Wales Centre for Public Policy
Canolfan Polisi Cyhoeddus Cymru

# Promoting Teacher Engagement with Research Evidence

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# Summary


- It is generally accepted that teaching is the most important school-level factor that influences pupils' attainment, and evidence points to a link between high quality teaching and practitioners' ability to engage with and use research.
- The Centre was asked by the Cabinet Secretary for Education to review the evidence on how best to support teacher engagement with, and use of, research. We conducted a review of key literature and presented this, alongside a map of existing activity in Wales, to a group of stakeholders.
- Wales is not alone in facing the challenge of seeking to increase teacher engagement with and use of research. Despite this, there has been little evaluation of interventions that seek to do this. Overall the available evidence is mixed and of poor quality.
- However, it is possible to draw conclusions from the broader literature on encouraging evidence use: simply providing access to evidence is ineffective; programmes designed to increase skills need to address motivation as well as capability; interventions that support unstructured interaction are ineffective; changes to standards and policies need to be supported by measures to address skills and access to evidence; and initial teacher education and training has a vital role to play.
- The Welsh education system has many of the features that evidence suggests contribute to a research-engaged education system. Experts raised concerns about the provision of professional development, and the quality of evidence and resources being accessed; uncertainty about capacity in the existing workforce to critically reflect on and engage with the evidence base; and uncertainty about the respective roles of the Welsh Government, the regional consortia and schools in delivering the necessary change.
- While the evidence does not provide a blue-print for a coordinated national programme to support teacher engagement with research, clear messages emerge:
    - Clearly define the desired behaviour. A long term vision for the workforce has been outlined, but what are the expectations of teacher practice in the short term?
    - Pursue multiple interventions. Providing access to evidence is necessary but insufficient. Teachers and schools need support to translate this into practice.
    - Integrate efforts into existing processes and structures. Any efforts should be integrated into the wider programme of reform of the education system in Wales.

# Introduction

There is broad consensus that teaching is the most important school-level factor influencing student achievement. One aspect of professional practice that is increasingly linked to high-quality teaching is practitioners' capacity to engage with, understand, and apply evidence-based knowledge in their lessons and pedagogy.

In Wales, this is well recognised. The Welsh Government's action plan – Education in Wales: Our National Mission – articulates an aspiration for the teaching profession to be *"research-engaged, well informed and learning from excellence"* (Welsh Government, 2017a, p.11). Indeed, the new curriculum being developed in Wales is predicated on teachers accessing and using the best available evidence to tailor their teaching to the needs of their pupils.

The Centre was asked by the Cabinet Secretary for Education to review the evidence on how best to support teacher engagement with research. Working with colleagues at the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI Centre) at University College London (UCL), we have:

- Reviewed and synthesised what is known about what works when seeking to improve teacher engagement with, and use of, evidence.
- Started to build a picture of existing initiatives in Wales (particularly at national and regional level) that seek to improve teacher engagement with, and use of, evidence.
- Provided some suggestions for how teacher engagement with, and use of, evidence can be supported and improved in Wales in the short, medium, and long term.

The first section of the report briefly sets out some of the broader issues that should be considered when seeking to develop policies and practices to encourage teacher engagement with, and use of, research, including different forms of evidence. Next, the report presents the results of the evidence review, focusing first on the evidence from the field of education and then the social science literature. Then the report details the implications for the eight intervention types identified. Finally, based on the review of the available evidence, and the current Welsh landscape, we reflect on the implications for efforts to enhance teacher engagement with research in Wales.

# A note on 'teacher engagement with research'

This review has focused on how to encourage teachers to use research-based evidence, but there are different types of 'research-based evidence' that can usefully inform practice, and different ways in which teachers might 'use' research-based evidence. Any attempt to improve engagement with, and use of, research should be designed with these differences in mind, because they point to intended outcomes that could look dramatically different.

The different forms of research-based knowledge that might be useful to education practitioners include:

- **Internal research.** Research evidence produced locally by practitioners and intended for local use involving the systematic and intentional study of their own professional practice, including evaluation into the impact of practice changes made in response to research evidence on outcomes for pupils. This can include participatory action research and other variants of teacher inquiry (Cochran-Smith & Lytle 2009).
- **Administrative data and statistical analyses.** Evidence derived from routinely collected school-level data from school management information systems, such as progress/attainment data and in-school observations of teaching and learning (Marsh 2012), or national-level datasets such as the National Pupil Database, an amalgamation of different datasets holding a wide range of information about learners who attend schools and colleges. This work can thus be conducted internally and/or externally.
- **External research.** Publicly available, scientifically-based research produced by academics, government departments and others in the form of: primary and secondary research; evidence synthesis[1]; evidence-supported programmes or strategies; and guidance development (e.g. EEF's Guidance Reports).

As this implies, teachers can engage with and use evidence in different ways, and increasing research use could entail encouraging a range of behaviours. For example it might mean encouraging teachers to:

- be research literate;

[1] Research synthesis can take different forms, for example systematic reviews or meta-analyses of published research; or 'toolkits' or other initiatives that use research evidence to rank or rates interventions according to their impact.

- actively participate in external research;
- adopt reflective practice techniques;
- purse action research; or
- adhere to what research suggests is ‘best practice’.

In practice, the ways in which teachers and schools access and use evidence blurs the boundaries between these and often they are used in combination. So, for example, analysis of administrative data may identify issues that encourage a school to access and interpret external evidence, and to undertake an examination of local practices.

For the purposes of this review, the differences between types of evidence and types of ‘use’ become significant when considering how to design a programme of activity to support ‘evidence use’. Different definitions will influence the kinds of outcomes that are desired or expected from intervention strategies, and shape how the process is promoted. For example, the strategies that are necessary to enable evidence-informed teaching practices to become routinely embedded within day-to-day activity are likely to be different to those enabling use of teachers’ action research in decision-making.

# What Does The Education Literature Tell Us About What Works?

We undertook a review to identify and synthesise what is known about what works when seeking to improve teacher engagement with, and use of, evidence. This drew together relevant evidence from three bodies of literature: effectiveness studies (direct evidence of impact), prior reviews on this topic (indirect evidence from the wider education literature), and a recent review of reviews (indirect evidence from the wider social science literature). Further information on the review methods are presented in Annex 1.

The literature on encouraging research use in the education field identifies eight types of 'intervention':

- **Professional development** interventions are designed to upskill teachers and equip them with information literacy and research methods skills, such as the capacity to conduct their own inquiries, apply research evidence, and implement evidence-based practices and programmes. Some also aim to build collective capacity in this area. Various models of professional development exist, including those providing access to dedicated websites, direct consultant support and helplines.
- **Intermediaries** translate evidence to make it more accessible. They can take a variety of forms, from stand-alone web-based resources, to comprehensive support systems with teams of intermediaries playing a range of brokerage roles. Examples include online matchmaking services; school-based programmes led by specialist leaders; Clearinghouses; and portals such as the Mapping Educational Specialist knowHow (MESH) initiative.
- **Repositories** provide a location and focus for the collection, preservation and dissemination of research outputs and information. They differ from 'intermediaries' in that the latter undertake some form of translation to make the research more accessible. Providing access to reviews and/or primary studies, they often allow searching by sector and country, and include specialist collections (e.g. Campbell Collaboration library) and major commercial databases (e.g. ERIC).
- **School-university partnerships** are based on a collaborative model aimed at strengthening the links between researchers and research users, improving the flow of information and ideas and supporting the use research to inform and enhance education practice. They differ from the conventional ways researchers and

practitioners work together in traditional research projects in that they are often long-term partnerships (over one year), focus specifically on problems of practice, and use intentional strategies to foster partnership.

- **Communication strategies** include traditional approaches to communicating research, such as via peer-reviewed journals and conferences, as well as a variety of newer technologies and communication channels that are available to connect researchers with the target audience, including social media. A key aspect of these tools is that they are researcher-driven, with limited or no direct interaction between the researcher and the target audience.
- **Networks** provide formal or informal opportunities for individuals or organisations that have a common interest to engage with one another, in order to support the exchange of information, increase awareness, knowledge and learning of each other's perspectives, develop professional or social contacts, and/or encourage trust for longer-term reciprocal relationships. One UK example is TeachMeets, where teachers come together (either physically or remotely) to discuss topics and share examples of good practice. Networks may be user- or researcher-driven, and the level of direct interaction between researchers, policy makers, and professionals varies.
- **Initial Teacher Education or Training (ITET)** provide a combination of academic study and time in school. Various routes, entry requirements, and statutory teaching standards exist, with different programmes across England, Wales, and Scotland.
- **Regulations, standards and policies**: Accountability and regulatory mechanisms and structures designed to improve use of research in education.

# Evidence of Effect

There has been little evaluation of the impact of these different types of intervention on evidence use in education, either in terms of the impact on teacher engagement with research, or in terms of classroom practice and pupil outcomes. A total of 15 evaluations published since 2014 were identified in this review. The majority were from the UK, with the remainder located in US, Australia, Thailand and Canada. Three of the UK-based projects were funded through the Education Endowment Foundation's Research Use in Schools grants round.

Evidence for the effectiveness of interventions of this kind is by no means non-existent, and it is possible even to speculate that this is a growing field. But overall the evidence is mixed or unclear and of poor quality. Although many authors reported a positive influence, particularly for intermediate outcomes such as attitudes towards using research evidence, the results of

most studies should be interpreted with caution. The evaluations typically lacked adequate controls, sample sizes and duration, and tended to rely on the perceptions of stakeholders gathered through surveys or interviews, rather than objective data. Key characteristics of the 15 studies are briefly summarised in Annex 3. These criticisms echo those reported by the authors of earlier reviews in this field.

# Factors Enabling or Impeding Intervention Success

Since the available evidence on impact was so limited, we turned our attention to evidence on contextual and intervention factors (e.g. those related to design or implementation processes) that might enable or impede the success of these types of intervention. There is a rich and diverse literature on this aspect of research use and relevant literature reviews, including recent work by the National Foundation for Educational Research (NFER) (Nelson & O'Beirne 2014) and Department for Education (DfE) (Coldwell et al. 2017) were examined for these insights. The enquiry by Coldwell and colleagues, a two-year study to assess progress towards an evidence-informed teaching system in England, was significant as the evaluation combined an overview of influential research with the findings from a series of qualitative interviews with senior leaders and teachers and a content analysis to examine the extent to which evidence-informed teaching is discussed in the public domain. Teachers and schools were selected to give a range of levels of engagement with research. A summary of the factors most strongly supported in the literature located through our search strategy is presented in table 1 (see Annex 4 for full list of work examined).

The factors referenced in the literature relate to the characteristics of the evidence, the individuals involved, the school context and the wider system. They will need to be explicitly considered as part of any strategy and any future evaluation, to assess whether and how far they influence the success of specific interventions in different contexts.

**Table 1. Contextual and intervention factors enabling or impeding success**

| Intervention types used in education | Enable | Impede |
|---|---|---|
| **Professional development** | • School's culture of evidence use<br>• Commitment, active support and encouragement from leaders and senior managers in the school and wider system<br>• Role of leadership in establishing evidence use as a cultural norm<br>• Research use framed in context of school improvement objectives<br>• Whole-school approach that establishes research practice within day-to-day activities<br>• Treat CPD as on-going process, not single event<br>• Follow-on support (coaching)<br>• Use of specialist expertise<br>• Release time and classroom cover provided to allow teachers to put learning into action<br>• Integrates teacher-led inquiry<br>• Structured peer-to-peer collaboration<br>• Encourages risk-taking and professional dialogue<br>• Design informed by robust research | • High staff turnover<br>• Lack of time given to staff to access and appraise research<br>• Over-attention on individual teachers as 'user' of research |

| Intervention types used in education | Enable | Impede |
|---|---|---|
| **Intermediaries** | • Intervention design central to decision making process in school<br>• Clearly defined approaches<br>• Comprehensive coverage<br>• Tailored support<br>• Role models/ people of influence<br>• Bespoke and tailored services<br>• External support via specialist advisers and experts<br>• Emphasis on translate and bridge | • Time-consuming and/or burdensome design<br>• Insufficient funding and investment<br>• Lack of a national, centralised platform with responsibility for mediating and transforming evidence<br>• Design lacks conceptual clarity, in respect of the shape and outcome of interaction<br>• Lack of trust between researchers and decision-makers<br>• Cognitive biases of individuals<br>• Limited knowledge about what evidence to draw on<br>• Neglect of how to interpret and act upon research findings<br>• Used as stand-alone element<br>• Lack of opportunities to discuss research |

| Intervention types used in education | Enable | Impede |
|---|---|---|
| **Repositories** | • Centralised resources<br>• Tagged and searchable evidence<br>• Research clearly presented, relevant, reliable<br>• Regulated and rigorous quality assurance procedures<br>• Synthesised evidence<br>• Evidence presented through accessible media | • Insufficient funding and investment<br>• Time-consuming and/or burdensome design<br>• Single studies |
| **School-university partnerships** | • User-driven<br>• Relationships based on mutual trust and respect<br>• Long term and dynamic trajectory<br>• Focus on common problems<br>• Intentional strategies to foster partnership<br>• Produces original analyses<br>• Adherence and continuing obligation of members | • Organisational structures of the university<br>• Cultural and aspirational clashes<br>• Unwillingness to break out of traditional roles and relationships<br>• Environment that discourages experimentation and reciprocal risk-taking<br>• Limited time and energy to establish and maintain partnerships |
| **Communication strategies** | • Cost-efficient | • Used in isolation |

| Intervention types used in education | Enable | Impede |
|---|---|---|
| **Networks** | • Sustainability<br>• Accessibility<br>• Use of social media<br>• Design follows systems approach | • High costs<br>• Linear or relationships models that fail to attend to capacity or resource barriers |
| **Initial teacher education or training (ITET)** | • Design and content of ITET programmes informed by robust research | • Shift from university-led programmes<br>• Insufficient funding and investment in applied research<br>• Lack of respect for research as a requisite part of ITET |
| **Regulations, standards and policies** | • Performance management aligns with CPD and evidence-informed practice<br>• Decentralised political systems and priorities<br>• Relationships and power within organisations<br>• Policy changes align with best evidence<br>• System-level coordination<br>• Alignment of wider systems (e.g. accountability requirements) to the use of research | • Punitive regulatory measures<br>• Absence of supportive organisational systems<br>• Sudden regime change<br>• Political nature of issues |

# What Can We Learn from the Wider Social Science Literature?

Given the weakness in the evidence identified, we also looked at the wider literature on encouraging evidence use. Here we drew on a recent study by Langer et al. (2016) which undertook a major review of *"the efficacy of interventions to increase decision-makers' use of research in various decision arenas"* (Langer et al., 2016: 1).

## Conceptualising Attempts to Encourage Evidence Use

At the heart of this work is a logic model for how interventions affect change, which has three elements (see Figure 1 below):

1. A universal **model of what drives behaviour**, and by extension what inhibits or encourages the 'target' behaviour (in this case 'evidence use');
2. An **articulation of the mechanisms** by which interventions can seek to affect a change in behaviour; and
3. A recognition that **intervention strategies can target different 'levels'** (e.g. individual behaviour, organisational structures, norms and processes, or wider contextual factors).

On the first of these, the model of behaviour incorporates the theory of change developed by Michie et al. (2014), which identifies three drivers that interact to produce behaviours:

- Capability: psychological or physical ability to enact behaviour
- Opportunity: physical and social environment that enables behaviour
- Motivation: reflective and automatic mechanisms that activate or inhibit behaviour

For a behaviour to occur, all three must be present and interacting. For example, the physical and mental ability to do something is insufficient without both the motivation to act (either consciously or through habit) and an environment that supports (or does not inhibit) the behaviour in question (Atkins and Michie, 2013: 30).

In terms of mechanisms, the review by Langer et al. (2016) identified six mechanisms through which interventions can seek to encourage evidence use:

1. Awareness (M1): Building awareness for, and positive attitudes toward, evidence use.

2 Agree (M2): Building mutual understanding and agreement on policy-relevant questions and the kind of evidence needed to answer them.

3 Access (M3): Providing communication of, and access to, evidence.

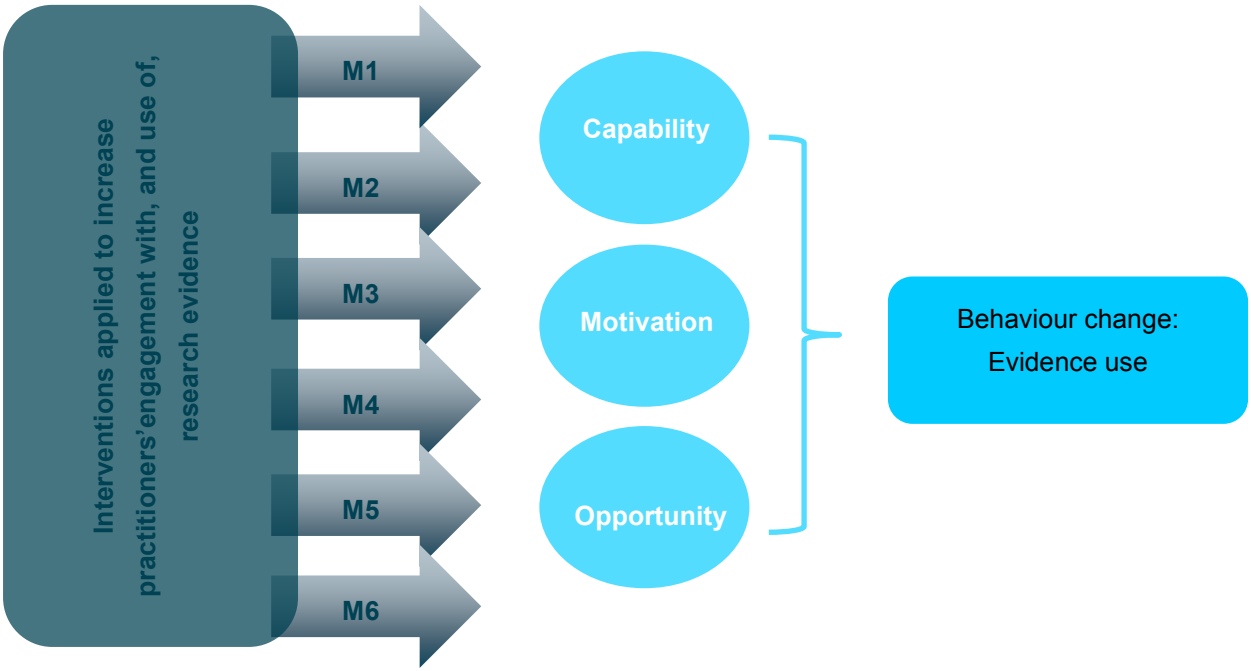
4 Interact (M4): Facilitating interaction between decision-makers and researchers.

5 Skills (M5): Supporting decision-makers to develop skills in accessing and making sense of evidence.

6 Structure and process (M6): Influencing decision-making structures and processes.

Together these intervention mechanisms target deficits at the level of the individual and/or the external environment. Interventions are assumed to work either through a single mechanism or through multi-mechanism combinations. Fuller details are given in Annex 4.

### Figure 1: Intervention logic model



# Evidence of Effect in Other Areas of Social Policy

Using this framework, Langer et al. (2016) then looked at what evidence they could find for the efficacy of these different mechanisms. Table 2 summarises their findings. It shows the combination of mechanisms and behavioural components shown to be effective and not effective.

### Table 2. Effective and not effective combinations

| | M1 | M2 | M3 | M4 | M5 | M6 | C | O | M | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **A. Evidence of effect** | | | ■ | | | | | ■ | ■ | Only if target opportunity and motivation. |
| **B. Evidence of effect** | | | | | ■ | | ■ | | ■ | Only if target capability and motivation. |
| **C. Evidence of effect** | | | ■ | | ■ | ■ | | | | |
| | | | | | | | | | | |
| | **M1** | **M2** | **M3** | **M4** | **M5** | **M6** | **C** | **O** | **M** | **Notes** |
| **D. Evidence of no effect** | | | ■ | | | | | ■ | | If do not also target motivation. |
| **E. Evidence of no effect** | | | | ■ | | | | | | |
| **F. Evidence of no effect** | | | | | ■ | | ■ | | | If do not also target motivation. |

Source: Langer et al. (2016)

Intervention strategies with evidence of effectiveness:

A. Interventions providing communication of, and access to, research evidence (**M3**), can be effective when the intervention design simultaneously tries to enhance both **opportunities** and **motivation** to use evidence.

B. Interventions building skills to access and make sense of evidence (**M5**), can be effective when the intervention design simultaneously tries to enhance both **capability** and **motivation** to use evidence.

C. Interventions that foster changes to decision-making structures and processes (**M6**), can be effective when applied in combination with other mechanisms, in particular **M5** (skills) and **M3** (communication & access).

Intervention strategies with evidence of no effect

D. Interventions that take a passive approach to providing communication of, and access to, research evidence (**M3**) are not effective if they only target the **opportunity** to use evidence.

E. Unstructured interventions facilitating interaction between decision-makers and researchers (**M4**) are not effective.

F. Multi-component capacity-building interventions (**M5**) are ineffective when they take a passive approach to building skills (i.e. those without an active educational component targeting motivation) and/or involve low-intensity skills-building, targeting only **capability** to use evidence.

Intervention strategies for which there is an absence of evidence

Interventions building awareness of, and positive attitudes towards, research evidence (**M1**).

Interventions building mutual understanding and agreement on policy-relevant questions and the kind of evidence needed to answer them (**M2**).

# What Does the Wider Social Science Literature Imply About the Interventions Identified?

The findings from the Langer at al. (2016) review suggest some implications for the eight types of interventions outlined above:

**Simply providing access to evidence is ineffective**. Repositories, communications strategies and light touch approaches to intermediaries will not, by themselves, lead to a change in behaviours. The recent findings from the EEF's Literacy Octopus trials echo this (Lord et al., 2017), and the behavioural model helps to explain it. Providing resources that help to increase capability is necessary. But, without complementary interventions that address barriers of motivation and opportunity (e.g. professional identify and behavioural norms), these resources will be insufficient.

**Programmes designed to increase skills must address motivation as well as capability**. Capacity-building efforts that only seek to impart certain skills in a passive way

are unlikely to affect change. As the findings from the education literature suggest, professional development programmes are more likely to be effective if they form part of a wider and ongoing process within the school and across the education system.

**Interventions that support unstructured interaction are ineffective**. This has implications for both networks and university–school partnerships. These need to be combined with other mechanisms and behavioural components.

**Changes to standards and policies need to be supported by measures to address skills and access to evidence**. That these mechanisms can be mutually reinforcing makes intuitive sense.

**Initial teacher education or training has a vital role to play**. As has already been recognised in the Welsh education system, well-designed ITET can help to shape motivations and develop capabilities that support engagement with, and use of, research evidence.

**Impacting on decision-making relies on attending to the behavioural need**. Across all the different types of research use interventions, success will depend on the extent to which the intervention addresses the barriers to the desired behaviour.

**The simultaneous deployment of multiple interventions is likely to be more effective**. Strategies that include multiple interventions are more likely to influence decision-making, especially where these approaches are embedded in existing structures and processes (e.g. school improvement or policy systems).

# The Current Landscape in Wales

To complement the evidence review and synthesis work, we undertook to build a picture of initiatives used to improve teacher engagement with, and use of, research evidence in Wales (focusing particularly on relevant national reforms).

The education system in Wales is going through a major programme of reform, at the centre of which is the development of a new curriculum for children aged 3 to 16 informed by the Donaldson Review (2015). One of the principles of the curriculum is that it will allow teachers increased flexibility to determine the best ways to support their pupils to develop and learn. The intention is that the curriculum is delivered by a workforce that is research literate, research active, and reflective in their practice; drawing on the best available evidence to inform their practice.

The process of designing the new curriculum started in 2015, and phased implementation will begin from September 2022. The design of the curriculum is being led by the 'Pioneer School Network', which involves practitioners from 175 schools across Wales in the development of the new curriculum. One cluster of schools – the Professional Learning Pioneers – is responsible for 'testing' the curriculum as it is being developed and identifying the professional learning needs for the effective implementation of the curriculum.

Alongside the development and implementation of the curriculum, there has been a focus on improving the quality of teaching, and ensuring the practitioners have the skills necessary to deliver high-quality teaching. Of particular note has been:

- the reform of initial teacher education and training;
- the development of a model of 'schools as learning organisations';
- the revision to professional standards and the development of the associated 'professional learning passport'; and
- the development of the National Academy of Educational Leadership.

In response to Professor John Furlong's 2015 report into the future of Initial Teacher Education and Training (ITE) in Wales (Furlong, 2015), the Welsh Government developed a new approach to accrediting Initial Teacher Education programmes. This new approach features a strong shift towards clearer and more structured links between university and school learning, as well as an expectation that research and research evidence will be integral to the ITE process (Welsh Government, 2017b). The aim is to improve capacity for, and quality of, evidence-informed ITE. The new ITE programmes will run from September 2019.

The Welsh Government's Action Plan (2017a) sets out an ambition that all schools in Wales will become 'learning organisations'. The model developed builds on work done by the

OECD (Kools and Stoll, 2016). The central idea is that a school is continually reflecting and adapting to improve outcomes. As part of the framework, schools are expected to have systems for collecting and exchanging knowledge, including research evidence. Resources are being developed with the aspiration that all schools start to develop as learning organisations from autumn 2018 (Welsh Government, 2018b).

The revision to professional standards was intended to bring them in line with the reform to the curriculum and to articulate the expectations of teachers and school leaders in light of this. As such, they are intended to inform ITE provision, professional development, and performance management, and therefore form a central part of the national framework for improving teaching engagement with research. One of the five 'dimensions' of practice is professional learning. The descriptors for this set out an expectation that as teachers develop and progress they will build from an *"understanding"* of relevant research (as a qualified teacher), to making pedagogic decisions based on research, with highly-effective teachers demonstrating to a *"structured engagement in an action research community"* and *"practice informed by […] research findings on a national and international scale"* (Welsh Government, 2017c: 48). Since September 2017, all new teachers have been working to the new standards; and existing teachers and leaders since September 2018. The Welsh Government and Education Workforce Council have developed the Professional Learning Passport (PLP), which is a secure website where practitioners can record their progress against the professional standards. Newly-qualified teachers are obliged to record evidence of achieving the required standards on the PLP.

In recognition of the importance of leadership to educational outcomes the Welsh Government has established a National Academy of Educational Leadership (NAEL), with the following objectives:

- Ensuring the availability of programmes and provision to support leadership development, and where there are gaps, commissioning suitable provision;
- Quality assure provision through a process of endorsement;
- Promote the use and accessibility of leadership research and national and international best practice;
- Offer support and advice on leadership career pathways; and
- Create a community of peers and offer information and advice.

Given the role of school leaders play in shaping the school environment, and creating the cultures that can be conducive to research use, the NAEL has an opportunity to play a role in facilitating increased teacher engagement with research.

# Reflecting on the implications of the evidence reviewed

To help translate the evidence reviewed into the Welsh policy context, we sought to map existing activity in Wales, and in November 2017 discussed this, alongside the evidence review, with a group of stakeholders. In what follows, we capture the key points to emerge from the discussion.

The literature points to a need to have a coherent package of interventions operating at national, regional, local, and school levels. At the national level, the Welsh education system has many of the features that evidence suggests contribute to a research-engaged education system, although most are still in the early stages of development / implementation:

- There is an enabling national policy framework (e.g. a long-term vision for the profession, new professional standards, a leadership training programme and the professional learning passport).
- The reformed ITET programme is research based, and encourages research-engaged practice.
- There are peer-to-peer networks designed to support practitioner reflection and links between schools / consortia and the HE sector.

There are concerns about the provision of professional development. It is a fragmented landscape, where quality is hugely variable. Schools are frequently approached by providers, and there are issues about the coherence and quality of what is accessed. Some examples of peer-to-peer collaboration have emerged across Wales, but the evidence on the efficacy of these approaches is mixed and there is concern that these networks prioritise the spread of experiential knowledge over other forms of evidence (EEF, 2018).

At the moment, determining the 'quality' of different types of evidence falls to individual teachers and schools. It is highly unlikely that all of those who have to make these decisions have the knowledge and skills, let alone the time, to make informed judgements on quality. It was clear from the discussion that Head Teachers feel 'overwhelmed' by offers of support from HE, consortia, Estyn, and private consultants, and that in this context are making more or less informed decisions about which types of support they accept.

While the vision for the future of the workforce has been articulated, the roadmap for upskilling the workforce is unclear. It will take time to realise the aspiration, articulated in Our National Mission (Welsh Government, 2017), of a workforce that is *"research-engaged, well informed and learning from excellence"*. How might the design and implementation of the new curriculum reflect the differing starting points for different teachers and schools? How

can the expectations of schools and teachers be better tailored to their current capacity? What additional capacity is needed (time, space and resource) in the system to support the necessary upskilling?

The respective roles of Welsh Government, the regional consortia, and schools / schools leaders in delivering the necessary change could be clearer. The Welsh Government has developed a 'three-tier model' for the Welsh education system (Welsh Government 2017a):

> Tier 1: Welsh Government. Responsible for: planning and policy making through evidence-based collaboration; managing models of accountability within the democratic process; and engaging with all tiers and supporting capacity-building for system improvement.
>
> Tier 2: Four regional consortia, local authorities, diocesan authorities, Estyn, Qualifications Wales, Education Workforce Council (EWC), examination boards and higher education. Responsible for: using their knowledge of schools and research to facilitate and support the sharing of best practice and collaboration to improve learner outcomes, within a self-improving school system.
>
> Tier 3: Schools. Responsible for: working together to provide the range of experiences for children, young people and professionals to enhance their learning and well-being.

However, the discussion we hosted surfaced uncertainty about respective roles, specifically in relation to encouraging increased research engagement. More generally, we found it difficult to find publically available information on what consortia are doing to support schools and teachers on research engagement, and whether and how their efforts are coordinated and coherent.

# Implications for future policy development

The lack of good quality evidence about successful initiatives to increase teachers' engagement with, and use of, research means that there is no blue-print for a coordinated national programme to support evidence-informed teaching. Despite this, the evidence reviewed offers some clear messages about which interventions are worth pursuing, and about how to approach the development of a national strategy.

## Elements of a national programme

As outlined above, evidence points to the importance of coordinated, multi-strand interventions that operate at different levels – national (policy, research funding, inspection etc.); regional (e.g. support from consortia and local authorities); and at a school and individual level.

The reforms that have been introduced – revised professional standards, reformed ITE, the introduction of a 'learning passport' – have the potential to create a supportive national environment. But for them to be successful they need to be reinforced by other interventions at regional, school and individual-levels. One aspect of this will be providing easy access to relevant research-based evidence; but there is strong evidence to show that traditional communication and dissemination strategies do not work in isolation. Schools and teachers need support to translate and adopt the findings into everyday practice; although doing this at scale can be resource intensive. Focusing on increasing capacity for evidence-informed school improvement – building on the 'self-improving school' model – might offer a way of developing the skills and capacity for this translation role in schools themselves. To pursue this, it would be necessary to identify any potential barriers (e.g. time and resource implications) and put in place measures to address these.

# Approach to developing a national programme

The starting point for the development of a national effort to increase teacher engagement with research should be an articulation of the desired behaviours and the barriers to the same.

It is not clear what the desired outcome is in the short term (the next 3-5 years) for teacher engagement with and use of research. It could be, for example:

- Greater research literacy (i.e. ability to interpret and use research);
- Increased adherence to national / international best practice in key areas (e.g. teaching numeracy, literacy and digital skills);
- A more reflective approach to practice and / or action research; or
- More schools / teachers engaging with external research.

In the longer term, the aspiration is that all will be features of the education system in Wales. But from what stakeholders say about capacity in the existing workforce, and the need for rapid change (particularly to respond to the need created by curriculum reform), it would seem important to prioritise efforts; while also considering taking action to manage the 'need' created by the new curriculum.

While there seems to be consensus that the workforce does not currently have the skills necessary to adopt the new curriculum, there is less clarity about the nature of the 'need', both in general and in relation to teacher engagement with research in particular. The reform agenda in Wales (especially the curriculum, and the new standards) articulates an aspiration for a research literate, research active, and reflective workforce, drawing on the best available evidence to inform their practice. This represents a significant change in what the education system is expecting from its workforce, so it unsurprising that the workforce is not currently displaying these behaviours. However, it is not clear where they 'fall short'. Nor is it clear where this presents a risk to the successful roll out of the new curriculum.

As alluded to above, a successful programme of activity to support teacher engagement with research will need to link interventions to desired outcomes, and should start with an assessment of the barriers to realising the desired behaviours.

By way of illustration, if the priority were to support teachers to adopt reflective practices, the starting point would be to assess what currently acts to inhibit this type of activity, for example:

- Is there teacher / leader understanding of the value of reflective practice?

- Do practitioners know how to do it?
- Do they have the time and resources to do it?
- Is it valued by leaders (at school level)?
- Is it valued by the system (e.g. through inspection, PDRs, incentives etc.)?

From this, it would be possible to design a package of interventions that seek to address the identified barriers.

But as this shows, the target behaviour should guide the intervention design. If, rather than reflective practice, the aim was to increase adherence to national / international best practice, then in seeking to identify the potential barriers one would want to consider:

- Is there agreement on what constitutes 'best practice', or which elements are essential for success?
- Do teachers / school leaders know how to implement the practice or programme effectively?
- Are the necessary resources (e.g. toolkits or guidance) easily and freely available?

The package of interventions that would respond to these barriers would be different from those designed to increase reflective practice. There may be some overlap in the elements (e.g. provision of resources) but the content would differ in significant ways.

Any large scale behavioural change will take time and resources. It would seem prudent to try to understand what behaviours are essential for the successful introduction of a radically reformed curriculum that creates new expectations on the workforce. Given the scale and pace of reform, it would seem advisable to prioritise interventions which target practice, alongside measures which build capacity over the longer term. The Professional Learning Pioneers will have a crucial role to play in articulating the essential behaviours, and in designing a programme of activity targeted at encouraging these.

In this context, it is essential that reliable measurement scales and instruments to assess engagement with, and use of, research in teaching practice are available. The research use outcomes survey developed by EEF and NFER (Nelson et al., 2017), although still in the piloting phase, looks likely to have significant potential across different contexts.

There is a risk that a major new initiative to support teacher engagement with research will flounder in the current environment. It was instructive that stakeholders talked of Head Teachers being 'overwhelmed' by offers of support from HE, consortia, Estyn, and private consultants. This suggests the focus should be on greater coordination of effort, and integration of any initiatives to support teacher engagement with research into existing programmes of reform.

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# Annex 1: Summary of Methods for Strand 1

This piece of work is not intended as a full or systematic synthesis of the evidence base. Time and resource limitations meant we were unable to search exhaustively or conduct a formal quality assessment of the included studies to the extent expected of a systematic review. The review methods used were similar to those used in a 'rapid scoping review', which has defined processes for gathering relevant literature.

The work for Strand 1 was undertaken in three phases. The first phase started by identifying different types of intervention strategies that have been proposed as a means to encourage or support teachers' engagement with, or use of, research evidence. At this stage interventions may have been tried out though not necessarily formally evaluated. We then reviewed the available research evidence on the efficacy of these kinds of intervention. Phase 2 examined the wider education literature to gather information on factors that may influence their success (e.g. factors related to intervention design or implementation processes). Phase 3 assessed the broader social science literature to identify conditions under which these interventions are more likely to be effective.

## Phase 1: direct evidence of impact

To get a feel for the overall research field we searched for reviews on the use of research in education. We identified several reviews and these showed that much of the academic writing in this area has been theoretical or conceptual (e.g., Hemsely-Brown and Sharp, 2003; Dagenais et al., 2012; Marsh, 2012; Walter et al., 2003; Coldwell et al., 2017; Nelson and O'Beirne, 2014).

Of the reviews identified, the work by Nelson and O'Beirne (2014) was the most suitable starting point for this phase of the present work. It was underpinned by a systematic process for identifying relevant literature published 1 January 2010 to 31 December 2013. We therefore searched for primary studies published since the last date of their search. The methods we used were as follows.

**Inclusion criteria**. Included studies should investigate the effects of a specific approach used to promote teachers' use of research. Teacher was interpreted broadly to include all school-based practitioners at primary and secondary institutions, not only teachers but heads, support staff and others. Studies could be based in the UK or another country. All forms of publication (e.g. peer-reviewed articles, research reports and dissertations) written in English were considered. Though the use of a control group and objective outcome measures are considered a necessary requirement for robust impact assessment, we also

included evaluations that did not use a counterfactual analysis and relied on self-report measures for assessing programme effectiveness. Reports published from 1 January 2014 onwards were included.

**Search strategy**. The team adopted a three-stage process to identify relevant primary studies published since 1 January 2014. First, a systematic search of the ERIC database was conducted using 'research use' related keywords. Second, a manual search was conducted within volumes published between 2014 and 2017 of two key journals (Evidence and Policy and Implementation Science) and relevant websites. The third and last stage of our search strategy involved checking the reference lists of included studies. Additional details of the sources searched, including the search query used in the electronic search, are available on request. Over 2000 documents were identified and screened for relevance.

## Phase 2: indirect evidence (from the wider education literature)

The existing research evidence identified in Phase 1 was not able to inform us as to what interventions were effective in increasing the use of research by teachers in their professional practice. We therefore examined the wider education literature to gather information on additional factors that may be important in enabling or impeding their success. The methods we used were as follows.

**Search strategy**. We searched for existing literature reviews about use of research in education. Relevant reviews were identified using backward and forward snowballing methods, such as pursuing references of references and electronic citation tracking, starting with sources that were already known to us. See Annex 2 for the list of reviews used in this part of the review.

## Phase 3: indirect evidence (from the wider social science literature)

We drew on the conceptual framework developed by Langer et al. (2016) and made use of the findings from this review to assess which of the components (of the education interventions) had been shown to be effective in other areas of social policy. Although the broader social science literature in this area is also limited, it provides some further evidence with which to assess the strategies that have been developed for teachers in education.

# Annex 2: Literature Reviews Providing Process-Oriented Evidence


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Nelson, J. & O'Beirne, C. (2014). **Using evidence in the classroom: What works and why?** Slough: NFER.

Scott, S. & McNeish, D. (2013). **School leadership evidence review: Using research evidence to support school improvement**. London: Department for Education.

# Annex 3: Primary Studies Providing Evidence on Impact

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| **1** | Blamires, M. (2015). Building portals for evidence-informed education: Lessons from the dead. A case study of the development of a national portal intended to enhance evidence informed professionalism in education. *Journal of Education for Teaching*. 41, 5, 597-607.<br>**Country**: UK<br>**Intervention**: The *Teacher Training Resource Bank* (TTRB) comprised portals developed by a consortium of universities with support from a software agency. It aimed to increase the range and quality of resources available for trainee teachers and those who support them. All materials on the TTRB were subject to rigorous quality assurance procedures. Once a resource was accepted by an academic it was entered onto the content management system where links, classifications and images were added. The site included longer briefings on key areas of interest and a 'real-life' librarian service called the e-librarian.<br>**Evaluation method(s)**: Single group, post-test only design; interviews (qualitative data); website usage statistics. |
| **2** | Briand-Lamarche, M., Pinard, R., Thériault, P. & Dagenais, C. (2016). Evaluation of the processes and outcomes of implementing a competency model to foster research knowledge utilization in education. *International Journal of Higher Education*. 5, 3, 168-81.<br>**Country**: Canada<br>**Intervention**: The Competency Model for Knowledge Translation to Support Educational Achievement among Quebec Youth (RAC- *Référentiel d'agir compétent à l'intégration de connaissances favorables à la réussite éducative des jeunes du Québec*) to encourage the use of research-based information (RBI) in education in Quebec includes nine components. The most salient being: 1) the RAC itself (including a document putting the project in context, and nine cards presenting the targeted competencies and the resources needed); 2) a one-and-a-half-day training session to present the RAC to participants and discuss various topics related to the process of promoting RBI use in education; and 3) four community of practice meetings over a one-year period.<br>**Evaluation method(s)**: Single group post-test only design; series of interviews and tracking sheets (qualitative data). |
| **3** | Churches, R. (2016). *Closing the gap: Test and learn* (Research report DFE-RR500b). Nottingham: National College for Teaching & Leadership. |

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| | **Country**: UK<br>**Intervention**: *Closing the gap: Test and Learn* is a programme that trialled multiple interventions simultaneously across 206 teaching schools. Alongside this teachers were trained in a range of research methods (particularly RCTs); support was given in the form of training days, research development and networking events, materials and a helpline. A total of 50 teacher-led 'micro-enquiry' experimental studies were conducted.<br>**Evaluation method(s)**: This report discusses several levels of research finding. To assess whether the programme developed teachers' scientific literacy and engagement with research, evidence was collected during the two end-of-year surveys and focus groups (qualitative data). To assess the effectiveness of teacher-led randomised controlled trials, the authors compared the proportion of teacher-led studies that yielded a positive effect on pupil outcomes to those yielding a negative one. |
| **4** | Edwards, E. & Burns, A. (2016). Language teacher action research: Achieving sustainability. *ELT Journal*, 70, 1, 6-15.<br>**Country**: Australia<br>**Intervention**: This study looked at the sustained impact of English Language teachers' participation in the ELICOS (English Language Intensive Courses for Overseas Students) Action Research Programme. The programme is structured around a series of three workshops that bring together the teachers and the English Australia professional development and support officer to present and discuss classroom investigations at the beginning, middle, and end of the programme. Between workshops, the teachers conduct action research in their own classrooms, supported by each other through a wiki, and email and Skype discussions with the author. The programme culminates in presentations of the teachers' AR at the national English Australia conference in September each year. Following the conference, the teachers then write up reports for publication in Cambridge Research Notes.<br>**Evaluation method(s)**: Single group post-test only design; survey and interviews (qualitative data). |
| **5** | Gorard, S., See, B. & Siddiqui, N. (2014). *Anglican Schools Partnership: Effective feedback. Evaluation report and executive summary*. London: Education Endowment Foundation.<br>**Country**: UK<br>**Intervention**: The *Anglican School Partnership Effective Feedback* programme developed teachers' skills in conducting and applying research evidence. It adopted a cyclical action research design, through which teachers reviewed academic literature on effective feedback before developing ways to apply it to their own classroom practice. The project took place over one school year and involved nine |

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| | treatment and five comparator schools (primary years 2-6) in the London Borough of Bexley.<br>**Evaluation method(s)**: Non-equivalent comparison group (partly matched), pre- and post-test design; Key Stage scores and interviews (quantitative and qualitative data). |
| **6** | Grace, M., Rietdijk, W., Garrett, C., & Griffiths, J. (2015). Improving physics teaching through action research: The impact of a nationwide professional development programme. *Teacher Development*, 19, 4, 496-519.<br>**Country**: UK<br>**Intervention**: *Action Research for Physics* (ARP) was a professional development programme for secondary school physics teachers, which required teachers to carry out small action research projects with their physics classes. The programme lasted about 12 months and consisted of three face-to-face training days for groups of teachers, plus an additional day away from school for background reading and planning using guidance and resources provided by the ARP tutors. These days were interspersed with periods of action research carried out by the teachers at their own schools. They presented and evaluated their practice on the professional development days. An important feature of the ARP professional development programme is the inclusion of senior managers who make overall strategic and administrative decisions about how to meet teachers' training needs.<br>**Evaluation method(s)**: Single group, pre- and post-test research design; focus group and survey (qualitative and quantitative data). |
| **7** | Griggs, J., Speight, S. & Cartegena, F.J. (2016). *Ashford Teaching Alliance research champion: Evaluation report and executive summary*. London: Education Endowment Foundation.<br>**Country**: UK<br>**Intervention**: An in-school research broker programme that ran for one academic year in five schools in Ashford, Kent (South-East England) within the Ashford Teaching Alliance (ATA). Delivery was led by a Research Champion, a senior teacher based at one of the schools who worked with research leads, other teachers, and senior leaders across several schools to promote engagement with research evidence. The programme had four key components: 'audits' of needs and research interests for individual schools; a series of research symposia for teachers; termly research and development 'twilight forums' and bespoke research brokerage.<br>**Evaluation method(s)**: Single group, pre- and post-test research design; survey and interview (quantitative and qualitative data). |
| **8** | Gutman, M. & Genser, L. (2017). How pre-service teachers internalize the link between research literacy and pedagogy. *Educational Media International*, 54, 1, 63-76.<br>**Country**: Unclear |

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| | **Intervention**: Training of pre-service teachers in research literacy skills using a Problem Based Learning (PBL) approach over a 12-week course. There were two differently formatted courses, one online and the other a blended environment. Student performance in both online and blended learning communities is compared.<br>**Evaluation method(s)**: Non-equivalent comparison group, pre- and post-test research design; self-assessment survey, skills test, and authors' analysis of online discussion forums (quantitative data); MANOVA used to test significance of group differences. |
| **9** | Hines, M.B. & Conner-Zachocki, J. (2015). Using practitioner inquiry within and against large-scale educational reform. *Teacher Development*, 19, 3, 344-64.<br>**Country**: US<br>**Intervention**: The *Indiana Reading Academy Project* (IRAP) was a graduate program developed as a supplementary practitioner inquiry program for the professional development of Reading First (RF) teachers. RF is a literacy strand of the federal policy No Child Left Behind (NCLB). The program adopted use of practitioner inquiry (also referred to as action research) in order to resist (and, to a degree, challenge) the constraints of what the authors describe as an 'over prescriptive reading program'. A website was developed that supported teachers with practitioner inquiry and directed them through the different phases of the inquiry project, which took place over two semesters. It also provided guidelines for submissions and included a calendar to show key dates.<br>**Evaluation method(s)**: Single group post-test only design; interview (qualitative data). |
| **10** | Lord, P., Sims, D., White, R. & Roy, P. (2017). *Evidence for the Frontline: Evaluation report and executive summary*. London: Education Endowment Foundation.<br>**Country**: UK<br>**Intervention**: Evidence for the Frontline (E4F) offers an independent brokerage service to link teachers and schools with academic researchers to support schools to engage with, and use, research evidence more effectively. In its pilot stage a broker helped teachers and schools to frame and publish queries, and then established initial contact between a teacher/school and research academic. A bespoke web-based interface was set up during the development phase of the project and this was used during the piloting of the project. Features include a dedicated website and discussions feature.<br>**Evaluation method(s)**: Single group, pre- and post-test research design; survey and interview (quantitative and qualitative data). |
| **11** | Speight, S., Callanan, M., Griggs, J. & Farias, J.C. (2016). *Rochdale research into practice: Evaluation report and executive summary.* London: Education Endowment Foundation.<br>**Country**: UK |

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| | **Intervention**: Research into Practice – Evidence-informed Continuing Professional Development in Rochdale was a pilot intervention aimed at supporting teachers to use evidence-based teaching and learning strategies to improve pupil progress. The project ran for one year (2014/2015) in ten primary schools in the Rochdale area, all of which are members of the Inspirational Professional Learning Community Network (IPLCN), and was delivered by a senior CPD consultant based at one of the schools. It involved CPD sessions and direct consultant support.<br>**Evaluation method(s**): Single group, pre- and post-test research design; surveys, interviews and observations (quantitative and qualitative data). |
| **12** | Szucs, K.A., Benson, J.D. & Corturillo, A. (2016). Use of a journal club for professional development: Outcomes in a school-based occupational therapy practice. *Journal of Occupational Therapy, Schools, & Early Intervention*, 9, 2, 208-219.<br>**Country**: US<br>**Intervention**: The guided journal club (continuing education course) for school-based occupational therapists was held in a face-to-face meeting at the end of the school day, the first week of each month for 6 months. The months were determined by the participants as times during the school year that would allow them the opportunity to fully participate based on the ebb and flow of workloads. Each session lasted approximately 1 hour. Co-investigators guided journal group members through: constructing a clinical question using the PICO format, how to read a research article, and how to critically appraise a study.<br>**Evaluation method(s)**: Single group, pre- and post-test research design; survey (quantitative and qualitative data). |
| **13** | Tapprich, W., Grandgenett, N., Leas, H., Rodie, S., Shuster, R., Schaben, C. & Cutucache, C. (2016). Enhancing the STEM ecosystem through teacher-researcher partnerships. *Biology Faculty Publications*, 80.<br>**Country**: US<br>**Intervention**: The Teacher-Researcher Partnership Program (TRPP) was developed as part of the UNO-OPS (University of Nebraska- Omaha Public Schools) partnership supporting the OPS K-12 Comprehensive Science Teaching and Learning Project. Eleven teachers applied, and were accepted on to the programme. Teachers were matched up with UNO faculty members from Science, Technology, Engineering and Mathematics (STEM) disciplines on account of the teachers' prioritised requests for mentors. Participants attended an orientation session and a pre-project focus group before embarking on their research project. Mentors and teachers arranged a 20-hour a week schedule in order to carry out the research. For the journal club teacher-mentor pairs took turns finding and presenting a research paper and leading the discussion. The summer research project required a minimum of 4 weeks. The journal club met for six weeks. |

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| | **Evaluation method(s)**: Single group, pre- and post-test research design; focus group and survey. |
| **14** | van Ingen, S. & Ariew, S. (2015). Making the invisible visible: Preparing preservice teachers for first steps in linking research to practice. *Teaching & Teacher Education*, 51, 182-190.<br>**Country**: US<br>**Intervention**: Participants were studying on an undergraduate mathematics methods course for junior and senior elementary education majors at a large state university. Both groups were taught how to articulate classroom-based problems, create research-guiding questions and design effective search strategies. Although students in both groups completed the *Education Research Project* over the same, semester-long time period, the intervention group attended additional workshops and received an a further four weeks of instructor/librarian collaboration.<br>**Evaluation method(s)**: Non-equivalent comparison group, post-test only design; questionnaire completed by the authors (quantitative data); MANOVA used to test significance of group differences. |
| **15** | Wuttiprom, S., Wuttisela, K., Phonchaiya, S., Athiwaspong, W., Chitaree, R., & Sharma, M.D. (2016). Preliminary Results of Professional Development Program for School Science Research. Universal Journal of Educational Research, 4, 4, 842-848.<br>**Country**: Thailand<br>**Intervention**: The *Professional Development Program for School Science Research* programme consisted of three phases: training science teachers to conduct research based learning (RBL), designing a RBL module, and implementing RBL in the classroom.<br>**Evaluation method(s)**: Single group, pre- and post-test research design; self-assessment survey and skills test (quantitative data). |

# Annex 4: Mechanisms Through Which Interventions Work

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| **M1. AWARENESS** | Build awareness for, and positive attitudes toward, evidence informed decision-making (EIDM)**.**<br><br>*This emphasises the importance of decision-makers valuing the concept of EIDM.* |
| **M2. AGREE** | Building mutual understanding and agreement on policy-relevant questions and the kind of evidence needed to answer them.<br><br>*This emphasises the importance of building mutual understanding and agreement on policy questions and what constitutes fit-for-purpose evidence.* |
| **M3. ACCESS** | Provide communication of, and access to, evidence.<br><br>*This emphasises the importance of decision-makers receiving effective communication of evidence and convenient access to evidence.* |
| **M4. INTERACT** | Facilitate interaction between decision-makers and researchers.<br><br>*This emphasises the importance decision-makers interacting with researchers in order to build trusted relationships, collaborate, and gain exposure to a different type of social influence.* |
| **M5. SKILLS** | Supporting decision-makers to develop skills in accessing and making sense of evidence.<br><br>*This emphasises the importance of decision-makers' having the necessary skills to locate, appraise, synthesise evidence, and integrate it with other information and political needs etc.* |
| **M6. STRUCTURE AND PROCESS** | Influencing decision-making structures and processes.<br><br>*This emphasises the importance of decision-makers' psychological, social, and environmental structures and processes (e.g. mental models, professional norms, habits, organisational and institutional rules) in providing means and barriers to action.* |

# Annex 5: Types of Evidence and Evidence Use

## Different types of evidence

There are different forms of research-based knowledge that might be useful to education practitioners (Gough 2016):

- **Internal research**. Research evidence produced locally by practitioners and intended for local use involving the systematic and intentional study of their own professional practice, including evaluation into the impact of practice changes made in response to research evidence on outcomes for pupils. This can include participatory action research and other variants of teacher inquiry (Cochran-Smith & Lytle 2009).
- **Administrative data and statistical analyses**. Evidence derived from routinely collected school-level data from school management information systems, such as progress/attainment data and in-school observations of teaching and learning (Marsh 2012), or national-level datasets such as the National Pupil Database, an amalgamation of a number of different datasets holding a wide range of information about students who attend schools and colleges in England. This work can thus be conducted internally and/or externally.
- **External research**. Publicly available, scientifically-based research produced by academics, government departments and others in the form of:
    - Primary and secondary research using original or previously collected data.
    - Evidence synthesis that bring together relevant research in an explicit and accountable way. Different research products include:
        - Systematic reviews or meta-analyses of published research, such as those produced by the **Evidence for Policy and Practice Information and Coordination Centre (EPPI-Centre)** and the **Campbell Collaboration**.
        - Toolkits or other initiatives that translate effect sizes from research into an index that ranks interventions according to average improvements in student outcomes that can be expected if the student has the intervention. Examples include the Sutton Trust–EEF's **Teaching and Learning Toolkit**, and the **What Works Clearinghouse (WWC)**.
    - Evidence-supported programmes or strategies - Interventions based on rigorous evidence from educational theories and research data, for example *Reading*

*Recovery*, a short-term intervention for young children with reading difficulties (Dyssegaard et al 2017).

- Guidance development - Research interpreted with recommendations for application (e.g. EEF's **Guidance Reports** which make clear, practical and evidence-based recommendations to help teachers translate the evidence into practice).

## What it means to 'use' research evidence

Research use is understood as a multifaceted, multidimensional construct (Weiss 1979). While there is no clear, agreed definition or understanding of what it means to 'use' research evidence, common distinctions are made between:

- **Instrumental use**. Involves the direct application of a specific piece of research, such as in deciding on a course of action or in defining a solution to a specific problem.
- **Conceptual use**. A more wide-ranging definition comprising the complex and often indirect ways in which research can influence knowledge, attitudes and understanding of issues, problems or potential solutions, promoting informed discussion and debate, challenging existing ways of thinking and doing.
- **Strategic or tactical use**. Research used as an instrument of persuasion, to support or validate existing ideas, practices or political stances, or to challenge the positions of others.
- **Process use**. The process of engaging in research can also impact on individuals and organisations involved, changing their way of thinking and behaving and leading, for example, to changes in the design or outcomes of a programme being assessed. This type of research use is important consideration for any research that closely or collaboratively engages practitioners.

The nature of research use is best understood as a fluid, ongoing process rather than a single event. Rather than contrasting 'types', the categories of instrumental, conceptual, strategic and process use of research may in practice occur in parallel.

Other process-orientated definitions emphasise different stages at which research may be used; Morton (2015) for example has distinguished the uptake of research, from its use and impact (Morton 2015). To this we can add a number of other stages in the process.

- **Research aware (or research literate).** Potential research users understanding what research evidence is, know how it can help to improve policy or practice decisions, and know how to access it and/or carry out their own enquiries.

- **Research uptake**. Research users are aware of research on a specific topic and have engaged with it in some way (e.g. read an article, attended a presentation).
- **Research use**. Research users have acted upon research evidence in some way. Acting upon it may not necessarily result in a change in policy or practice. The evidence may have been considered when making a specific decision, and ultimately rejected as being unhelpful.
- **Implementation and / or scale up (of evidence-informed decisions and innovations).** Once a decision is made to act in a way that is informed by research then there is the process of implementation and possible scale-up of such actions. Research can be undertaken on these processes.
- **Research impact**. Research findings have been applied and contributed to some sort of societal change (e.g. new education policy or improved student attainment).

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