Teachers as Researchers: RE teachers' engagement with research (TasR project)

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Evidence-informed practice aims to achieve the best outcomes for students and is at the heart of any claim that teaching is a profession. Central to the mission of Culham St Gabriel's Research Strategy is recognition of the value of a productive relationship between research and practice in developing an evidence base on which to improve teaching and learning in RE. However, much remains to be done to understand how teachers engage with research and how best to promote a 'bi-directional relationship' that draws upon the expertise of researchers *and* teachers. Deeper understanding is needed of the types of research, both subject specific or general educational research, that is used and the ways in which it is accessed, interpreted, mediated by RE teachers. Developing such understanding in the context of RE will make a significant contribution to educational research and, crucially, will be of lasting value to the professional knowledge, confidence and autonomy of present and future teachers.

To achieve the necessary breadth and depth of understanding the TasR project had three phases: a mapping review of research literature to identify factors in teacher engagement with research; interviews with RE teachers to ascertain if and how research featured in their classroom practice; comparison of the factors identified in the literature with themes from the interviews to understand what is most effective in promoting engagement with research in RE.

Phase 1: the mapping review of research literature

Mapping reviews categorize characteristic features of the research field and identify gaps in the evidence base. The method was developed by the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI) to provide a transparent means of identifying what is known, what is not known and what it would be useful to find out more about concerning specific areas of inquiry.[1] We followed the PRISMA[2] guidance on the evidence-based minimum set of items for reporting in systematic reviews and meta-analyses. The first step was to develop the protocol to guide the search strategy.

Question:
What do we know from published sources about teachers' engagement with research?
Search

1. **Database** searches in Education Research Complete, ERIC, BEI, AEI, PQDT, Web of Science using free text and controlled vocabulary (if available).
2. **Website** searching of:

[1] Grant & Booth 2006 A typology of reviews: an analysis of 14 review types and associated methodologies. HILJ 26(2): https://onlinelibrary.wiley.com/doi/full/10.1111/j.1471-1842.2009.00848.x

[2] http://www.prisma-statement.org/

British Educational Research Association (BERA)
Department of Education (DoE)
Ofsted
General Teaching Council Scotland
Teacher Unions
University Council for the Education of Teachers (UCET)
Education Endowment Foundation
Culham St Gabriel Trust
John Templeton Foundation
Christian Education

3. **Hand** searching of:
   Professional Development Today
   RE Today
   Times Educational Supplement
4. **Forward citation** searches of the New Zealand Government Best Evidence Synthesis in 2003 in Web of Science and SCOPUS

Screening

Published in English from 2010 onwards (we had originally planned to take the publication of the New Zealand Government Best Evidence Synthesis in 2003 as the starting date but revised this due to the overwhelming number of records, 17,382, in the initial search).
Primary or secondary school teachers
In countries known to have both a history of support for teacher research and research in Religious Education in the school curriculum: Australia, Denmark, Finland, Netherlands, New Zealand, Norway, Sweden, UK.
Include: Primary research, policy documents, opinion pieces, all types of review with a focus on how teachers engage with existing research/how teachers engage in producing research
Exclude: Initial Teacher Education, pre-School

Data extraction

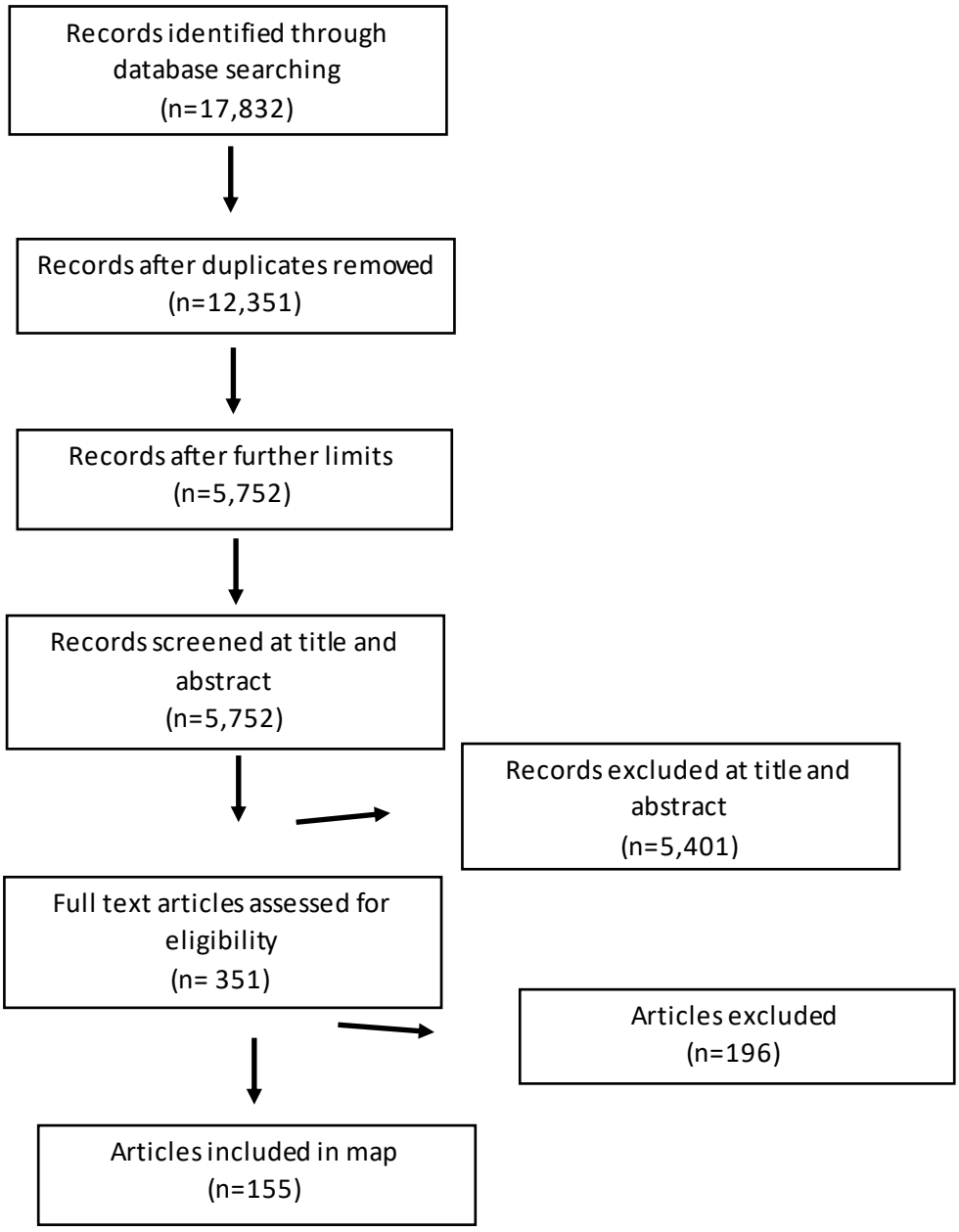
Country, phase, curriculum area, study design, population, duration, topic of interest and outcome of interest.

Using the following search terms, we found 5,752 records to be screened at the title and abstract stage using the inclusion/exclusion criteria.

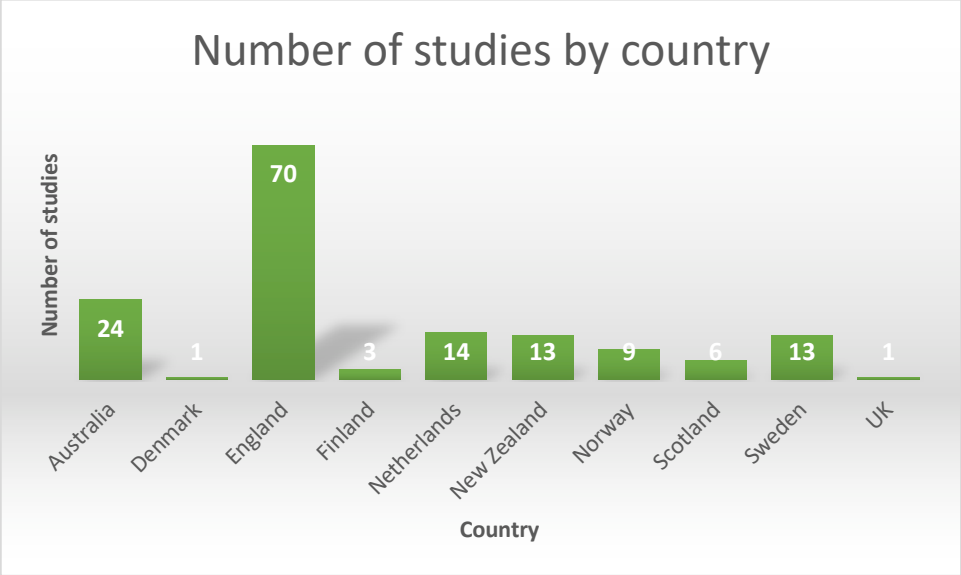
(Engage* or develop* or collaborat* or influenc*) in title OR (Engage* or collaborat* or influenc*) in abstract
AND
(Teacher in title near/2 (research* of evidence*)) in title or abstract
OR
(Research or evidence*) near/2 (Engage* or develop* or collaborat* or influenc*)in title
OR
(Research or evidence*) near/2 (Engage* or collaborat* or influenc*) in abstract
AND
teacher* in title or abstract

10% of the records were double screened and 351 were included in the full text database. Screening of full texts resulted in the exclusion of a further 196 records leaving 155 to be included for data extraction.

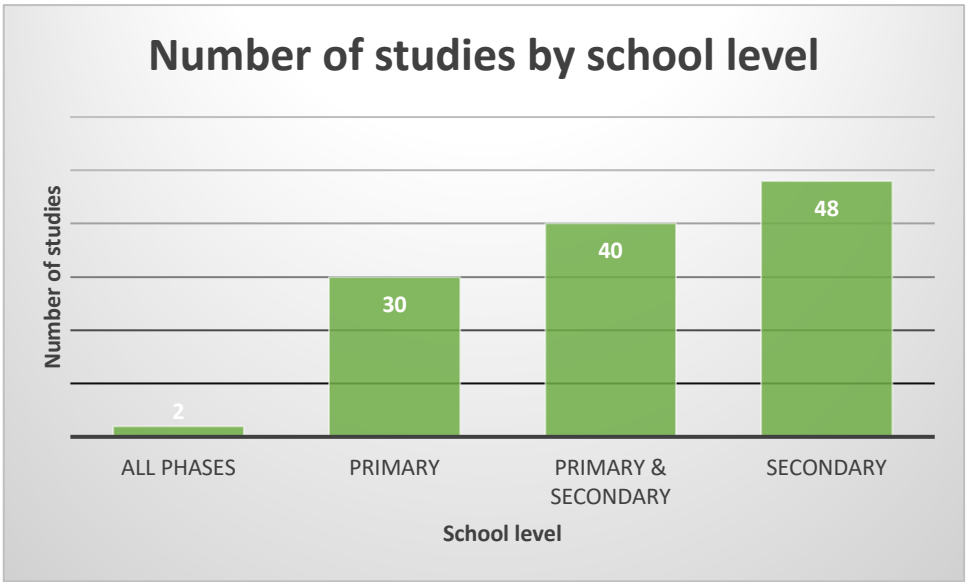
PRISMA Flowchart



The following graphs provide a map of the characteristics of the included studies according to country, phase, curriculum area, study design, population and duration.



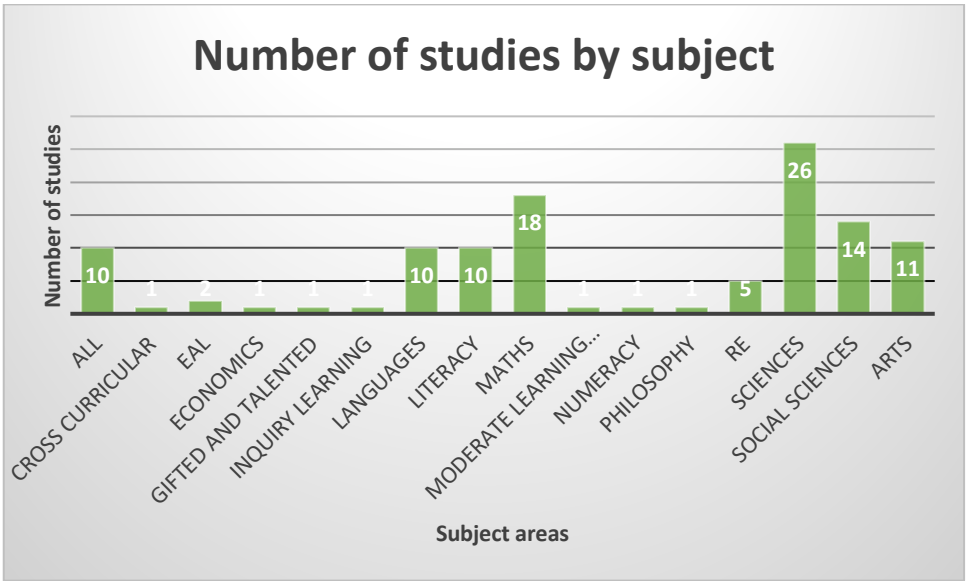
We wanted, as far as possible, to distinguish with which of the devolved nations of the UK studies were concerned given the increasing divergence in the construction of teacher professionalism and provision for engagement with research this affords[3].



One of the challenges when conducting a mapping review is determining from the published article's reporting of the study some of its basic characteristics, hence the category here of 'all phases' as well as primary and secondary. We can assume that this group of 2 was indeed both

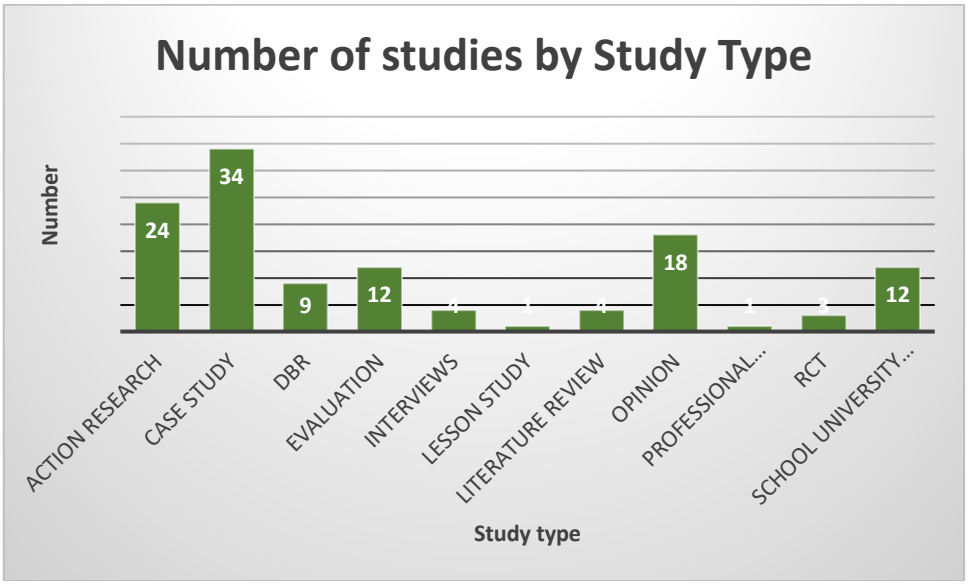
[3] Menter, I., Hulme, M. , Elliot, D. , Lewin, J. , Baumfield, V.M , Britton, A. , Carroll, M. , Livingston, K. , McCulloch, M. , McQueen, I. , Patrick, F. and Townsend, A. (2010) Literature Review on Teacher Education in the 21st Century. The Scottish Government. ISBN 9780755995875 (Web only publication)

primary and secondary but in the data extraction table the terms used by the study authors are used whenever possible.



Here we can see the effect not only of what the authors of published articles include in their accounts of research but also the impact of the use of different terms and variations in the composition of school curricula in different national contexts. Given that in Phase 1 our interest was in mapping what was known about teachers' engagement with research regardless of curriculum area, it is interesting to see that RE is represented. The preponderance of studies in maths and science is not surprising given the general trend in school-focused educational research. Understanding why this should be the case and what its impact might be on maths and science teachers' engagement with research cannot be determined from this mapping review but is one of the areas that it has shown it would be useful to find out more about. The distinction between the categories 'All' and 'Cross-curricular' is whether the study looked at all of the subjects within the school curriculum as distinct entities or was concerned with approaches or issues across more than one curriculum subject. Lawrence Stenhouse, one of the leading advocates of teacher engagement with research, stressed the importance of curriculum development as the place in which teachers and researchers meet on equal terms[4]. The proportion of included studies with a curriculum focus is, therefore, to be noted as is the number of studies that either did not have this focus or did not make it explicit in the article (42).

[4] Stenhouse, 1975



DBR = Design-based Research
Professional = Professional Learning Community
RCT = Randomised Controlled Trial
School University = School University Research Partnership

The search strategy was not confined to finding only empirical research or particular types of study as we wanted to cast the net wide to include as many sources as possible and considered opinion pieces to be as likely to yield insights as the reporting of research projects. Having a sense of the range of study types can also inform plans for future research, do we have a preponderance of certain methods and could the range or number of types of study be expanded? It is also possible to detect a correlation between country and study type with, for example, Action Research being popular in Australia and New Zealand and Design-based Research associated with the Netherlands and Scandinavia. The trend may reflect the support for research available in different national contexts and the preference for a particular type of study promoted either by researchers or funders of educational research. Surprisingly, authors do not always make the study type clear in the published accounts and even when they do, definitions can be fluid; this is noticeable in the use of Case Study, for example. Whilst this level of uncertainty would be problematic if attempting to conduct a systematic review, where judgements of the 'weight of evidence' of an included study are made it is less so for a mapping review.

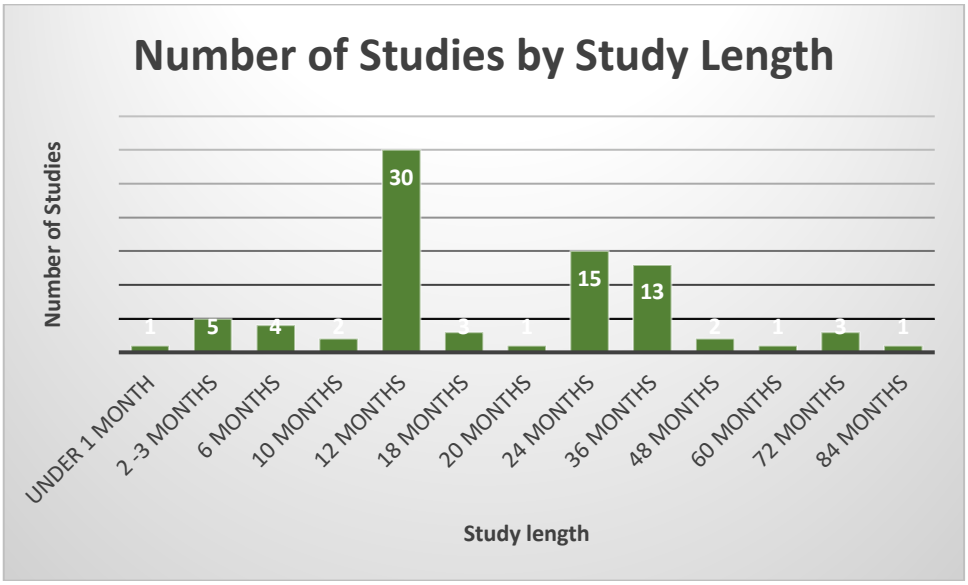
Number of Studies by Study Population

< 5 schools	6-10 schools	< 100 schools	>100 schools
5	4	6	3

1-5 schools	6-10 schools	11 -20 schools	21-30 schools	31-40 schools
25	23	17	3	3
41-50 schools	**51-60 schools**	**61-70 schools**	**71-80 schools**	**81-90 schools**
3	2	2	2	1
91-100 schools	**>100 schools**			
1	1			

The scale and scope of the studies included in the mapping review is also of interest but is not always easy to ascertain from published sources. Accounts sometimes report numbers of teachers and sometimes numbers of schools and less frequently both. It would be helpful to know if we are dealing with lone enthusiasts across a number of schools or a critical mass of teachers in one (or

more) schools; both could inform our understanding of how to support teachers' engagement with research but the difference is likely to be significant.



The duration of the study is another factor to be considered but, as with the reporting of study population, this is not always stated clearly. Whilst a mapping review is not aiming to reach a conclusion as to how robust the evidence presented may be, it is useful to know whether the conclusions reached reflect a short-term or sustained relationship or intervention.

Data extracted on the topic and outcome of interest is less amenable to presentation in the form of a graph or table and so has been summarised according to key themes. Statements recorded in the data extraction table have been grouped so that their integrity is preserved albeit at the expense of the fluency of the prose. The summary is provided to enable the reader to gain a sense of the import of the studies and the extent to which the mapping review has addressed the research question, 'What do we know from published sources about teachers' engagement with research?' We do, however, need to be cautious as summaries are also interpretations with all the attendant risks of bias. The exercise has been described as similar to making mixed fruit jam and then attempting to pick out the strawberries.[5] The value of conducting a mapping review is that the process is transparent and the reader is equipped to form their own judgement having the information on the steps taken to identify limitations and propose alternative interpretations. The full data extraction table precedes the thematic summary below.

[5] http://www.leeds.ac.uk/educol/documents/00003835.doc

1st author	Date	Country	Phase	Subject	Study Design	Population	Duration	Topic of interest	Outcome of interest
Andersson	2011	Sweden	Secondary	Maths	Case Study	1 tr	1 yr	Collaborative research partnership as a learning opportunity	Organisational structures important
Andree and Eriksson	2019	Sweden	ns	ns	Opinion	na	na	Tensions in teacher-driven research infrastructure	Tensions in • knowledge cultures between oral and text-based ways of sharing knowledge, • research interests • ownership.
Askell-Williams	2012	Australia	Secondary	Science	Case Study	2 trs	1 yr	Reducing the gap between research findings and their use	Researcher collaboration with teachers to develop pedagogical tools focused on student learning and matched to curriculum designs
Aspfors	2015	Finland	ns	ns	Case Study	ns	ns	Role of the researcher in facilitating CPD projects with teachers	Creation of sustainable arenas for communication is needed, researcher role mainly as negotiator concerning cultural-discursive, material-economic, socio-political arrangements.
Aspland	2012	Australia	Primary Secondary	ns	Opinion	n/a	n/a	Professional Practice Research as the optimal mode of teacher professional development	Teachers need to take an activist stance, engage with paradoxes and dilemmas focused on the everyday world of curriculum work. Requires being transparent in stating values, collaborative dialogue and networks.
Attorps	2015	Sweden	Primary	Biology Maths	AR	9 trs	2 yr	school–university action research project	Content representation in Learning Study provides pedagogical tools for working collaboratively
Bangs	2012	England	na	na	Opinion	na	na	Potential for teacher unions to improve teacher involvement in research	The withdrawal by government from the direct oversight of teacher policy presents new opportunities for teacher unions
Barlow	2018	England	Secondary	na	Opinion	na	na	Rationale for appointing a Research Lead	Research Lead as an in-house 'evidence expert' to keep up with the latest research and tailor pedagogical approaches to suit setting,
Barr	2010	Australia	Secondary	Science	PLC	4 trs	12 wk	Role of teachers' epistemic beliefs in translating research into practice	PLC promotes reflexivity and can change epistemic beliefs,
Beckett	2012	England	Secondary	ns	SUP	6 schls	1 yr	Can teachers' active participation in research build local knowledge and contribute to school improvement plans?	Sustainable improvements in attainment, reorientation of relationships, learning-focused professionalism. Constraints of the macro-environment is a challenge
Bennett	nd	England	na	na	Opinion	na	na	Research Leads as an interface between the two domains of school and research.	Commit time and resources and decide level of autonomy Encourage partnerships with research-based institutions Use action research as a reflective tool to drive professional development not as sole strategy to avoid cognitive bias and lack of rigour
Berg	nd	Norway	Primary Secondary	Maths	DBR	13 schls	3 yrs	Impact of participating in research on mathematics teachers' practice	change to attitude to mathematics, practice, classroom culture. deep impact on school organisation - meetings between ***all*** teachers and the school principal where they discussed mathematical tasks.
Betlem	2019	Australia	Primary Secondary	ns	SUP	12 trs	2 yrs	Contextualised professional development teacher-mentors and academic partnership in schools	Increased participation in professional sharing and dialogue with access to academics as a resource "an outside opinion . . . a different set of eyes on us . . . because then you can see things clearer".
Bevins	2014	England	Primary Secondary	Science	AR	15 trs	2 yrs	What are the factors for success in collaboration to reduce theory-practice gap?	Team and task support must be good. Without adequate resources a facilitation model might be better than collaboration.
Blackberry	2019	Australia	Primary Secondary	ns	Eval	330 trs	3 yrs	Development of an interpretive learning framework to evaluate impact of	Tools developed - innovation matrix and innovation rubric can be adapted to suit specific school contexts and support assessment of quality in

								teachers' action research on their professional learning	action research.
Blakeney-Williams	2013	New Zealand	Primary	ns	AR	2trs	ns	Co-construction of understanding between teachers and researchers	Preferred 'hands-on' activities to investigate practice rather than reading articles unless there was a 'need to know'
Brindley	2013	England	ns	ns	Case Study	53 trs	ns	Ethics in school-based action research	3 major categories in current practice: • unexamined use of gatekeepers • the unsupported use of existing ethics guidelines (such as those of the British Educational Research Association) • the conflation of legal and ethical demands by schools.
Brooks	2010	England	ns	Geography	Opinion	na	na	Geography education research is under-resourced.	With adequate research training, practitioners could make a significant contribution to the field
Brown	2016	England	Primary	ns	Survey	696 trs	ns	Do beliefs and perspectives of teachers in relation to Evidence Informed Practice align with their evidence-use behaviours?	Need direct support from school leaders to: • Promote the vision for evidence use • Engage in actions/strategies that illustrate how research and evidence can be effectively employed.
Brown	2017	Same study as above							As above plus • establish effective learning environments in which learning conversations around the use of evidence can flourish
Bruniges	2012	Australia	na	na	Opinion	na	na	How to improve pedagogic decision-making and practice, and engender school improvement	Collaborative approach to improving data literacy through access to evidence base to expand understanding of effective teaching practice
Bryan	2017	England	Primary Secondary	ns	Interview	25 trs	ns	what are schools doing in the area of practitioner research or enquiry.	Teachers' dissatisfaction with the gap between actuality and idealism, the possible evolution of a new teacher-educator population to address shifting needs
Bryan	2018	England	Primary Secondary	ns	Survey	44 trs	na	Research-active schools' awareness and use of ethical guidance	research activity is treated as teaching activity need for a deeper understanding of the dimensions to research ethics that would enhance their practices.
Cain	2010	England	Secondary	Music	AR	7 trs	1 yr	Ability of AR to generate new knowledge and secure its status as research.	Knowledge generated included experiential, presentational, propositional and practical knowing. Although such knowledge is positioned as 'Little K' knowledge, the reception accorded to it by other teachers suggests that it might have potential to be accepted as 'Big K' knowledge.
Cain	2011	England	na	na	Opinion	na	na	Teachers' classroom-based action research is misunderstood	Drawing on the work of Heron and Reason, I outline a view of how teachers are positioned in their classroom to explain why teachers' classroom-based action research cannot be underpinned by positivist, interpretive or critical paradigms, is necessarily self-reflexive, collaborative (albeit in a weak form) and political and is suitable for dissemination to teachers, working in similar contexts.
Cain	2012	ns	ns	Music	Opinion	na	na	Considers paradigms of educational research, and their relation to teachers'	Participatory paradigm is more appropriate than others. • includes self-study,

								action research in their classrooms or studios	• involves students, • considers the influence of context, • involves more than one turn of the action research cycle, • engages with, and contributes to, the development of theory.
Cain	2013	England	Secondary	English Maths	AR	5 trs	1 yr	How the teachers perceived action research, how they planned it and carried it out, and how they sustained their motivation	Despite the common input and a common school culture, the teachers engaged in very different models of action research. due to different responses to a performativity culture.
Cain	2015	England	Secondary	All	Case Study	8 trs	1 yr	How can educational research impact on teachers and teaching?	Research knowledge can impact on pedagogical knowledge through 'enlightenment'- three types of thinking enable this to happen: • conceptual development, • reflection on cases drawn from personal experience • imaginative diffusion of research knowledge into areas beyond those originally researched.
Cajkler	2014	England	Secondary	Maths	Lesson Study	4 trs	½ yr	Feasibility and value of collaborative research lesson study for teacher learning	Improved understanding of their students and created a stronger sense of teacher community. Substantive organisational challenges if its use is to expand.
Casey	2013	England	Secondary	PE	AR	2 trs	12wk	Are iterative cycles of Action research more beneficial than a single intervention?	2nd cycle enabled messiness to be understood and improved what could be learned about the processes.
Colucci-Gray	2013	Scotland	Primary Secondary	ns	Eval	13 trs	1 yr	Impact of a scholarship initiative supporting classroom teachers to undertake action-research projects on a topic of their own choice with the assistance of a university mentor.	Identified a multi-faceted concept of practice unfolding from individual inquiry and dialogical conversations with colleagues and university mentor – 'a different way of knowing'
Constable	2018	England	ns	na	Opinion	na	na	Has practitioner research become shaped more by the needs of universities than by the schools and teachers it was hoped it would serve?	Education departments in universities might think much more radically about the range of expertise that they can offer schools.
Cooper	2010	New Zealand	Secondary	Science Geography History	DBR	3 trs	1 yr	The practice and impact of assessment for learning	Need for a dynamic interconnection between the personal, micro or school-related level and the macro or policy level factors. importance of external support, shared teacher knowledge and beliefs, professional experimentation, and shared reflection on student responses
Cordingley	2015	England	Primary Secondary	na	Literature Review	na	na	How teachers engage in and with research as part of CPD.	The need for a shared language between teachers and researchers to enable concepts like analysis, theory and criticality to be valued as practical tools for enhancing professional practice.
Cornelissen	2011	N'lands	ns	SEN	Case study	9 trs	ns	Which aspects of a school-university research network play a role in processes of developing, sharing and using knowledge based on research by teachers on a masters' programme?	Collaboration was the most important aspect of the context and engagement and expertise were important qualities.

Cornelissen	2013	N'lands	ns	SEN	Case Study	5 trs	10 m	How is knowledge based on practice-oriented research by master's students developed, shared, and used in school–university research networks in which education is primarily offered within a university setting?	Existing network structures in master's programs is complex, but could be a promising avenue for creating successful school–university research networks.
Cornelissen	2017	England	Secondary	na	Case Study	1 schl	1 yr	What is the social network structure and the collegial relationships that enable collaborative research and learning in schools?	Immediate value of combined development of formal structures and informal networking to increase research-engaged interactions reinvigorated through discussing research with colleagues. Potential value of staff starting to experiment more with new ideas in their teaching practice creating new knowledge for improving their practice in the future.
Cowie	2010	New Zealand	Primary	Science	SUP	12 trs	3yrs	Recognising mutual interest in understanding the complexity of classrooms so that research can inform teaching.	Sharing multiple perspectives on the same data bridges theory-practice. Collaborative writing deepens mutual understanding. Promotes research literacy and critique of resources.
Cramp	2019	England	Secondary	ns	Case Study	7 trs	2yrs	Role of an in-school Innovation Unit in supporting teacher learning through practitioner research	Helped them live more fulfilled lives at work. increased their confidence, expertise and enthusiasm at work. Contributed to a shift in their identities and changed the ways they felt about themselves and how they thought they were seen by others.
Cremin	2012	England	Primary	Literacy	Case Study	2 trs	ns	Does teachers' active involvement as researchers blurring boundaries between home and school empower and help to resist the dominant discourses of successive governments and question the high profile 'what works' agenda?	New spaces for teachers to explore possibilities for shared enquiry, knowledge-building, communication and action are needed
Davies	2012	England	Primary Secondary	Dance	AR	3 trs	12wk	What happens to teachers practice and professional identity when they adopt a collaborative action research approach to teaching and involve external creative partners and a university mentor.	Able to: • make decisions about learning based on the educational potential of learners that they proved resulted in elevated standards • justify their actions on established educational principles. Tensions between what they perceived as their normal required professionalism imposed by external agencies and the enhanced professionalism experienced working through the project where they were able to integrate theory and practice.
Day	2011	England	ns	ns	Opinion piece	na	na	External and internal challenges for the research and teaching communities – the perils as well as excitements of border crossings	No single model of research will necessarily be best fitted to bridge the gap. obligation of all researchers is to reflect upon their broader moral purposes and measure the worth of their work against their judgement of the extent to which they realise this
De Geest	2011	England	Primary Secondary	Maths	Survey	92 trs	ns	Research utilisation in CPD and impact on teachers	5 descriptive categories: • reading research literature • using research-based resources • research inspired CPD • being part of a research project • doing research as CPD 50% of teachers aware of research underpinning CPD - stimulates thinking and debate as a 'zoom lens' on practice needs trust, validity, status and courage to try out

De Luca	2015	na	na	na	Literature Review	na	na	To examine the structure, challenges, and benefits of Collaborative Inquiry as a professional learning structure	Texts and research in this field are highly practical, describing CI steps or case-study examples. Identified areas for future CI research: • clarifying the focus of CI initiatives, • articulating what 'inquiry' means in CI, • sustaining CI within the profession of teaching.
Dimmock	2016	England	ns	ns	Opinion	na	na	Need for coherent, holistic frameworks in addressing pressing problems arising from gaps between research, practice and professional development.	Adopt a workable methodology (namely, research–design–development) for teachers and leaders to put research into practice and tailor innovations to specific school contexts. • research engagement on the part of all teachers and leaders; • creating schools and school networks as professional learning communities.
Doddington	2013	England	Primary Secondary	All	Opinion	n/a	n/a	Professionalization and the characteristics of thinking for teacher autonomy	Exercise of practical judgement (phronesis) requires dialogue to achieve deployment of universal knowledge and techniques to the right person, to the right extent, at the right time, with the right aim and in the right way.
Donaldson	2013	New Zealand	All phases	All	Opinion	na	na	What evidence base do we need to build a stronger theory-practice nexus?	Researchers must change their focus from disseminating research to facilitating research projects in which teachers and researchers collaborate
Drew	2016	Scotland	Primary Secondary	All	AR	25 trs	ns	Critical collaborative professional enquiry in a local authority-university partnership focused on curriculum development	Making sense of the data generated promotes the exercise of professional judgement/better able to link purposes to practices/flattens institutional hierarchies. Demands on time hard to sustain beyond a 'project'. Enquiry vulnerable to manipulation and need to be aware of micro-politics of institutions
Eley	2017	England	Primary	Science	Case Study	3 groups of schools	ns	How working as part of a professional learning community can support a collaborative and evidence-informed approach to improving practice in primary science	• School leadership supporting and valuing the initiative important. • Sufficient time being allowed to establish trust and good working relationships, • Time to carry out a complete research cycle. • Access to relevant literature – teachers have no time to find this, and it is difficult for them to access. • Expert support being available – for guiding the research and sourcing the literature.
Elliott	2015	England	All phases	All	Opinion	na	na	The role of theory-informed action research in developing teaching as a virtuous form of action.	Practical wisdom requires a 'process model' of curriculum planning informed by an appropriate pedagogical theory – learning study is a good example.
Farrell	2013	Australia	Primary	Maths	Opinion	na	na	Practitioner-led research projects as a form of professional learning resulting in improved learning outcomes for students.	Must be embedded in the practical knowledge tradition not the science-based tradition, as its aim must be to improve teachers and teaching. a professional not an academic mindset needs to be adopted by the participants. Of critical importance will be addressing how and where the research will be published and more importantly, with and by other professionals
Flynn	2019	England	Primary Secondary	EAL	AR	7 trs	1 yr	Examines relationships between research and practice when academics and professionals work together	Communal constructivism as a pedagogy of learning that can build understanding between researchers and practitioners for how practice might become research informed.
Fordham	2016	England	Secondary	History	Literature Review	na	na	What does analysis of history teachers' published discourse between 2004-2013 tell us about the growth of their professional knowledge?	Curricular emphasis is not prevalent in the dominant 'professional development' and 'what works' traditions of teacher research but is the concern of history teachers. Stenhouse's 'curriculum theorising' could prove to be powerful component in establishing a more systematic knowledge base for the profession.

Foreman-Peck	2018	England	na	na	Opinion	na	na	Defence of Action Research as a valuable form of teacher inquiry even in an adverse set of policy conditions	Action research projects, while they may not be transformative in the sense of transforming the present conditions weighing on teaching, have the capacity to transform that teacher's practice and to communicate to others what and how and why such transformation has come about.
Fraser	2010	New Zealand	Primary	Art	SUP	10 trs	ns	University-school research partnership as generative communities of inquiry enhancing both theory and practice	Deepening understanding but not necessarily providing answers – develops wisdom to act whilst retaining doubt Need to recognise and respect different types of expertise and goals. Researchers need to be seen as co-learners. Intimacy of insider knowledge is both a strength and a weakness.
Fraser	2015	New Zealand	Primary	Art Dance Drama Music	SUP	10 trs	2yrs	Issues and paradoxes in collaborative research are considered alongside particular processes that build school and university partnerships.	Requires regular, ongoing interaction between university and school partners. Relationships need to be hospitable so that partners feel supported and understood. But the research partnership should also be "charged" so that challenge is welcomed, dispute is encouraged, and competing perspectives are aired. Use of describe *then* interpret data supports mutual understanding and reduces bias.
Gade	2012	Sweden	Primary	Maths	AR	1 tr	ns	Can participatory action research nurture a reflexive platform that informs theory as well as practice?	Developed actionable knowledge in the form of self-directed mediated and semiotic activity, with diagrammatic objects as cultural artefacts. Attending to linguistic, social, political as well as theoretical aspects opens opportunities for arriving at and understanding empirical truths in situ.
Gade	2015	Sweden	na	na	Opinion	n/a	na	Two forms of creative local action pursuing knowledge vital to the advancement of teaching and learning	Self-study using texts can transform personal, practical knowledge into a social, cultural and institutional narrative. Supports inquiry into the 'everyday'. Teacher-researcher collaboration essential for creating productive learning environments in classrooms
Getenet	2019	Australia	ns	Maths	DBR	16 trs	ns	Nature of partnership working when a DBR approach was employed to bring researchers and practitioners together	Working with practitioners to design interventions such as CPD programmes, DBR can provide a practical approach for improving practice and deepening the relationship between educational research and classroom practice.
Gittner	2019	England	Secondary	Science	Opinion	n/a	n/a	Reflections on the *Improving Secondary Science* report from EEF highlighting use of research evidence.	The key is to focus on one aspect of research that seems important and potentially useful in the context of that school, those teachers and their students. Next steps are to carefully plan how to move ideas forward for teachers so that they can engage with the research in that area. This will enable teachers to undertake some exploration and action research in their own classrooms, before coming back to share ideas with like-minded colleagues.
Glasswell	2016	Australia	Primary Secondary	Literacy	DBR	121 trs	3yrs	How can schools and universities form practice-relevant, research-rich partnerships	Generative knowledge work is possible when researchers and teachers engage in design-based research grounded in a collaborative inquiry (co-inquiry) model of school improvement and can make a significant difference to student outcomes
Glover	2016	England	Secondary	Chemistry	Interviews	9 trs	na	How and why relationships between academic researchers and teachers develop through university-led outreach	Schools and HEIs underestimate the strength and importance of the individual connections at their peril. Ignorance of the power dynamics at play in forming and maintaining these connections undermine sustainability.

								to secondary schools, as well as how these relationships impact and influence secondary teachers.	strengthened their position to negotiate and achieve access to resources for their subject and their efforts have been looked on favourably by the school management.
Godfrey	2016	England	na	na	Literature Review	na	na	Conditions for the growth and expansion of research-engaged schools	Growth of a school research culture occurs within an interconnected ecosystem. Four 'nourishing' factors are: • systemic connectedness • leadership for knowledge creation • teaching as a research-informed practice • the school as a learning organisation. School leaders are urged to consider developing a culture of research engagement as a long-term, sustainable improvement strategy.
Goff	2015	Australia	na	Maths	Opinion	na	na	Alternate reading of Gade's theory of teacher-researcher collaboration as an expansive learning activity	Need to understand the cultural interface perspective on the relational space that emerges. How this happens can restrain or facilitate trajectory of collaboration.
Goodchild	2014	Norway	Secondary	Maths	Case Study	6 trs	ns	Potential of a community of inquiry with researchers (teacher educators) to enable teachers to resolve tensions in practice through creative innovation	Teachers need to extrapolate from their regular practice to see how any proposed activity can be imagined in their classrooms. Need to give more attention to shared experiences of teachers and researchers of constraints on changing practice
Goos	2014	Australia	ns	Maths	Opinion	na	na	Theoretical and analytical approaches to investigating how researchers and teachers can work together to create knowledge	Successful research collaborations are characterized by: • mutuality of researcher and teacher motivations, roles, and purposes, • complementarity of their expertise and knowledge. Collaborations build two-way connections between communities through practices that support mutual engagement across boundaries.
Greany	2017	England	Primary Secondary	ns	DBR	66 trs	2yrs	How to secure ownership of change among teachers and how to ensure that improvements are based on evidence	Collaborative R&D can help to secure ownership of change among teachers and ensure that innovations are based on rigorous evidence but due to time and resource constraints, well-designed CPDL is necessary to enhance professional judgement and ownership of evidence-informed change across wider groups of staff
Griggs	2016	England	Primary Secondary	ns	Eval	5 schls	1yr	Whether, and to what extent, research communication and engagement strategies had the potential to improve teachers' use of, and attitudes towards, academic research to support pupils' progress	Programme led by a teacher as Research Champion and including an audit of needs and interest, research symposia, R&D forums and bespoke research brokerage - no evidence that teachers' attitudes towards research, or their use of research evidence in teaching practice, changed during the intervention. Teachers were generally positive about implementing learning from the programme in the classroom, although the extent to which this happened varied considerably from school to school. Key issues that must be considered are • the provision of adequate time to attend programme sessions, • teaching cover for events, • buy-in from senior leaders.
Groothuijsen	2019	Netherlands	Secondary	Science Maths	Case Study	10 trs	3 yrs	Teachers' perspectives on the quality of practice-oriented educational research	7 quality concerns – 5 over-lapped with those mentioned in literature from research perspective:

								and to analyse how these differ from the research perspective	• Truth value • Applicability • Consistency • Neutrality • Cumulativity 2 were specific to the group: • Recognizability- links to teacher experience • Effectivity – contributes to educational practice
Groves	2018	England	Primary Secondary	ns	Interviews	10 trs	ns	Introduction of teaching schools with commitment to developing evidence-based practice	Senior Leaders committed to the concept of developing professional learning Networks. However, there was also evidence that these networks did not systematically use research evidence. Ease of access and popularity within both real world and virtual networks were the criterion on which evidence was judged.
Hammersley-Fletcher	2018	England	Primary Secondary	ns	Interviews	9 schls	ns	What is the democratic potential of teacher engagement in research in their classrooms?	The teachers demonstrated capacities reflecting an agonistic democratic ethos - difference and disagreement as constitutive and constructive elements in rethinking areas of policy and practice.
Hamza	2018	Sweden	Secondary	Science	Case Study	3 trs	3 yrs	Dynamics of introducing educational research into experienced and successful science teachers' practice.	• teachers need to recognize salient outcomes of the new knowledge • recognition may be facilitated if the researchers take increased responsibility for implementing the new knowledge in teaching practice themselves. Teachers were relieved from some of the risks connected to change in teaching practice but the distribution of power over the content of the collaboration was temporarily tilted towards the researchers. it seems reasonable that the differential distribution of power and responsibility be explicitly negotiated both at the beginning of a new collaboration and as the collaboration proceeds
Handscomb	2013	England	Primary Secondary	na	Opinion	na	na	Overview of evidence to support the importance of the Research Engaged School for both pupil learning and teacher learning	Continuum of research from individual inquiry to large scale projects should be recognised and all types valued. Need to match criteria for evaluation of its rigour to the type of research. Research needs to support the sharing of knowledge across boundaries and this is achieved through translation not simply application of research findings into practice. Integral to professionalism and requires institutional support.
Harnett	2012	New Zealand	Primary	English	AR	2 trs	2 yrs	Investigation of the effects of teachers' knowledge, thinking, and beliefs on the mediation of learning in teacher-student interaction	Identified discrepancies between espoused theories and theories-in-use. Implicit beliefs and routinised behaviours were a detrimental influence on the nature of the teachers' interactions with students. AR enabled change.
Harris	2013	England	na	na	Opinion	na	na	Use of Educational Effectiveness Research (EER) by schools.	Practitioner engagement is limited. Need a new paradigm of EER that involves practitioners and policymakers in a true EER community of expertise, in order to increase the reach and take-up of the discipline.
Harrison	2013	England	Secondary	Science	AR	6 trs	1yr	Collaborative action research project with science teachers to support the strengthening of classroom assessment practices	Collaborative action research functioned as a tool for generating formative feedback, which supported the teachers in making sense of and further developing their class-room assessment practices.

Haynes	2011	England (and South Africa)	Primary Secondary	Philosophy with Children (PwC)	Opinion	ns	ns	PwC as 'philosophical practitioner action research' and implications for teacher professional development.	PwC enhances noticing the dynamics of the classroom through dialogue. Creates a 'transformative critical space' for the exercise of practical judgement. Being grounded in practice is key.
Hennessey	2011	England	Primary Secondary	PSHE English History	Case Study	3 trs	½ yr	How university researchers and teachers worked together to analyze and develop dialogic teaching and to jointly reformulate existing notions of classroom dialogue by incorporating technology use.	Each of the participants played a unique contributory role in developing "intermediate theory" – a dynamic and recursive process of dialogic interaction between research-informed theory and classroom practice, Success depends upon teachers being willing to engage both in and with research and having dedicated teaching release time
Heyman	2011	England	Primary Secondary	Creative Arts	SUP	22 schls		Can collaboration between teachers, researchers, students and the community support creative activity to engage learners?	• Need 'tools' to create interest and provide triggers for meaningful discussion at every stage. • Teachers are skilled in identifying the significance of changes. • Participation can have a negative impact on practice if it shifts attention away from action. • It is hard for researchers to challenge the assumptions of teachers.
Hilton	2017	Australia	Primary Secondary	ns	Case Study	11 trs	1yr	To determine if and why practitioner research is effective for teachers, what support they need to develop research skills to design and implement practitioner research	• teachers must direct their own research rather than being directed by others such as principals or school systems • sense of collegiality promoted a culture of inquiry within the group as each participant shared his or her experiences, ideas, progress, data, and interpretations • access to research literature important • mediation by research mentors
Humes	2014	Scotland	Primary Secondary	na	Opinion	na	na	Critique of General Teaching Council Scotland's policy for professional development through teacher research.	Focus on teacher research in the form of practitioner enquiry is not new. Need to understand why it has never really taken hold – • bureaucratic structures obstruct and are hard to change • academic culture does not favour close to practice research • prescription is antithetical to enquiry.
Jaworski	2012	England	Secondary	Maths	Case Study	3 trs	½ yr	Teaching as a developmental process in which inquiry plays a role.	The teacher has the knowledge but not necessarily the power to influence classroom processes most overtly. Teacher inquiry is enhanced by the involvement of outside researchers with a critical, theoretical approach to the subject discipline.
Jaworski	2014	England Norway	Primary Secondary	Maths	SUP	ns	ns	Maths teachers and maths teacher educators as communities of inquiry to promote development in learning and teaching	• Critical alignment is necessary • Need both internal and external resources • Examples of small scale well-funded projects do not answer the question of whether it is possible to scale-up • Paradox inherent in any prescription of exploratory, creative, critical 'inquiry'
Johannesen	2015	Norway	Primary	RE	AR	9 trs	3yrs	How action research can lead to professional development with respect to the relationship between personal and professional aspects of teacher identity and practice.	Introduction of core concepts from theories of RE and Action Learning triggered a collective inquiry among the participants into their own professional knowledge. Gradually a common professional discourse developed within the community of practice, and the participants became aware of and started to investigate critically how personal values and beliefs played a role in their professional work.

Kane	2013	New Zealand	Secondary	Chemistry English Geography Maths Physics RE	AR	6 trs	½ yr	Developing inquiry to enable teachers to understand if and how, what they were teaching in their classrooms was being learned by the students	Direct dialogue between teachers and students supported by researchers disrupts roles and relationships leading to transformations in classroom practice.
Kemmis	2012	Australia	ns	ns	Opinion	ns	ns	What practitioner research and *only* practitioner research can do.	Practitioner research is research within a practice tradition. It understands and develops the ways in which practices are conducted. Need to speak the language, use interpretive categories and join the conversations and critical debates of those whose action *constitutes* practice.
Kosky	2011	England	Primary	Gifted and Talented	SUP	42 trs	3yrs	Outcomes of AR carried out by teacher researchers in 14 local education authorities in England, working collaboratively with university tutors,	Action research offered a suitable methodology to explore the complexity of the topic of giftedness through cycles of collaborative planning, action, reflection and teachers' personal theory building.
Lambirth	2017	England	Primary Secondary	Science Literacy	AR	9 trs	1yr	Challenges of teachers engaging in research raising questions in the current school setting	Teachers struggled to embody an enquiring approach within their demanding professional lives. Nevertheless, according to the participants, action research allowed them to listen to the children's voices, needs and interests, and inspired the adoption of a more systematic approach resulting in pedagogy shifts and gains in motivation, engagement and attainment.
Lane	2018	Australia	Secondary	Geography	AR	4 trs	ns	Feedback as a prompt for professional reflection to stimulate conversations about improvements to teachers' knowledge and practice.	Participatory action research can be an effective tool for enhancing teachers' pedagogical content knowledge (PCK) including their knowledge of evidence-based assessment practices in Geography
Leask	2013	England	na	na	Opinion	na	na	Unacknowledged problem of providing a sustained approach to improving the quality of and access to the evidence base underpinning teachers' CPD	Emerging technologies provide opportunities for low-cost inter-linked national and international e-infrastructures to support knowledge sharing and building.
Leat	2015	England	na	na	Opinion	na	na	Experience of teachers participating in research.	Whilst evidence of the benefits of teachers participating in research is overwhelmingly positive: • acceleration of professional understanding and new perspectives, • re-invigorating This is not the experience of all teachers and recognition of: • importance of dialogic approaches • ecological agency Is needed to take account of teachers' multi-dimensional perceptions of and participation in research.
Leeman	2014	N'lands	Secondary	ns	DBR	37 trs	2yrs	Whether and how a course for experienced teachers intended to enhance their professionalism by engaging them in doing research based on reflection on their educational aims stimulated teachers to connect doing research and taking a reflective stance	Combination of learning to do research and reflecting on aims is not enough to make teachers into critical research-minded professionals. A more context-aware view of their learning process is necessary: the institution school limits their possibilities.
Leuverink	2019	N'lands	Secondary	All	Eval	133 trs	4yrs	Investigation of the criteria for evaluating teacher research	• Anderson and Herr's 5 quality criteria (outcome /process/ democratic/catalytic/ dialogic) are useful for assessing teacher research • successfully conducted teacher research contributes to professional and school development. • contribution to professional development is greater and more concrete

									than to school development.
Limbrick	2010	New Zealand	Primary	Literacy - writing	Case Study	20 trs	2yrs	Does teachers' pedagogical and content knowledge of writing increase when taking a research lens to their practice to raise students' writing achievement?	• Indicated enhanced pedagogical and content knowledge of writing, • marked gains for students on a standardized test of writing • Through re-searching their own practice and teaching targeted to students' strengths and needs, achievement in writing can be raised.
Lofthouse	2014	England	na	na	Opinion	na	na	Principles of practitioner enquiry and constructs of professionalism and professional learning,	Practitioner enquiry rests on the proposition that those in practice can take informed intentional actions, explore their effects and form judgements of their value.
Lofthouse	2016	England	Primary	EAL	SUP	2 schls	1yr	Characteristics of collaborative action research and the proposal of a new model.	Need to • conceptualise collaborative action research through time • Recognise the importance of the partners' zones of proximal, contributory and collaborative activities in sustaining change and knowledge-creation.
Lord	2017 a	England	Primary Secondary	ns	Eval	32 schls	1yr	Evidence for the Frontline (E4F) as an online brokerage service designed to provide teachers and school leaders with timely access to relevant evidence on supporting young people's learning.	Users considered that there were benefits - • providing opportunities for research discussion. • increasing their interest and enthusiasm for research evidence. • improving their schools' use of research evidence. • and (although to a slightly lesser extent) helping to improve their practice in the classroom and pupils' learning. Hard to measure last point
Lord	2017 b	England	Primary	KS2 Literacy	RCT	823 schl	1yr	Impact of the different literacy interventions on pupil outcomes and teachers' use of, and engagement with, research.	Teachers felt research evidence was most effectively communicated when it was: • Interactive • Accessible • Relevant • included a balanced and credible discussion of the evidence • Focused on how to apply the evidence in practice. Simply communicating research evidence to schools is not enough to improve outcomes. How easily the presented evidence can be used in practice—and the conditions in schools for implementing evidence-based change—might be just as important.
Lord	2017 c	England	Primary	KS2 Literacy	RCT	12,500 trs	1yr	Follow on from 2017 b	Simply disseminating research summaries and evidence-based resources to schools is not an effective way for research organisations to support schools to improve pupil outcomes.
Luttenberg	2018	N'lands	Secondary	Geography Chemistry	Case Study	2 trs	1yr	Initial attempt to use a framework based on four domains of reflection, namely, scientific, artistic, moral and technical, in relation to the actual practice of teacher reflection in action research	Framework allowed the various domains of reflection teachers use to be mapped and gain insight into differences and the course of reflection in action research. The framework – through orientation, differentiation and deepening – might provide support for reflection in action research.
Madsen	2013	Norway	Primary Secondary	ns	AR	8 trs	1½yr	How did the use of narratives affect the level of equality between the researcher and teachers in a collaborative action research project?	Narratives could be a useful tool in creating equality in action research. Equality, active participation and involvement strengthened each other.
Makar	2013	Australia	Primary	Maths	AR	40 trs	7yrs	Teachers' contribution to knowledge building	• Requires new thinking about research methodology. • Important to write to publicise work.

McAleavy	2015	England	Primary Secondary	na	Opinion	na	na	Should schools undertake research as well as use evidence created by academic researchers?	The concept of 'the research-engaged school' and the idea of evidence-informed, rather than evidence-based, pedagogy offer practical solutions to some of the problems associated with the application of education research.
Mehli	2013	Norway	Primary Secondary	Science	Eval	100 trs	1wk	Does participation in an authentic scientific community of practice develop science teachers' subject related identity? Will this counteract tendency for 'school science' to present a generic, narrow conception of scientific inquiry?	Teachers able to connect theory with something concrete and realistic in specific scientific practice in modern society. Value authentic experience even though the professional development broke all the 'rules' (not based on immediate need/ short term/ no follow up/no engagement with epistemic objects of a research project).
Meijer	2013	N'lands	Secondary	ns	Interviews	45 trs teachers	1yr	What are learning outcomes of teachers' research for both prof dev and school dev?	Benefits at individual teacher level but little impact at school level. Need a change of culture in schools from 'doing' to 'thinking'.
Mitchell	2010	Australia	Secondary	ns	SUP	2 schls	6yrs	In school-university partnerships, are different forms of knowledge relevant or legitimate across institutional boundaries?	Bernstein's concept of 'pedagogical discourse' highlights the need to differentiate between 'official knowledge' (vertical discourse) and 'local knowledge' (horizontal discourse). Need to align both forms of discourse within school-university partnerships.
Mitchell	2014	Australia	Secondary	Visual Arts	Case Study	12 teachers	ns	Repositioning teachers in relation to research	Research as Practice. Teachers have been able to talk of the lived experience of teaching and the reasoning behind their practice to provide deeper insights into practice. This has necessarily involved consideration of both conceptual and practical aspects of practice.
Moen	2012	Norway	Primary Secondary	ns	AR	9 trs	3yrs	Action research in schools implies that the researchers and the teachers should collaborate on solving problems and improving practice. One underlying premise when choosing, such an approach, is that the participants are interested in, and willing to participate in such a process.	Thinking tools - written texts about various problems connected to action research processes may be helpful, to initiate reflections and discussions.
Mockler	2014	Australia	na	na	Opinion	na	na	Research ethics in the context of both practitioner inquiry and classroom practice.	Reflexive nature of the theory/practice dynamic means that, in the context of sustained practitioner inquiry, the ethics of research and the ethics of practice both hold the potential to be shaped by and to shape the other. Cross-field effects hold the potential to support teachers in thinking anew about their classroom practice, and ultimately the potential to provide a framework and catalyst for more just, ethical and democratic approaches to schooling.
Morgan	2010	Australia	Secondary	Art	Case Study	1 tr	3yrs	Impact of a learning intervention on teacher professionalism	'Learning by Design' prompts a teacher to think, plan, enact, review and share practice as a teacher-researcher
Morgan	2012	Australia	Primary	Science	Survey	8 trs	ns	Value of collaborative research partnerships to enhance both student learning outcomes and teacher wellbeing.	The learning that occurred for all participants, in a research context of shared discussions, planning and reflection on practice, considered within the overarching concern for teacher wellbeing, allowed for honest personal responses

Nelson	2015	New Zealand	Secondary	'inquiry learning'	AR	3 trs	1yr	Need for amplifying neglected student perspectives in learning and improvement processes is well established, supporting teachers to learn from students has received less attention	Collaborative action research supports teachers to engage with their students as decision-making partners in the classroom and to learn from them about effective pedagogy at the same time. Provides reflective spaces to notice and challenge taken-for-granted roles and practices, address expectations contradictory to their student voice goals.
Niemi	2019	Finland	Primary	na	Opinion	na	na	Opportunities for teachers to conduct research in their classrooms restricted in many countries	• Important that the researcher knows the development of curriculum and understands both global and local perspectives and the political agendas behind curriculum (approach to curriculum development) • Pedagogical action research forces a teacher to reflect on his or her practical theory and develop its structure (approach to practical theories)
Nilsson	2014	Sweden	Secondary	Science	Case Study	3trs	9wk	Learning Study as a collegial process in which teachers work together with a researcher to explore their own teaching activities in order to identify what is critical for their students' learning.	Teachers developed their self-understanding in which they questioned their own epistemological beliefs, aims and objectives of teaching and taken-for-granted assumptions about science teaching and learning.
Nilsson	2015	Sweden	Secondary	Science	Case Study	6 trs	1yr	Learning Study as a way for teachers to develop their professional knowledge.	Throughout the learning studies and supported by variation theory, a 'science of teaching' (Elliot,2012) was developed as teachers were given an opportunity to pose critical questions about the subject matter they were to teach, as well as about their own tacit and largely unexamined theories about the minds of learners and learning. By participating in the learning studies, they became aware of things they had previously taken for granted; they became able to define critical aspects that they had not been aware of before; and they became able to design lessons based on their findings.
Nixon	2010	England	Primary	PSHE	AR	1 tr	1½yr	Relationship between researcher and researched during a participative project involving sensitive issues.	We are empowered by each other. I'm less clear about what's happening nearer the top of the Ivory Towers, but I am glad they (the towers) are there.
Norwich	2013	England	Secondary	Moderate Learning Difficulties (MLD)	Case Study	61 trs	2 yrs	Can Lesson Study improve outcomes for teachers and their students with MLD by bringing together research, theory and practice?	LS shifts focus from teaching to learning and ability of teachers to critically examine their own teaching using observation and teamwork. Has much to offer as a professional learning approach but challenges how schools are organised and teachers managed.
O'Grady	2020	England	Secondary	RE	AR	1 tr	9wk	Can existing research assist teachers dealing with religious diversity in making classrooms a 'safe space' for dialogue?	Low intervention, supportive collaboration between researchers and teachers can be beneficial. Provides closer points of reference than the usual 'generic' CPD. Need to consider context when seeking to enact/implement findings from research.
Olin	2016	Sweden	Secondary	Science	Case Study	ns	1yr	Integration of science education research outcomes—here 'didactic models'—with teaching practice, aligned with professional development.	Enabling actions: • collaborative work with concrete material from the classroom regular meetings • collaborative group with a core of shared competence—in science • teaching and learning. Constraining actions: • introducing research results with weak connection to practical action in the school practice,

									• differences between school and university practice architectures • general 'oppression' of teachers' classroom practice.
Oolbekkink-Marchand	2014	N'lands	Secondary	Chemistry Dutch Economics English French Geography Physics	Case Study	11 trs	ns	Insight into the quality of practitioner research and the impact on the professional development of the individual teacher and the school.	• Evidence of outcome validity and catalytic validity in most projects, • Evidence of process validity and democratic validity was only found in some of the projects.
Oversby	2013	England	ns	Science	Opinion	na	na	What are the useful incremental questions that teacher-researchers could use to initiate and develop research into their own practice?	Focus on quality by considering methods and purpose develops practice, but also promotes thinking critically and becoming more research knowledgeable.
Ovenden-Hope	2015	England	Primary	Literacy	Survey	120 schls	1yr	Investigation of MESH (Mapping Education Specialist know How) guides for translational educational research and knowledge mobilisation in schools and colleges.	• Teachers value evidence-based resources for curriculum planning and delivery. • MESH guides help by reducing planning time. • Translational research for knowledge mobilisation in education is shown to give confidence to the teacher through resources that are perceived to be 'tried and tested' and can therefore be 'trusted' to improve learning.
Parr	2010	New Zealand	Primary Secondary	Literacy	Case Study	78 schls	6yrs	Can professional learning communities of teachers and researchers look inside the 'black box' of professional learning and connect inputs with outcomes?	• Inquiry driven by feedback from students creates shared understanding of values • Facilitates interacting communities of practice. • Feedback loops increase coherence of input and improve student outcomes.
Platteel	2010	N'lands	Secondary	Dutch	AR	14 trs	1½yr	Complex nature of collaborative relationships, the difficulties of conducting research with others, and the complications of partnerships in educational research.	Participants had to come to terms with their roles and responsibilities and, through dialogue and reflection, evolved and learned to contribute to the collaborative action research partnership by sustaining dialogue and utilizing their unique expertise.
Postholm	2011	Norway	Secondary	English Maths Norwegian	DBR	12 trs	2yrs	Teachers' learning in a R&D project.	Teachers want to reflect together to learn, but both the form and content of these collective reflections have a major impact on their learning. Before the teachers are ready to challenge each other, they must have confidence in each other. Once they have this confidence, the form of the reflection dialogues can change. During the R&D work the teachers learn how reflections become part of the planning process for their next teaching sessions, and after a while theories become a tool that can help them with their reflections.
Prendergast	2019	Australia	Primary Secondary	All	Survey + interviews Literature review	73 trs	na	Conceptual framework for understanding and improving school research engagement, and outlining the implications for research organisations, schools and jurisdictions.	Schools are: • selective about research involvement • discerning about what the research is on and how it is conducted. • access research in indirect and informal ways. • value research more than they use it • need much more than research access.
Qvortrup	2016	Denmark	Primary Secondary	All	Eval	1051 trs	3yrs	Linking research and practice by:	Positive effects on professional practices such as team-based and school-based collaboration.

								(1) capacity building (collaboration in the practical school context through problem-based learning) (2) data- and research-informed professional competence support and development of learning environments to increase professional capital	Positive outcome on motivation and work performance of students as an important precondition for students' achievements and well-being. Early indications of building capacity.
Reeves	2010	Scotland	ns	ns	Eval	19 trs	10 mnth	Relationship between established teachers' professional learning and their use of practitioner enquiry, or action research, as a means of improving the quality of their classroom teaching.	Evidence of beneficial effects reported by teachers: a) greater awareness of research literature and of learning theory b. analytical skills c. increased attention to issues of evidence and pupil learning. BUT evidence about pupil learning in the classroom, arising from everyday teaching ignored or side-lined as neither objective nor generalisable.
Riggall	2015	England	Primary Secondary	All	Eval	55 trs	2yrs	School Research Lead role	Considerable variation in the extent to which the Research Leads had a clear plan for development of research engagement in their schools. Those Research Leads who were operating in a more strategic way identified: • the need to formalise the role • strengthening the links between research and professional development • engaging staff more systematically with academic research • strengthening the relationship between research activity and SLT decision-making.
Roberts	2010	England	ns	Geography	Opinion	na	na	Outlines the different kinds of research evidence related to geographical education, which might inform practice.	Practitioners will always learn from the evidence of their own experiences. Geographical education research can, if it is accessible, inform teachers about pupils' knowledge, skills and attitudes, particular ways of working and about the complexity of classroom practice and individual students' thinking. Accessibility is best achieved by researchers working closely with teachers and being involved in action research. Research evidence, however, has its limitations partly because of its contestable nature and partly because ultimately what happens in the classroom needs to be determined by professional judgments on what is worth teaching in geography and why.
Ronnerman	2016	Finland Norway Sweden	Primary Secondary	All	Opinion	na	na	Teacher research network anchored in educational traditions, and three important ideal-shaping Nordic educational concepts: bildung, folk enlightenment and pedagogy.	The importance of traditions of education embedded in each local site. Challenges should be connected in greater detail to teacher education. Connecting scientific tools to the development of different kinds of knowledge.
Rose	2017	England	Primary	Literacy	RCT	119 schls	2yrs	Impact of Research Learning Communities on Research Use in Schools.	• Found no evidence that RLCs improve reading outcome • Positive impact on teachers' disposition towards research. • Some evidence that this impact may have been influenced by other factors such as the level of postgraduate qualifications or seniority of teachers that took part in the intervention. • Exploratory analysis identified some evidence of a small positive relationship between teachers' disposition towards research and pupil outcomes, Irrespective of involvement in RLC.

									Evidence Champion roles in each school were intended to be held by the same people throughout the intervention, to support the development of a research-focused culture within each school. Staff turnover was therefore a barrier to implementation. Some teachers felt that it may take several years for participation in a RLC to change teaching practice and improve pupil outcomes. Future research could therefore examine longer term impacts.
Runesson	2019	Sweden	Primary	Maths	Opinion	na	na	Learning study as an approach to overcome disconnection between research and practice,	• Teachers must be included as interpretative professionals making professional sense of events in the research. • Theory is used as an analytical tool in the process and thus become a "lived theory" among the teachers. • Learning Study provides them with a language, the jargon of variation theory, to talk about teaching and learning in theoretical terms. • When teachers make the theory their own, it is most likely that the theory-practice gap will be closed.
Rushton	2019	England Scotland	Secondary	Science	Case Study	17 trs teachers	ns	Professional identities of UK-based secondary science teachers who actively participated in science research for at least six months.	Through participation in research, teachers identified as both science teachers and scientists- a transition in professional identity to 'teacher scientist'. The key enabling factor in identification as a 'teacher scientist' is positive interaction with scientists/researchers Teachers are motivated to participate in research projects in response to the enthusiasm of their students and a desire for students to contribute to research that could provide solutions to real-world challenges. Understanding the capacity of science teachers to become 'teacher scientists', and recognising teachers' altruistic motivations, could contribute to retention and recruitment strategies that are less focused on financial Incentives.
Schenke	2016	N'lands	Secondary	ns	SUP	ns	1yr	Analysis of cross-professional collaboration between teachers, school leaders and educational researchers and/or advisers as part of R&D projects in terms of three dimensions: • reasons for collaboration, • division of roles and tasks, • communication structure.	Four types of cross-professional collaboration in R&D projects. These types differ in the extent to which the school or the external party direct the project: (a) School-directed collaboration; (b) School- and researcher-directed collaboration; (c) School- and adviser-directed collaboration; (d) Researcher-directed collaboration. The fact that cross-professional collaboration can be shaped in different ways implies that teachers, school leaders, external researchers, and advisers need to negotiate tasks and that they may need time to learn new tasks. Support participants in consciously choosing a particular type of collaboration to fit their purposes and specific situation.
See	2016	England	Primary Secondary	ns	Case Study	10 schls	1 yr	Experience of schools engaging with research evidence to support their own enquiry into the effectiveness of feedback in the classroom.	May be feasible for practitioners to use research evidence to inform their own practice. However, to do it well would require: • clearer guidance • professional development • modelling of any strategies suggested. These findings have implications for policy on teacher development, and for the research community to make research outputs more comprehensible and accessible to research users.

Sinnema	2011	New Zealand	Primary Secondary	Social studies	Eval	26 trs	1 yr	Impact of a R&D professional learning intervention on the improvement of social studies teachers' practice, and their students' learning.	*Both* engagement with outcomes-linked evidence and collaborative inquiry supported and challenged teachers to improve their classroom practice, and positively impacted on a range of outcomes for their learners.
Snook	2011	N'lands	Secondary	ns	Case Study	11 trs	2yrs	'What does teachers' research contribute to individual and collective learning within the school?'	Importance of the culture and structure within the school to optimising the learning impact of the research conducted by teachers at the school level. • Commitment on the part of school management is essential • Teacher researchers are not content to pursue their own individual preferences they want is to contribute to school development. • Need to begiven a clear position and status within the school. • Ensure that the results of the research are used within the school by giving the teacher researchers a leading role in team meetings and study days. This can help intensify the link between professional development, educational innovation and school development achieved by means of research.
Speight	2016	England	Primary	ns	Eval	10 schls	1yr	Pilot intervention aimed at supporting teachers to use evidence-based teaching and learning strategies to improve pupil progress.	Some positive changes in teachers' attitudes towards research. No evidence that teachers were more likely to use research to inform their teaching practice after being involved in the pilot. The project was very well received by teachers suggesting that this model may be a promising way of engaging teachers in evidence-based practice. Finding time for working collaboratively on implementing research evidence in practice was considered a challenge, but overall, the requirements of the programme were feasible.
Stern	2010	England	Primary Secondary	RE	Case Study	9 schls	1yr	Research as the most appropriate pedagogy in RE.	Self-consciousness of pedagogy and its likely 'impact', exemplifies both reflective practice and research as pedagogy. Research to inform teachers and pupils about how teaching and learning take place, in their classrooms, and how they can develop different ways of teaching and learning.
Stern	2014	UK	Primary Secondary	RE	Eval	79 trs	6yrs	What is the impact of RE seminars intended to develop the relationship between research and professionals?	Seminars influenced pupils in schools and professionals. Publications from the seminars had a distinctive influence, and spending time to think and discuss RE was at least as influential as presentations by researchers.
Stoll	2015	England	Primary Secondary	ns	Opinion	na	na	Role of leaders in supporting evidence informed practice.	High stakes accountability environment militates against the risk taking and collaboration needed but some success in programmes aimed at leadership development.
Taylor	2013	New Zealand	Secondary	Social Science	Case Study	10 trs	1yr	Explores supply-side, demand-side, and contextual factors influencing teachers' research utilisation.	It is the skill of teachers and the dynamics of their social settings that impact significantly on how much research is utilised. Attention needs to be given to education and working conditions rather than to the nature of the research artefacts themselves.
Thomas	2014	England	Primary Secondary	Cross curricular	Case study	41 schls	4yrs	The motivation for undertaking practitioner enquiry, the experience for both teachers and students, and the support needed to facilitate success.	Teacher agency Reflective practice and Continuous professional learning Focus on pupil learning Support of a professional learning community
Thorsten	2017	Sweden	Primary	Literacy	Opinion	na	na	How Learning Study can be used to generate knowledge about teaching and learning addressed from a teacher researcher's perspective,	Labaree states that teacher researchers need to go from being normative, experimental, personal and particular to being analytical, theoretical, intellectual and universal. Using examples from Learning Study, I argue that these areas do not have to be seen as dichotomies; instead, they can be combined and intertwined. Thus, in a Learning Study, elements from both the teaching practice and

									academic practice matter, thus enhancing the possibility that results are useful for practitioners.
Van Kraayenoord	2011	Australia	Primary	Literacy	SUP	3 schls	ns	Collaborative partnership between university researchers and school teams of administrators and teachers. How different kinds of knowledge were negotiated during the process of undertaking action research.	More complex understandings of how researchers and teachers develop and negotiate knowledge while engaged in collaborative research. The analysis provides a demonstration of the social processes of knowing.
Van Rens	2010	N'lands	Secondary	Chemistry	DBR	5 trs	3yrs	Value of establishing an iterative cycle of inquiry	Creates an equal partnership between the teachers and the researchers in the community.
Van Velzen	2012	N'lands	Secondary	All	Case study	120 trs	ns	Experienced senior high-school teachers' interest and the questions they pose about their educational practice were studied to establish insights for teacher education and teacher-educator research.	Teachers were interested in the topics of cognitive growth and insightful and engaged learning and how to include this in teaching regardless of discipline. The focus in initial teacher-education courses on learning to teach one's discipline is logical and necessary but should also learn at the start how educational research results can support them in understanding student learning.
Vrijnsen-de Corte	2013	N'lands	Secondary	ns	Case study	10 trs	ns	Perceptions of the actual and preferred situation in terms of the context, process and outcomes of practice-based research in Dutch professional development schools.	Despite the central focus of research on pupil learning and learning results, according to participants effects on pupil level were not (yet) reached. These results suggest that in Dutch professional development schools increased attention is needed both by researchers and practitioners on the process and outcome dimensions of doing teacher research.
Wall	2018	Scotland	na	na	Opinion	na	na	How a practitioner enquiry frame located within Scottish education professional learning model, encourages thinking about how teachers engage with research.	For practitioner enquiry to be perceived as more realistic for the majority of the profession then a productive synergy is needed between research methodology and pedagogy, where assumptions about 'good practice' on either side are not mutually exclusive but rather complementary in supporting practitioners' Reflective and strategic thinking. There needs to be a two-way dialogue between teachers and education researchers seeing the potential for methods thinking emerging from classrooms. Productive thinking about methods is likely to come from an orientation much more aligned to practice. For this to happen, more transparency about multiple ways of doing education research is necessary.
Wells	2014	Australia	Primary	ns	Case Study	19 schls	3yrs	Teachers' professional learning can be enhanced by positioning teachers as practitioner researchers and professionals capable of generating change within their local educational communities.	Must be a strong commitment to the key elements of: • knowledge building, • provision of time, • ongoing strategic support from in-school and out-of-school leaders • a rigorous accountability environment. This provides a context in which teachers can be positioned as professionals who can effectively research and make changes to their teaching practice If some elements are missing, then this is less likely to happen.
Widjaja	2013	Australia	ns	numeracy	DBR	6 trs teachers	20 wks	Opportunities for teachers to engage in collaborative learning to examine and reflect on their practice are vital for sustained professional learning.	Lesson Study centres on teachers coming together with colleagues to plan, observe, and reflect on classroom teaching and learning as a Community of Inquiry. Provides a vehicle for teachers to deepen their professional learning.
Woore	2020	England	Secondary	MFL	Case Study	3 trs	2yrs	Does a Masters' course with a strong component of practitioner research promote research literacy and bridge	Identifies characteristics 'more likely' to sustain successful research engagement: 1.Dissatisfaction with existing practice 2. Specific aspiration to improve

								propositional and procedural knowledge for teaching?	3. Adoption of an 'inquiry stance' 4. Deliberative, pro-active approach to professional learning 5. Willingness to seek out knowledge and perspectives beyond immediate context 6. Resilience when faced with constraints These are necessary but not sufficient. Also need: -School support -University supported research community; teacher-educators -Policy makers to remove barriers(funding/workload)
Yandell	2013	England	na	na	Opinion	na	na	Is there an alternative to positioning teachers as the objects or the recipients of research that is conducted by specialist researchers who possess categorically different forms of expertise and equally different perspectives on what happens in schools and classrooms?	EEF version of research is focused on a managerialist version of accountability, weighing the effects of interventions against their costs. The alternative is not a retreat into unaccountability–teacher knows best. Telling stories is also a way of achieving accountability–a rigorous, careful account of what has happened for which the storyteller accepts responsibility and for which they remain answerable.
Zimmerman	2018	Sweden	Primary secondary	ns	AR	35 trs	5yrs	Complex relationships between external facilitators and teachers in action research, as they work in a critical friendship to develop interaction in specific ways that open rather than shut down communication and learning.	Communication in a context of incompatible positions and professional distance did not lead to further communication, whereas communication in a context of confidence, mutual reliance, and challenge opened possibilities for further dialogue. Three aspects affecting communication: • absence of ownership of specific problems • trust without relationship • courage before trust. Implication for the action research community is the importance of making strategies for critical friendship explicit.

TasR Data Extraction Table

AR= Action Research
Eval= Evaluation
PLC= Professional Learning Community
SUP= School-University Partnership
Tr = teacher

What research are teachers interested in?
Research that is focused on student learning and matched to curriculum design is of interest to teachers as it is relevant to the paradoxes and dilemmas of their everyday world. Understanding their learners' cognitive growth and listening to their voices are important to teachers. More consideration should be given in Initial Teacher Education to how research supports understanding of learning. Teachers will engage with research on how to develop different ways of teaching and learning from across subject disciplines provided it enables better understanding of the way classroom practice is conducted and considers how evidence can be applied. Curriculum theorising is also relevant to teachers when it is linked to evidence-based resources for curriculum planning and delivery. Teachers have more confidence when evidence is 'tried and tested' and can be trusted to improve learning.

Determining the Value and Quality of Research
Teachers share quality concerns common to researchers:

- Truth-value
- Applicability
- Consistency
- Neutrality
- Cumulativity

But have specific concerns regarding:

- Recognizability (links to their experience)
- Effectivity (contribution to practice).

They are discerning regarding the focus of research and how it is conducted. When presented with evidence teachers consider the research methods and purpose. Teachers are not content with pursuing their individual interests and preferences through research but have altruistic motives focused on their students. Five quality criteria for teacher research have been proposed:

- Outcome validity
- Process validity
- Democratic validity
- Catalytic validity
- Dialogic validity[6]

Studies have found evidence of the use of outcome and catalytic validity criteria by teachers to be relatively common, whilst the use of process and democratic validity criteria is rarer.

The intimacy of the insider knowledge of teachers is a positive quality but it is important to include challenges to pre-existing beliefs to mitigate its negative aspects. Action Research has value as a reflective tool for teacher professional development but not as the sole strategy as there is a risk that cognitive bias can impact negatively on its rigour. Action Research develops pedagogical content knowledge changing the relationship between implicit beliefs and routinised behaviours to support closer alignment of teachers' espoused theories and theories in use. It is suitable for dissemination to teachers working in similar contexts as it is a self-reflexive, collaborative and politically aware approach to research. Tools such as an 'interpretive learning framework' have been developed to support the assessment of the quality of Action Research[7].

Teacher inquiry can be enhanced by the involvement of outside researchers with a critical, theoretical approach to subject disciplines; such relationships can lead to the appreciation that abstract theory has a role despite a lack of immediacy. It can, however, be hard for researchers to challenge teachers' assumptions and academic culture does not favour close to practice

[6] Lather P. (1986) Issues of validity in openly ideological research: between a rock and a soft place. Interchange 17 (4): 63–84

[7] Blackberry, G., Kearney, J. and Glen, M (2019) Developing an Interpretive Learning Framework for Understanding Action Research Projects . Educational Action Research 27 (2): 318-331.

research. Professional Learning Communities can change teachers' epistemic beliefs to open up different ways of knowing and teachers value research as a 'zoom lens' on practice, helping them to see things more clearly. Teachers' individual practical 'knowing' can contribute to establishing a systematic knowledge base in community with other teachers. Establishing research as a teaching activity encourages connecting theory with concrete and realistic specific practice 'in situ'. Support in recognizing the salient outcomes of new knowledge and understanding the messiness of research and its complexity can help to address the barrier of the contestability of evidence to teachers' engagement with research. New thinking about research methodology is needed so that the continuum from individual inquiry to large scale projects can be acknowledged and criteria for rigour matched to purpose. This would facilitate connecting scientific tools with different types of knowledge and the alignment of techniques and knowledge.

Provision of research training for teachers can add to the significance of their contribution but learning to do research and reflecting on its aims is not sufficient; we need to be more aware of context and the role of personal values and beliefs in professional learning. How teachers exercise professional judgement in deciding what is worth teaching and how and why it should be taught needs to be understood. As does the influence of the interpretation of feedback from their students on their actions. The absence of such awareness can lead to teacher dis-satisfaction stemming from a perceived gap between the actuality of their working life and idealism regarding practitioner inquiry. Teachers can also be vulnerable to manipulation when the impetus to engage with research is from an external source. It is important to achieve a balance between valuing evidence from experience as well as from research, some studies show that research training can lead to a loss of confidence in professional judgement. Attention also needs to be paid to the influence of the popularising of evidence from research in the media and virtual networks. Greater transparency in stating values is required along with recognition that there is not one standard model and the measure of the worth of research should be integrity with its moral purpose.

Some success has been achieved by approaches that recognise the importance of both the use of evidence generated by researchers and support for teacher inquiry. Providing opportunities for engaging *with* and *in* research enables dynamic interaction between research-informed theory and classroom practice to produce 'intermediate' or 'lived' theory.

There are Tensions in Knowledge Cultures between Oral and Text-based Ways of Sharing Knowledge

Teachers prefer using activities to investigate practice unless there is a 'need to know' by reading articles; although having access to research literature is important. Research needs to be embedded in a practical knowledge tradition not a science based tradition in order to develop 'actionable knowledge'. Researchers should facilitate research *with* teachers and not rely on dissemination as what is needed is translation not application. Teachers are discerning in their engagement with research in terms of what it is about and how it is conducted. Research needs to be 'recognizable' and this is more likely when it is timely, focused on student learning, involves inquiry into the 'everyday' nature of their work and is acknowledged by other teachers. Evaluations of the appointment of a Research Lead in a school to keep up with the latest research as an in-house 'evidence-expert' can encourage teachers to value research more but not necessarily to use it. Environments, new spaces, in which learning conversations around the use of evidence can flourish need to be established. The exercise of practical judgement (phronesis) requires dialogue between teachers and researchers based on 'hospitable' relationships to build trust. Through dialogue what Bernstein characterized as horizontal and vertical discourses[8] can be aligned in a shared language, or intermediate theory, as a tool for professional practice. It is a case of recognizing mutuality rather than similarity; teachers value alternative perspectives on situations, a 'different set of eyes' and working across boundaries as 'co-learners'. Successful strategies for collaboration include sharing multiple perspectives on the same data and the use of narratives to construct understanding and 'make sense' of a situation. Focusing on one aspect of

[8] Bernstein, B (1999) Vertical and Horizontal Discourse: an essay. British Journal of Sociology of Education 20 (2): 157-173.

research that is important in the context to increase its immediacy can improve data literacy and expand understanding of practice as teachers are able to extrapolate to new situations. Sustainable arenas, zones of proximal development, for communication between teachers and researchers need to be created.

What is the Impact of Teachers Engaging with Research?
Engaging with research promotes reflexivity and can impact on epistemic beliefs. It improves the learning-focused professionalism of teachers, enabling them to be better able to link purposes to practices and develop an improved understanding of their students. Studies report a shift in pedagogy due to the stimulus of engaging with research on the generation of actionable knowledge, practical knowing, and a multi-faceted concept of practice. Decision making based on the capacity to gauge the educational potential of their students, and the opportunity to learn *from* them that insight from research provides, has a positive impact on attainment. Access to rigorous evidence to support innovation increases teachers' willingness to experiment in order to improve their practice, to justify their actions according to educational principles and to take ownership of change.

Teachers who engage with research describe themselves as reinvigorated, enthusiastic, experiencing 'enlightenment' as their confidence and expertise increases leading to more fulfilment in their work. Shifts in individual teacher identity are matched by a stronger sense of teacher community with increased participation in professional debate and the sharing of ideas. Changes in attitude to curriculum, pedagogy and classroom culture can result in teachers strengthening their position in negotiations to achieve access to resources for their subject and find their efforts being looked on favourably by Senior Leaders in schools. Learning more about the research process, particularly its messiness, promotes research literacy. Recognising that deepening understanding does not necessarily provide answers promotes 'boundary crossing' between the domains of researchers and teachers, flattening hierarchies of knowledge.

However, positive attitudes to research do not necessarily result in changes in practice. The enhanced professionalism that engagement with research supports can create tensions with the more restricted professionalism normally required of teachers. It may lead to frustration if greater knowledge is developed without increasing the power to act; there may be a negative impact on practice if engaging with research becomes a distraction from acting. We need also to take account of the fact that the evidence of the contribution of engaging with research on teachers' professional development is more tangible than any contribution to school improvement. Studies of interventions to support teacher engagement with research indicate variations across schools and even within a school, due to differences in how an individual teacher responds to the demands of the performativity culture affecting the profession.

The Organisational Structure of Schools is important
The conditions in school to support evidence-based change might be just as important as any efforts to communicate research evidence as schools as institutions limit possibilities. Attention needs to be given to teachers' professional education and working conditions rather than to refining research artefacts. School Leaders need to give direct support by showing that they value research by making its use explicit. However, support should leave scope for teachers to exercise autonomy. Research engagement needs to be a long-term, sustainable school improvement strategy with resources allocated to provide time for research in the working day and provision of teaching cover if necessary. This will require a change of culture in schools from 'doing' to 'thinking' to alleviate the general 'oppression' of teachers' classroom practice. The high stakes accountability environment in which many schools function militates against the risk taking engaging with research may involve. Efforts to develop a research oriented culture in schools is more likely to be successful when the focus is on leadership development. It is important to consider the school context when seeking to implement or enact findings from research. Engagement with research needs to be recognised as integral to professionalism and a more context aware view of teachers' learning is necessary. Teacher researchers need a clear position and status in school, taking a lead role in team meetings and study days. If a school appoints a Research Lead, they need to have a clear plan for the development of research engagement and be able to strengthen the

relationship between research activity and SLT decision making. Developing a school network as a Professional Learning Community (PLC) promotes dialogue by flattening hierarchies and can support teacher engagement with research. However, becoming a PLC does not always lead to the systematic use of research evidence. Success will require the interconnection of the micro and macro level factors impinging on teacher engagement with research and policy makers to remove the barriers to institutional change. It is hard to effect such change when attempts to 'scale up' projects that have demonstrated promising outcomes has proven to be difficult. It is also difficult when any impact on teachers' professional development is not reflected in concrete evidence of impact on school development.

Strategies to Support Teacher Engagement with Research
Recognition of the mutual interests and paying attention to the shared experience of teachers and researchers as participants in the interconnected eco-system of education is the key to supporting teacher engagement with research. Building relationships that recognise different roles and responsibilities and are concerned with enabling student learning drives engagement. Long-term partnerships with research-based institutions are beneficial provided the type of collaboration is discussed and agreed. Determining levels of autonomy and making strategies for critical friendship explicit is important. University Education Departments have a role to play provided attention is given to developing the role of the teacher-educator to address shifting needs resulting from a change in focus from the dissemination of research to facilitation. Researchers can, for example, be more prepared to take the risk of modelling the use of research in practice and engage with teachers as collaborators in developing pedagogical tools. The Senior Leadership Team are also key to providing resources, especially time, integrated into daily working conditions and illustrating how research and evidence can be effectively employed. Establishing a direct connection between research, CPD and school improvement and modelling this across the school in staff meetings and the allocation of responsibilities is essential for success. Teacher Unions can also take an active role in promoting changes in policy to support access to relevant literature to provide an evidence base and improvements in the terms of conditions for teachers.

Approaches that promote a participatory paradigm for educational research emphasising professional experimentation and shared reflection on concrete material presented in cases drawn directly from experience have achieved a measure of success.

- Action Research illuminates the transformative possibilities of teachers taking an 'activist stance' and developing knowledge through multiple Action Research cycles
- Lesson Study and Learning Study provide a student learning and subject centred focus, a clear process and a shared language through which to develop phronesis (the deployment of knowledge and techniques to the right person, to the right extent, at the right time, with the right aim and in the right way).
- Professional Learning Communities, when constituted on the principles of a community of inquiry, promote dialogue about learning and develop wisdom to act whilst retaining the doubt necessary for challenging assumptions and the recognition of alternative possibilities.
- Design Based Research can be adopted as a workable methodology for classroom based research with a deliberative, pro-active approach to professional learning. It has been used very effectively to design CPD provision.
- Research Leads in schools can be supportive provided they themselves are adequately supported and are able to establish viable external networks.

Phase 2: Interviews with RE Teachers
The aim of the second phase of the project was to gain insight into the experiences of teachers of RE to ascertain the extent to which their engagement with research might differ from the factors identified in the mapping review. Were particular barriers to engaging with research encountered by RE teachers or did they have any advantages in terms of opportunities available to them? Whilst not wanting to assume exceptionalism in the experience of RE teachers, we were aware

that the 'Does RE Work?' project[9] had found that although teachers might be isolated within their schools, they did benefit from access to specialist subject networks for support. We were also mindful of the differences in the provision for teachers of RE across the four devolved jurisdictions of the UK, particularly Scotland and Wales, given the emphasis on research in professional development in general and the involvement of teachers in curriculum development. As Wales was currently involved in a major exercise in curriculum reform at the time, we chose to include primary and secondary teachers with responsibility for RE in England and Wales. An advert asking from expressions of interest from RE teachers across England and Wales who willing to participate in a research project entitled 'RE Teachers' Engagement with Research' funded by Culham St Gabriel's was circulated to teachers via a) REC Newsletter b) NATRE Chairs and Local Area Leads c) LTLRE Area Leads d) Culham St Gabriel's website. Expressions of interest were received from 19 teachers, of whom, 16, evenly divided between the primary and secondary phases, agreed to participate in individual interviews. We were aiming to recruit a purposive sample based on the objective of the study, which was to understand the characteristics of the factors affecting RE teachers' engagement with research. We wanted, therefore, to interview those teachers who responded positively to an invitation to talk to us about their attitudes towards and experiences of research. Due to CoVID restrictions all the interviews were conducted virtually using Teams, recorded and transcribed.

Semi-structured interview schedule:

1. Can you say a little bit about what you understand by the term 'research'?
2. What do you think makes 'good' educational research?
3. Where would you go to find research?
4. What kind of research would you look for? (e.g. RE specific? Generic? Or both?)
5. How would you complete the following sentence: "understanding research is like....."?
6. What might or has prompted you to undertake your own research?
7. How has research informed your understanding and/or practice?
8. What are the challenges you face when trying to access, understand and/or implement research?
9. Why might it be important for teachers to engage with research?
10. What do you think would help teachers to engage with research more effectively?
11. What do you think the future priorities for research in RE should be?

The transcripts were analyzed by two members of the project team (SM and KW). In the first instance a preliminary analysis was completed in relation to their allocated questions:

SM questions 2; 4; 5; 7; 8; and 12
KW questions 3; 6; 9; 10; and 11

The template below was used to record their findings:

[9] Conroy, J.C., Lundie, D., Davis, R.A., Baumfield, V., Barnes, L.P., Gallagher, T., Lowden, K., Bourque, N., and Wenell, K. (2013) Does Religious Education Work? A Multi-dimensional Investigation. London, Bloomsbury

TaSR TEACHER INTERVIEWS: PRELIMINARY ANALYSIS OF TRANSCRIPTS

NAME OF RESEARCHER:
QUESTION:

INTERVIEW NO.	KEYWORDS/PHRASES	QUOTATION	EMERGENT THEMES
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			

In order to ensure reliability and trustworthiness of data analysis, both researchers analyzed the following data and compared results to establish inter-rater reliability:
Participant 1 Q2
Participant 2 Q3
Participant 7 Q6
Participant 8 Q8
Participant 15 Q9
Participant 16 Q11

The second stage involved analysis of the emergent themes using descriptive statistics: frequencies. Thematic analysis identified the following key themes:

- Nature and purpose of research
- Importance of research
- Challenges
- Factors that would enable teachers to engage with research more effectively

Question no.	Content of question	
1, 2 ,3 & 5	Teachers' understanding of 'research'	• Takes place in universities (not accessible/relevant to teachers) • Takes place in schools as well as in universities • Important dialogue needed between research communities and school communities • Research connects teachers to the 'bigger picture', a larger tradition • Testing out hypotheses or testing out resources or approaches to teaching • 'Poking about'; digging deep into a problem and finding solutions; making connection; deep investigation. • Searching for knowledge • Trying to find out about something within defined parameters and methods • Talking to and interacting with people • Reading published research in journals/books

		• Leads to more questions rather than answers • Examines what might work in practice • Raises standards
4,6,7 & 9	Why is it important for teachers to engage with/in research?	• An important part of being a professional (comparisons made to doctors and nurses) • Keeps you up to date and relevant and at the top of your game • Stops you from stagnating; challenges you out of your comfort zone; revitalises you; liberates you; empowers you; • Gives the subject (in school) credibility (links with academia and discipline specific knowledge) • Deepens academic understanding of subject • Gives you a sense of autonomy and ownership of what you do • Deepens your understanding of why you do things the way you do (or why you have been asked to do them differently) • Impacts on classroom practice • Impacts on students' engagement, learning and outcomes • Develops criticality • Can lead to pay rise/enhance promotion prospects
8	Challenges	• Time (there are just too many other priorities and demands!) • Mental space • Accessibility (it's hard to know what's out there; there is too much out there – paradox of choice leads to paralysis; it's often communicated in ways that are not easily accessible to teachers) • Cost • Relevance (mismatch between world of research and world of teaching) • Lack of support at institutional level (it can be difficult to create and maintain a research supportive school culture and collaborative environment)
10 & 11	What would help teachers to engage with/in research more effectively?	• Sense of belonging to a community e.g. wider RE community such as NATRE; or smaller research networks; or links to HEIs) • Culture of research and collaboration in school; allocating time in school to individual/group research activities; building confidence to undertake own research • Greater focus on subject specific research (aids sense of relevance) • Funding (e.g. to be able to access magazines/journals etc; bringing experts into school) • Ease of access to the research itself (e.g. overview of what research is out there; guidance as to what research is useful for what; digests/summaries that are teacher friendly) • Greater cohesion within the subject (e.g. not getting caught up in discussions about what the name of the subject should be)

We were interested to know how the participants responded to the question inviting them to suggest metaphors and similes for research and how this might shed light on their understanding.[10]

QUESTION 5: How would you complete the following sentence: "understanding research is like....."? [If you were to use a metaphor, what would you use and why?]

INTERVIEW NO.	KEYWORDS/PHRASES	QUOTATION	EMERGENT THEMES
1	Research is a multi-levelled tool. Understanding research can be like that Newton moment or Einstein's ah ha! The process of trying to understand research can be like wading through grey dark boring dry mud.	Research can be difficult to access (e.g. long words, long sentences and long chapters).	Research needs to be accessible. The more accessible it is, the more useful it is.
2	Understanding research is like trying to follow a recipe and create the dish.		Understanding research requires interpretation.
3	Understanding research is an impossible endless goal. Understanding research is a hermeneutical spiral.	Requires understanding different perspectives.	Understanding research is a complex and ongoing process
4	Understanding research is like being back in school (as a pupil)	I don't approach research as it just having the answer I am after. I have got piles of books with sticky tabs that I need to cross reference.	Understanding research is a complex and ongoing process
5	Understanding research is like scratching your head until you relieve the itch.	You have to keep researching it is not a one-off thing. Even if you think that you have found the answer there is always perspectives that you can go down.	Understanding research is a complex and ongoing process
6	Understanding research is a like a mine field	You could just go anywhere with the research, once you start looking into something it brings out so much other things that maybe you weren't looking for.	Understanding research is a complex and ongoing process
7	Understanding research is a bit like making daisy chains	You have many elements to bring together and you have to	Understanding research requires interpretation –

[10] Walshe, K (2020) Seeing, Grasping and Constructing: Pre-service Teachers' Metaphors for 'Understanding' in Religious Education, *British Journal of Religious Education,* DOI: 10.1080/01416200.2019.1708703

		put a little work in to link things over and over until hopefully you have something beautiful at the end of it!	making links to create understanding
8	Understanding research is a beautiful endless journey. Lots of branches actually shoot out.	Knowledge to me is endless, when you start to research you discover so many things and the thing with research is you know you have to narrow it down. You have to say I will put this on the shelf and come back to it. Then lots of branches actually shoot out. Dissertations and theses from different people they will always quote someone, it can never end. Someone has to take the mantra after you.	Understanding research is an ongoing process.
9	Understanding research is like opening an encyclopaedia	When I was a child, I used to love reading encyclopaedias but if you open it up and dip into it some things you really like some things you might be passionate about, other things will be boring, and you won't want to do them or read them, so you flick past it.	
10	Understanding research is like a choosing from a box of chocolates	Like a choosing from a box of chocolates, to steal from Forrest Gump, you never know from research what you're going to get. You start looking for research, sometimes you go looking for things and it doesn't even exist, it's never been done, it's not even out there so that's not what I needed. Yes, so you don't even know sometimes if the thing you want is even out there and then to come back to the box of chocolates…in a chocolate box there's somethings you like, things you don't like, things that suit you, things that don't. So many bits of research is out there to do with RE it's about picking and choosing the bits the most relevant to you and your context	Need to select research relevant to your context
11	Understanding research is like switching on a light bulb and re-energising my teaching.	Research is refreshing and reminds me why I do things and it gives me new ideas.	Affirms current practice and inspires new ideas

12	Understanding research is like planning or embarking on a journey.	Research is like the painting 'Wonderer above the sea of fog' by Caspar David Friedrich. I think research does the same to me, as you sit on that out rocky outcrop one piece of research could say well you go this way because something over that way lies, you go West and find this, we had another piece of research told you to go East and then you find this and that's what understanding research is like.	Research can offer lots of different avenues.
13	Understanding research is like sunshine after the rain	Because it's raining…..you're in a quandary, you don't know what you should be doing, then you find that piece of research and you know what you're doing and you think yes…I've got it this, this is where I'm going now.	Research can shed light. It can help you to see your way. Research can show you where you need to go. It can clear confusion.
14	Understanding research is like an uphill effort. It's like looking through the bushes to fine the piece of that you want, that's relevant.	Because you've got to find the research that's relevant to what you want, so it's like looking through the Bushes if you like. Sometimes you can't find what you want, what quite hits the mark, which is frustrating, especially since you have put the effort in. Other times you do find what you're looking for and then I'll bookmark it and wait till I need it.	It's not always easy to find research that's relevant.
15	Understanding research is like pushing a rock up a hill!	Research is the last thing you want to do when you've had a tiring day/term/year and you're exhausted. You have to drag yourself to do it. It's difficult but it's worth doing.	Engaging with research is difficult and the last thing you want to do, but it's worth doing.
16	Understanding research is like walking through mud	Lots of research, is very intellectual and very book based and it needs to be accessible to people like me. There are important theories but when you're reading something because you want to find out about something it needs to be set out in layman's terms for somebody like me!	Research needs to be accessible.

Summary:

Understanding research is like:

• Wading through [dark grey boring] mud • An uphill struggle • Searching through the bushes	Research needs to be made more accessible. Firstly, it can be hard to find exactly what you're looking for. Secondly, it can be too intellectual (long words, long sentences, long chapters)
• Using a multi-levelled (or multi-layered) tool • Embarking on a [beautiful and endless] journey • Being faced with different paths from which to choose • Walking across a mine field • Choosing from a box of chocolates	Research can reveal so many different perspectives. How do you know which way is the best or right way? Each way will lead to something different.
• That ah ha moment • Sunshine after rain	Understanding research sheds light. Reveals new ideas. Energising.
• Being back at school • Opening an encyclopaedia • Scratching your head until you relieve the itch • A hermeneutical spiral	Understanding research is a complex, continuous, and iterative process of interpretation.
• A bit like making daisy chains • Trying to follow a recipe	The aim is to make something new

Phase 3: What is known, what is not known, what would it be useful to know about promoting engagement with research in RE?

The two phases of the project were initially intended to run consecutively so that the outcomes of the mapping review would inform the interviews directly. However, the impact of the pandemic meant that plans needed to change and the mapping review and interviews ran in parallel with members of the research team allocated to separate phases. In the end, this has resulted in a more robust outcome as the degree of similarity between what we know about teachers' engagement in research in general and from our RE teacher participants in particular is all the more striking. Key issues raised in the interviews that resonate with data from the mapping review include: the importance of context, in schools and in research-focused institutions; the need to build relationships between teachers and researchers; relevance in terms of meeting individual teacher needs and school priorities; an interest in both generic and subject specific research and their integration; access to research requiring both knowing what's out there, readability and cost. If we focus on the five studies specific to RE included in the mapping review we gain further insight.

Johanessen (2015) presents the outcomes of a three year project with nine primary school teachers in Norway in which core concepts from theories of RE when combined with Action Learning triggered collective inquiry among the participants into their own professional knowledge. Gradually, participants became more aware of how their personal values and beliefs played a role in their work and started to investigate their practice more critically. Kane (2013) found that Action Research in New Zealand involving six secondary teachers supported by researchers enabled direct dialogue between teachers and students. This led to the disruption of the normal roles and relationships resulting in positive transformations in classroom practice. O'Grady (2020) working with one teacher in England for nine weeks on an Action Research project, concluded that low intervention, supportive collaboration between researchers and teachers can be beneficial. Such collaborations provide closer points of reference than generic CPD but consideration needs to be given to the context when seeking to enact/implement findings from research. Stern (2010) advocates research as pedagogy in his Case Study of nine primary and secondary schools in England. Over the period of a year research to inform teachers *and* pupils about how teaching and learning take place in their classrooms developed self-consciousness of pedagogy and its likely impact leading to different ways of working. Stern (2014) evaluates the series of Westhill

seminars on RE held in the UK for primary and secondary teachers over a six year period. He concludes that their impact extended into the practice of the teachers in schools and the effect on their pupils. Publications from the seminars were important but the space to think and discuss RE during the residential was at least as influential as formal presentations by researchers.

In summary, what we know about promoting teachers' engagement with research in general applies in equal measure to teachers of RE. There is interest in research that connects student learning to curriculum development and awareness of a spectrum of types and scale of research in which the criteria for rigour need to be matched with purpose. Context matters and we need to create hospitable places in which dialogue between teachers and researchers can be fostered and relationships of trust developed. Teachers find insights from research enlightening but are frustrated if this cannot be linked to action because of a lack of agency. School culture is pivotal to engagement, more so than the form in which research may be presented, Senior Leaders in schools need to recognise the value of research and support its integration into CPD and strategies for school improvement. We need to develop an ecosystem for evidence-based practice in education[11] in which teaching and research are in a productive, dynamic interaction. Teachers' professional growth can be understood as a dynamic relationship between evidence and experience in which research, understood as both enquiry and inquiry, plays an important role.

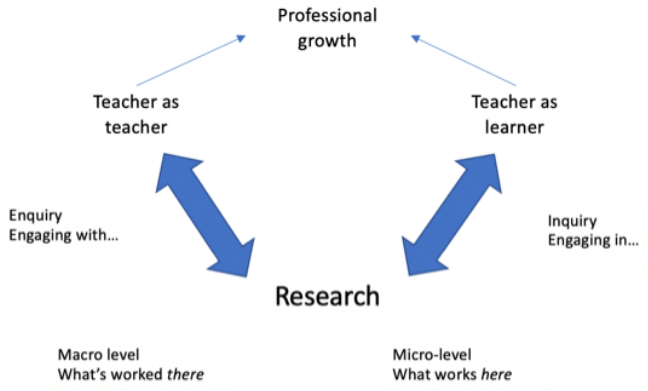


Figure x: Teachers' Professional Growth[12]

Considering what is not known and what we need to know is equally important for the future development of support for RE teachers' engagement with research. To some extent there is clearly a correspondence between what is not known and what we need to know but we must also make a distinction between what is not known and what might be unknown. Gaps may reflect limitations in the project rather than indicating where there is a lack of knowledge. The benefit of conducting reviews of published research literature is that they reduce the waste of not building on an existing evidence base when scoping future activity. Whilst the work of organisations such as EPPI have provided guidance and protocols to improve literature reviews as a research method, difficulties remain. Searches are hampered by the lack of consistency in the practice of giving articles titles, keywords and abstracts that make the work of researchers discoverable no matter how carefully the search terms are formulated. It is little comfort that the biggest culprits are often the authors of the published articles themselves and publishers should give more regard to using

[11] DOI: 10.13140/RG.2.1.5101.8967

[12] Further discussion of these ideas and their derivation from the work of John Dewey can be found in Baumfield, V and Higgins, S (in press) Child and the Curriculum in the 21st Century: The Relationship between Enquiry and Inquiry in the Classroom in J. Avila and A.G. Rud (Eds.) The Contemporary Relevance of john Dewey's Theories on Teaching and Learning: Deweyan Perspectives on Standardisation, Accountability and Assessment in Education. Routledge: London.

the expertise of information scientists in keywording and writing abstracts. Access is also inhibited by the extent to which a publication is listed on educational research databases and inevitably, there is much that would be of interest that cannot be readily accessed. In short, there will be important research that would be in scope missing from the review; whether this would alter the map substantially is an unknown. Even in the case of the sources we did find we need to recognise limitations. As can be seen from the data extraction table, the conventions of academic writing for journals may not capture all the details of the research; the growth in online publishing may help in the future by encouraging the practice of including data sets and research reports to accompany an article. The interviews provide a rich source of data on the experiences of the RE teachers and what is reported here can be developed through further analysis. We aimed to recruit a purposive sample of participants and achieved an equal number of primary and secondary teachers but teachers from Wales are under-represented and this militated against understanding contextual factors linked to curriculum reform and teachers' professionalism in one of the devolved jurisdictions of the UK. Efforts to address the known 'unknowns' should continue and will enrich the project outcomes.

Priorities in what we need to know about RE teachers' engagement with research based on the outcomes of the project include:

1. Best processes for developing sustainable partnerships between teachers and research-focused institutions to provide 'hospitable spaces' for dialogue about research aims, methods and outcomes in RE
2. Identifying conditions in different national contexts shown to be conducive to supporting teachers' engagement with research and investigating how these impact on the situation of teachers of RE in greater depth.
3. How to improve access to and relevance of research for practitioners through cross-professional analysis and collaboration; the Health Service have developed approaches that could be adapted to the context of teachers and would facilitate RE taking a leading role in future developments
4. How to work with school leaders and policy makers on linking evidence of professional learning through engagement with research to school improvement

Next Steps

The TasR project outcomes provide an evidence base on which to formulate best 'BETS'[13] for future activity in shaping the research agenda for RE that will engage teachers and impact positively on learners. We now need to take immediate steps to develop a dissemination strategy to deepen our understanding and fill the gaps by consulting and debating with the wider RE community. Following this, we can then seek ways of engaging school leaders, policy makers and other professions in dialogue to develop a sustainable ecology for evidence informed practice.

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