

RESEARCH AND TEACHER EDUCATION: THE BERA-RSA INQUIRY

THE CONTRIBUTION OF RESEARCH TO TEACHERS' PROFESSIONAL LEARNING AND DEVELOPMENT

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TABLE OF CONTENTS

Abstract	1
Introduction	2
The range of ways research can contribute	3
Types of research engagement	3
Teacher or researcher led	4
Key components	5
Specialist expertise	5
Peer support and professional dialogue	5
Enquiry oriented learning and the use of tools	6
Learning to learn from looking	6
Aspirations for pupils	7
Understanding why things do and don't work; the role of theory	7
Leadership	7
Proactivity	8
The contribution of research at different stages of teachers' working lives	8
Conclusion	8
References	10
Appendix 1 The source and nature of the evidence and reviews	12

ABSTRACT

This paper summarises findings from several systematic research reviews about the contribution of research to effective continuing professional development (CPD) activities and their impact on teachers' professional learning and outcomes for pupils. It starts with a review of how teachers engage in and with research as part of CPD, how teachers and researchers shape professional learning activities and identifies key processes linked to positive outcomes. Finally it explores how different research contributions can be developed to make a more visible contribution to CPD.

The paper highlights eight common characteristics of effective CPD, which are summarised here as:

- Sustained collaboration with professional colleagues, including both making use of specialist expertise and structured peer support for embedding specialist contributions;
- An understanding of and commitment to professional learning, including enquiry-oriented learning and learning to learn from looking;
- A focus on refining teaching and learning, working towards aspirations for specific pupils side by side with theory; and

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- Effective scaffolding and modelling of learning by both teachers and leaders for colleagues and for pupils.

It follows that researchers can make a positive contribution to CPD through the input of specialist expertise, while schools should look to harness the potential of peer support in order to motivate teachers and sustain their engagement with research. Furthermore, engaging in enquiry-oriented learning through observation of teaching and learning exchanges entails core research and professional learning skills. Masters programmes that develop these skills and capacities could usefully make the connection more explicit between research literacy and improving teachers' professional practice. Although the importance of refining teaching and learning processes and developing understanding of the underpinning theory is well established in academic circles, there is still a need to develop a shared language to enable complex notions such as 'theory' and 'criticality' to be more widely understood and valued by practitioners. New initiatives like Teaching Schools and the promotion of randomised controlled trials (RCTs) should be seized as an opportunity for modelling research-rich CPD for teachers, leaders and researchers.

INTRODUCTION

In the first part of the 21st Century, intense exploration of the evidence about effective Continuing Professional Development (CPD) and Continuing Professional Development and Learning (CPDL) has revealed a coherent, if challenging, international evidence base about the key elements of effectiveness. At the same time, the effects of austerity and of radical changes in the educational landscape in England are focusing attention on how to direct scarce resources. There are many approaches in education that are quite good. What the education system needs is to understand those that make the most difference. In the context of hard pressed resources and policies such as School Direct and Teaching Schools that promote localism and thus increase fragmentation, this paper attempts to make clear the evidence about highly effective professional learning that benefits pupils as well as teachers and the role of research within it. It does so with the aim of informing teacher policy and practice in the many new locations where these

are framed and determined; with the aim of connecting the exponentially increasing numbers of policy and practice sites with research.

To this end, the paper draws on a series of systematic reviews of research into effects of CPDL interventions for both pupils and teachers, and the contribution of research to such CPDL, synthesising evidence from:

- a PURR review (Practitioner Use of Research Review) of research about effective teacher engagement with the research of others and/ or their own research and its role in CPDL (Bell et al, 2010);
- a series of four reviews sponsored by the EPPI Centre (Evidence for Policy and Practice Information and Coordinating Centre) about effective CPD (Cordingley et al, 2003, 2005a, 2005b and 2007);
- a New Zealand Best Evidence Synthesis (BES) about effective CPD (Timperley et al, 2007); and
- a New Zealand BES about effective leadership contributions to teacher and pupil success (Robinson et al, 2009).

It also draws, occasionally, on more recent studies and interpretive reviews, where systematic reviews highlight relevant issues but do not explore them in-depth; for example, a large-scale review was commissioned by the then Teacher Development Agency (Buckler et al, 2009) to explore the evidence behind the planned Masters in Teaching and Learning (MTL). Its focus was relevant to this paper as it explored work-based professional learning. It was carried out quickly and within a much more limited resource base, so this paper draws on it mainly to illustrate key parts highlighted but not explained in depth in the other reviews. Figure 1 below illustrates the contribution of these reviews in graphical form.

A technical appraisal of the source and nature of these reviews and evidence can be found in Appendix 1.

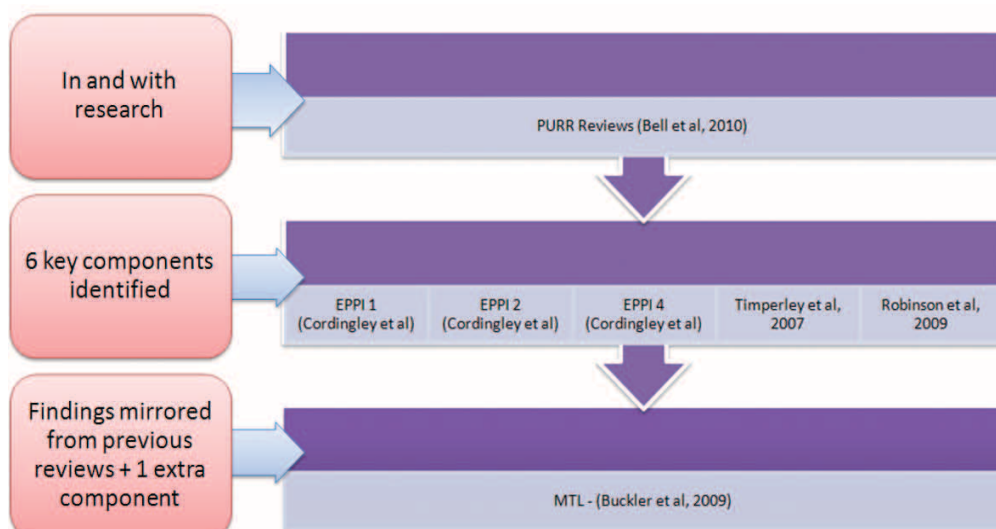


Figure 1

This paper will use the findings of these reviews to illustrate the key ways in which teachers engage in and with research as part of CPDL and how teachers and researchers influence and shape activities. It then draws together the key professional learning characteristics highlighted by these reviews that both enable effective professional learning and what is needed for the realisation of research's full potential contribution to teacher and pupil success. It concludes with reflections about the intensity of the links between different elements and research in relation to the content of the CPD and/or CPDL processes, and the extent to which researchers themselves or those who mediate research do or could build on these findings.

THE RANGE OF WAYS RESEARCH CAN CONTRIBUTE

The conceptualisation of teachers' relationship with research has a long and distinguished pedigree, for example in the work of Dewey (1938) and Stenhouse (1979). Stenhouse was hugely influential internationally and in England, asserting in 1979 that to engage with research, teachers need to engage in it. His focus on teachers investigating pedagogy through different ways of realising curriculum goals gave birth to highly effective curriculum and professional development by teachers through action research, and laid the foundations for the steady development from 1996 to 2010 in England of several waves of investment in research-informed practice. These ranged from the Teacher Training Agency Teacher Research Grants, the Department for Education and Skills-Funded Best Practice Research Scholarships and the National College Research Awards, to the more recent Government funding of R&D for Teaching Schools and National Scholarships for subject-based enquiry (Cordingley, 2013).

Notwithstanding Stenhouse's contribution to the growth of teacher action research, the empirical evidence from the systematic reviews of CPD explored here shows that there are a number of ways and contexts in which education research can and does contribute to effective teacher CPDL. In their review of research about use of research, Bell et al (2010) set out to map this range. In doing so they established a continuum of activity extending from teachers engaging with the research of others in ways strongly mediated by the researchers and/or CPD facilitators, to groups of teachers engaging in their own self-directed research. These modes were linked with extensive benefits for pupils and teachers, ranging from improvements in achievement, attainment and engagement for pupils and improvements in differentiation, willingness to experiment and expansion of the range of learning activities offered by teachers. There was also evidence that engagement in and with research was linked with an increase in teachers' readiness to and confidence about identifying the underpinning rationale for the new approaches being explored, that is, developing a practical theory about

different approaches to teaching and learning and specific pupils, or in their own context.

Bell et al (2010) highlighted the different role that research processes and evidence played in CPDL in different contexts, the extent to which teachers were involved in and/or with research, and the distribution of agency between teachers and researchers or CPD facilitators (illustrated in Figure 2). By engaging with research, the review was describing practitioners accessing publicly available evidence, interpreting it and adapting it, with support, to their own contexts. The review defined engaging in research as carrying out enquiries that:

- addressed a research question;
- analysed and reported systematically on the evidence collected;
- used instruments (observation and interview schedules, etc) to collect evidence that enables them to explore adverse as well as positive effects of an intervention/new teaching strategies; and
- analysed and reported the evidence from their enquiries publicly.

TYPES OF RESEARCH ENGAGEMENT

The systematic review process in the review of practitioner use of research, Bell et al (2010) identified three distinct groups of studies:

- Researcher-led, larger studies (academic studies). These involved researchers and teachers as joint participants in research projects designed by academic researchers. Although the teachers were active participants, the extent to which they were involved in designing and planning the intervention, and in data collection and analysis varied, as did the aims of the research. Category A
- Teacher-initiated small scale studies (TISS studies). These studies were reports of substantial practitioner research undertaken with specialist research support for the explicit purpose of improving practice and evaluating its impact. These studies were drawn from a number selected and quality assured for promotion nationally via the English National Teacher Research Panel. Category B
- Masters-based teacher enquiry (Masters-based studies). These studies were undertaken by teachers within a Masters programme with specific requirements about publication. This single cluster of Masters reports were distinctive in that the programme deliberately set out to develop teacher researchers to the point where they could conduct and write up research that could contribute to the wider public knowledge base. Category C

Effective teacher engagement in and with research spanned a range of methods. Some of the teachers in

the researcher-led Category A studies were involved in qualitative research while others used mixed qualitative and quantitative methods. Similarly, many teacher researchers collected and analysed both qualitative and quantitative evidence. The range of engagement is illustrated in Figure 2 below.

All the studies involved in Bell et al (2010) involved teachers engaging with the work of other researchers but this was not necessarily more prevalent in the researcher-designed studies. As Figure 2 illustrates, 11 academic studies focused teachers' attention strongly on practical issues of data collection. Researchers analysed the wider evidence to ground the study, leaving the underpinning evidence implicit to participating teachers. By contrast, Category B and C studies all involved explicit exploration of the research literature as a springboard for CPD.

Although Bell et al (2010) did not uncover any examples of studies that only involved teachers in engaging with the research of others, there were many examples of this in the effective CPDL reviews, where the process of learning from research involved coaching or other, similar, sustained support for professional learning to embed new research-based strategies.

The studies in the reviews are all linked with benefits for both teachers and pupils so there is no implication that one approach is more effective than another. The reviews simply flag up and start to map the different forms of activity that provide a context for engagement in and with research that is effective.

TEACHER- OR RESEARCHER-LED

Bell et al (2010) also explored how far engagement in and with research was determined by teachers or researchers; a notion of teacher agency represented by the second axis in Figure 2. At one end, researchers planned, analysed and reported the research and involved practitioners actively in implementing interventions, collecting data and reviewing findings from the academic researchers' data analysis (Category A studies): a process that offered extensive support to teachers, often via enquiry-rich development activities.

At the other end of the spectrum, activities explored were wholly practitioner-planned, implemented, analysed and reported. In the teacher-initiated and directed studies a range of support was drawn down by the teachers involved, from diverse sources including Higher Education Institutions (HEIs), Local Authorities (LAs) and specialist organisations. In the Masters-based studies, the guiding hand of the HE tutors and the design of the programme are evident in the consistencies between the authors' methodologies.

Whilst the nature of the support varied between studies, the processes were similar. Practitioners designed and undertook data collection through different methods, usually including observation; review of practice through the resulting evidence, iterative, evidence-based refining of approaches; and finally, analysis and reporting.

The suggestion is not that agency is best located in the hands of either teachers or researchers, simply that there are choices to be made, depending on purpose and context. Nonetheless, Cordingley et al (2007) explores

the contribution of specialists to CPD, highlighting the important role that specialists (often researchers) have in scaffolding the growth of independent learning amongst teachers. This raises interesting questions about balancing the engagement of teachers as co-constructors of large-scale research projects (which increase their sense of connection with academic research) against the risks of reducing their direct engagement with the wider evidence base and underpinning theory.

Having mapped some of the parameters of teacher engagement in and with research as part of CPDL, the paper now goes on to explore what is involved in more practical terms.

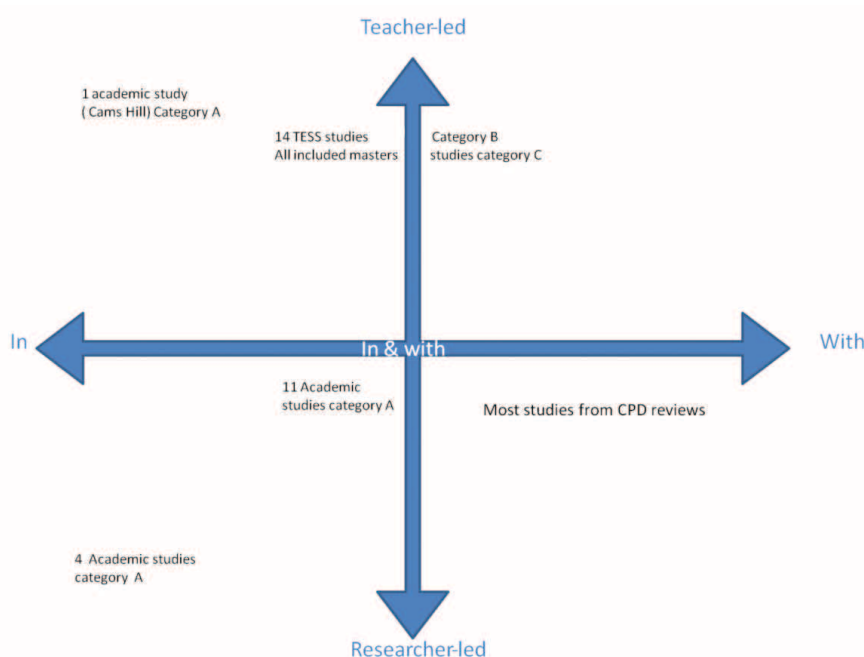


Figure 2

KEY COMPONENTS

The research-informed CPDL and support highlighted by all these systematic reviews as being effective tends to comprise a combination of experiences. It is often accorded a specific title and the labels vary, ranging from a mixture of specialist and collaborative coaching, through collaborative enquiry, action research, teacher conferencing and research lesson study to, more recently (Hargreaves, 2010), joint practice development. The names may differ but the practices cohere. Each characteristic of effectiveness relates closely to the research process and/or to explicit use of others' research.

In short, the combination of interactive contributions to effective CPDL highlighted by the reviews involves teachers in:

- making use of **specialist expertise**, including expertise in the form of research evidence; using evidence and expertise to support planning in particular;
- giving and receiving structured **peer support** using collaboration, especially reciprocal risk-taking and professional dialogue, as core learning strategies;
- Sustained, **enquiry-oriented learning** over (usually) two terms or more supported by **use of tools** and protocols to discipline learning and secure coherence and progression;
- **learning to learn from looking** through exploration of evidence about pupil outcomes and from observing teaching and learning exchanges especially those involving experiments with new approaches;
- **using aspirations for specific pupils** and evidence about their learning as a driver for development;
- focusing on **why things do and don't work** in different contexts to develop an underpinning rationale or practical theory alongside practice;
- seeking out **leadership support** – time/encouragement/modelling - including specialist coaching and engaging in enquiry-oriented approaches to development; and
- **proactivity** – actively **seeking out specialist and peer support** and taking responsibility for creating and taking opportunities for professional learning within day-to-day school life.

These experiences, skills and support mechanisms are explored in more detail in the following section to clarify the different ways in which they contribute to the relationship between CPDL and educational research, demonstrating the importance of this relationship and illustrating how research can inform and improve professional, and hence young people's, learning.

SPECIALIST EXPERTISE

Specialist expertise is ever-present and serves a range of functions. Teachers who are involved in effective

CPDL use specialist advice or information to identify strategies that address their concerns and aspirations for pupils: research is clearly an authoritative source of such expertise. Teachers in the studies explored (and more usually schools acting on their behalf) sought specialist expertise for illustration of new approaches and phenomena in action and help in unpacking what did and didn't work well in their early experiments. They also use specialist expertise to provide the scaffolding that helps them take control over their learning about new approaches. The reviews suggest that such specialist support is usually drawn from colleagues who sit outside day-to-day routines, the immediate school environment and accountability systems. This suggests that providing objective information about alternative possibilities and current realities, challenging orthodoxies and creating a sense of planned purpose for experimentation and risk-taking are all roles that researchers and others who are knowledgeable about research findings and processes are well placed to provide.

PEER SUPPORT AND PROFESSIONAL DIALOGUE

Peer support is also omnipresent in the studies included within the research analysed here. It is recognised as making an important contribution to embedding new practices (including practices from research) introduced by others in day-to-day practice and providing practical and emotional support through shared risk-taking. The shared risk-taking associated with peer support of this kind is frequently reported as helping teachers persist in using new, challenging approaches from research or from other sources because they don't want to let each other down. This evidence suggests strongly that sharing the risk of looking silly, as teachers abandon familiar routines to try something new, helps them to trust each other quickly.

Interestingly, peer-supported CPD is shown in the reviews to work as well for conscripts as for natural enthusiasts (Timperley et al, 2007; Cordingley et al, 2007; and Bell et al, 2010). The process of determining with a partner how to tackle new approaches and coming together regularly to offer each other an ear and moral support is an effective catalyst for ownership of professional learning, however it is initiated.

Reviews also highlight collaborative enquiry and problem solving. In the studies underpinning the reviews, working with trusted colleagues created a meaningful context for teachers in making tacit practices explicit, expanding their sense of what is possible and increasing their self awareness through requiring them to put themselves in the shoes of others. This approach significantly expanded the opportunities for professional learning-focused dialogue. But professional learning conversations that focused simply on analysing current practice and those not rooted in evidence from experimenting with new approaches were not linked

with benefits for students (Cordingley et al, 2007). These particular features of peer support appear to help teachers to move on from the, as Desforges (2003) puts it, 'pull of the status quo'.

Although peer support is less explicit in its links to research than some characteristics of effectiveness, it emerges strongly as a key approach to motivating teachers to persist in engaging in professional learning and development and thus with research processes and/or findings.

ENQUIRY-ORIENTED LEARNING AND THE USE OF TOOLS

Tools emerge from the studies in the reviews, particularly from Robinson's review (Robinson et al, 2009), as facilitators of learning in the context of CPDL, and research dissemination itself. For example, Leat and colleagues (2008) have focused on developing tools for coaching which teachers can internalise and use to 'experiment, assess consequences and talk about their practice and knowledge'. These might include the development and use of, for example, learning agreements and questioning frameworks as prompts to help teachers plan their own learning and create structures for sustaining coaching-based CPDL. Learning agreements which capture the goals and learning contributions of specialist coaches and teachers help to address the power disequilibrium. Used in combination, well-structured agreements and frameworks help to create an environment for exploring new possibilities and challenging previously held beliefs. They involve taking control of the process of inviting others into their learning and have an important role in helping teachers and researchers to bridge the differences that flow from their different roles and warrants for action.

Equally in leadership practice, Spillane (2006) looks at tools such as student data, observation protocols and students' academic work as the mechanisms that help leaders secure depth and consistency as they and their colleagues strive to balance strategic goals and actions for improvement. Robinson et al (2009) builds on this with her analysis of the role of 'smart tools' as a means of 'incorporating useful knowledge that can help teachers improve their practice in relation to a specific task'. She identifies five design criteria, each with its own evidence-based rationale to help school leaders use evidence to reinforce and systematise professional learning. Research evidence and theory both feature as things school leaders need to take into account when choosing tools.

The way time is organised represents one of the most visible tools. The time needed to sustain enquiry-oriented learning in order to secure coherence and impact on pupils depends on the learning distance to be travelled.

But engaging in and with research, in ways that secure benefits for both teachers and pupils, is not a quick fix. All of the research indicates that significant improvements depend upon elapsed time as well as having enough of it and that more time secures greater depth; later reviews reported significantly improved student outcomes when teachers participated for at least one year (Timperley et al, 2007).

LEARNING TO LEARN FROM LOOKING

The research reviews about effective CPDL point towards the importance of opportunities to observe and analyse multiple teaching and learning exchanges, to identify strengths and to visualise what progress in embedding and interpreting new approaches from research or other sources will look like. This review finding is importantly elaborated by Gallimore and Stigler (2003) who pose the question: "How will teachers ever be able to envisage and implement alternative practices if they seldom see any? Seeing that something can be completely different is one of the most effective ways of opening eyes to the ubiquity of cultural practices and creating the circumstances for change." They go on to cite Bandura's acknowledgement that "a general principle of behaviour change theory is that acquisition of complex competencies depends on opportunities for observational learning" (Bandura, 1977).

The reviews also point to the importance of learning how to learn from looking; suggesting that observation for learning is different from tourism or monitoring and depends upon clarity about a focus on learning as well as teaching, clarity about teachers' aspirations for their pupils and a willingness to explore the principles underpinning the practices teachers are exploring, as well as their surface features, in order to enable them to transfer learning between contexts. Collecting and using evidence for professional learning rather than for making a judgment, a type of 'Evidence for Professional Learning' (EfPL) (Cordingley, 2011), helps teachers move forward effectively in their development. Observation when coupled with structured, collaborative co-coaching or shared analysis of data within action research allows the teacher to observe and gain support in reviewing practice. It also acts as a catalyst for analysis and reflection on how professional development and enhanced practice connect with pupil learning experiences and outcomes.

Research skills like the careful identification of research questions, the selection of a sample (for example, of pupils to focus upon in early experiments), designing data collection tools and observation frameworks are all closely related to the skills highlighted in these reviews as important for teachers to develop if they are to benefit fully from opportunities to observe teaching and learning in practice as part of CPDL.

ASPIRATIONS FOR PUPILS

The fifth review in the series used for this paper, Timperley's BES (Timperley et al, 2007), was the first to look closely at the importance of focusing in depth on pupils' needs during the professional learning process. Her proposition is that to engage in professional learning that has a positive impact on pupils' learning, teachers have to learn how to specify what they need to know, understand and be able to do to support their pupils towards the learning outcomes they and their schools are seeking.

Subsequent reviews elaborate this point, highlighting the importance of taking as a starting point for teacher learning their aspirations for their pupils' learning. It needs to work forwards from current outcomes towards future ones enhanced by CPDL. This helps teachers to focus in different learning cycles on sub-sets of pupils and to identify the evidence they need to collect and engage with through coaching or enquiry conversations in order to make connections between the two. Implicit in the reviews are synergies between the tasks of identifying the potential impact of new strategies on learning experiences and outcomes and then tracking them, and the design and use of data collection instruments; important processes that sit at the centre of most research methods courses.

This is important since most models of professional learning and development focus on the teaching strategies being developed and/or the content of the learning. As Timperley points out, "Teachers need sophisticated assessment skills if they are to identify (i) what their students know and can do in relation to valued outcomes and (ii) what further learning they themselves need if they are to assist their students in learning. Assessment of this kind cannot take place outside of the teaching-learning process—it is integral to it... and goes well beyond standardised assessments". In this sense CPDL depends upon and develops enquiry and in-depth assessment skills.

UNDERSTANDING WHY THINGS DO AND DON'T WORK; THE ROLE OF THEORY

Evidence from the second EPPI review (Cordingley et al, 2005a) found, at the time controversially, that reflective practice rooted in exploration of the status quo and divorced from evidence about how teacher and pupil learning interacts is not linked with benefits for pupils.

Later reviews point to the importance of exploration of evidence focused on understanding why things do and don't work in similar and different contexts, in order to build an understanding of the underpinning rationale for key approaches and the nature of their pupils' learning. As Timperley et al (2007) put it, CPDL "involves grounding learning in the immediate problems of practice...and engaging existing theories of practice

on which to base an ongoing inquiry process". Similarly, Bell et al (2010) suggests "when research engagement involves more than one practitioner, application of research to existing standards and contexts is richer.... As the number of teachers expands, so does the number of working contexts and the relevance of working standards. In these situations it becomes more important to identify key principles and the underlying theory in order to adapt research findings from elsewhere or from micro-enquiry safely".

Robinson et al (2009) underlines this point by highlighting the need for leaders to engage teachers with theory to explore theories held by teachers and make them explicit in order to change or challenge them. She argues that only once the theory behind an approach is made explicit can teachers evaluate its worth in relation to the alternatives. This echoes the need to study classroom practice and map the outcomes against practitioners' present theories.

LEADERSHIP

Given that we now have a detailed picture of what is needed for effective support for, and progress through, professional learning in schools, the next question is what is known about how schools and their leaders do and don't structure support for such CPDL. Robinson et al (2009) helpfully identifies five different leadership activities linked with pupil success:

- setting challenging expectations;
- leading teaching, learning and the curriculum;
- establishing an orderly environment that promotes learning;
- strategic resourcing so that all activities align around key priorities; and
- promoting and modelling professional learning.

Although use of research, theory and involvement in research processes do not feature at headline level in this review, they are strongly present in the evidence about professional learning in all the ways described above, and in the section on the use of tools. This is significant in the context of relative effect sizes. The effect sizes for these contributions range from .24 to .84 and the correlation for the most powerful contribution is twice that of the next nearest. Interestingly and importantly, it is the promotion and modelling of professional learning, with its attendant emphasis on enquiry-oriented learning that connects leadership evidence with research, that is linked with the biggest effect sizes.

Timperley (2007) suggests that for professional learning to be effective it needs to occur at three inter-related and parallel levels: student, teacher and organisation. She argues that effective leadership of CPD of this kind involves goal setting, enacting, monitoring and adjusting at each of the three levels.

Bell et al (2010) also began teasing out the role of school leaders in both enabling and inhibiting teacher engagement in and with research, pointing in particular to the importance of explicit leadership interest in and support for engagement in and/or with research.

PROACTIVITY

Although not a systematic review, or a cornerstone for this paper, a review undertaken for the then Teacher Development Agency in its early scoping of the introduction of a Masters in Teaching and Learning (Buckler et al, 2009) crystallises the way evidence about professional development and professional learning come together. Much of the evidence focused on work-based professional learning reinforces key messages from the CPD evidence about key forms of support and provides a mirror image of the evidence about CPD itself, thus reinforcing the evidence about the role of both research findings and processes in contribution to effective CPDL. This evidence highlights the importance of teachers taking an active role in their own learning. Taking such responsibility involves setting out to understand connections between practice and theory and drawing on multiple sources of knowledge and evidence, including research and scholarship. It also involves teachers seeking out specialist expertise from others including researchers and contextualising new understanding through being curious about expertise, experimenting with modelled behaviours in their own context and comparing their own and modelled expertise.

THE CONTRIBUTION OF RESEARCH AT DIFFERENT STAGES OF TEACHERS' WORKING LIVES

The research underpinning this paper provides no empirical evidence in response to BERA's question about differences in the benefits of using research to promote professional development at different stages of teachers' working lives. Nor does it provide evidence that the key components of effective engagement in and with research varied significantly across career stages; instead what emerges is a coherent shape to CPDL across the professional life course. Effective schools facilitate the key elements of CPDL for teachers at all career stages; less effective schools invest more heavily in specific contexts such as entry to the profession and the early years of practice or when teachers are struggling to meet pupils' needs.

However a more recent interpretative review that compared evidence about teachers' and leaders' professional learning (Bell et al, 2012) did highlight that effective professional learning for those in leadership roles was linked with a number of additional factors, including:

- greater emphasis on external sources of peer support;
- flexible non-linear programmes;

- careful identification of starting points and recruitment; and
- the use of standards as a framework for strengthening the leadership of learning (Bell et al, 2012).

Analysis of evidence from the reviews about how the structures shaping different stages of teachers' careers affect engagement in and with research revealed some distinctions, especially with regard to initial teacher education and induction. Here, opportunities to learn from looking are more prevalent. Trainees and newly qualified teachers are expected, often entitled, to carry out observations of experienced teachers. But this is not an expectation of those who have completed their induction year. It is only as teachers take on leadership roles that observation of other teachers is likely to become an expectation of their role. At this stage, the focus of observation is generally not on the learning of the observer but on monitoring practice. In general, although observation features strongly in teachers' professional lives and learning, it usually takes the form of being observed and receiving feedback from others.

Individual surveys do point to interesting questions here. For example, a survey of over 3,000 teachers carried out by the English National Teacher Research Panel (NTRP, 2011) suggests that interest in using research seemed to be less for those in the early stages of teaching than for those who have had more experience, as only a small proportion of respondents had been teaching for less than four years. Interestingly, Advanced Skills teachers were second only to supply teachers as being unlikely to use research or to access research summaries on a regular basis. Heads and deputies were more likely to access research than those without a leadership position. Unsurprisingly, those most likely to use and access research regularly were teachers on Masters programmes or studying for a PhD, but again there was no sense that teachers participating in such programmes would be at a particular point in their career. Overall, whilst the evidence for this paper reveals some interesting outliers, it does not reveal any significant differences in the contribution of research at different stages in teachers' lives.

CONCLUSION

The strong and coherent empirical evidence underpinning this paper provides a platform for promoting engagement in and with research by teachers as part of CPDL. It also demonstrates the benefits of using research, alongside evidence about pupils' learning and teachers' aspirations for their pupils, to identify content and direction for CPDL. In effect, the eight core characteristics form eight research-based principles for shaping effective support for CPDL.

Although the connections between research processes and findings and some core elements are explicit

and part of the traditional contribution of Academe to CPDL, others are less usual or, sometimes, less widely accepted, so there is scope for further development.

Research findings and the work of researchers in supporting professional learning has grown considerably in the United Kingdom in principle and practice (Cordingley, 2010) since Hargreaves' Annual Lecture to the TTA in 1996 (Hargreaves, 1996). But there is plenty more to do. Perhaps conceptualising the researchers' contribution to CPDL as specialist expertise has a useful role to play in helping teachers and schools relate research to their growing awareness of the importance of internal expertise, thus making use of research feel like part of their professional world. Using the evidence in this paper to ensure teachers, school leaders, researchers and CPDL facilitators all understand the importance of building on research findings about content and learning through research processes may have the effect of helping schools to recognise and be more confident in drawing specialist expertise from research.

Whilst structured peer support, professional dialogue and strengthening proactivity in professional learning and development may seem beyond the remit of researchers, this paper highlights the important role that CPD facilitators, including researchers, have in developing growing independence amongst teachers and the way harnessing peer support could motivate teachers to sustain their engagement with research.

Sustained, enquiry-oriented learning is part of the research world's traditional approach to supporting CPDL which is increasingly being used. However, what may not yet be being used to its potential is the development and mediation of research-based tools to sustain and embed CPDL within day-to-day practices and provide coherence.

Opportunities to observe and analyse multiple cases of teaching and learning exchange are an implicit part of many modes of practitioner research. The disciplines of designing coherent research projects have the potential to develop the skills needed to make such processes meaningful and effective in supporting depth in learning. Perhaps the risk is that the virtues and applications of research skills are too implicit? Some Masters programmes approach research skills as self-justifying. A focus on the way they help teachers manage other demanding aspects of their role and take control of their CPDL might be helpful in creating interest in research skills at scale?

The contribution of research to developing understanding of the underpinning rationale for different

approaches or practical theory is well established within the Academe. But its role and contribution is much less widely recognised amongst teachers and schools where at its worst there is a 'tyranny of common sense' (Cordingley, 2010). Concepts like criticality which make an important contribution to the development of such understanding may seem like self-justifying virtues to researchers, but their purpose is less apparent to teachers who may instead be alarmed by what appears to be unnecessary and possibly even dysfunctional negativism. There is work to do in developing a shared language for and about CPDL that includes a role for theory and criticality.

Robinson's BES (2009) is not yet widely known or understood. It represents an important bridge between different bodies of evidence and theory about CPDL and the contributions of research, school leadership and school improvement. Researchers, and research-based CPDL facilitators, are learning to work with and through research-interested school leaders and to awaken such interest amongst those who have taken other routes to leadership. The evidence in this paper should prove helpful in convincing them about the potential contribution of research to pupil, teacher and school success and about the power of their own modelling of research-informed CPDL.

But practice and evidence from empirical studies of effects and systematic reviews of such research work to different rhythms. Evidence necessarily lags behind practice. As noted at the start, the introduction of Teaching Schools and School Direct are making significant and sparsely funded changes to initial and continuing professional learning whose impact is, as yet, untracked. Some of these changes are potentially helpful to securing a position for research within initial and continuing professional learning of the kind highlighted here. The requirement for Teaching Schools to engage in research & development work is raising the profile of teacher engagement in research. There is also an increasing emphasis on carrying out randomised control trials (RCTs) to gain evidence about effective teaching interventions. For example, the Education Endowment Fund (EEF) is funding a large number of RCTs, and the National College for Teaching and Leadership (NCTL) is attempting to build capacity for and interest in connecting teaching and research through funding RCT-style trialling of interventions to Close the Gap across 740 schools, involving schools in both qualitative local research and larger scale meta-analyses of rigorous data. Perhaps in three years' time a paper of this kind will have a much more direct and larger scale evidence base to build upon, and schools themselves will be much more confident and expert users of research and researchers?

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APPENDIX 1: THE SOURCE AND NATURE OF THE EVIDENCE AND REVIEWS

Internet access to research, new methodologies for systematic reviews, and practitioner and government interest in research-informed teaching all combined with a growing interest in the quality of CPD in the UK in the early 21st Century. The Centre for the Use of Research and Evidence in Education (CUREE), The National Union of Teachers, the General Teaching Council and later the Teacher Training and Agency and Department for Education and Skills all provided financial and practical support for a series of five linked systematic reviews of research about the impact of CPD and the nature of practitioner engagement in and with research (Cordingley et al, 2003, 2005a, 2005b and 2007 and Bell et al, 2010). The reviews used the methodology for systematic reviews developed by the EPPI and involved usually double blind:

- systematic, comprehensive searching of identified databases for studies relating to explicitly identified questions;
- filtering of studies first on abstracts and then on scanning of full reports against review questions and criteria;
- further filtering for additional questions about evidence weight;
- data extraction of evidence from the studies offering high and medium quality evidence for the review question and the researchers' own question using transparent sub-questions;
- a bespoke project data base;
- analysis and synthesis of the resulting data;
- testing of the findings and their implications with appropriate stakeholders; and
- rigorous peer review.

Timperley et al (2007) followed similar but more exacting protocols and involved collecting and re-calculating effect size data, and more detailed and demanding stakeholder sign-off for all key stages in the process.

A large-scale review was commissioned by the then Teacher Development Agency (Buckler et al, 2009) to explore the evidence behind the planned Masters in

Teaching and Learning. Its focus was relevant to this paper as it explored work-based professional learning. It was carried out quickly and within a much more limited resource base, so this paper draws on it mainly to illustrate key parts highlighted but not explained in depth in the other reviews.

The resulting evidence is surprisingly consistent and coherent across all these reviews. Common and substantial benefits for pupils are linked to CPD that is both research-informed and rich in research-related processes. These include improvements in: achievement and attainment, behaviour, attitudes to subjects which pupils had previously been wary of and their ability to organise themselves, collaboration with others and selection of appropriate learning strategies.

Benefits for teachers from participating in research-rich CPD activities include improved knowledge of subjects and teaching and learning strategies, willingness to innovate and continue learning, improved confidence and skills in matching teaching and learning strategies with individual needs, and confidence in embedding strategies highlighted as high leverage by research in their day-to-day practice.

Both Timperley et al (2007) and Bell et al (2010) not only reinforced the earlier findings about the benefits to both learners and teachers of research-rich CPD, they also identified conditions that foster teacher learning linked with pupil achievement and those conditions that present obstacles to such learning, highlighting the contributions of school leaders and broader school learning environments. So a final piece in the jigsaw explored here is the BES by Viviane Robinson (Robinson et al, 2009), which identified five key leadership activities that are linked with pupil achievement, most importantly the promotion and modelling of professional learning by teachers. Robinson's review also highlights the importance of an underpinning evidence-based rationale for CPD programmes and support. In particular she emphasises the importance of: leaders selecting teaching and learning interventions, and linked CPD, on the basis of good research evidence about likely impact; the intellectual and practical demands being made on participating teachers; and the use of underpinning theory to help teachers interpret strategies and make informed adaptations for context.



This paper has been commissioned as part of a major Inquiry undertaken by BERA and the RSA on the role of research and teacher education. The Inquiry aims to shape debate, inform policy and influence practice by investigating the contribution of research in teacher education and examining the potential benefits of research-based skills and knowledge for improving school performance and student outcomes.

To investigate the contribution that research can make to teacher education, seven academic papers have been commissioned from experts in the relevant fields: international and UK policy and practice on teacher education; philosophical reflections on the nature of teachers' professional learning; innovative programmes of initial teacher education based on the model of research-informed 'clinical practice'; the role of research in effective continuing professional development (CPD); the impact of research-based teaching on school improvement and student outcomes; and research engagement from the teacher's perspective.

Further information on the Inquiry and its other outputs can be found via the BERA website: www.bera.ac.uk