on educational practice within the sample of impact case studies and an emphasis on research around teaching and learning across the different sectors.

Figure 13: Substantive Area of Research Focus



Key Areas of Impact

Table 14 offers examples of excellent research impact that are likely to have been marked 4* in the REF 2014.

Table 14. Examples of excellent research impact from REF 2014 case studies

1. **School Performance Monitoring**: the performance monitoring systems developed by the Centre for Evaluating and Monitoring at Durham University are used by 6000 schools and local authorities across the country in the assessment of three quarters of a million pupils a year. The work has led to impacts on policy, on the education system and on other systems via satellite centres in Australia, New Zealand and Hong Kong.
2. **Assessment for learning**: The work of Paul Black, Dylan William and colleagues at King's College, London has led to the adoption of formative assessment as a central feature of the interactions between teachers and learners in UK classrooms and overseas. It has informed the teacher education standards and is widely used in initial teacher education and professional development practice in the UK.
3. **Early years**: The Effective Provision of Pre-School Education study, led by Kathy Sylva and Pam Sammons at the University of Oxford, has transformed the landscape of early years education. Key policy initiatives based on the study's findings include: the 3-4 year olds' education entitlement; free early years education for disadvantaged 2 year olds; the Early Years Foundation Stage Curriculum; and major funding (like the £305 million Graduate Leader Fund) for upgrading the professional qualifications of early years staff.

4. **Further education**: Recommendations arising from work led by Gareth Parry at the University of Sheffield (2001-12) were adopted by HEFCE in 2006 as sector policy. As a result, they contributed to changing the national funding and reporting arrangements for higher education in FE colleges, informing institutional strategy and institutional capacity building, and developing guidance for professional practice.
5. **Mathematics teaching**: a design research programme in mathematics education led by Malcolm Swan at the University of Nottingham was adopted by the Bill and Melinda Gates Foundation and the US National Council of Supervisors of mathematics as part of their strategies to improve the quality of mathematics teaching and learning in US secondary schools.

Based on the analysis of REF data, we have developed the following aggregate examples of selected types of impact to illustrate these key areas in more depth, highlight the complex relationship between impact, policy and practice, and the eco-system in which the main stakeholders in educational research participate. The following vignettes represent 'ideal types' of impact that combine information from across the sample of REF 2014 case studies analysed.

a) Policy

Impact on policy occurred at different levels, with research shaping the work of local authorities, national (including both UK-wide and in each devolved administration) policy makers, and international policy makers (both in international organisations and in other national governments). The majority of the impact case studies were focused on the UK contexts and described beneficial impacts at a national level on policies ranging from early years to higher and adult education and also moving into areas such as children's services, international development, social policy, arts and culture, or health. Such primarily policy impacts further rippled into positive changes for the benefit of children and young people, parents, education professionals, communities and organisations. Some case studies (n=5) also claimed evidence of educational research with global impact, for example where research contributed to shifting discursive trends in educational thought so significantly that impact was felt across the world (e.g., research that shaped approaches to systematic reviewing and policy decision making) or where researchers deliberately collaborated with colleagues across continents to maintain a globalised policy focus (e.g., examining the impact of mobile technologies on learning in a global context).

Key pathways towards achieving policy impacts include the production and targeted dissemination of high-quality and timely publications, the preparation and submission of evidence and policy briefings, and an array of expert advisory roles and interactions arising from relationships of challenge and trust. For example, the chain of evidence included in one impact case study describes how publications from the research project, focused on enhancing equal opportunities and equitable educational provision in both primary and secondary education, led to an invitation to give evidence to a House of Commons Select

Committee. Publications, advice and evidence further contributed to raising a debate to the House of Commons through an Early Day Motion and to the establishment of a council to focus on the issues raised by the research. Similarly, other impact case studies describe feeding research findings and outputs directly into governmental reports through publications, training sessions, and expert advisory meetings, which then shaped changes to the national curriculum or to professional qualifications and status.

These examples illustrate the close relationships between policy makers and researchers that frequently frame pathways to impact on policy. They highlight a context in which communication between these stakeholders takes place in a variety of formal and informal ways; while rigorous, high quality research is a key ingredient in this process, mutual trust and a strong network that links the educational research community with policy related groups and with key decision-makers, gatekeepers and brokers are also important.

b) Practice

Impact on professional practice was closely linked with impact on policy in the REF2014 impact case studies, suggesting a well-developed system of "productive interactions" (Spaapen and van Drooge, 2011) between research, policy and practice. Professional practice was conceptualised in different ways across the case studies, including: teaching and pedagogic practice; administrative practice; wider professional practice; and senior leadership team's (SLT) practice and educational institution management.

Teaching and pedagogic practice was the most commonly cited type of practice-based impact in the case studies (occurring in more than half the case studies analysed). It was frequently linked with practice-based and pedagogic interventions (teaching about the Holocaust, for example, or supporting the development of digital games in the classroom). However, teaching and pedagogic practice were also often closely tied to policy development through curriculum and assessment design. For example, an impact case study that focused on geography described shaping the geography curriculum by engaging with policy makers. This consequently influenced teaching practice by providing a reconceptualisation of core geography content and new methodological approaches to teaching it. Research-led programmes of CPD and training, alongside resources and practitioner-focused publications were then used to support changes in teaching practice in the light of curriculum changes and related pedagogic developments.

Examples of administrative practice in the case studies were largely focused on developing new approaches to performance measurement and new systems for recording pupil progress. While this type of impact closely overlaps with strategic work undertaken by local authorities, heads and senior leaders, a small number of impact case studies related to this kind of work also described ongoing impact on everyday practice for practitioners and the need for significant training and CPD to implement this change.

In our analysis, we have used the phrase "wider professional practice" to cover practice-related impacts that did not fall squarely within teaching, pedagogy and administration. This type of impact included: the pastoral care for students (for example, supporting teachers' engagement with counselling services to help student wellbeing); behavioural management (for example, supporting school ethos development and tackling low-level negative

behaviour); parental engagement (for example, supporting communication between teachers and parents with children with special educational needs).

Just under a fifth of the selected case studies explicitly highlighted impact on senior leaders and the practicalities of school management. As mentioned above, this included case studies focused on performance, the measurement of pupil progress, and the ways in which senior leadership teams (SLT) could manage teaching and resourcing appropriately according to the gathered data. Further ways in which the case studies impacted on SLT practice included other frameworks and tools for decision making around financial and personnel resource allocation (the provision of technology in schools, for example, or the use of teaching assistants) and taking a strategic approach to staff CPD (by supporting practitioners' engagement with research, for example).

The range of different types of impact related to practice highlights the complex context associated with educational research and the eco-system that links policy makers, senior leaders and educational practitioners. The close working relationship between educational researchers and practitioners is illustrated by case studies that show how the co-design and co-production of knowledge, as well as wider approaches to knowledge exchange, can be key pathways to practitioner-based impact. The examples above illustrate the broad understanding of professional practice that runs through the REF2014 impact case studies, while showing the limitations of attempting to separate policy from practice impacts.

c) Teachers' Professional Development

Teachers' professional development is a type of impact closely related to teachers' professional practice. In the analysis of the REF2014 impact case studies, in-service professional development was coded as both a pathway to impact, where CPD and training shaped practice, and a form of impact in its own right. This dual coding reflected the emphasis that nearly a third of the case studies placed on teachers' professional development. This type of impact may be facilitated by a wide range of activities, from very focused single-session training or outreach events (e.g. related to pedagogical interventions or curriculum change) to longer-term ongoing formal training programmes.

However, professional development was conceptualised in the impact case studies as going beyond this kind of formal training. For example, descriptions of teachers' professional development in 14 case studies also emphasised community building and facilitating informal peer-to-peer networking as important parts of development. This suggests an important understanding of CPD that includes both formal 'top down' training models for development, and more informal models rooted in networking and collaborative learning.

Although professional development was an important focus of many impact case studies, relatively few highlighted impact in ITE, as noted above. Those that did include impact on ITE were focused on pedagogic developments, curriculum design, more generally on improving teaching practice, and on ITE in specific subject areas. Main pathways to impact included resource provision and training. For example, a case study about the improvement of teaching and learning scientific content in schools, described generating large-scale impact in ITE (reaching 12k trainee teachers) by creating and disseminating resources to

both teacher trainees and teacher educators, and by providing training for PGCE tutors. Such examples highlight the potential for depth and breadth of impact in ITE.

d) Learning Environments and Student Outcomes

The most frequently referenced outcome focused on improvements to learning environments and student learning. The case studies that mentioned this covered a wide variety of substantive focuses, including curriculum design, pedagogy, the use of technology, resolving disputes between parents/ carers and teachers, behavioural management, and resource allocation. This breadth of topics suggests that there was a consistent conceptualisation of educational research and impact that placed students' learning at the heart of the endeavour.

More than a third of the selected case studies specifically highlighted improvements to students' learning. The most commonly mentioned types of outcome were in literacy, numeracy and STEM subjects, although other areas specifically highlighted were Modern Foreign Languages, English, Citizenship, and Religious Education. Other types of student outcomes highlighted in the sample of impact case studies include: increased understanding and manifestation of community cohesion; improvements to student health and well-being; and widening participation (including the participation of students with special educational needs and students from different socio-economic backgrounds). A focus on community cohesion was particularly apparent in institutions based in Northern Ireland, reflecting the context, but was also highlighted in case studies that discussed research in the specific curriculum areas of Citizenship and Religious Education. 10 impact case studies highlighted health and wellbeing and were generally rooted in early years interventions, although they also included studies on 'sexting', counselling, and smoking prevention. 15 case studies highlighted impact on widening participation and included a wide range of focuses from technology, to teaching assistants and student motivation.

These examples illustrate both the depth of the impacts of educational research on specific learning outcomes, as described in the REF2014 case studies, and the breadth of the impacts on student outcomes, conceptualised in a holistic way.

e) Conceptual and discursive influence

More than a third of the analysed REF2014 impact case studies mentioned conceptual and discursive influence as an important type of impact, although they did so ususally as a secondary or "further" area of impact, rather than a standalone claim. This figure highlights the ability of educational research to challenge existing practices and ways of thinking. Conceptual and discursive impacts unfold over a long period of time and across a wide range of substantive topics, sectors, and areas of policy and practice. Some large-scale developments were highlighted. For example, the conceptual reframing of early years provision was linked to ongoing influence on early years policy development and on changes to early years participation, curriculum, quality assessments, and professionalization. The discursive influence on the way in which the educational community conceptualises and engages with 'research evidence' was linked with the development of the Pupil Premium Toolkit and the work of educational researchers collaborating in the foundation of the Education Endowment Foundation. Further large-scale conceptual and discursive developments included areas related to foundational research on threshold concepts and

measuring pupil performance. More localised influence was also highlighted in areas related to, for example, discourses around technology in the classroom, teachers' conceptualisations of children with special educational needs, and pedagogic approaches related to specific subjects.

It was also notable that several impact case studies highlighted conceptual and discursive impact in relation to research projects that had only limited directly attributable positive impact on policy and practice or student outcomes, or indeed had preventative impacts. These examples included critical analyses of educational systems or policy, critical analysis of networks around education, and more generally research that critiqued dominant discourses within the field. Although there are relatively few of these case studies, their inclusion within the REF exercise signals the potential for a broad understanding of impact that takes into account longer-term patterns of change and a confidently critical approach to educational research within some institutions.

2.3. Analysis of REF 2014 impact (REF3a) statements

We analysed the impact statements of the 11 most highly ranked Education submissions to REF 2014. Between them, the 11 Education units analysed have a total FTE of 489 (head count 541), which represents a FTE of 33.9% of the total (33.7% headcount) (these figures include the large UCL IoE submission, which had 219FTEs). Therefore, the most impactful 14.5% of institutions employ 33.9% of the total submitted FTE. WP 2 offers more contextual information about the size and shape of the field. Also between them, these units attracted £160,392,277 (actual value) in research income over the census period; this figure is made up of individual unit total research incomes between 1.2m and 80.5m (actual values).

Infrastructure to enable impact

The analysis of the impact statements submitted by the 11 Education units with the strongest REF 2014 profiles for impact shows that the institutional infrastructure and mechanisms to enable impact in these institutions encompassed:

- *Research management and leadership structures and processes*: the impact statements evidenced management structures for impact (director of research, research committee, research impact group, impact director, dedicated administrative staff) with clear decision-making, strategic and operational responsibilities; allocated resources to impact-related activities; inclusion of impact in annual planning processes; and the mobilizing influence of impact champions.
- *Clear, operational impact strategy*: the impact strategy was tailored to the research aims and strengths of the unit, rather than attempting to be all-encompassing. The strategy showed clear understanding of the users and beneficiaries and the types of impact that were specific to the unit, as well as of the pathways to impact appropriate to achieving them. Commonly mentioned pathways included networks and partnerships, knowledge exchange, dissemination and communication, user-tailored advice and outputs, and different forms of collaboration. The co-design and co-production of research and the provision of research-informed teaching also

featured strongly in the impact statements, although they were not equally widely represented in the case studies submitted by these units – most likely, a by-product of selection processes.

- *Personnel policies, management and support*: in some institutions, impact potential and/or track record were among the criteria used in recruitment and annual reviews, including for senior appointments; staffing strategy also took into account the need to ensure continuity of impact, and impact and partnership work was included in workload models, including those for senior staff time. Some units also appointed visiting staff who could broker relationships, and facilitated secondments and internships in and from relevant organisations.
- *Dedicated provision of staff and PGR training and research capacity building*: from including impact in staff induction training, to dedicated workshops and other staff development events on impact, KE and engagement, the units analysed offered an array of activities aimed at developing impact capacity and a culture that nurtures research impact. Other mechanisms used for these purposes included PGR internships and studentships, staff secondments and exchanges, and individual meetings with senior management.
- *Dedicated funding and funding support*: some units had internal funds to support external visits, events and KE activities. They also provided support in securing externally funded impact projects, as well as including impact in internal peer review of proposals.
- *Research-informed ITE and CPD programmes*: examples include teacher fellowship schemes, action research programmes, school-based Masters programmes, and teacher education EdD programmes.
- *Communications*: investments in communication include technology for open access (more widely but also in setting up their own journal or publishing house); online resources; interactive data visualisations; redesigned websites and web 2.0 technologies; and targeted social media use.
- *Shared spaces and co-location arrangements*: some units described the role played in their impact activity by user-oriented centres, institutes or groups, whether integrated with or located within the unit; but also the importance of co-locating key external partners in the same campus. Further initiatives included joint international ventures, more widely contributing to linking impact and internationalisation agendas.
- *University-wide strategy, infrastructure and services*: some of the infrastructure and services offered by the HEIs in which the units are embedded include university-wide KE strategies; provision of intelligence and advice; seed-corn knowledge exchange and impact acceleration funding; and dedicated services, including business engagement, consultancy, development and innovation services.
- *Monitoring arrangements for research and impact*: unsurprisingly, most institutions reported only incipient systems for monitoring impact activity; many had included an overall assessment of progress in their annual review processes.

2.4. Analysis of REF 2014 Environment statements

Features of impact-conducive research environments

A qualitative analysis of the 11 universities with the highest rankings for the impact of their research suggests that the following aspects of the research environment may be particularly favourable to high quality impact.

1. *Coherence between research strategy and impact strategy*: qualitative analysis of the submissions suggests that coherence between a unit's research strategy and its impact strategy may be a precondition of high REF performance on impact. The research and impact strategy included clear conceptualisations of impact and impact pathways. Success in impact was not clearly associated with particular sub-fields of educational research or particular methodologies; a wide range of fields and methodologies is covered by the units analysed. Instead, the units with the highest impact profiles in the REF were likely to describe a culture of appreciation of the importance of innovation, application and collaboration.

2. *Scale and stability of research funding*: a healthy portfolio of research grants, relative to the size of the institution, characterises most institutions that performed very well on impact. This size of the funding portfolio may also be relative to the context of the institution, in particular in relation to the devolved administrations. There are also institutions in UoA 25 where a large-scale funding portfolio is not mirrored by an equally performing REF impact submission; it is thus more likely that research income works as a factor in tandem with the unit's research and impact strategy and with other factors, rather than being on its own a determinant of success.

3. *Infrastructure to support capacity building and professional development at all career stages*: departments that scored highly on both impact and environment tended to show coherence between the staffing and research strategy, emphasising research and in some cases impact in staffing decisions and workload planning. They also had clear mechanisms and resources for staff development, review and training, and invested in PGR students' research training (including via Doctoral Training Centres) and in the early and mid-career development and progression of staff. Highly impactful institutions included mechanisms to support the achievement of research impact across all career stages.

4. *Support and investment from the HEI in which the unit is embedded*; strong university infrastructure (such as libraries, IT, innovation, consultancy, research support, seed funding etc.) at university level characterises many of the highly impactful submissions, but it is not in itself sufficient; many factors of success reside inside the unit and in the networks of which it is a part.

5. *Leadership*: successful institutions evidenced strategic thinking, explicit arrangements for research management and governance, monitoring and quality assurance arrangements that were commensurate with the size, capacity and ambition of the institution, as well as strong leadership on impact. Individual

members of staff may have also exercised leadership, for example by championing impact, or taking on formal impact oversight roles.

6. *Networks and partnerships*: many of the 11 units referred in their environment statements to strategic investment in building and maintaining engagement in multi-disciplinary, cross-sectoral, and international networks as well as in partnerships with impact potential. Some highly impactful units evidenced outstanding local and regional partnerships and networks, encompassing the national level in the case of some units based in the devolved administration. Others prioritised partnerships with key agents of change internationally and nationally – for example, with international organisations (UNESCO, UNICEF, OECD, NATO, International Labour Organisation, European Commission, global corporations and charities) or with knowledge transformation and evidence sharing organisations nationally (in some cases, co-located or integrated with the submitting unit). Further partnerships included influential organisations in other countries; the countries mentioned in the impact statements analysed include, for example, Afghanistan, Australia, Belgium, Canada, Thailand, China, Chad, DRCongo, Cote D'Ivoire, Denmark, Germany, India, Ireland, Japan, Jordan, Kenya, Liberia, Lebanon, Malaysia, Malawi, Mozambique, Myanmar, the Netherlands, New Zealand, Nigeria, Norway, Pakistan, Qatar, Rwanda, Sierra Leone, Singapore, South Africa, Sri Lanka, Tanzania, Uganda, and the USA.

Some of these characteristics were signaled in the REF guidance (REF 2012) itself; for example, the guidance indicated the importance of research income, the role of the staffing strategy in supporting the research strategy, the value of adequate ECR provision, and of infrastructure and facilities. However, some of the points above were not discussed explicitly in the guidance – for example, the relationship between the impact and the research strategies, or the role of leadership. Also, the guidance unavoidably stopped short of describing the actual qualities that might be exhibited by a successful submission along each of these indicators.

Work Package 3. The engagement of non-university organisations and networks in education research and analysis

Summary. The UK has a complex and rapidly evolving ecosystem of educational research and knowledge production. Alongside university-based research capacity, a dynamic range of non-university research organisations and networks span the public, commercial and third sectors, bringing together academics, policy-makers, practitioners and schools, and producing different types of educational analysis and scholarship

This work-package maps the non-university research organisations that are involved in generating and sharing educational 'research' and analysis in the UK. It explores the different types of educational research and analysis these organisations pursue,. Further mapping of the impact of these organisations' work, and its articulation with HE research would require much more extensive original empirical research, both field and desk-based, than that included in our brief. Our recommendations suggest directions for such research.

After discussing our methodological strategies, the first part of this work-package, *'Estimating research capacity'* highlights the challenge of accurately measuring research capacity within the non-university sector. The second part, *Mapping the educational research landscape*, offers a typological mapping of the different organisations and networks, based on the forms of educational research and analysis they carry out. We categorise these for heuristic purposes into five broad areas of research

1. Operational analysis and organisational research
2. Evidence-based synthesis and 'what works' research
3. Design and product-development research
4. International comparisons and benchmarking
5. Strategy and policy research.

Whilst we recognise that there are overlaps between the different types of research identified above, and that some organisations carry out more than one type of research, the categorisation does helpfully highlight emergent and established areas of research activity. We offer examples of key organisations working in each of these five areas. Further, established streams of work include evaluation (common among for-profit consultancies and freelance researchers) and practitioner inquiry (characteristic of much of the research activity happening within educational institutions themselves). However, mapping the populous and undocumented communities engaged in these two forms of research was beyond our brief, and indeed may be difficult to conduct even with higher levels of resource and time.

The third section of this report explores the increasingly important role of informal institutional collaborations and networks, such as school partnerships, in brokering and using research, as well as in promoting practitioner research. We go on to discuss the rise of ResearchEd as a case-study of an influential individual practitioner network. In our

conclusion, we analyse how the impact of this work differs from, and complements the research 'impact' sought by research and funding councils. Our report ends by calling for further research on these organisations and networks and the way they are redefining the relationships between educational research and practice.

3.1. Methods

This work-package iteratively deployed several methods to understand this research landscape. Our initial desk-based survey approached the task by classifying different types of non-research organisation. We identified the following groups: 'in-house' and 'arms-length' government agencies; multinational agencies; commercial consultancies; third sector organisations (including charities, think-tanks and exam boards); and schools and further education colleges.

This desk-based survey was supplemented with a small number (n=5) of informal expert interviews conducted with academics, teachers, and representatives from publishers and exam boards. In order to understand how these organisations worked, we analysed publicly accessible materials on their websites, including funding portfolios, annual reports, staffing, financial statements etc. We began to appreciate that there are particular forms and modes of research that they foreground when they describe their research portfolio.

Through our searches and expert interviews we gradually learned more about the funding opportunities and research capacity in this sector, in the context of the financial and governance responsibilities granted to academies and school-led teacher-training partnerships. As a result, we restructured our typology to focus on the genre of educational research being pursued, and to systematically categorise these different research functions. We also recognised that research capacity and capabilities were being generated within informal practitioner-led networks as well as organisations. This led us to attend more closely to the work of funders such as the **Education Endowment Foundation**, and the activities of **ResearchEd.**

3.2. Estimating research capacity within non-university research organisations

Estimating educational research capacity within UK universities is difficult, but estimating non-academic research capacity is even more difficult, as capacity and activity are partly defined by the availability of funding. Our first approach was to try adding up the total funding awarded to non-academic organisations for educational research and evaluation commissions. As discussed in WP1, the DfE are no longer the largest funder of educational research and evaluations, given that in 2015/16, the Educational Endowment Foundation (EEF) funded £18 million of educational interventions and evaluations, of which approximately one half were awarded to non-academic organisations (though these are sometimes have close links to academic departments). EEF is just one of many philanthropies and charities now commissioning educational research and evaluation studies, as discussed in WP1, making an accurate estimate of funding difficult.

We then looked for ways to estimate the total research staffing within this sector. A sample sub-set of established and successful non-university research organisations is defined by the seven organisations awarded evaluation contracts from EEF in 2015-16. These included three long-established, independent and not-for-profit UK research and evaluation organisations (NFER, NatCen and NIESR), along with RAND and several commercial consultancies. By analysing their annual reports and websites, we developed a rough estimate of their current staffing capacity. **National Foundation for Educational Research (NFER)** employs around 150 staff, of whom the majority are researchers, analysts and research managers – and FTE that is larger than that of most university departments. **NatCen** employs more than 130 full-time research staff (and with a pool of almost 1000 research temporary staff employed on short-term contracts), with particular specialisms in large-scale data sets, RCTs and evaluation research. It has carried out evaluations of many educational interventions (including childrens' centres and early years interventions). It also hosts a major longitudinal survey entitled Next Steps. [12] The **National Institute for Social and Economic Research (NIESR)**, founded in 1938, is the oldest of the three and employs around 30 research staff. NIESR is a partner with universities in two ESRC research centres (including LLAKES, which focuses on education and skills) and regularly wins ESRC funding. The other non-academic organisations winning evaluation contracts included two non-profits: **RAND Corporation** and **AIR** (American Institutes for Research), the Government-owned social purpose company **BIT** (Behavioural Insights Team) and **Alpha Plus** (a small commercial consultancy). Drawing on their own internal reporting we estimate that there are at least 300 people with relevant educational and social research expertise in these seven organisations. This is only a subset of all the research organisations in the sector. Not all of these organisations are UK-based, and actual staff capacity at any one time will depend on their success in winning commissions. In some cases they also employ academics on consultancy contracts when appropriate. Nonetheless, their success in winning EEF evaluation contracts is a measure of the quality of the research and analysis they are able to deploy.

Researchers employed in non-university organisations have to deal with contradictory pressures in their work. Some seek to sustain para-academic identities and publication profiles, whilst also negotiating the expectations of the organisation (policy responsiveness, attracting customers, sustaining market share). They also face the challenge of combining evaluation, operational data analysis, and more mainstream research. Their research environment partly depends on how the team is seen internally in the organisation and the types of relationships it can establish within them. Further organisational case-studies would help develop our understanding of these challenges.

3.3. Mapping non-university research organisational capacity

This section maps non-university research capacity into five broad areas: operational analysis, evidence-based synthesis, design research, international comparisons, and strategy research. In this section, we discuss each of these five different genres of educational research, give examples of organisations actively researching in each area and, where

[12] http://natcen.ac.uk/our-expertise/policy-expertise/children-education/

possible, highlight the impact of this work. The focus in this section is specifically on organisational capacity for research, whereas 3.4 discusses the capacity and energy generated within informal practitioner networks.

1. Operational analysis and organisational research

Operational and organisational research activities constitute the largest component of non-university research capacity. Government departments and agencies commission and use educational research intelligence to inform their own internal policy planning and operational needs. Some have 'in-house' data and analysis teams, but most also commission research from academics, consultants, and independent research organisations. In this section we discuss this work and its impact.

In England the Department of Education works with 17 government agencies, many of which have their own internal research units. These include two non-ministerial departments (**Ofqual** and **Ofsted**), three executive agencies (including the **National College for Teaching and Leadership**,) and eight executive 'arms-length' non-departmental public bodies (such as the **Office for Students** (from 2018) and the new **Institute for Apprenticeships**). The Department's **Strategy and Social Mobility unit** carries out research,[13] as do many of these agencies, but the department also regularly commissions work. Between 2010 and 2016, the Department and its agencies spent £83 million on policy research and evaluations[14], including the cost of the periodic implementation of PISA and TIMMS surveys[15] as well as other longitudinal research projects. Other Government departments also commission education-related research, such as the **Office for Science's** Foresight inquiry into the future of skills and lifelong learning. Devolution in 1997 led to the creation of three new Education departments, each with their own arms-length agencies and operational research needs. These include **Education Scotland**, the **Department for Education and Skills** in Wales and the **Department of Education** in Northern Ireland.

Under its new Chief Inspector, Ofsted has recently strengthened its own internal research capacity. Its research department also carries out an annual programme of surveys of schools, early education and further education. Its counterparts include **SQA** in Scotland, whose Policy, Assessment, Standards and Statistics team produces Educational Research Reports in support of curriculum development. In Northern Ireland the **Council for the Curriculum, Examinations and Assessment (CCEA)** combines regulatory and award-body functions[16]. **Estyn** is the inspection body in Wales, while **Qualifications Wales** acts as the independent qualifications regulator for Wales, and also carries out operational research. The **Higher Education Funding Council for England (HEFCE)** has acted as a funder and regulator for the university sector, and its research team analyse sector-level data and publish extensive reports and policy briefs. Its counterpart in Scotland, the **Scottish Funding**

[13] http://schoolsweek.co.uk/dfe-hires-grammar-school-critic-as-head-of-strategy-and-social-mobility/
[14] http://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2015-09-07/9247/
[15] https://www.whatdotheyknow.com/request/pisa_cost_and_participation
[16] http://www.sqa.org.uk/sqa/35847.8031.html

Council (SFC), also has a research and innovation team with a remit to support a Scottish REF and researcher career development.

Despite this research capacity within government agencies, organisational research and evaluation continues to be outsourced. Large global consultancy companies such as **PWC** and as **McKinsey** carry out international strategy and policy work for government departments, but are also commissioned to implement education sector reforms. Commercial organisations also have in-house research units, such as the **Observatory on Borderless Higher Education**, part of Tribal plc, **Pearson Education**, part of Pearson PLC. There are many small and mid-size educational consultancies offering independent evaluation and data analysis skills. Examples of consultancies that have recently successfully won government agency evaluation tenders include **CFE Research, AlphaPlus, York consulting and Technopolis.**

Each of the devolved administrations has one or more awarding and qualification bodies, with their own assessment research units. In England, these include **AQA, Edexcel,** and **OCR**, independently registered charities, all of whom are regulated by Ofqual. The analytical capacity of the **AQA's Centre for Education Research and Practice** (about 30FTE) offers a useful case-study. The Centre carries out research and evaluation aimed at informing the operational activity of the awarding body (such as research on grade standards setting and on assessment quality), as well as having a smaller-scale programme of more fundamental research on assessment, both in-house and through supporting the doctoral research of staff members. It also contributes to data sharing agreements with other assessment organizations, a partner in academic research, and an active participant in public debates about assessment, for example through events, policy briefings and submissions, outputs aimed at schools and practitioners, as well as publishing blogs and opinion pieces. The AQA Centre's website has an extensive archive of research reports.[17] **Cambridge Assessment** is another example. Formally constituted as a department of the University of Cambridge, it oversees the OCR and CIE awarding bodies, carries out academic and operational research on assessment, offers consultancy services, and holds assessor professional development events. It employs more than 1700 staff worldwide.

Finally, it is noteworthy that the larger academy chains have their own evaluation and assessment units collecting and analysing classroom data, as the 'datafication' of education and the monitoring of student performance becomes ever more important (Robert-Holmes 2014).

2. Evidence-based synthesis and 'what works' research

Amongst educational practitioners and policymakers, there is a growing interest in 'evidence-based' policy-making informed by robust quantitative analysis, research syntheses, systematic reviews and even RCTs. This second type of educational research is increasingly influential and is regularly commissioned and promoted by funders. The evidence-based agenda has been particularly championed by EEF through its funding of

experimental and quasi-experimental trials, and rigorous independent evaluations, universities and non-university research organisations

A set of national centres of excellence and 'what work' centres now exist, following the example set by the **UCL EPPI Centre (Evidence for Policy and Practice Information and Co-ordinating Centre)** since the 1990s through its work on developing and promoting systematic reviews**.** Examples include the **National Centre of Excellence in the Teaching of Mathematics (NCETM),** managed by a consortium including **Tribal Education** and **Mathematics in Education and Industry** and funded by the Department for Education (DfE). The Centre supports individuals and schools, primarily through its Maths Hubs programme and its web-resources. The Centre also promotes the provision of high quality, maths-specific CPD, through the NCETM CPD Standard.

A few organisations specialise in brokering and synthesising this research evidence for schools. The **Centre for the Use of Research & Evidence in Education** (CUREE) is a company engaged in "mediating education research knowledge and promoting the use of research to enhance educational practice". It distils existing research, offers CPD tools and services for schools, and aims to help schools make sense of policy initiatives. The **Institute for Effective Education** began as a research centre at the University of York in the early 2000s, but is now an independent registered charity that champions evidence-based education. It works with schools to help them adopt 'effective and efficient' approaches to improving teaching and learning. As well as supporting a new network of **Research Schools** in collaboration with the EEF, the Institute also produces practitioner briefings and newsletters, the Evidence4Impact website, and 'Evidence for the Frontline', a support service for teachers. It also facilitated and backed the creation of **CEBE** in 2008 (Coalition for Evidence-Based Education). Its Chair of trustees is Baroness Estelle Morris, a consistent advocate for evidence-based reforms. Like other brokering organisations, **CUREE** has developed a suite of web-resources for communicating with teachers about research. Its chief executive, Philippa Cordingley, has a fortnightly TES column and an active twitter following, where she promotes research resources for teachers.

The **National STEM Learning Network** is the largest provider of STEM education and careers support to schools, colleges and other groups working with young people across the UK. Organised by the White Rose University consortium, and funded by the Department of Education, Wellcome Trust and the Gatsby Foundation, the Network seeks to raise young people’s engagement with STEM, and increase the proportion of young people progressing in STEM studies and into STEM-related careers post-16. It supports 50 sciences learning partnerships, as well as web resources, CPD, and STEM Ambassadors, as well as working with employers.

How does this policy and practice 'brokering' activity complement and supplement the research 'impact' of HE-based researchers? As well as carrying out their own evaluations and analyses, these organisational networks also work to translate and adapt research 'evidence' for teachers, promoting access to educational knowledge and changing the attitudes of some teachers to academic research. This is assisted by several recent policy initiatives, such as the expectations that Teaching Schools foster research-uptake by

appointing dedicated Research 'Champions', and the emergence of teacher-led 'grass-roots' practitioner networks, debating how best to assess and make use of research evidence.

3. Design and product-development research

Design research is now a key aspect of educational development, and is used by companies and organisations to ensure that new products and services are responsive to user agendas, needs and concerns. Examples of design research can be found within the work of the education publishing companies, educational software companies and other EdTech companies.

Education publishers (such as **Pearson** and **OUP**) no longer simply produce academic textbooks, but have also become education content providers and suppliers, carrying out a range of research functions. In order to ensure their products are evidence-based and to maximise the impact of their work, publishers and software companies are increasingly using participatory design research techniques, working in partnership with practitioners, qualification bodies, and schools themselves.

4. International Comparisons and Benchmarking

Transnational assessments and comparisons of educational achievement are increasingly key to national policy debates. The PISA benchmarking survey carried out by the **OECD** is perhaps the most influential. PISA is a system of assessments focusing on 15-year-olds' capabilities in reading, mathematics and science literacies, and it also includes measures of general or cross-curricular competencies such as problem solving. The Department of Education funds England's three-yearly participation in PISA, as well as in surveys of maths and reading (TIMSS and PIRLS), and in 2011 this cost around £800,000.

Organisations bid to manage these surveys. In 2018 PISA in England is being run by the National Forum Educational Research (NFER). **NFER** has developed a reputation for its testing services, and it will also administer the 2019 TIMSS tests on behalf of the Department for Education[18], as well as a new National Reference Test.

UNESCO also has an international mandate to implement the UN sustainable development goals in relation to education, and alongside the research carried out by the **IIEP** (International Institute for Educational Planning), it supports education capacity-building initiatives, such as the UNESCO Chairs. Other UN agencies that work on education, and are mentioned in Impact statements, include the ILO and UNICEF.

Several **European Commission agencies** mediate and broker research on education. Amongst the most significant is **NESSE - Network of Experts in Social Sciences of Education** and Training set up in 2007 by the Directorate General for Education and Culture. Its mandate is to advice the commission and to disseminate knowledge on social aspects of

[18] https://www.nfer.ac.uk/about-nfer/media-and-events/NFER-is-the-national-centre-to-deliver-PISA-2018-in-England-Wales-and-Northern-Ireland/

education and training.[19] **CEDEFOP**, promoting research on vocational education, and **CRILL**, researching life-long learning.

5. Policy and strategy analysis

This final category of educational research covers policy analysis, advocacy research and strategy carried out by education think-tanks, charities and consultancies. Most have relatively few staff. They commission and carry out research that is sometimes linked to promoting their own policy agendas within political debates, or to promote their services to schools.

Alongside the established political think-tanks (such as **Policy Exchange** and **IPPR**) who sometimes publish research and policy-briefings on Education, there are several think-tanks dedicated to the sector. Examples include the new **Education Policy Institute**, a Westminster think-tank that seeks to influence the political agenda through its own research analyses, as well as through commissioned work. Others include the **Higher Education Policy Institute,** which specializes in university policy. **The Education Foundation**, co-founded by Ian Fordham and Ty Goddard, sought to kick-start a high-level policy debate about educational reform in 2011, and is closely involved with several EdTech incubators.

Recognising the limited policy attention given to vocational education, **FETL** (Further Education Trust for Leadership) is an independent think tank and charity working to strengthen and support the leadership of thinking in further education and skills. Promoting research into the FE sector, it awards fellowships and research grants, brokering and disseminating research evidence in schools.

Some of the Multi-Academy Trusts seek to shape the future of educational policy internationally, and to leverage their UK expertise to inform their profile and operations in developing country contexts. **Ark Academies** is an influential example. As well as running 35 academies in London, it is involved in third-sector partnerships across Africa, and a new chain of schools in Delhi. Its **Education Partnerships Group** sets itself the ambition to 'be a lead in educational policy and research'.[20] The **Pearson Affordable Learning Fund** offers a different model, leveraging research knowledge and a $65 million investment fund to support low-cost private schooling, and to influence developing country education policies.

Non-university research organisations have developed additional funding streams by providing CPD and assessment services to schools partnerships. For example, **NFER** has created an Impact team, dedicated to getting research evidence into policy and practice. It offers baseline assessment tests, a 'self-review' tool, allowing school heads to assess how research-engaged their school is, a CPD programme for school leaders called 'Enquiring Schools' and a national 'Research Mark' scheme allowing schools to seek accreditation for their use of in-school enquiry and evidence. Accreditation costs £800 for three years, and is

[19] http://www.nesse.fr/nesse/links/institutions/nesse/about-nesse/mandate/

[20] https://isw.changeworknow.co.uk/ark/vms/e/phases_and_departments/positions/b3gXqdLTHhKQdqlA97xHeq

based on schools meeting the eight criteria set out by NFER.[21] Several universities have spun out educational service companies. An example is **Evidence Based Education**, a consultancy company that is closely linked to **CEM** (Centre for Educational Measurement) at the University of Durham, which offers consultancy and training for staff in the use of CEM instruments and tools.

Other charitable organisations offering research-informed professional CPD services to school-based partnerships include the **Education Support Partnership,** which began as the Teachers Benevolent Fund in 1877. In 2015 it combined the resources of three charities working to understand and limit the stresses faced by UK teachers and educators. As well as a confidential helpline, it carries out surveys and offers resources and services to schools.[22] The **Education Development Trust** began in 1968 as the Centre for British Teachers (CfBT), supporting English teachers working internationally. This initial expertise in bilingual and English language educational programmes extended to educational reform programmes in low income countries. Within the UK, it owns three independent schools and sponsors a set of free schools and academies. Espousing a strong set of educational values, it also carries out and funds research. Finally, the **Teacher Development Trust (TDT)** is an independent charity, founded by teachers, that works to raise the quality of professional development opportunities for teachers. It carries out research on CPD, has a TDT Network of schools and colleges, as well as a TDT Advisor database of 3000 CPD resources.[23]

3.4. Practitioner-led networks

In this final section we discuss the rise of practitioner networks and collaborations. These include institutional networks (such as school-led SCITTs and Teaching School alliances) and networks of individual practitioners. As teachers' engagement with educational research evidence increases, school-led CPD initiatives, networks and partnerships have emerged, often involving universities and other training providers. Funding initiatives and incentives seek to promote 'research-mindedness' within schools, and fund practitioner research.

As part of the 2010 Coalition Government's reforms of teacher training, the category of **Teaching Schools** was introduced to promote school-based leadership and 'evidence-based' professional development. One result of this policy has been the growth in schools appointing 'Research Leads' or 'Research Champions'. Experienced individual heads with experience of leading partnerships apply to be recognised as Teaching Schools, and then are supported to lead **Teaching School Alliances** that can bring in universities, local authorities, other schools and private sector organisations. These teaching school networks are also expected to set up **SCITTs** (School-led Initial Teacher Training) opportunities. In some regions these school networks have led to the creation of new partnership organisations, some registered as both charities and not-for-profit companies. Examples here include **Birmingham Education Partnership** and the **Oxford Education Deanery**. School-level networks, alliances, and consortia are burgeoning. Some are the result of successful funding bids to set up teaching networks.

[21] https://www.nfer.ac.uk/schools/research-mark/about-the-nfer-research-mark/
[22] https://www.educationsupportpartnership.org.uk/
[23] http://tdtrust.org/

Strongly encouraged by successive Conservative Governments, universities are sponsoring schools. These schools allow their sponsoring universities to carry out research and train teachers. One of the best developed of these collaborations, the **University of Birmingham School**, hosts research projects and supports teachers with journal access and opportunities for advanced study. The University of Cambridge partnership includes several teaching schools, and also the **University of Cambridge Primary school.** The UK Research Councils funded a three-year **School-University Partnerships Initiative (SUPI)** through the **National Coordinating Centre for Public Engagement** from 2014-2017, supporting 12 universities to understand what makes these partnerships successful, and producing a valuable set of reports. The **Brilliant Club** and its **Researchers in Schools** initiative has also built links between PhD students and schools and facilitated teaching careers for researchers.

New collaborations continue to emerge. **Research Rich Schools** is a consortium of 15 teaching school alliances supported by the **National College for Teaching and Leadership**. They have created a website with practical suggestions for developing a Research and Development strategy within a school or network of schools. The **Research Schools Network** is another example of a cross-sectoral partnership, this time funded by **EEF** and led by the **Institute for Effective Education,** coordinating a network of schools who draw on research evidence to improve teaching practice. There are currently 11 such schools, and in 2017, the EEF ran a second competition, awarding this status to six further schools. The **Sutton Trust** charity has become an influential voice in education policy circles, promoting social mobility and widening access to higher education. Related initiatives include **Nesta**, the innovation foundation, an independent charity since 2012.

Individual practitioner networks As we carried out our review of non-university educational research we became increasingly aware of the growing importance of policy entrepreneurs (Roberts and King 1991), mobilizing teachers in support of evidence-based approaches to practice. In this final section of the report we discuss the work of **ResearchEd** as a teacher-led network movement, and its role in promoting practitioner engagement with research through regular conferences and events and its online social media profile.

ResearchEd emerged from an event organised by Tom Bennett in 2013. It was given legitimacy by the Department of Education's support for Ben Goldacre's call for evidence-based approaches to educational informants. Led by a charismatic group of teacher reformers and bloggers, its website describes Tom Bennett 'enlisting an army of volunteers who built the movement from the ground up'. Many have come into teaching through Teach First, and see themselves as future teacher-leaders. It has a growing online following. It has sponsored regular events, first in London and then across the UK, and it is now becoming an international movement: in 2018 ResearchEd events are planned in the US, Canada and Australia. During 2015 ResearchEd was supported by the **Education Development Trust** to develop its own website[24]. Its 2017 UK national conference, held at Chobham Academy in East London, included almost 100 presentations/seminars from many of the organisations discussed in this report, including teachers, school leaders, and

[24] https://researched.org.uk/

commercial companies. A small fraction (10-15%) of the presenters were pursuing doctoral research or held academic posts.

Many of its organisers are active on social media. Their blogs and posts highlight evidence-based teaching resources, opportunities for teachers to obtain funding and promote events. Alex Quigley, Director of Research at Huntington School and an active blogger too, has written extensively about a ResearchEd initiative funded by the EEF and co-organised with support from the University of Durham. He notes that *'our trial has seen how the role of the research-lead faces the typical challenges faced by most school leaders: the poverty of time; the urgency of action; the anxiety that attends honest evaluation. We have attempted to mitigate those issues by supporting RISE (Research Leads Improving Students' Education) treatment schools with expert support, such as regular training, a website, twitter feed and a regular newsletter on practical topics for teachers'*[25]

Alongside ResearchEd, a small group of other influential bloggers have cultivated extensive twitter networks amongst teachers. Several have written popular books on teaching. They thus act as key gatekeepers, brokers, systematisers and distributers of educational knowledge and research to teachers. These include David Didau, an educational psychologist; Andrew Old, blogging at *teachingbattleground.wordpress.com*; Carl Hendrick, Head of Learning and Research at Wellington College, blogging at *chronotopeblog.com*; and Alex Quigley, Director of Huntington Research School and author of 'The Confident Teacher'. They tend to support and cross-reference each other's work, and espouse a broadly 'traditionalist' and knowledge-based approach to the curriculum:

David Didau https://twitter.com/DavidDidau - 39k followers
Andrew Old https://twitter.com/oldandrewuk 15.8k
Carl Hendrick https://twitter.com/C_Hendrick 12.6k
Alex Quigley https://twitter.com/HuntingEnglish 27.4k

There are undoubted benefits of this democratisation of research knowledge. With schools appointing dedicated 'Research Champion' roles, and heads and other senior teachers studying for professional doctorates, there is a new culture of enquiry in schools. One risk, especially in the context of online 'echo chambers', is that the concept of evidence itself becomes politicised, as has been seen in the debates around Charter schools in the US (Henig 2008). Not all research evidence is of the same quality, and poor quality 'evidence' may end up having a disproportionate impact on practice. The influence of charismatic individuals promoting 'magic-bullet' educational 'solutions' can lead to educational fads. There is a risk of a narrowly instrumental approach to 'research' and evidence, with analyses commissioned to support particular agendas or to validate existing practice. Given the influence of teacher-led networks in brokering and translating educational knowledge for teachers and schools, [26] further empirical research would help understand how pedagogic 'fashions' emerge, are promoted and received. 'Grassroots' advocacy increases the

[25] https://www.educationdevelopmenttrust.com/en-GB/news-and-opinion/news/2016/8%20August/ResearchEd

[26] https://www.theguardian.com/education/2016/may/10/growth-mindset-research-uk-schools-sats

opportunities for teachers to engage with research, but this can lead to over-simplified pedagogic answers.

The case of **ResearchEd** highlights the influential role that teacher-led networks can play in brokering and disseminating educational research knowledge. It demonstrates the speed with which new educational policy actors and networks can emerge, given the role of social media. Developing a nuanced empirical understanding of this activity and its impact is important and will require further work.

Recommendations for further research

This report has analysed educational research capacity within the UK and its impact on evidence-based policy-making and on professional practice. It has shown how this capacity is located both within universities and in non-university research organisations. The report has drawn attention to the different types of educational research being carried out within these organisations, and the way that this capacity complements (and sometimes competes with) academic capacity. It has highlighted the importance of new funding and policy incentives for promoting a research-base with which to engage teachers and to help inform evidence-based practice. Given our limited brief, timeframe and resources, these topics require further empirical research, and we make the following recommendations:

1. Further research on how research capacity is strategically deployed across the higher education sector, including an understanding of staff and PGR movement into and out of universities at all career stages.

2. Detailed investigation of the interface between educational research and other subjects and disciplines.

3. Fuller analysis of the growing popularity of the EdD as a degree and the contribution of practitioner research to capacity in the sector.

4. Research on the types of mechanisms, structures and incentives that enable academic researchers to aim for substantial research impact, including high-risk impacts, and to report on conceptual and discursive impacts, and long-term impacts).

5. Closer analysis of why, how and when educational research impacts on the policy-practice nexus, in order to inform future REF guidance

6. Further empirical research into the features of successful research environments

7. A more detailed analysis of the research expertise found within non-university research organisations, including how these staff and their knowledge is sustained, developed and deployed, and how individual academics collaborate with these organisations.

8. Detailed empirical fieldwork on how 'research' and 'evidence' are understood within schools, and the creation of 'cultures of enquiry'.

9. A more nuanced understanding of the role that practitioner research initiatives and teacher-led networks are having on the ways in which teachers learn about, and engage with research evidence. Follow-up interviews exploring the biographies and trajectories of key leaders and opinion-formers in this ecosystem would help understand this development, and the role of social media in mediating educational knowledge and the impact of academic research.

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Appendices

Appendix 1 List of Institutions used in the analysis of the REF2014 impact case studies.

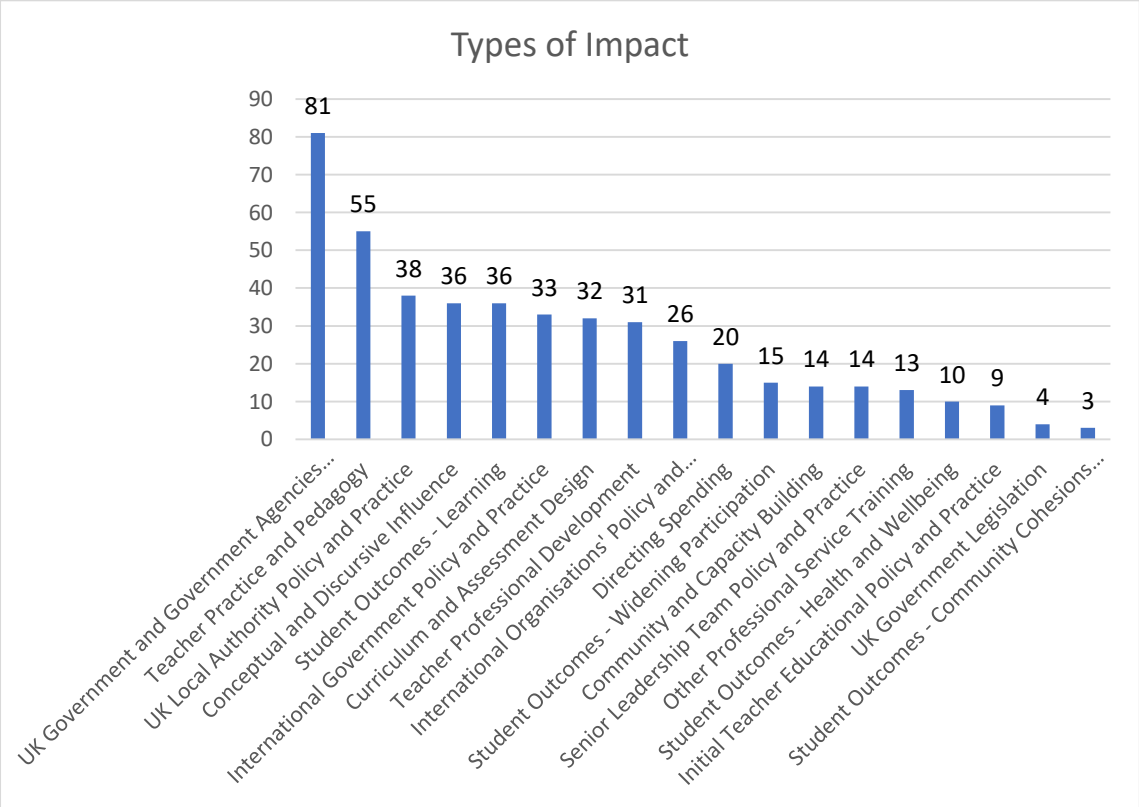
Nottingham
Durham
Sheffield
King's College London
Oxford
Ulster
Southampton
Edinburgh
York
UCL A: Institute of Education
Cambridge
Cardiff
Bristol
Leeds
Queen's Belfast
Open
Glasgow
Manchester
London Met
Manchester Met
Warwick
Strathclyde
Loughborough

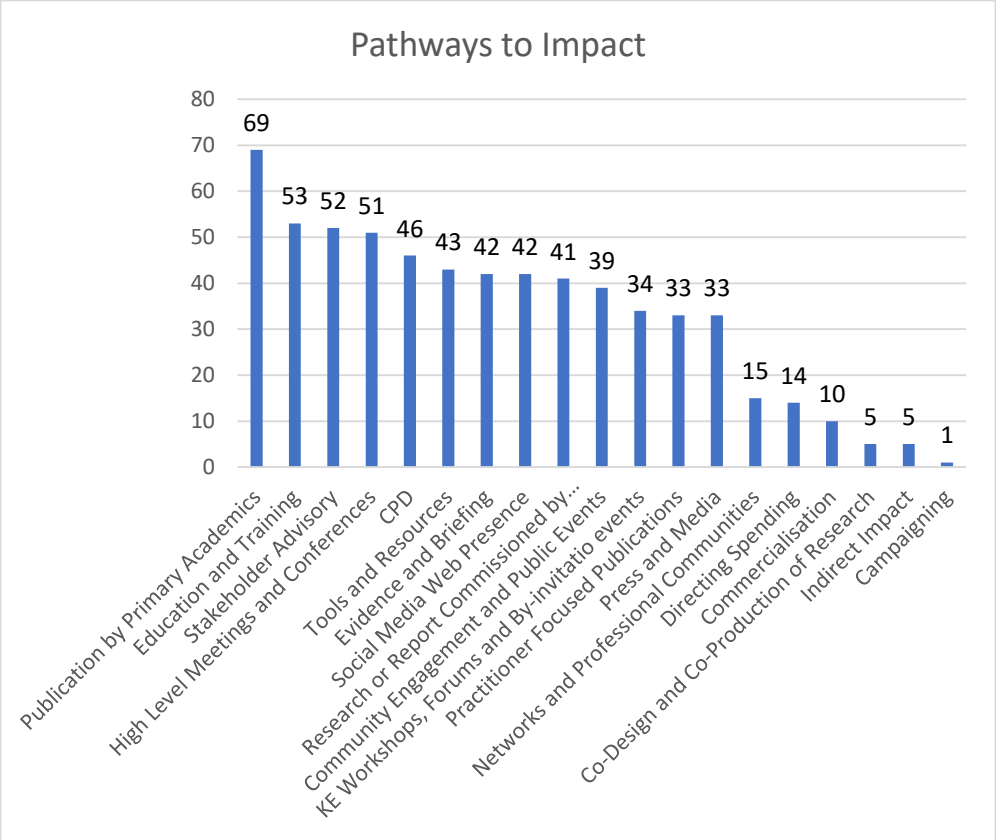
List of the institutions used in the analysis of impact and environment templates

University	FTE	4* impact	3* impact	2* impact	1* impact	unclassified
University of Durham	24.50	100.0	0.0	0.0	0.0	0.0
University of Nottingham	24.60	100.0	0.0	0.0	0.0	0.0
University of Sheffield	14.50	100.0	0.0	0.0	0.0	0.0
King's College London	36.30	92.0	8.0	0.0	0.0	0.0
University of Oxford	39.22	84.0	16.0	0.0	0.0	0.0
University of Cambridge	34.20	80.0	10.0	10.0	0.0	0.0
University of Ulster	12.20	80.0	20.0	0.0	0.0	0.0
University of Southampton	22.00	76.7	23.3	0.0	0.0	0.0
University of Edinburgh	39.97	76.0	24.0	0.0	0.0	0.0
University College London	219.00	73.9	22.6	3.5	0.0	0.0
University of York	22.30	73.3	26.7	0.0	0.0	0.0

Appendix 2 Codes used to analyse different types of impact when analysing the REF2014 impact case studies:

- UK Government and Government Agencies' Policy and Practice
- Teacher Practice and Pedagogy
- UK Local Authority Policy and Practice
- Conceptual and Discursive Influence
- Student Outcomes – Learning
- International Government Policy and Practice
- Curriculum and Assessment Design
- In-Service Teacher Professional Development
- International Organisations' Policy and Practice
- Direction of Public Spending
- Student Outcomes - Widening Participation
- Community and Capacity Building
- Senior Leadership Team Policy and Practice
- Other Professional Service Training
- Student Outcomes - Health and Wellbeing
- Initial Teacher Educational Policy and Practice
- UK Government Legislation
- Student Outcomes - Community Cohesions and Respect



Appendix 3 Codes used to analyse pathways to impact in REF2014 impact case studies

- Publication by Primary Academics
- Dedicated Education and Training Activities
- Stakeholder Advisory Roles
- High Level Meetings and Conferences
- Continuing Professional Development Developing or Co-Developing Tools and Resources
- Evidence Submissions and Policy Briefings
- Social Media and Other Web Presence
- Stakeholder- Commissioned Research, Evaluation and Analysis
- Community Engagement and Public Engagement Activities
- KE (Knowledge Exchange) Workshops, Forums and By-invitation events
- Practitioner Focused Publications
- Press and Media
- Networks and Professional Communities
- Contributing to Spending Decisions
- Commercialisation
- Co-Design and Co-Production of Research
- Campaigning
- Indirect Impact