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# **DEVELOPING TEACHERS' RESEARCH LITERACY**



# **DEVELOPING TEACHERS' RESEARCH LITERACY**



INTERNATIONAL PERSPECTIVES

Editors: Pete Boyd, Agnieszka Szplit, Zuzanna Zbróg

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# Prologue

PETE BOYD, AGNIESZKA SZPLIT & ZUZANNA ZBRÓG

There is overwhelming agreement, internationally, that the quality of teaching is a fundamental element of effective education systems. Within this consensus however, the contribution of teachers themselves is somewhat contested. A teacher might be positioned along a continuum between a technician, delivering evidence-based practice, and a professional, using research-informed judgment to decide what and how to teach. Clearly, the resources available within national education systems affect teacher recruitment, initial education, working conditions, retention, and continuing professional development. There are also significant policy and cultural differences between national contexts, for example the extent of centralised national prescription of curriculum content and the status of teaching as a profession within society. This book examines the concept of ‘teachers’ research literacy’ by drawing on international critical perspectives on policy and practice in initial teacher education and in professional development for experienced teachers. The issue of teachers’ research literacy is important internationally because it has considerable implications for policy, teacher recruitment and development, school leadership and classroom practice. Building teachers’ capacity for professional inquiry and professional judgment within the development of research literacy is particularly important in our post-truth era. In this era, feelings or personal beliefs are often considered to be as important as the facts, and science denial has become part of ideological persuasion leading to a post-truth politics (McIntyre, 2018).

Part one of the book focuses on the concept of teachers’ research literacy. In provisionally defining the central concept of teachers’ research literacy in chapter one, Pete Boyd argues that a research literate teacher must have a capacity for professional judgment in deciding what and how to teach.

Within this, he discusses three key elements: the complexity of the field of education and of classroom teaching including the varying contexts in which teachers work; the philosophical issues of purposes and values underpinning education systems and teaching; and the contested nature of theory and research, ways of knowing, within policy and practice in education and teaching. Chapter one expects teachers' professional judgment to include everyday in-action decisions but also a capacity for professional inquiry, leading to the development of research-informed practice and change. In this chapter, a provisional working definition of teachers' research literacy is presented as: 'Demonstrating a reasonable understanding of the contested nature of 'ways of knowing' (epistemology) within the field of education, including appreciation of purposes and values and the interplay between research and practical wisdom in deciding what and how to teach, as well as practical skills in critically evaluating different sources of research evidence as an element of professional inquiry into practice.' To provide a broader systematic consideration of what we know about teachers' research literacy, Leah Shagrir in chapter two provides a literature review focused on seven carefully selected studies. She finds that despite the value and ambition of teachers regarding engagement with theory and research, many currently do not feel they have sufficient research literacy to support professional inquiry and development of research-informed practice.

Part two of the book focuses on development of student teachers' research literacy. It is worth noting at this point that language is a powerful influence on thinking. On principle we therefore prefer the terms 'student teacher' or 'beginning teacher' and 'teacher education', which lend themselves to the development of teachers as professionals. These terms seem preferable to 'trainee' and 'teacher training' which imply development of teachers as technicians. In chapter three, colleagues based in the Netherlands, Quinta Kools, Rutger van de Sande and Willem Maurits, investigate student teachers' professional inquiry stance through engagement with Design as research. These authors position 'Design as research' within the range of approaches to teachers' professional inquiry but argue for its distinctive advantages. For example, as an approach it considers all decisions made by the teacher to be an element of design and therefore open for discussion and change and it emphasises enactment so encouraging classroom experimentation and evaluation. The chapter offers a fresh perspective and approach to developing student teachers' research literacy through

professional inquiry. In chapter four, UK based colleagues Karen Blackmore and Jennifer Hatley critically evaluate the affordances of ‘close to practice’ research for the development of student teachers’ research literacy. This approach emphasises collaboration in empirical research focused on an issue identified by an experienced teacher, with the student teacher in this case positioned as researcher. The Netherlands is a leading nation with regard to the development of teacher education and another team based there, Bregje de Vries, Hanna Westbroek, Wilma Jongejan and Anna Kaal, focus in chapter five on the development of student teachers’ personal theories. In this empirical study they develop the definition of teachers’ research literacy beyond interpretation of research literature using goal system representation to help student teachers understand and articulate their personal theories. In chapter six, colleagues based in the Caribbean, Jennifer Yamin-Ali and Murella Samburcharan-Mohammed, investigate the impact of action research journals on student teachers’ developing research literacy. They contribute to understanding of teachers’ research literacy by emphasising the emotional element of working through research-informed change in practice. The final two chapters in this section focus on the knowledge and learning of teacher educators. In chapter seven, UK based colleagues Elizabeth White and Claire Dickerson, provide and evaluate practical resources consisting of ‘narratives of practice.’ These stories are designed to enhance teacher educators’ use of modelling to help student teachers connect theory and research to classroom practice. In chapter eight, colleagues based in Poland, Agnieszka Szplit and Anna Babicka-Wirkus, use a study of university-based teacher educators and a framework of critical pedagogy to analyse how critically reflective learning supports the development of professional inquiry and research literacy.

Part Three of the book focuses on the development of research literacy by experienced teachers. Policymakers often seem to prefer the more contained system of initial teacher education when claiming to address quality of teaching, rather than considering action to support the more complex continued professional learning of the majority of teachers who are in schools making a difference to children. However, in chapter nine colleagues based in Croatia, Dragana Božić Lenard, Josip Juraj Strossmayer and Ivan Lenard, evaluate the perspective of teachers towards a national policy that seeks to encourage lifelong learning for teachers through practitioner research. They find that teachers have a professional

commitment to lifelong learning, are familiar with research procedures and occasionally read scholarly literature. They do not feel they currently have a strong level of research literacy but are open to developing it and being involved in collaborative research. In chapter ten, within the UK context, Hilary Constable and Pete Boyd report on their study of 'master teachers' who have completed a part-time masters level programme. They find that these teachers demonstrate a research literate stance when reflecting on their studies. However, within the interplay of professional learning in their school workplaces the practical wisdom of teachers is privileged and critical engagement with the public published knowledge of relevant theory and research is constrained. In chapter eleven, UK based colleagues Jack Whitehead and Marie Huxtable consider how a Living Educational Theory Research approach supports teachers to develop their research literacy as they realise their educational responsibilities as professional educators. In this approach the lifelong study by a teacher comprises an evolving educational curriculum including development of research literacy. The final two chapters in this section focus on developing the capacity of experienced teachers for professional inquiry and their research literacy. In chapter twelve colleagues based in Israel, Smadar Donitsa-Schmidt and Ruth Zuzovsky, consider attempts to address low levels of teacher research literacy across a national education system. They identify tensions around the value of different forms of knowledge within teacher education but perhaps more significantly also recognise the influence of social status of teachers and their working conditions in relation to developing research literacy. In chapter thirteen, UK based colleague Bethan Hindley focuses on the need to develop the research literacy of school managers and facilitators of coaching and professional learning. Informed by analysis of teacher survey responses and review of the literature she argues convincingly for professional learning through school-based professional inquiry supported by research literate colleagues. In chapter fourteen, Zuzanna Zbróg argues for professionalization of teacher educators' pedagogical approach in response to a national policy requirement in Poland for higher education programmes to prepare students as researchers. These issues of collaboration and leadership of change contribute further to the critical development of the concept of teachers' research literacy. Teaching is arguably a collaborative endeavour and so teachers' research literacy might be considered also to be a collective capacity.

## Prologue

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Overall, the different authors provide a range of perspectives on teachers developing research literacy through different forms of professional inquiry. Your engagement with chapters of this book may be selective and based on your particular contexts and interests, but we consider the synthesis of these international perspectives to be useful in developing a nuanced and critical perspective and definition of the concept of teachers' research literacy.

## CHAPTER ONE

# Teachers' Research Literacy as Research-Informed Professional Judgment

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### ABSTRACT

In this chapter I propose a concept of 'research literacy' as a central professional knowledge requirement of a teacher. Developing research literacy is positioned within a professional inquiry approach to high quality initial teacher education and provision of effective professional development for experienced teachers. The argument develops from a focus on the knowledge that teachers require to teach effectively and to contribute as professionals to collective leadership in developing education practice and policy. The complex interdisciplinary and multi-paradigmatic field of education is seen as lending itself to development of 'research-informed' rather than 'evidence-based' practice by teachers. Collaborative professional inquiry is proposed as a middle way for teacher professional development, beyond pragmatic top-down evaluation, that borrows tools such as ethical frameworks and systematic analysis of data from practitioner research. Such professional inquiry requires teachers to develop a level of research literacy, knowledge and skills they may use to critically evaluate different sources of research-based evidence, including randomised control trials, meta-reviews of research, qualitative research, narrative research reviews and most challenging to evaluate, professional guidance materials that claim to be 'evidence-based'. Both research literature and professional guidance are entangled with the plethora of blogs, websites, social media exchanges, and published books based on social media notoriety rather than scholarship, meaning that teachers need to be selective and discerning readers. However, teachers are not positioned as merely consumers of research and professional guidance, because they also contribute to knowledge in the field, via collaborative research activity and via development of practical wisdom through professional inquiry.

## Research Literacy

In this chapter I will argue that teachers require a level of ‘research literacy’ to inform reasoned judgments they have to make as part of their day-to-day professional practice and to inform their professional contribution to collaborative school leadership and wider level development of practice and policy. Some external observers and naïve policy makers are convinced that education should be more like the field of biomedicine, with top-down identification of ‘evidence-based’ practice (Goldacre, 2013). However, the field of education is multi-disciplinary, including for example philosophy, psychology, history and sociology, and multi-paradigmatic, meaning that the same educational issue might be investigated from a range of different theoretical perspectives. Therefore, it is more convincing to compare the field of education to the field of healthcare, or even mental healthcare, where the ‘evidence’ is far more contested and the varied contextual settings for practice, as well as the characteristics of the individual practitioners involved, and the frequent need for professional judgments, are far more significant (Philpott, 2017; Philpott & Poultney, 2018).

In considering the concept of teachers’ research literacy it is important that we critically consider the overlapping and sometimes conflicted purposes of education and the values that shape these purposes. Based on Gert Biesta’s useful framework, three broad and overlapping purposes of education may be considered. First, a purpose of ‘qualification’ meaning knowledge and skills and to which we might add ‘ways of knowing’ within curriculum subjects (Boyd, 2018). Second, the purpose of ‘socialisation’ meaning for family, citizenship and employability. And third, the purpose of ‘subjectification’ meaning development as a unique individual (Biesta, 2010) perhaps with ‘well-being’ added as an explicit element of this third purpose. Building from these multiple purposes, many professional educators and other stakeholders consider that a significant purpose of education is to work towards social justice. From this value-based perspective, a central purpose of formal education is to tackle the attainment gap and broader inequitable outcomes in health, employment and well-being that exist in relation to social disadvantage and its intersectionality with factors including social class, children in care, race/ethnicity, gender, sexuality, religion, citizenship, and prior attainment (Tefera & Powers, 2018). The multi-disciplinary and multi-paradigmatic nature of the field of education, the contested nature of



ways of knowing within it, the significance of context and local practice, the complexity of teaching, and the role of values and professional judgments mean that the terminology and ambition of developing 'research-informed practice' is preferable and more appropriate than using the term 'evidence-based practice'.

In a major and useful report on teachers and research, the British Educational Research Association define 'research literacy' as referring to: 'the extent to which teachers and school and college leaders are familiar with a range of research methods, with the latest research findings and with the implications of this research for their day-to-day practice, and for education policy and practice more broadly (BERA, 2014, Appendix 2). This definition perhaps positions teachers in relation to the field of educational research and as consumers of research, rather than positioning them in relation to the field of education, in which they have a central role including as developers of knowledge. A provisional definition of research literacy that more centrally locates teachers might be: 'Teachers demonstrating a reasonable understanding of the contested nature of 'ways of knowing' (epistemology) within the field of education, including appreciation of purposes and values and the interplay between research and practical wisdom in deciding what and how to teach effectively, as well as practical skills in critically evaluating different sources of research evidence as an element of professional inquiry into practice.'

Internationally, a graduate level of such understanding and skills is widely expected of teachers although in some regions, including most of Europe, it would be expected to be at an academic 'Masters' level. It is important to note that this definition of 'research literacy' might equally, but rather more clumsily be termed 'theory – research – policy – professional guidance' literacy. The skills in critical evaluation embraced by 'research literacy' need to extend to research-informed (or not) public knowledge, published texts within the field that claim to be based on, or at least informed by, educational theory and empirical educational research. The term theory is particularly problematic because it ranges from grand 'Theory' in psychology and sociology to situated 'practical theories' that teachers use daily as 'ways of working'. Developing a level of research literacy sufficient to critically evaluate professional guidance texts that claim to be research-informed is particularly challenging, especially in an age of blogging and open access publication on the web.

This definition of research literacy for teachers is provisional and the rest of this paper is intended to provoke debate by proposing an outline view on the knowledge and skills a teacher should master in order to be considered to be 'research literate'. The main body of the paper consists of four sections. First, a section that focuses briefly on teacher knowledge, as this is proposed as a meaningful way to engage teachers in consideration of the nature of the field of education. Second, a section that focuses on teachers' critical evaluation of randomised control trial (RCT) research and meta-reviews of such studies, as these are considered by many observers and policy makers to represent a 'gold standard' of research evidence. Third, a section that focuses on critical evaluation of individual research papers including qualitative studies, as these form a large but difficult to interpret body of evidence in education. This section also considers the evaluation of research reviews because they are often an accessible way for busy teachers to access the huge and growing body of educational research. Fourth, the considerable challenge of critically evaluating professional guidance texts, hard copy or online, that claim to be underpinned by research evidence. This section acknowledges the influence of online blogs, websites and social media postings and the need for teachers to develop a discernment in judging the scholarly basis of a wide range of materials that may reflect ideological power struggles, simplistic but false dichotomies, and the 'post-truth' world. Finally, the paper discusses the position of research literacy in relation to teachers' professional contribution to everyday classroom practice and collective leadership of change in practice.

## Teacher Knowledge

For teachers to develop a critical understanding of the field of education it is useful to approach from a challenging question: What does a teacher need to know, to be an effective teacher? Lee Shulman considered teacher knowledge to include at least 7 categories:

- 1) Knowledge of educational purposes and values – a philosophical perspective on education.
- 2) Curriculum subject content knowledge – including knowledge and ways of knowing.
- 3) Pedagogical content knowledge – the best ways to make the subject comprehensible to others.

- 4) Curricular knowledge – materials, sequences of learning, and connections across the curriculum.
- 5) General pedagogical knowledge – how to teach.
- 6) Knowledge of learners and their characteristics – knowing your learners.
- 7) Knowledge of educational contexts – from classroom and school to community and wider society.

(Adapted from Shulman, 1986, 1987)

This challenging range of knowledge illustrates the complexity of teaching and the inter-disciplinary nature of the field. Shulman's second category of curriculum knowledge deserves mention at this point because a large proportion of published educational research, even when focused on teaching strategies, tends to ignore this key contextual factor and is reported as a kind of generic finding. For example, consider the different relevance and value to a secondary school mathematics teacher of a generic meta-review of randomized control trial (RCT) research studies claiming that formative assessment has considerable learning power compared to an in-depth qualitative case study within a secondary mathematics classroom. From a social realist perspective, children should learn rich subject discipline knowledge and also tackle big social interdisciplinary issues such as climate change and poverty, but they should also be taught the social, dynamic and contested nature of such knowledge and should learn the different 'ways of knowing' within different disciplines (Young, 2019; Boyd, 2019). Teachers' engagement with research should not be limited to studies of generic 'interventions' such as formative feedback but also include in-depth study that is within the context of curriculum subject teaching and learning.

Internationally, and with different developments over time, initial teacher education has placed varying emphasis on Shulman's seven categories of knowledge. In England there is a considerable difference between initial teacher education for primary and for secondary teachers. This is not least because secondary teachers are curriculum subject specialists, normally with a first degree in that subject or a related field, and so they generally complete a one-year postgraduate course to qualify as a teacher. Primary teachers in England generally teach a class across the curriculum subjects, although they may act as a lead teacher across the school for one or two curriculum subjects. Many primary teachers in England complete a first

degree then a one-year postgraduate course whilst others complete a three-year first degree in Education that includes workplace learning and gaining qualified teacher status. A one-year postgraduate course for primary teachers, with around 50% of the time spent working in placement schools, clearly leaves limited scope for learning curriculum subject content knowledge, numbers 2, 3 and 4 in the list of Shulman's categories above. Such an intense course of teacher education may perhaps create an emphasis on generic pedagogical knowledge, number 5 in the list. In England, the USA and elsewhere internationally, there has been an emphasis on workplace learning and this has squeezed foundation studies for example in philosophy and sociology, numbers 1 and 7 in the Shulman list of teacher knowledge categories (Hartlep & Porfilio, 2015).

The range of knowledge required by teachers is formidable. The 'research literacy' of a teacher, as proposed in this chapter, must stretch across the breadth of Shulman's knowledge categories. This requires a critical stance towards a highly contested knowledge base as well as recognition of the contribution to knowledge in the field made by teachers through their participation in professional inquiry and research activities and their generation of knowledge as practical wisdom, ways of working in a particular setting, through professional inquiry.

## Professional Inquiry

Teachers require knowledge and skills to support their critical evaluation of different types of research literature. However, although I support the usefulness of practitioner research by teachers as a contribution to knowledge and as powerful professional learning, I do not consider that all teachers need to be active educational researchers. I do propose that all teachers should develop sufficient research literacy so that they are able to contribute to collective professional inquiry, for which they need to borrow some features of practitioner research, including critical engagement with existing research.

Professional inquiry is positioned between pragmatic evaluation, which is widespread in high accountability education contexts, and practitioner research, which requires a high level of researcher skills and time, or support from a university-based research mentor (Boyd & White, 2017). Table 1 outlines ten iterative steps of inquiry and summarises, in the centre

column, key characteristics of professional inquiry by teachers as part of collective school leadership. As part of professional inquiry, it is important that teachers adopt a critical stance towards relevant public knowledge including published theory, research, policy and professional guidance. This characteristic of inquiry is highlighted by step 3 in Table 1. However, it is also important that teachers adopt a critical stance towards their own local practice, established ways of working in their school, so that change becomes possible. In this way, teachers' professional learning consists of a power knowledge struggle, an interplay between the two inter-related domains of public knowledge and practical wisdom (Boyd & Bloxham, 2014; Boyd, Hymer & Lockney, 2015). Public knowledge may be considered as a vertical domain, including theory, research evidence, professional guidance and policy documents but sorted to some extent through critical peer review and therefore hierarchical. Practical wisdom may be considered to be the horizontal knowledge domain, the situated ways of working of teachers and therefore segmented between different schools and other settings.

If we intend to develop professional learning through 'interplay' between theory or research and teachers' practical wisdom, then a good place to start would seem to be teachers' questions that arise from their own reflections around classroom practice and student learning. An initial teacher concern might be referred to as 'a stone in the shoe' and may be simply expressed as a starting point for inquiry such as 'I would like to improve ...' or 'I want to change ... because ...' (Baumfield, Hall & Wall, 2013, p. 39). Generating even an initial teacher question may require a 'safe space' and a measure of discomfort (Amira *et al.*, 2017) if it is to avoid bland questions that merely evaluate the techniques of schooling rather than tackling challenging issues that may give rise to findings that are uncomfortable for the teacher or the school. A key step is to problematise and develop such an initial question to become a focused and manageable research question. In action research the teacher might ask 'what is going on?' in the first cycle and then make an intervention and ask, 'what if?' in the second cycle (Baumfield, Hall & Wall, 2013). Developing a teacher research question requires a thoughtful balancing process focused on improving your teaching, avoiding 'yes-no' questions, engaging with your deep-seated feelings, asking what is researchable and above all challenging your personal theories and resonating with your identity as a teacher (Inoue, 2015). A key step in developing a teacher question is to critically engage with relevant theory and research to position the inquiry

in relation to what we already ‘know’ and to consider published theories as potential tools through which to investigate the developing research question. Nori Inoue suggests that a teacher action researcher might adopt the East Asian concept of ‘emptiness of self’ which is a fluid and transitory approach to identity that embraces the possibility of change and growth (*Ibidem*, p. 47). A well-developed teacher question might include some element of challenge to the wider purposes of education, to social justice issues, and to school leadership approaches.

This critical engagement with ‘external’ knowledge, shown in step 3 in Table 1, is one of the characteristics of effective professional development for teachers highlighted by a useful research review (Cordingley *et al.*, 2015). This review also points out the need for a ‘rhythm’ to professional development that allows sufficient time for teacher experimentation and evaluation in the classroom. One of the most well-developed forms of professional inquiry is lesson study, which has been used for many years in Japan and has been adopted internationally (Lewis & Hurd, 2011; Dudley, 2014; EEF, 2017).

Table 1. Professional Inquiry: Ten Steps  
(From Pete Boyd & Liz White, 2017, pp. 130–131).

Ten Inquiry Steps	Pragmatic evaluation	Professional inquiry	Practitioner research
<b>1. Identify a focus and develop questions*</b>	The issue for inquiry or at least the quality assurance framework is identified top down	<b>Even a top down issue is shaped by teachers who frame questions and come to own them</b>	The issue may be top down, but the focus and questions are developed through engagement with literature
<b>2. Collaborate with other stakeholders</b>	Collaboration is defined largely within formal teams and structures	<b>Engagement by teachers is to some degree voluntary and others, especially learners, are invited</b>	Research ethics and seeking co-construction of knowledge lead researchers towards collaboration
<b>3. Engagement with public (published) knowledge</b>	Some engagement with policy and professional guidance; increasingly may refer to research meta-review evidence	<b>Critical engagement with professional guidance and research evidence to refine your question and design</b>	Informed by critical literature review and more likely to include a well-developed theoretical framework

## Teachers' Research Literacy as Research-Informed Professional Judgment

<b>4. Develop an approach and inquiry design</b>	Quality assurance processes provide or strongly shape the approach and design for evaluation of the techniques of schooling	<b>A critical inquiry stance begins to question purposes of education, social justice issues and/or leadership</b>	Systematic literature review and a formal research methodology underpin the inquiry design
<b>5. Establish an ethical framework</b>	Workplace organisation ethics and codes dominate and may generate contrived collegiality	<b>Professional codes and ethics, as well as a supportive workplace culture may create good levels of trust</b>	Gaining formal ethical clearance and working to research ethics guidelines create a strong framework
<b>6. Collect data systematically</b>	Often use existing sources and methods of data collection already designed for quality assurance	<b>Selected sampling may include student voice. Use existing evidence of learning and data collection tools</b>	May use secondary data and a range of data collection tools
<b>7. Analyse data systematically</b>	Some statistical analysis, for example of test results, but often a 'common sense' interpretation rather than critical analysis	<b>Some use of systematic data analysis based on researcher methods</b>	Sophisticated approach to quantitative and qualitative data analysis
<b>8. Disseminate findings and gain peer review</b>	Local dissemination and may be included in institutional quality assurance reports	<b>Local and wider teacher network dissemination, seeking some level of peer review</b>	Aiming for national / international dissemination and often peer reviewed research journal publication
<b>9. Take action</b>	Local action is likely and may inform practice across the organisation	<b>Local action is likely and institutional action possible, depending on level of support from managers</b>	Local action is likely. Wider influence needs support from managers and on publication of accessible guidance
<b>10. Review the process and identify the next cycle</b>	Evaluation systems are frequently revised but usually in a pragmatic way. Evaluation is usually part of a regular annual cycle	<b>Sustained cycles of inquiry will depend on the development of a learning community and manager support</b>	May depend on learning community, partnership with a research mentor, funding and support from managers

Within higher education, a body of work adopting an ‘academic literacies’ approach addresses the ‘deficit discourses’ about students often found within policy documents and informal academic debate (Lillis & Scott, 2007). The academic literacies approach adopts a sociocultural perspective (Wenger, 1998) and aims for epistemic quality of teaching (Hudson, 2018) so that tutors focus on enabling diverse students to join an inclusive learning community within the subject discipline and learn knowledge but also ‘ways of knowing’ (Boyd, 2019). In this way the academic literacies approach encompasses the development of research literacy, for example of student teachers. Andrew Northedge has written two papers that provide an accessible introduction to an academic literacies approach (2003a, 2003b). In the first paper Northedge argues for a middle way between teaching as telling (or lecturing) and teaching as light-touch facilitation:

...we cannot persist with models of teaching as ‘knowledge transmission’ nor rely on unfocused student-centred approaches that leave the students floundering within everyday discourse.’ ‘Students need practice at participating both vicariously, as listeners and readers, and generatively, as speakers and writers, so that they can develop identities as members of the knowledge community and move from peripheral forums to more active, competent engagement with the community’s central debates. (Northedge, 2003a, p. 31)

This ambition has resonance for teacher education and professional development that develops teachers’ research literacy, includes foundation studies, and prepares teachers to contribute to tackling social disadvantage and addressing social justice in education (Thompson, 2017). In the second paper Northedge emphasises the teacher’s subject knowledge expertise and uses a concrete example to illustrate three ways by which a teacher may support students’ disciplinary literacy development:

The teacher, as subject expert, has three key roles to play in enabling learning: lending the capacity to participate in meaning, designing well planned excursions into unfamiliar discursive terrain and coaching students in speaking the academic discourse. (Northedge, 2003b, p. 169)

By ‘lending the capacity to participate in meaning’ Northedge means that the tutor teaches a new concept to the students, then sends them out into the field, through a well-designed learning activity, to practice using that concept



to debate different solutions to a problem. In initial teacher education this emphasises the need for enactment, student teachers learning from classroom practice and reflective learning. In professional development for experienced teachers this is the rhythmic experimentation and evaluation identified as a characteristic of effective provision of professional development (Cordingley *et al.*, 2015).

In the spirit of an academic literacies approach, the following three sections discuss critical evaluation of different forms of research publications. No doubt they will introduce some unfamiliar terminology or concepts to many readers and may provoke further reading on different aspects of research design, methodology, data generation and analysis. However, research literacy does not mean the same as research expertise, these sections are designed to be an introduction primarily for self-assessment. If, as a schoolteacher or teacher educator reading through, you feel reasonably comfortable with the range of ideas discussed, then you would seem to be self-assessing as 'research literate'. Perhaps you completed a first degree in a relevant discipline or have completed a masters level degree in education. No doubt you will have some areas of stronger knowledge and may wish to pursue some selected further reading and professional learning. Different pathways of previous study may have involved you more or less in analysis of numerical data, statistics, or in analysis of narrative data. If the three sections include many aspects of educational research that are unfamiliar or obscure to you, then you are self-assessing as requiring some further professional development of research literacy.

### **Randomised Control Trials and Systematic Reviews in Education**

Although 'evidence-based' approaches in education, prioritising randomised control trial (RCT) research studies, have been foregrounded internationally over the last twenty years, it is important for teachers to be able to adopt a critical stance towards such evidence on two levels. First, teachers should be able to express a philosophical critique around the nature of evidence to inform teaching. Such a critique would highlight the need for teachers to consider the wider purposes of education, the complex and relational nature of teaching, the value of action research approaches, and the limitations

of the data on which large-scale quantitative studies are based (Malone & Padraig, 2020; Gale, 2017). Second, teachers should be able to critically evaluate a single RCT study and appreciate the limitations of a systematic review of such research studies, including the possible inclusion of meta-analyses. This section will focus on this second element and may seem quite technical, but the technical limitations of experimental research in education help to reveal its philosophical weaknesses.

An RCT study in education is an experimental design that generally tests the impact of a change in teaching by using an intervention group and a 'control' group and comparing them before and after the period of change in practice. When designed and conducted well, an RCT is a powerful form of research. A systematic review is a high-level overview of research on a focused question that identifies, selects, and evaluates all research evidence relevant to the question. It will have an explicit approach to selection of what the authors consider to be 'high quality' research and what they consider to be 'relevant' to the question. A systematic review may include a meta-analysis, which is the use of statistical methods to combine data from across the selected studies included in the systematic review and estimate an overall impact or 'effect size' of the intervention. When designed and completed effectively then a systematic review is a powerful and useful form of research evidence.

Fundamentally, it is difficult to design and implement an effective RCT study in the complex messy world of schools and classrooms. Experimental research methods generally rely on reducing the number of relevant variables, and yet a classroom as a laboratory includes around 30 varied and non-voluntary potential learners as well as an individual teacher with values, knowledge, repertoire of practice and personal characteristics. This laboratory is also influenced by an externally imposed curriculum, available learning materials, and its physical environment, as well as school, community and national level culture and policy frameworks. This context produces at least 4 significant challenges for design of an RCT (Wyse & Torgerson, 2017; Torgerson & Torgerson, 2003).

First, an RCT in education will often mean that some pupils receive an intervention, others in a control group do not. The fidelity of the intervention, meaning its consistency, is notoriously difficult to ensure in education and it normally requires a well-developed and relatively expensive package including professional development for teachers, specifically designed

teaching materials, and some classroom coaching and monitoring. Imagine trying to ensure the fidelity of an intervention such as 'formative assessment in primary History' or 'mastery approaches to teaching secondary maths'. This issue of fidelity of the intervention is a critical weakness of RCT studies in real world education settings. Vague outlines of the 'intervention' undermine the usefulness of educational research to schools and teachers and this effect is exacerbated if multiple studies are conflated and reported as if the intervention in each study was the same, as happens for example in a meta-review.

Second, an RCT in education will normally face a difficult decision concerning the control group. Often a research paper reporting on an RCT in education will include a throw away comment such as 'the control group continued to receive the established regular approach to teaching mathematics'. Comparing this design to biomedicine, this is seen as the equivalent of using a placebo pill or treatment. But such a 'do nothing' approach to the control group is highly problematic in education. To be of a suitable sample size, the control group will consist of several classes, involving different teachers, almost certainly across several schools. Now consider how secure you might feel, in assuming that this group are receiving something even vaguely consistent in their maths lessons. It might improve the study design if this control group were to receive an alternative intervention, for example in a study of a mindset theory intervention the control group might receive an input on study skills. There is an additional ethical issue concerning a 'do nothing' control group, because those children in the control group miss out. One way to resolve this, and help to encourage school participation, is to provide the intervention for the control group at a later date. However, funding bodies of large-scale RCT studies may wish to avoid this because they want to study the long-term impact of the intervention. Alternatively, the issue of long-term impact is important in education but is often ignored because the research funding body want published results within a relatively period.

Third, an RCT in education requires some measure of impact of the intervention and this normally takes the form of pre and post intervention tests, meaning at the beginning and at the end of the period of the study. The choice of test is critical because the measure used needs to be valid and reliable. Standardised tests are often used but identifying or designing valid and reliable tests that measure wider purposes of education, for example

orientation to maths as well as attainment, is challenging. Here we touch upon the underlying philosophical weaknesses of experimental research in education such as an RCT.

Fourth, an RCT in education should use randomized sampling but, unlike patients diagnosed with a specific medical condition, pupils are generally already allocated to different schools, classes, and teachers so that true randomized sampling is not feasible. For this reason, RCTs in education will attempt matching of samples. Just consider the challenge of using broad indicators to match two schools and then within them two classes of 12-year-olds and their maths teachers. One of these classes will be part of an intervention group and one will be in the control group. Now imagine building up a suitable sample size of at least 100 pupils in intervention and control groups, it is likely to involve several schools. It is not acceptable to have intervention and control group classes in the same school because of 'leakage' in that pupils and teachers will hear about and be influenced by what is going on in the other class. The use of matching as a proxy for randomized sampling is a difficult operational aspect of using RCTs in education.

Moving on to consider meta-reviews of RCT studies in education, it is important for teachers to appreciate how such studies generally report the impact of an intervention using effect size and then how a review or meta-review calculates an overall effect size. 'Effect Size' uses variation within the test results (estimated population standard deviation) as a yardstick to consider the difference between mean scores of the intervention and control groups (Coe, 2002). An effect size of 0.8 means the score of the average person in the intervention group is 0.8 standard deviations above the average person in the control group, so higher than 79% of the control group. Unfortunately, at the level of an individual study, 'the intervention plays only a partial role in the calculation of effect size' (Simpson, 2018). Also, when comparing studies, 'relative effect size can be a proxy for the relative effectiveness of interventions only in the highly restricted circumstances where all other factors impacting on effect size are equal' (Simpson, 2018). This latter point is significant, given the previously explained complexity of schools and classrooms. A research review or meta-review is devised by selecting RCTs that broadly claim to measure the impact of an intervention, recall the issue of fidelity previously discussed, and adds together their effect sizes to calculate and report the mean effect size. In addition to the challenge of fidelity, other issues in selection within a meta-review include

how dated some of the RCT studies might be as well as the economic and cultural context of the studies. There is also considerable debate about the magnitude of effect size that signifies a useful educational intervention (Torgerson & Torgerson, 2003).

All of the above concerns about RCTs in Education, as well as the issues around systematic reviews and meta-analysis, mean that an accessible and powerful research meta-review tool such as the UK Education Endowment Fund 'Teaching and Learning Toolkit' needs to be used by schools and teachers but in a careful, critical and 'research literate' way<sup>1</sup>. It is important for those using the toolkit to read the accompanying short paper provided on each intervention and to consider the details of the research underpinning the synthesis and overall effect size reported. Gert Biesta argues that judgments by teachers and other school leaders are influenced by facts, but crucially also involve values about the purposes of education. In this way judgment is research-informed rather than evidence-based: "The role of the educational professional in this process [of engaging with research] is not to translate general rules into particular lines of action. It is rather to use research findings to make one's problem solving more intelligent." (Biesta, 2007, p. 20). Teachers and other school leaders need to be aware of the limited philosophical basis of RCT research in education, as well as evaluating the technical limitations of individual studies. They seem to offer "scientific precision' but arguably: "RCTs can never deliver on this precision because they operate on a false premise: that the social world is the same as the physical world" (Gale, 2017, p. 9).

## Individual Research Papers and Literature Reviews in Education

Teachers, as leaders of change in practice, may find a peer reviewed research journal paper that seems relevant to their current area of professional inquiry. Sometimes it may be a single empirical research study, but literature review papers are often useful as a good starting point for a professional inquiry. If you find and decide to engage with a single study paper further, the list of

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<sup>1</sup> <https://educationendowmentfoundation.org.uk/evidence-summaries/teaching-learning-toolkit/>

questions below are designed to help you to 'critically evaluate' the research, to identify its strengths and weaknesses and its relevance to your professional inquiry. In the case of a literature review paper, then question 4 must be expanded to consider the approach to selection and inclusion of studies as well as considering the quality and relevance of each study included in the review.

- 1) **What kind of publication is it?** Who is the author and what is their affiliation and role? Does it appear to be independent research? Does it appear to be peer reviewed in any way? Does the work use citation and referencing or otherwise make clear the research it is informed by? Is it on a university or government website for example .edu / .ac / .gov?
- 2) What is the **full Harvard style reference**? Write it down.
- 3) What is the **research question** or scope of the publication?
- 4) What **data collection method(s)** did the researchers use to collect their data? What were the strengths or weaknesses of the methods used? What other, perhaps better, methods could they have used to collect their data?
- 5) What **sample** (for example of participants) have the researchers used? What were the strengths or weaknesses of the sample, how could it be improved? What was the context of the study and how does it align to your educational setting?
- 6) What **ethical risks** did the researchers identify? Is there a convincing explanation of how the ethical risks were controlled? Do the researchers explicitly state that they gained formal ethical approval?
- 7) What was the **approach to analysis**? Is it clear how the researcher systematically analysed data to generate reliable findings? With qualitative research this should include a step by step explanation of the approach to coding and generation of themes.
- 8) What **significant contribution to knowledge** does the research make – new findings, development of theory or innovative methodology? Are the findings positioned with respect to previous research?
- 9) Overall, **explain any significant problems** with the researchers' conclusions or any important limitations to the research in relation to your professional inquiry?
- 10) What is the key **relevance** of this publication to your issue, context, argument and / or research project?

Applying these prompt questions to critically evaluate a research paper will initially be challenging, and individual teachers will benefit from collaboration with other interested colleagues and from partnership with a university-based research mentor. In reading research, teachers will need to give the researcher author a little benefit of the doubt over some technical aspects of research that are unfamiliar, and this seems reasonable if the paper is published within a peer reviewed journal. However, teachers should not underestimate the value of their own practical wisdom, developed through workplace learning in schools and classrooms. The aim is to engage in an open-minded power knowledge 'interplay' between the published research and your collaborative practical wisdom (Boyd & Bloxham, 2014; Boyd, Hymer & Lockney, 2015).

Some research papers will present clear and confident answers to the questions proposed here, others will seem weak in one or more areas. In reading and evaluating quantitative research a teacher will need to focus on design issues, as highlighted in the section on RCT studies, and rely to some extent on the peer review process to identify technical issues around statistical analysis. In reading and evaluating qualitative research the approach to analysis should be made clear within the methodology section of the paper, including the practical steps of coding and generating themes with reference to relevant methodological literature. The written presentation of analysis in qualitative studies is particularly significant because its transparency contributes significantly to confidence in the findings. As a reader you should be provided with considerable insight into the way that the researchers have interpreted illustrative quotations from the data. For an introduction to thematic analysis, which is a frequently used and flexible approach to qualitative data analysis, it is worth reading key papers by Virginia Braun and Victoria Clarke (2006, 2019) or, for a multi-media introduction, visit their website at the University of Auckland<sup>2</sup>.

Having emphasised the importance of a thorough approach to qualitative analysis it is worth mentioning an example of an influential qualitative research paper that pushed the boundary between systematic data analysis and professional judgment. In their study of primary teachers in Scotland, Bethan Marshall and Mary Drummond, analysed classroom video of lessons as part of a larger project that included teacher surveys and interviews (2006).

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<sup>2</sup> <https://www.psych.auckland.ac.nz/en/about/thematic-analysis.html>

They were focusing on the development of pupils as autonomous learners as a principle of developing assessment for learning in the classroom. They involved teachers and other teacher educators in the process of analysing and judging the video lessons and after a considerable effort using systematic analysis turned to Eisner's concept of 'connoisseurship' (1991). In the end they simply watched a lesson video and made a professional judgment to classify those lessons in which the teacher's observed practice appeared to capture the 'spirit' of assessment for learning, meaning that it included the underpinning learner autonomy principle (Marshall & Drummond, 2006). This is a useful example of a highly cited and influential qualitative research paper because it shows how professional evaluative judgment may become strongly embedded within qualitative data analysis. This is the ambition of many educational researchers who pursue collaborative practitioner research with schoolteachers, to co-construct knowledge with practitioners that is socially and contextually robust (Cochran-Smith & Lytle, 2009; Boyd & Ash, 2018).

Developing research literacy is an ongoing project for a teacher. I would argue it deserves some priority, but it will clearly have to fit into a work-life balance and professional development schedule of a busy teacher. Published research is increasingly being published open access online and there are also increasing moves to give teachers access to research. Some, but certainly not all, research papers seem to be written in impenetrable dense academic language. However, with persistence it is usually possible to gain some understanding, if only sufficient to reject the paper as irrelevant and move on.

A literature review, published in a peer reviewed research journal, is often a useful resource for the teacher to quickly gain a grasp of previous research on an issue. Unlike a systematic review, a literature review tends to focus on a topic rather than a specific question. It should explain the methods used to search and select relevant research and should evaluate the reviewed studies to provide a summary of the main findings and scope for further research. Such a review should be thorough but clearly there may be new research studies available, so the date of the review is significant.



## Policy and Professional Guidance in Education

It is difficult to judge an education policy text in relation to underpinning research. A single RCT was influential in justifying the inclusion of direct instruction on formal grammar into the Primary National Curriculum in England (Wyse & Torgerson, 2017). This RCT had no checks on the fidelity of the intervention, which appears to have been embedded grammar rather than direct instruction. The pre and post 'tests' consisted of a piece of first-person narrative and the project team, employing expert judges, found it difficult to gain agreement on grading. The sample was lower secondary school rather than primary school pupils, even though the study strongly influenced the primary curriculum document. Many education policy documents will claim, or at least imply, that they are 'evidence-based' but do not use academic genre of writing, including substantial citation and referencing, to demonstrate this explicitly to the reader.

In England the school inspection agency (Ofsted) has begun to publish research reviews as part of promoting an 'evidence-based' approach. A recent Ofsted review on teaching mathematics (Ofsted, 2021) was subjected to critical review in a paper published in the journal of the association of mathematics teachers. This review, written collaboratively by three academics and an education consultant, presents a careful critique which identifies four areas of weakness of the Ofsted review. These are that the Ofsted review: draws unwarranted causal claims from studies; Oversimplifies or overgeneralises the results of research; bases practice implications on poor quality studies; and omits substantial bodies of relevant research (Gilmore *et al.*, 2021). The authors conclude that 'the recommendations in such a report cannot be considered to be research-informed' (2021, p. 38). It is possible to shroud ideological purposes and agendas with reference to selected research findings and this seems to add a political element to teachers' research literacy (Helgetun & Menter, 2020).

Professional guidance texts will also often claim that they are founded on research evidence. However, to increase their accessibility to teachers and other school leaders they tend to avoid academic style, conventions and in-depth discussion of methodology and data analysis, that are found more generally in research journal papers. Often the author will summarise the findings of a body of research, which means they are giving their interpretation, and then draw their own view of implications for practice

from this. The teacher as reader has a challenging job in critically evaluating the evidence-based status of such professional guidance texts. To some extent teachers might rely on independent reviews to help them in selecting a professional guidance text, but they need to beware of authors congratulating each other on the back of each other's publications. In the UK, the Chartered College of Teaching, a membership professional association for teachers, is actively developing as a broker of research for teachers by publishing peer reviewed professional journal articles<sup>3</sup>, but is pursuing a difficult balancing act between the education research community, the blogosphere and school-based practitioners. The thriving 'blogosphere' for teachers, with increasingly high-profile bloggers who may be school-based, but may have shifted to full-time blogging, also publish hard copy texts that may seem on the surface to be scholarly. While many contributors across these networks claim that their professional guidance is underpinned by research, even with minimal evaluation this is often proves to be fragile. In addition, and adding further complication, there are considerable differences between academic researchers in education. It is important to note that Professors, such as myself, are just as human as bloggers and do live in a competitive world, with incentives to disseminate their research to increase citation and impact and promote sales of their books. Teachers should be particularly wary of commercial schemes that may come at a high price for schools and yet are based on publicly funded research that is available in published texts. It is important to ask if the commercial materials and/or training contribute sufficiently to the impact of the development in practice and to reducing the costs of implementing it compared to an in-house or network partnership project.

A more concrete example of professional guidance around an important aspect of classroom practice, that of 'dialogic teaching', will illustrate some of the dilemmas faced by teachers in selecting professional guidance sources. Research and professional guidance on the topic of dialogic teaching developed considerably from the first 2004 edition of Robin Alexander's slim volume, *Towards Dialogic Teaching*, now in its 5<sup>th</sup> edition, setting out a concise and convincing guide. This text was underpinned by critical engagement with research and the new editions reflected the ongoing research. It is important to note that the RCT research evidence base for impact of dialogic teaching

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3 <https://chartered.college/impact/>

on learning depends on the fidelity of the approach as an intervention and is promising but not substantial (EEF, 2016). Informed by recent research, Alexander has recently published a much more substantial professional guidance text (2020). Alternatively, to get a broader overview of classroom talk and dialogic teaching, Rupert Knight's book 'Classroom Talk' offers a scholarly critical review and practical guide for teachers (2020). A recently developing critique of dialogic teaching includes the claim that it over-emphasises classroom talk and proposes a material-dialogic approach that acknowledges the agency and voice of materials such as textbooks or concrete manipulatives (Barad, 2007; Hetherington & Wegerif, 2013). To complicate the issue of dialogic teaching further, there has been an ongoing debate around 'direct instruction' that is often characterised by a false dichotomy between direct instruction and 'inquiry-based' teaching. However, direct instruction generally is where '...the teacher is actively engaged in bringing the content of the lesson to pupils by teaching the whole class directly' (Muijs & Reynolds, 2018, p. 36) and includes a characteristic of 'interactive teaching' meaning whole class discussion facilitated by the teacher. The problem with the current fad for 'direct' or 'explicit' instruction, which seems a reasonable approach for some teaching during a school day, is when it is proposed as a general approach for all lessons, all curriculum subjects and for lessons where the aims include higher level conceptual learning and problem-solving, for example, in the confidently entitled book by a successful teacher blogger 'The Truth About Teaching' (Ashman, 2018). Well-established and effective approaches such as Japanese inquiry-based teaching of maths are dismissed as part of vague references to 'discovery learning'. The question is how compatible dialogic teaching is with direct instruction and how a teacher finds their way through the complex literature to decide on to what extent dialogic teaching should become part of their repertoire of strategies.

Critical evaluation of professional guidance texts is challenging. This is made more complex when engaging with teacher blogs and other online teacher network resources. Teachers need to look at the background of authors, together with independent reviews, as well as the claims and citation in the text itself. The term 'post-truth' was Oxford Dictionary word of the year in 2016 and is defined as: 'relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief'. In a useful and concise book on the topic, Lee McIntyre (2018) defines post-truth as: 'Facts are less important than feelings

in shaping our beliefs about empirical matters?’ McIntyre shows how post-truth is connected to changes in news media and the growth of social media but also to ‘science denial’ for example in relation to smoking causing cancer and carbon causing climate change. In an era of ‘post-truth’ it may be useful to consider how teachers and teacher educators might develop ‘responsive attunement’. It is too easy to get carried along with others, on social media or in a workplace, whereas ‘Responsive attunement entails... *responding* to the particularities and complexities of a situation on the basis of *tuning in* to others and things in the social and natural worlds, with reflexivity.’ (Dall’Alba, 2020, p. 32). Dall’Alba uses the term ‘tuning in’ to mean focusing in on what matters and how we might nurture such a capacity among students and teachers. A report based on survey data in the UK showed that a quarter of 8 to 15 years olds consider that a website listed by a search engine can be trusted and half of teachers felt school was not developing the level of critical literacy young people need (National Literacy Trust, 2018). The National Literacy Trust have developed learning resources for teachers to develop children’s critical literacy, teachers and teacher educators need to consider supporting this work (National Literacy Trust, 2019). All of us are potentially too strongly influenced by theory and research that seems to be common-sense, which may be referred to as ‘seductive theory’. The widespread demise of ‘foundation studies’ in initial teacher education programmes has implications for student teacher awareness of social justice issues (Hartlep & Bradley, 2015) but also perhaps means that they are less likely to develop an understanding of the big picture of educational research in relation to politics and democracy. Critical evaluation of professional guidance also requires teachers to ask questions related to their practical wisdom and current classroom practice: To what extent are we already doing this? What changes does it imply for our practice? What are we currently doing that we would need to stop doing to make this change?

It is difficult to develop, as part of research literacy, a strong grasp of this big picture of educational research and its value for informing practice in schools. It is worth some further reading and it seems appropriate to at least suggest some starting points here. To get an overview of the current zeitgeist, a perspective that is heavily influenced by cognitive psychology and convinced about the value of experimental research, an evidence-based approach that perhaps adopts a technical view of teaching, then it is worth selectively engaging with ‘Effective Teaching: evidence and practice’

by Daniel Muijs and David Reynolds (2018). However, to balance that and help you to adopt a critical perspective, you might read through Gert Biesta's well-argued philosophical text 'Educational Research: an unorthodox introduction' (2020). Biesta argues convincingly that teachers and teacher educators need to understand educational research in relation to politics and democracy and 'scientific evidence' as a social process.

## Conclusion

I have argued that education is a complex, interdisciplinary, and multi-paradigmatic field. Therefore, ways of knowing in education are more comparable to the field of mental healthcare than to the discipline of biomedicine. In deciding how to teach, teachers and other school leaders, as well as policy-makers, should place considerable value on teachers' contribution to knowledge generation through collaborative research activity, professional inquiry and the practical wisdom generated through evaluative practice. All stakeholders need to acknowledge the power knowledge 'interplay' between teachers' practical wisdom and public published knowledge, including theory, research, policy and professional guidance. Within that public published knowledge, experimental research including randomised control trial (RCT) studies and meta-reviews provide useful but limited sources of research evidence, alongside well-theorised and robust individual research papers including qualitative studies. Arguably, some teachers should be involved in co-creation of knowledge, through action research, preferably with a research mentor to guide them, or in collaborative practitioner research with professional researchers, who would normally be university-based. However, it is apparent that *all* teachers, and teacher educators, should develop a level of 'research literacy' that enables them to contribute to the critical evaluation of research publications as part of their professional contribution to leadership of change in practice. It follows that career development of teachers, including gaining formal leadership roles, should include a developing level of research literacy and that all teachers should have funded access to advanced professional education at masters level or beyond that includes development of research literacy. I have proposed a provisional definition of teachers' research literacy as: 'Demonstrating a reasonable understanding of the contested nature of 'ways of knowing' within the field of education, including appreciation of the

interplay between research and practical wisdom in deciding what and how to teach effectively, as well as practical skills in critically evaluating different sources of research evidence as an element of professional inquiry into practice'. I have argued that in a post-truth world a teacher's research literacy needs to include a critical perspective of the big picture, including an understanding of educational research in relation to politics and democracy and critical skills in interpreting professional guidance sources.

The nature and level of research literacy required by teachers clearly deserves far more development. In accepting that teachers' research literacy is a key area for development we are of course creating significant implications for the research literacy of teacher educators, based in both universities and schools, and for the content and pedagogy of teacher education. An accessible and useful overview that I would recommend to teachers and teacher educators is the concise professional guidance text 'Evidence-based Teaching' by Carey Philpott & Val Poultney (2018). To operationalise the concept of research literacy perhaps requires some of the infrastructure of learning outcomes and level descriptors as already exists in the assessment frameworks for well-developed masters level programmes for teachers that foreground practitioner research approaches. Further research and development is required to extend our understanding of teacher research literacy and to negotiate and consolidate a shared language for its discussion across the boundaries between schools and universities. Meanwhile, as a teacher, school leader, university or school-based teacher educator, education consultant, or as someone with influence on education policy, it is important to self-assess our own level of research literacy and consider how it might be further developed.

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