Educational Research and Innovation

Who Cares about Using Education Research in Policy and Practice?

STRENGTHENING RESEARCH ENGAGEMENT

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BETTER POLICIES FOR BETTER LIVES

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Foreword

Policy makers like immediate answers but education research moves at a snail's pace: It sometimes takes decades before a longitudinal survey yields policy-relevant insights to the burning questions we have right now. Education research also does not always focus on the questions that are most relevant to policy makers and practitioners. Nor are research results always available in a form intelligible to them. And even when they are, research will have insufficient impact if it is not used to challenge conventional wisdom or long-held beliefs in what works. Sometimes policy makers and practitioners forget that data are not the plural of anecdote, and often they are simply too busy to look for research-based answers. On top of that, education systems often lack adequate infrastructure and mechanisms to support them in using research in their daily decisions.

In the medical sector, a vaccine will not go into the field before clinical trials have delivered sufficient evidence that it will not be harmful – even amid a pandemic. In contrast, 9 out of 10 reforms studied in OECD's Education Policy Outlook did not even attempt to study their long-term efficacy. It is no surprise then that the health sector invests 17 times more on research and innovation than the education sector does even though education and health occupy similar positions in public budgets.

The price of this disconnect between education policy, research and practice has been high: Over the last few decades, education in most OECD countries has lost productivity, with teacher salaries having risen but outcomes not improved.

The good news is that we can do better. The OECD's Strengthening the Impact of Education Research project looks at a question at the heart of the Centre for Educational Research and Innovation (CERI)'s mission: How can we make education research more relevant and more impactful? This report represents the first step towards addressing the knowledge gap on what and how initiatives to increase the use of research can be effective. It brings together leading experts who discuss recent research in the field of education and other sectors. The report describes mechanisms used to strengthen the impact of education research in policy and practice, and the different levels of engagement by individual and institutional actors in these processes. It also looks at the drivers of, and barriers to, using research in education policy and practice systematically and at scale.

Getting this right is important. Our schools and universities of today are our economy and society tomorrow. Only bold, innovative and evidence-based education policy and practice will help develop better and more equitable economic outcomes, greater social participation and stronger democracies.

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Table of contents

FIGURES

TABLES

BOXES

Executive summary

Across the OECD, enormous effort and investment has been made to reinforce the quality, production and use of education research in policy and practice. Despite this, using research systematically and at scale in education policy making and practice remains a challenge for many countries and systems. The OECD launched the *Strengthening the Impact of Education Research* project to respond to this challenge.

This report represents the first step in addressing the knowledge gap on what and how initiatives to increase research use work. It does this by bringing together leading experts who provide insights into recent research in the field and international experience gathered from both policy and practice, including from sectors other than education. In addition, the volume provides a first set of analyses of data collected from over 30 systems through an OECD policy survey. The analysis describes the mechanisms used to strengthen the impact of education research in policy and practice, and the levels of engagement of various – individual and institutional – actors in these processes. The report also maps the drivers of, and barriers to, using research in education policy and practice. While some promising practices are highlighted across the report, the primary focus at this stage is not to provide clear solutions. This initial mapping of structures and processes aimed at improving research use points to a number of knowledge gaps and directions for future work.

A diverse set of actors and mechanisms facilitate research use in countries; yet, important barriers to more systematic production and use continue to exist

A large number of organisations are active in producing research and facilitating its use in policy and practice across the OECD. The landscape is dominated by research organisations in many education systems while agencies with an explicit brokerage mission exist in about half of the systems. Countries have a number of mechanisms for facilitating research use, with projects encouraging interactions between the different actors being the most common. Countries also report various barriers to using research systematically in policy and practice. The lack of time to access and engage with research is a shared challenge. Barriers are commonly linked to the absence of appropriate structures and mechanisms although insufficient accessibility of research due to inappropriate or inconvenient formats means that user-friendliness is also a problem in many systems.

Co-producing research is a promising avenue but evidence is still weak on what good research-practice-policy engagement looks like

There is consensus that teachers' and policy makers' involvement in research can make research more relevant and reinforce its use. However, the nature of involvement matters for its impact. The different actors involved in research production should be equal partners in bringing their own unique knowledge to the table. Genuine curiosity, respect and active listening are necessary. But, though research co-production promises research that is more relevant and more readily used, it is far from being a mainstream instrument in education. And when research is co-produced, teachers, school leaders and policy makers

are often only involved in limited ways. More research is needed to understand how exactly engagement works in research co-production and what the necessary ingredients are for its success.

Conceptual development in the field of knowledge mobilisation has not yet translated into action

Conceptually, knowledge mobilisation has moved away from linear research transmission to a systems approach. There is now substantive evidence showing that the linear strategy of making research findings accessible and disseminating them to practitioners and policy makers is necessary but not sufficient for research uptake. Rather, it is important to build relationships between different communities through partnerships and networks. But simply connecting people is not enough. Agents are embedded in complex systems, and the whole system needs to be activated to establish connections among its various parts. To date, most knowledge mobilisation initiatives have not been able to realise the promise of a systems model.

Strategic leadership, and appropriate incentives and funding mechanisms are needed to enable a systems approach to research use

To activate the whole system for research co-production and use requires system-level coordination. At a minimum, three elements are necessary. S*trategic leadership* – both at the level of each initiative and at the level of the system – should be based on a well-developed theory of change. Practitioners, policy makers and researchers need *incentives* for engaging thoughtfully in and with research. Notably, traditional academic incentives are a major obstacle for researchers to engage with practitioners and policy makers more deeply. *Funding mechanisms* need to be aligned with the needs of high-quality research-policy-practice engagement. Funding needs to recognise the time it takes to create trusting relationships. It should also recognise the importance of capacity building, rewarding skills and incentivising outputs that serve the needs of research users and, ultimately, beneficiaries. Although local efforts aim to support teachers, school leaders and policy makers to use research and adapt it to their particular contexts, very few countries have a system-wide strategy. This can block local initiatives from scaling up and making a systemic impact.

There is immense potential for peer learning in this field if contexts, actors and sectors are more connected

Potential for peer learning is (at least) threefold. First, learning from other contexts: Discussions on the use of research in education tend to focus either on the context of policy or practice. Evidence-informed policy and practice have developed in parallel but developments have not been systematically translated from one context to the other. Second, learning from other countries: The diversity of the research production and use landscape provides fertile ground for sharing good and bad practices, and exploring what works and how. Third, learning from other sectors: Research and experience have accumulated in a number of sectors, including health, environment, agriculture and fields of social science. Learning more from these sectors could benefit education. Platforms for mutual learning will contribute to developing a more robust knowledge base in the field.

We need to better understand what works in research mobilisation for such initiatives to become evidence-based themselves

Research on “What works in what works” has become a vibrant field of study in recent years but it has not, as yet, yielded enough robust evidence. The systematic investigation and evaluation of existing efforts to reinforce research impact are critical to improving such efforts. Yet, such evaluations to date have been scarce. For research mobilisation initiatives to become evidence-informed themselves, we need to better understand what makes them successful in generating high-quality research and reinforcing their use. The next stage of the *Strengthening the Impact of Education Research* project will involve an in-depth investigation of research mobilisation initiatives to advance this knowledge base.

Part I
Conceptual landscape and the evolution of the field

1 The changing landscape of research use in education

Nóra Révai, OECD

This chapter provides an overview of the evolution of evidence-informed policy and practice discourse. It starts with a brief discussion of the key concepts: research, evidence and knowledge. The chapter then presents the conceptual evolution of the field, developments in efforts to reinforce research use in policy and practice as well as some questions and challenges related to research production. Building on contemporary conceptualisations, some conceptual considerations and a number of questions are raised regarding current barriers to increasing research dynamics. To address some of these questions the OECD conducted a policy survey in 2021. The chapter describes this survey and presents the purpose and structure of the volume.

Introduction

We may be getting tired of every book starting with "The pandemic has shown us…" but when we talk about using science in decision making, this is an almost inevitable reference. In the context of the pandemic, we have been able to witness both the power of science (e.g. the extremely rapid development of vaccines) and the difficulty in balancing evidence on epidemiology and risks affecting the economy, and knowledge of people's behaviours and attitudes. With limited evidence available, governments have had to make difficult decisions on education with huge, potentially unpredictable impacts on children and society. The challenge of using evidence in decision making is, however, not new. (OECD, 2007[1])

Using research more systematically to improve public services has become a policy imperative in the past two decades (Powell, Davies and Nutley, 2017[2]). The Centre for Educational Research and Innovation (CERI) has contributed to advancing this agenda in education. In 2000, CERI work on knowledge management highlighted that the rate and quality of knowledge creation, mediation and use in the education sector was low compared with other sectors (OECD, 2000[3]). In the early 2000s, country reviews on educational research and development (R&D) showed generally low levels of investment in educational research as well as in research capacity, especially in quantitative research. They also confirmed weak links between research, policy and innovation in many OECD systems (OECD, 2003[4]).

However, the landscape has started to change as the evidence-informed movement spread in education. First, many countries have invested in strengthening research itself. Although public spending on educational research and development is still limited compared to other sectors (Education.org, 2021[5]), significant funding has gone into experiments, systematic reviews and other forms of primary and secondary education research (OECD, 2007[1]). Second, there has been growing investment in initiatives intended to facilitate the use of research. These include establishing dedicated brokerage institutions designed to mediate research for policy and practice (OECD, 2007[1]), and making research more accessible to users through funding research syntheses and toolkits. In the 2007 OECD volume *Evidence in Education*, experts and politicians formulated a number of challenges to stronger evidence use in decision making (OECD, 2007[1]). They highlighted the lack of relevant and accessible research for policy and the conflicting timeframes of political cycles and research production. In addition, challenges included the lack of appropriate processes to facilitate the interpretation and implementation of evidence by decision makers and the difficulty of ensuring sustainability and stability of funding (OECD, 2007[1]). Despite widespread investment since then, OECD countries still face many of the same challenges today.

Third, research on evidence-informed policy and practice has also been expanding. Early conceptualisations of knowledge transfer as a linear process (OECD, 2000[3]) have evolved into an understanding of research ecosystems that recognise complexity (Burns and Köster, 2016[6]; Boaz and Nutley, 2019[7]; Best and Holmes, 2010[8]). Increasingly, more studies are also looking at various brokerage initiatives. However, very few of such initiatives have been rigorously evaluated. Research has only recently started to explore how they work and can be improved (Gough, Maidment and Sharples, 2018[9]). To date, there is no strong evidence about how we can effectively strengthen the use of research in decision making.

The CERI project *Strengthening the Impact of Education Research* was launched in 2021 to address the knowledge gap on what and how initiatives to increase research use work. The project thus aims to support countries in understanding how to use education research in policy and practice systematically and at scale.

This first volume of the project presents an initial mapping of countries' strategies to facilitate the use of education research in policy and practice. To frame the discussion for the volume, this chapter starts with an overview of how evidence-informed policy and practice discourse has evolved. It also discusses developments in knowledge mobilisation and research production. The chapter then outlines some conceptual considerations and key questions that build on contemporary conceptualisations of knowledge

mobilisation. Next, the chapter describes the policy survey, which was developed by the project, to answer a first set of these questions. Finally, the purpose and structure of this volume is presented.

Cornerstones: Research, evidence and knowledge

The nature and source of research evidence as well as its quality and relevance for policy and practice have long been debated (e.g. Nutley, Walter and Davies (2007[10]), OECD (2007[1]), Nutley et al. (2010[11])). "What counts as evidence?" has been a core question ever since the evidence-informed movement started.

The evidence-based (or evidence-informed) practice and policy agenda is built on the premise that education research can and should establish "what works", similar to many other sectors including health and agriculture and to other social sciences. In the hierarchy of evidence established in the health sector, systematic reviews and evidence syntheses represent the highest level, followed by randomised control trials (RCT), cohort studies, case studies and expert opinion at the lowest level (Glover et al., 2006[12]). Some in education have also promoted rigorous syntheses and RCTs as the gold standard (Goldacre, 2013[13]).

The "what works" movement in education has led to the reformulation of research agendas in some (mostly Anglo-Saxon) countries (Cochran-Smith and Lytle, 2006[14]). This has focused attention on intervention and effectiveness research. Examples include the Best Evidence Synthesis (BES) in New Zealand (New Zealand Ministry of Education, 2019[15]) and the Teaching and Learning Toolkit developed by the Education Endowment Foundation in England (EEF, n.d.[16]). Continuously updated, the latter puts great emphasis on high standards of evidence and has gained huge traction around the world in the past years.

However, the narrow interpretation of evidence associated with the "what works" movement has opened up a strong debate between methodological schools and has provoked reflections about its implications for practitioners' professionalism. As a result, understandings of the evidence itself and what it means to be "evidence-informed" have evolved considerably. First, numerous scholars have suggested more inclusive conceptualisations of evidence (OECD, 2007[1]). Nutley, Powell and Davies (2013[17]) argue that the type and quality of evidence depends on the question, which is not necessarily an instrumentalist view of "what works". For example, practitioners and decision makers could be interested in why, when and for whom something works, how much it costs, and what the risks are. They may also wish to understand the nature of social problems, why they occur, and which groups and individuals are most at risk. The authors suggest that mapping what kind of evidence can answer what kind of question is more useful than defining a hierarchy of evidence types that does not take the question into account. For example, questions such as "how does it work" and "does it matter" are ones that qualitative research can answer but RCT evidence cannot (Petticrew and Roberts, 2003[18]).

Second, scholars have contributed to understanding what we mean by "evidence-informed" in more subtle ways. Research and other sources of evidence are often not used directly but they shape attitudes and ways of thinking in indirect and subtle ways (Nutley, Powell and Davies, 2013[17]). In relation to teacher professionalism, scholars have emphasised that research is an important contribution to teachers' "technical knowledge", which provides support for decision making (Kvernbekk, 2015[19]; Winch, Oancea and Orchard, 2015[20]). It is often used indirectly to "back up" a decision (Kvernbekk, 2015[19]). In this sense, evidence does not replace professional judgement or prevent a value-based decision. Teachers' engagement with and in research enriches their reflection on practice and vice versa: Teachers' reflection on their practice helps them interpret research and enhances research itself (Winch, Oancea and Orchard, 2015[20]).

Recent definitions explicitly distinguish between research knowledge and practical knowledge (expertise), and emphasise the connection between them. For example, Sharples defines evidence-informed practice

as "integrating professional expertise with the best external evidence from research to improve the quality of practice" (Sharples, 2013, p. 7[21]). In a similar vein, Langer, Tripney and Gough define evidence-informed decision making as "a process whereby multiple sources of information, including the best available research evidence, are consulted before making a decision to plan, implement, and (where relevant) alter policies, programmes and other services" (2016, p. 6[22]).

These definitions also recognise a distinction between evidence and research. This is particularly important in today's world, which is characterised by an abundance of information and data that is often cited or taken as "evidence". Indeed, the concept of evidence can range from a narrow understanding of "gold standards" (RCTs, systematic reviews) to a broader one that incorporates data and information, including in raw and unanalysed forms. See Box 1.1 for the use of "research" in this volume.

Box 1.1. Meaning of "research" in the Strengthening the Impact of Education Research project

In the *Strengthening the Impact of Education Research* project, the focus is on the production and use of *education research*, understood as a form of systematic investigation of educational and learning processes with a view to increasing or revising current knowledge. This is consistent with most definitions of research (e.g. Langer, Tripney and Gough (2016[22])). It is a broader conceptualisation that recognises that research need not necessarily be conducted within academia or by researchers only. However, this definition does not consider (raw) information and data as "research" as such - only when these are analysed and investigated for a purpose.

Conceptual evolution of knowledge mobilisation

The evidence-informed practice movement gave rise to a rich field of study looking into the dynamics of knowledge. Terms such as knowledge management, knowledge-to-action, knowledge translation, transfer, mobilisation, brokerage and mediation consider the dynamics of knowledge from different angles (Levin, 2008[23]). There have been two major and interrelated developments in conceptualising the interplay of research production and use.

The first is a change of perspective *from linear to system* models. Best and Holmes (2010[8]) describe the three models of knowledge mobilisation in a nested perspective:

- Linear model – Making research available for users, focusing on "getting the right information to the right people in the right format at the right time" as defined in the health sector (Levin, 2008[23]). This model focuses on disseminating research evidence to users such as teachers and policy makers, who are seen as passive recipients of knowledge.
- Relationship model – Incorporating linear models but focusing on strengthening the relationship among stakeholders through partnerships and networks to facilitate the link between research and practice/policy. Here, knowledge can come from multiple sources (research, theory, policy, practice).
- Systems model – Building on linear and relationship models but recognising that agents are embedded in complex systems and the whole system needs to be activated to establish connections among its various parts (Best and Holmes, 2010[8]).

In both the linear and relationship models, a strong emphasis is placed on mediation, i.e. intermediary actors and processes that bridge the gap between communities of research producers and users. Intermediary actors include organisations (e.g. brokerage agencies) and individuals (e.g. translators, brokers, gatekeepers, boundary spanners and champions). While each actor is important in a systems view, this view implies that all actors together shape the research ecosystem through their interactions, feedback loops and co-creation (Campbell et al., 2017[24]).

The second development is a shift from a *research push to a user-pull* approach. Early efforts focused primarily on disseminating research evidence towards practice and policy. The push approach corresponds to the linear model of knowledge dissemination and a transfer issue focused on making research findings more accessible to practitioners and policy makers. It has since become clear that dissemination alone does not increase research use in decision making (Langer, Tripney and Gough, 2016[22]), building on users' needs in producing research and synthesising available evidence has gained attention. Pull mechanisms require researchers (and research funding schemes) to map and understand users' needs, and respond to them accordingly. They also require practitioners and policy makers to formulate their knowledge needs as part of their work and problem solving process. The most recent research ecosystem models put greater emphasis on pull mechanisms (Gough, Maidment and Sharples, 2018[9]).

Neither of these developments can be equated to a simple shift from one model or strategy to another. Push and pull mechanisms can – and perhaps should – co-exist. Linear processes of knowledge transfer are not outdated; rather, they are embedded in more complex dynamics and remain key building blocks of research use. Relationships are fundamental elements of a systems view but it is not sufficient to only consider and foster partnerships. Strengthening the dynamics of research production and use is not simply about transferring and translating a narrow set of "codes" from one community to the other.

This idea is captured by Van de Ven and Johnson's (2006[25]) three ways of framing the "theory-practice" gap. The first framing sees this gap as an issue of *knowledge transfer*. Users (e.g. teachers and policy makers) do not adopt and implement findings from research because it is frequently unavailable in a suitable format. This interpretation corresponds to the linear model and a push approach. The second framing sees theory and practice as distinct *forms of knowledge*. Practitioners' knowledge and research knowledge are ontologically and epistemologically different from that of researchers. Because these two forms of knowledge are in themselves partial, the issue relates to ensuring that they are effectively combined. This leads to the third framing, which views the gap as a *knowledge production* issue. Where, how and by whom knowledge is produced determines the distance between theory and practice. Collaborative forms of enquiry in which researchers and practitioners work together on a complex problem (called "engaged scholarship" by the authors) reduce this distance in a natural way (Van De Ven and Johnson, 2006[25]). The latter two framings recognise that relationships as such are not enough: The ways in which different communities engage with each other is what makes the difference.

However, more is needed to activate the entire system. Best and Holmes (2010[8]) identify four components of systems thinking:

- Evidence and knowledge: Research evidence is only one form of knowledge and the interplay between different forms (e.g. tacit and explicit) needs to be considered.
- Leadership: Rather than merely command and control, leadership in a complex system involves "facilitation and empowerment, self-organising structures, participatory action and continuous evaluation" (p. 151[8]).
- Networks: Organisational networks can strengthen relationships between actors if coupled with collaborative (system) leadership to help work towards shared goals (see also literature on network effectiveness in e.g. Rincón-Gallardo and Fullan (2016[26])).
- Communications: Rather than simple information packaging, strategic communication identifies interdependencies and trade-offs, and negotiates interests in a process leading to mutual understanding (Best and Holmes, 2010[8]).

The next two sections discuss the evolution of knowledge mobilisation policies and practices.

Developments in knowledge mobilisation in policy and practice

In the context of teaching practice, evidence use is strongly rooted in discourses on teacher professionalism. The core idea is that the teaching profession lacks a systematic and robust knowledge base that can consistently constitute the scientific basis of teaching practice. More than 20 years ago, Hargreaves' seminal lecture (1996[27]) laid the groundwork for the research-based profession paradigm. This exerted a large influence on policy. With growing pressure for greater accountability and effectiveness in education in the late 1990s and 2000s, the call for educational policy decisions to be based on the best evidence also became stronger in OECD countries (OECD, 2007[1]).

Early knowledge brokerage efforts in practice and policy adopted primarily linear and push approaches and many still bear the signs of a research transfer model to date. For example, *What Works Clearinghouse* (WWC) provides teachers "with the information they need to make evidence-based decisions" (Institute of Education Sciences, n.d.[28]). Other agencies, such as the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) in the United Kingdom and the Best Evidence Synthesis (BES) programme in New Zealand, also provide robust evidence syntheses. Products of such agencies are based on the idea of "translation", i.e. transforming researchers' knowledge products into products accessible for users. These include user-friendly evidence snapshots, practice guides and sometimes more sophisticated toolkits.

Recognising that linear transmission is not enough, efforts have increasingly gone towards building relationships between researcher and practitioner/policy communities. The EPPI-Centre, for example, provided capacity-building opportunities and worked with a range of partners to foster evidence-informed policy. The BES programme in New Zealand also emphasised collaborative approaches to foster dialogue and engagement (OECD, 2007[1]).

An early example of bringing together researchers and practitioners is the *Teaching and Learning Research Programme* (TLRP) in England between 2000 and 2011 (OECD, 2007[1]). Its strategic commitments include user engagement; partnerships for sustainability; knowledge generation by project teams; and capacity building for professional development (OECD, 2007[1]).

The new generation of the United Kingdom's brokerage effort, the *Education Endowment Foundation/ Sutton Trust* (EEF), applies an "evidence ecosystem" model, drawing heavily on the systems view described above. In this model, evaluation, synthesis, translation, use of research, and innovation are explicitly linked (Gough, Maidment and Sharples, 2018[9]). Activities include synthesising evidence, generating new evidence and supporting schools in using this evidence (EEF, 2019[29]). The latter is realised through the "Research Schools Network". Member schools benefit from regular communication and events, and professional development for senior leaders and teachers on how to improve classroom practice based on evidence. They also receive support for developing innovative ways of improving teaching and learning. Some Research Learning Networks have developed close partnerships between universities and schools in which researchers and teachers co-create knowledge through learning conversations (Brown, 2018[30]). University-school partnerships are becoming popular forms of facilitating interactions between researchers and teachers in many OECD countries.

Practice and policy share many challenges in using evidence. The relevance and timeliness of research, and difficulty of reconciling different sources of knowledge, attitudes and values are subjects of discussion in both contexts. In addition, evidence and research in policy must be reconciled with politics and the agendas of different stakeholder groups. Scholars complain that policy makers often cherry-pick research to underpin their predetermined agendas while policy makers struggle to find answers from research when they need them. These tensions have been demonstrated and discussed widely (OECD, 2007[1]).

Box 1.2. CERI work on knowledge for policy and practice

Since its work on knowledge management and educational R&D in the early 2000s, and the publication of *Evidence in Education* in 2007, CERI has continued to contribute to the agenda of increasing the impact of education research on multiple fronts.

Teacher knowledge and innovation

Work on innovative teaching and learning has promoted and supported the use of research in practice for over a decade. *The Nature of Learning* volume brought together research on learning with the objective of "help[ing] build the bridges, 'using research to inspire practice'" (Dumont, Istance and Benavides, 2010, p. 14[31]). The contribution of *Science of learning* to building teachers' professional knowledge has been further explored (Kuhl et al., 2019[32]). The OECD's Teacher Knowledge Survey[1] set out to assess teachers' pedagogical knowledge (Sonmark et al., 2017[33]; Ulferts, 2019[34]; 2021[35]) to obtain an objective picture of the current knowledge base across systems. As part of the conceptual basis for this work, CERI explored teachers' knowledge dynamics, arguing for an appropriate governance of teachers' professional knowledge in a complexity perspective (Révai and Guerriero, 2017[36]). Recent work looking at the role of networks in scaling innovation and evidence in education demonstrated the complexity of knowledge dynamics underlying these questions (Révai, 2020[37]).

Knowledge governance

Work on governance helped better understand complexity in education systems and for policy making, and rethink the range of actors involved in shaping systems (Burns and Köster, 2016[6]; Burns, Köster and Fuster, 2016[38]). This work also conceptualised the relationship between knowledge and governance. The governance frameworks were then used to support countries in strengthening evidence-informed policies and map systems' capacity for effective knowledge production and use (Shewbridge and Köster, 2021[39]; Köster, Shewbridge and Krämer, 2020[40]).

Stronger collaboration between policy makers and researchers may ease such tensions. Interestingly, policy-research partnerships are much less discussed in the literature than research-practice partnerships. Nevertheless, policy networks, in which policy makers and various interest groups including researchers interact (Cairney, 2019[41]), are examples of spaces where research can shape policy makers' thinking. Governments also have mechanisms for commissioning research to address specific policy interests. In some cases, this is done in collaboration with research councils or advisory groups. While partnerships and networks are popular ways of scaling evidence use in education (and have in some cases, become policy tools), few have been studied over time and in depth, let alone systematically evaluated (Révai, 2020[37]; Coburn and Penuel, 2016[42]).

Overall, the inability of linear knowledge transfer mechanisms to address the complexity of evidence use in policy and practice is today widely accepted. With recent developments over the past decade, it is time to ask what efforts have been successful in developing necessary relationships and "activating" the whole system to increase research use. In a systems perspective, facilitating the production of research in novel ways is part of the answer.

Research production

From the perspective of knowledge production (Van De Ven and Johnson, 2006[25]), the focus of research-policy and research-practice links is on co-producing knowledge. The collaboration of teachers and researchers in knowledge production is central to relational and systems approaches to knowledge

mobilisation. It is argued that teachers will find research relevant and applicable for their practice if they have ownership of the research – if they are involved in the production process from the start. While some positive outcomes have been reported on teachers' engagement in research for pupils and teachers, difficulties have also been highlighted such as lack of time and inadequate external support for practitioners (Cooper, Klinger and McAdie, 2017[43]; Bell et al., 2010[44]).

In addition, researchers are often not prepared for co-production either. Co-producing research requires research institutions and researchers to understand the contexts of policy and practice while actively seeking to address needs. Despite the increasing requirement in some countries to demonstrate research impact (e.g. through research excellence frameworks in the United Kingdom and Australia), academic incentives are still not aligned to these needs (Cherney et al., 2012[45]). Publishing in high-impact journals is favoured over grey literature or user-friendly formats. Academics also lack support and training in how to work together with practitioners and policy makers. In sum, a number of educationalists still criticise the culture of research production (Burkhardt and Schoenfeld, 2021[46]).

Another issue with research production relates to its overall coordination, or rather, the lack of it. Education research has been accused of not producing evidence in a cumulative way (e.g. Burkhardt and Schoenfeld (2003[47])). This implies that education research does not directly lead to improved practice. Research insights and outcomes are often scattered and disconnected from practice and policy. In addition, publishers tend to prioritise certain methodologies and results (notably positive ones that confirm hypotheses). This inhibits building a comprehensive knowledge base for teaching and schooling.

The fact that multiple actors are involved in research production and use means that the traditional gatekeepers of research quality are no longer necessarily used. For many decision makers, it is difficult to know what information they can trust to guide policy and practice. The co-creation of knowledge by researchers and practitioners / policy makers also raises questions about the quality and rigour of research. While true co-production automatically ensures the relevance of research for practice/policy, it also necessitates consolidating such locally created knowledge. This implies iterations within the same context and replications in other contexts. While such processes are necessary for local knowledge to become explicit, robust and suitable for wider diffusion and use, they happen to a very limited extent (Enthoven and de Bruijn, 2010[48]).

Finally, funding sources and mechanisms raise a number of questions with respect to research production. In some countries, national education acts set out a strongly directed agenda for education research. A widely criticised example for this was the No Child Left Behind Act in the United States that regulated production in ways that restricted funding to certain types of methodologies and ways of production (e.g. Fazekas and Burns (2012[49])). Actors funding education research have diversified in the past decades. In addition to public funding, education research is increasingly funded by private organisations and foundations. Given that the particular interests, aims and criteria of funders influence the aim, scope and sometimes even the methods of research, the funding source becomes an important consideration for the relevance and quality of research (Rasmussen, 2021[50]).

Research dynamics in systems thinking: Key questions remain

Most knowledge mobilisation initiatives have so far been unsuccessful in realising the promise of a systems model and in enabling well-functioning dynamics in research production and use (Cooper, 2014[51]; Boaz et al., 2019[52]). To drive research dynamics in a true systems approach, we need to depart from some long-used terminology and frames of reference. We also need to identify and understand the factors that facilitate and hinder the systematic and high-quality production and use of research in a holistic way. This section raises two important conceptual considerations and highlights key questions that still need to be answered.

Conceptual considerations

Recognising complexity in the way we talk about "knowledge mobilisation"

The literature talks about knowledge transfer, transmission, mediation, knowledge-to-action, knowledge mobilisation and brokerage. Though the definitions of some of these terms have evolved towards a more complex understanding, the words themselves have a linear association; that is, of passing on explicit forms of knowledge in direct and straightforward ways. However, modern theories describe education systems as complex: With multiple actors interacting at multiple levels, characterised by non-linear feedback loops and emerging patterns (Burns, Köster and Fuster, 2016[38]). None of these terms reflects this complexity. Yet, systems thinking will only be truly taken on board when it is reflected in the vocabulary used.

By understanding which words should be used to capture complex research (or more broadly, knowledge) dynamics (Révai and Guerriero, 2017[36]), we can reframe the problem in a way that helps us move forward.

Connecting policy and practice

Despite recurring efforts to bridge the worlds of policy and practice, discussions on the use of research in education tend to focus on the context of policy or practice (evidence-informed policy/practice). These two fields have developed in parallel and – as this volume will demonstrate – developments have not been systematically translated from one context to the other.

However, separating policy from practice is artificial and problematic: Not recognising the intimate link between the two prevents a true systems perspective. In reality, the boundary between education policy and practice is blurred. In decentralised systems, school leaders have substantial autonomy to shape school-level policies (e.g. on teachers' professional learning). Some actors, such as system leaders (e.g. leader of a school cluster), directly shape both practice and policy. In addition, the subject of policy and practice substantially overlaps. For example, both are directly concerned with pedagogical approaches, and monitoring and assessing student learning. At the same time, they also have their distinct areas of focus: For example, teachers' status and salary are policy areas whereas interacting with students and parents are matters of practice.

The complex and increasingly fluid relationship between policy and practice requires rethinking the use of research as well. Further consideration must be given to whether evidence-informed policy can truly be seen as distinct from evidence-informed practice. Exploring how using research in policy making influences and interacts with its use in practice, and what this means for the production of research can help us better understand how to drive these processes.

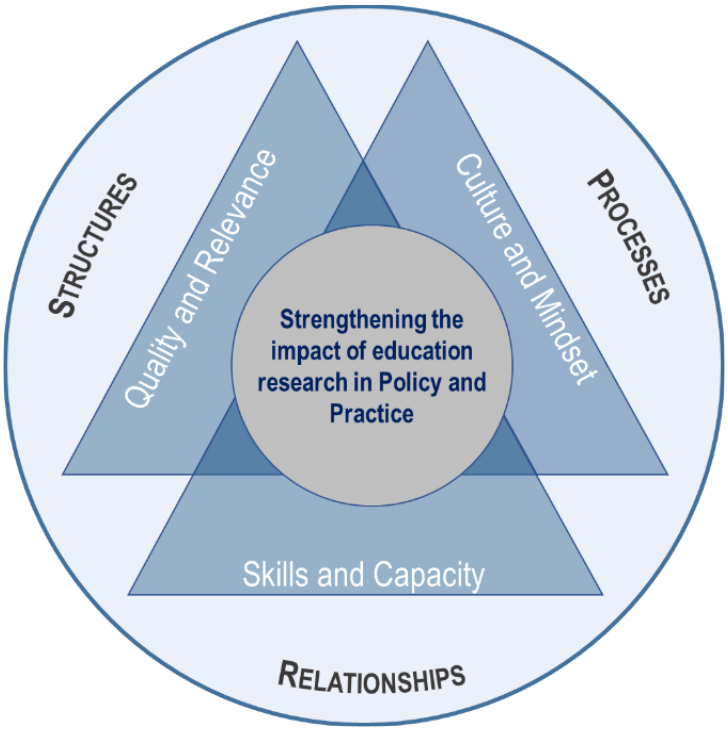
Key questions

If the policy, practice and research environments are complex, non-linear, "messy" processes (Best and Holmes, 2010[8]; Cairney, 2019[41]; Burns and Köster, 2016[6]), how can we enable a more systematic and high-quality production and use of research in both policy and practice?

Unlocking the potential of systems approaches requires understanding all dimensions of the education research "ecosystem". These include the *quality and relevance* of education research; the *quality* use of evidence in different contexts; the *culture and mindset* required for high-quality, systematic research use; and the *skills and capacity* of actors at individual and organisational levels (Figure 1.1).

Key questions that still remain along these dimensions are summarised in Table 1.1.

Figure 1.1. Dimensions of strengthening the impact of education research



Source: Inspired by the QURE framework in Rickinson, M. et al. (2020[53]), *Quality Use of Research Evidence Framework*, Monash University, Melbourne.

Table 1.1. Key questions around strengthening the impact of education research

Dimensions	Questions
1. Structures and processes	How can we evaluate the impact of education research, and the structures and processes that support research use?
	What structures (e.g. institutions, networks) and processes facilitate the use of research in policy and practice?
	What system-level strategies and coordination can strengthen the impact of education research at scale?
2. Relationships	What relationships are necessary to strengthen the impact of education research in policy and practice?
	How can relationships and interactions reinforce research use?
3. Quality and relevance	How can we describe the quality use of research in policy and practice?
	How can we improve the quality of education research and how can we make it more relevant?
4. Culture and mindset	How can we raise awareness of and build positive attitudes towards using research systematically in policy and practice?
	How can (organisational and system-level) leadership contribute to strengthening the impact of education research?
	How can we redesign systemic incentives to increase the impact of research for policy and practice?
5. Skills and capacity	What skills and support do policy makers, practitioners, researchers and other actors need for using and (co-)producing research?
	What organisational and systemic capacity is needed to support the (co-)production and use of research in policy and practice?

Mapping the landscape: Policy survey

Although understanding of the evidence system has evolved greatly and major efforts have been made across the OECD to strengthen the impact of education research, how to effectively ensure its systematic use in policy and practice remains a challenge. The first step in addressing that challenge is to map existing mechanisms, actors and challenges across systems.

The *OECD Strengthening the Impact of Education Research* policy survey – conducted from June to September 2021 – is one of the first international efforts to collect data on the mechanisms used to facilitate research use in countries/systems. Overall, 37 education systems from 29 countries[2] have responded to the survey. Responses represent the perspective of ministries of education at the national or sub-national (state, province, canton, etc.) level. As such, they are subject to the bias of personnel within these ministries, their perceptions and personal realities (see Box 1.3 for who policy makers are in this survey).

Box 1.3. Who are policy makers?

There are policy makers at national, regional and local levels in every system. However, the nature of the education system (e.g. centralised, decentralised, federal) implies different structures, which involve differences in the locus of control for decision making (OECD, 2007[1]). The *Strengthening the Impact of Education Research* policy survey targeted the highest level of decision making in education (ministry/department of education). In federal systems, this corresponds to the state (province, canton, autonomous community, etc.) department. Ministries were asked to coordinate the response across departments.

The follow-up interviews revealed that ministries of education had various definitions of policy makers. Interviewees most commonly associated the term with high-level ministry officials such as Directors, Deputy Directors and Director Generals. There was overall a high degree of recognition that policy makers are those with influence over the policy process, rather than those tasked with implementation of policies. Some systems however took a broader view, considering all those working at the ministry of education, as well as individuals in the executive and legislative branches of government. As a result of the different understandings, comparisons between systems in policy survey data should be made with caution.

The survey has three parts, which cover the various elements and dimensions represented in Figure 1.1

- The first part maps the actors, mechanisms and relationships that facilitate the *use of research in policy making*. It also asks how policy makers use research and their levels of satisfaction with research use.
- The second part pertains to *using education research in practice* and maps actors and mechanisms that foster this. In line with the key dimensions described above, the survey asks about drivers of and barriers to research use in policy and practice, covering issues of mindset and culture, resources, skills and capacity as well as learning opportunities.
- Finally, the third part relates to the *production of education research*: The accessibility and relevance of research; the various mechanisms in place; the involvement of actors and their incentives; and funding for research.

As a follow-up to the survey, six countries[3] were selected for further data collection through semi-structured interviews. The criteria for selection included: Ensuring that diverse geographical and educational contexts are represented, including countries/systems that provide substantial qualitative information through the open-ended answers in the survey.

The purpose of these interviews is to:

- Ensure that survey data is correctly interpreted.
- Further understand good practices and challenges with regard to using research in policy and practice systematically and at scale.
- Understand what ministries/governments hope to gain from the analysis of survey data; highlight any specific areas of interest; and answer any questions.

In this volume, two chapters (6 and 7) provide a first set of analysis of survey data.

Purpose and structure of this report

This volume aims to provide a modern account of research use in education policy and practice. It does so in two main ways. First, by inviting a number of leading experts in knowledge mobilisation (evidence-informed policy/practice) to present their cutting-edge research. Second, by reporting on the first results of the *OECD Strengthening the Impact of Education Research* policy survey. While chapters across the volume touch upon most questions set out in Table 1.1, the main focus at this stage is to provide an initial mapping of structures, processes and relationships and the main barriers to improving research use. Rather than offering clear solutions, the report illustrates some promising practices and directions for future work. The report is structured as follows.

Part I. Conceptual landscape and the evolution of the field

The first part sets the scene for the report with three introductory chapters.

The current **Chapter 1** presents the background and rationale for this work.

In **Chapter 2**, *José Manuel Torres* provides an overview of some dominant models of knowledge mobilisation. The author compares and contrasts these models, and analyses the evolution of perceptions and priorities of this field over time. The chapter highlights some additional, more recent models that focus on a specific aspect of research dynamics. The author concludes with questions and recommendations for developing a new vision that captures research dynamics in the complex interactions of education research, policy and practice.

In **Chapter 3**, authored by *Tracey Burns* and *Tom Schuller*, revisits the discussion of evidence-informed policy with a specific focus on brokerage and brokerage agencies. The chapter presents some advances in the field and argues that, despite these, the same challenges remain with additional emerging ones. To conclude, the chapter proposes an ambitious agenda for moving forward towards building a collective knowledge base on research brokering.

Part II. Actors and mechanisms facilitating research use in policy and practice

The second part of the volume focuses on the various actors and mechanisms that aim to facilitate the use of research in policy and practice.

In **Chapter 4**, *Jordan Hill* analyses the OECD Strengthening the Impact of Education Research policy survey results with respect to the actors involved in producing research and facilitating its use. The chapter starts with an overview of the various factors to be considered when mapping actors and their relationships. It presents actors active in facilitating the use of research evidence at organisational and individual levels in the 37 participating education systems. The chapter describes actors' engagement in the production of research and how co-production is incentivised and realised. Finally, it discusses the quality of policy makers' relationships and interactions with various actors.

Chapter 5 provides an analysis of the OECD survey regarding the mechanisms of and barriers to facilitating research use. *José Manuel Torres* presents a framework for classifying the various mechanisms and describes their use in the policy and practice contexts across respondent systems. It then discusses the various barriers countries face in making research use systematic. The chapter concludes noting the importance of system-level coordination of the various mechanisms and the current lack of such coordination.

In **Chapter 6**, *Annette Boaz*, *Kathryn Oliver* and *Anna Numa Hopkins* present results from a cross-sectoral mapping exercise that mapped and reviewed 513 organisations promoting research-policy engagement. The chapter catalogues a large number of examples of linear, relational and systems approaches from a wide range of sectors, including health, agriculture and environment. Drawing on evaluations, the authors highlight key findings with respect to the effectiveness of the various approaches. The chapter ends with a number of cross-cutting themes and implications for the education sector, presented through five key questions.

In **Chapter 7,** *David Gough, Jonathan Sharples and Chris Maidment* discuss how initiatives that aim to facilitate the link between research, policy and practice can themselves be evidence-informed. Drawing on examples of "knowledge brokerage initiatives", the chapter addresses five areas of evidence-informed brokerage. These are: Needs analysis; integrating evidence use in wider systems and contexts; methods and theories of change; evidence standards and evaluation and monitoring. The chapter ends with a set of recommendations for brokerage initiatives, policy makers and funders.

Part III. New approaches to understanding research use

The third part offers fresh perspectives on the production and use of education research.

Chapter 8 argues that research use and research impact in education should be discussed from the perspective of co-construction. *Gábor Halász* tells stories of co-construction through a range of personal experiences. The chapter presents various forms of cooperative knowledge production in which researchers and practitioners learn from each other. It argues that using innovation and knowledge-management approaches could add a positive dimension to thinking about research use and impact.

In **Chapter 9**, *Mark Rickinson and colleagues* focus on using research well in practice. The chapter draws on findings from a five-year study of research use in Australian schools. It explores how quality use of research can be conceptualised, what it involves in practice, and how it can be supported. The chapter concludes with four implications for individuals and organisations interested in strengthening the role of research in school and system improvement.

Chapter 10 presents different perspectives on education research. The chapter starts with a short overview of key questions that have emerged from decades of debate about the relevance of education research for teaching practice and policy. What is its purpose? What types of research are relevant for policy and practice? How should research be produced? This is followed by seven short opinion pieces by: *Mark Schneider, Dirk Van Damme, Vivian Tseng, Makito Yurita, Tine Prøitz, Emese K. Nagy, Martin Henry* and *John Bangs*. The viewpoints come from academia, policy, consultancy, funders, teacher training, and unions, and from different countries. The chapter concludes with a set of convergences, divergences and open questions.

Chapter 11 draws together the lessons learnt from the previous chapters and the OECD policy survey. *Nóra Révai* highlights six overall messages that emerged from the research presented in the volume, taking stock of the remaining challenges for improving research-policy-practice engagement. The chapter ends with describing how the Strengthening the Impact of Education Research project will advance this agenda in the coming years.

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Notes

[1] The Teacher Knowledge Survey has been integrated as an optional module in the 2024 Teaching and Learning International Survey (TALIS).

[2] OECD member countries: Austria, Belgium (Flemish and French Communities), Canada (Quebec, Saskatchewan), Chile, Colombia, Costa Rica, Czech Republic, Denmark, Estonia, Finland, Hungary, Iceland, Japan, Korea, Latvia, Lithuania, Netherlands, New Zealand, Norway, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland (Appenzell Ausserrhoden, Lucerne, Nidwalden, Obwalden, St. Gallen, Uri, Zurich), Turkey, United Kingdom (England), United States (Illinois). Non-member countries: Russian Federation, South Africa.

[3] Japan, New Zealand, Norway, Portugal, Slovenia, South Africa.

2 Louder than Words: Review and comparative analysis of knowledge mobilisation models

José Manuel Torres, OECD

This chapter provides an overview of some dominant models of knowledge mobilisation. First, it compares and contrasts these models using the three approaches of thinking described by Best and Holmes: Linear, relationship and systems. Second, the chapter highlights some additional, more recent models that focus on a specific aspect of research dynamics. The last section builds on these models and presents recommendations to capture the research dynamics at play within the complex interactions of education research, policy and practice. These recommendations may inform the development of a future model which could ultimately enhance student and professional learning.

Introduction

Understanding the links between education research and its use in policy and practice is important to frame efforts to increase the impact of research. Substantial research has been done to conceptualise and model knowledge mobilisation over the past two decades. It is now timely to map the evolution of this field and identify major developments and current shortcomings.

The literature presents a large number of sometimes confusing concepts describing knowledge mobilisation, its different elements and the contexts in which it develops. Gough and colleagues refer to "knowledge mediation" defined as "connections between evidence production and use with the overt purpose of bringing together producers and users of evidence" (Gough et al., 2011, p. 23[1]), Cooper uses "knowledge mobilisation" and defines it as "intentional efforts to increase the use of research evidence […] in policy and practice at multiple levels of the education sector" (Cooper, 2014, p. 29[2]).

In line with this diversity of definitions, multiple conceptual frameworks on knowledge mobilisation have been developed. The focus of the models and the sectors for which they were developed differ, with health and education being the most common. As with definitions, some frameworks cover the relationships between research production and research use while others centre their analyses on the relationships between research, practice and policy. The lack of agreement on terminology, conceptual framing and the elements composing them was identified more than 10 years ago as one of the main challenges to enhancing knowledge mobilisation efforts (Levin, 2008[3]).

These frameworks have evolved over time to capture more of the complexity of educational research systems. They have shifted from presenting one-way processes, with research as a generalisable product, to considering the system as a whole. This system is characterised by different elements influencing one another. Nevertheless, this evolution has not converged towards a general framework of knowledge mobilisation, articulating each local framework within a larger framework (Nokes, 2009[4]). Nor has it resulted in a universally agreed model outlining the nature of research-based practice and policy (Gough, Maidment and Sharples, 2018[5]). The feasibility of converging on such a model is highly unlikely due to the complexity of educational ecosystems and the specific interests that different stakeholders may choose focus on.

The aim of this chapter is to identify the strengths of existing frameworks and the shortcomings they may still have despite their evolution. The analysis of different knowledge mobilisation models provides an overview of how depicting complexity in education research systems have evolved over time. It also sheds light on the relative importance assigned to each element in the models. Ultimately, this will help us think about knowledge mobilisation in new ways and this thinking will inform initiatives aimed at reinforcing research production and use.

First, the chapter provides an overview of selected models of knowledge mobilisation, analysing and comparing them using three conceptual approaches described by Best and Holmes (2010[6]). Next, it presents some additional models that focus on specific aspects of research dynamics that provide new perspectives on knowledge mobilisation. The last section proposes recommendations emerging from the analysis of existing models to capture the complexity of educational research dynamics in policy making and teaching practice and inform the development of a clearer vision of knowledge mobilisation.

Conceptual approaches: An analytical lens

The different conceptualisations of interactions between research, policy and practice on one side, and research production and its use on the other, determine their relevance and shape efforts to improve their outcomes (Best and Holmes, 2010[6]). Finding an appropriate model for knowledge mobilisation can

ultimately contribute to harnessing the use of research evidence in both policy making, and school and teaching practice.

Best and Holmes (2010[6]) characterised three ways of thinking about research-policy-practice links: The linear model, the relationship model, and the systems model. The former two have already been analysed in earlier OECD work (2000[7]).

The *linear model* presents one-way processes in which knowledge is a generalisable product and the use of it depends on "effective packaging". Knowledge is produced by researchers, disseminated to users, and incorporated into practice and policy. This model assumes that these phases or processes follow a logical successive and dependent order, an assumption reflected in the language used to describe these phases (e.g. "knowledge transfer", "research uptake"). While Figure 2.1 gives a simplistic representation of a linear model of knowledge mobilisation with three phases, in more detailed models these phases can go up to seven: production, validation, collation, dissemination, adoption, implementation, and institutionalisation (OECD, 2000[7]).

Figure 2.1. Knowledge mobilisation linear model

Source: OECD (2000[7]), *Knowledge Management in the Learning Society*, https://doi.org/10.1787/9789264181045-en.

With research knowledge production being isolated from research use in policy and practice, these linear knowledge transfer models have been refuted since at least the late 1970s (Lave and Wenger, 1991[8]). One argument is that one-way research transfer processes (i.e. research "passing" from producers to users who implement it) do not adequately explain what happens in reality (Levin, 2013[9]). A second argument is that the assumption of a linear model has led to "a gap between the communities of researchers and decision-makers, [failing] to interact and understand each other" (Langer, Tripney and Gough, 2016, p. 49[10]). Far from being an orderly exercise, "knowledge processes" tend to have feedback loops and overlaps between them. Thus, a more accurate representation would be interactive modelling, where connections and interdependencies between components influence one another at different points.

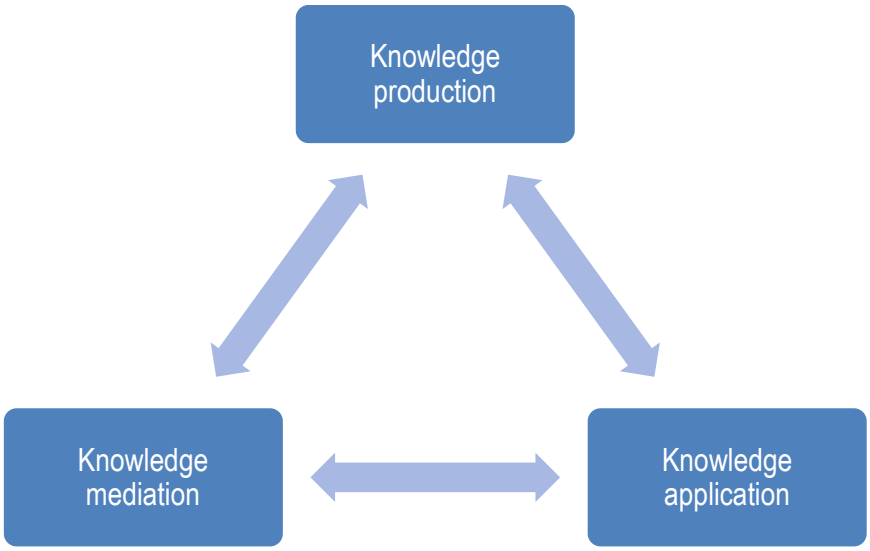
The *relationship model* focuses on the connections and interactions between either actors using knowledge or processes related to its production and use. This model still takes into account linear processes such as dissemination and diffusion of knowledge. It also stresses the influence that partnerships and networks of actors with similar concerns can have on the sharing of knowledge. In this approach, knowledge can come from multiple sources – either research or theory, policy or practice – and its use will depend on the effectiveness of the processes and relationships developed.

In this conceptualisation, knowledge users such as teachers have a more engaged role in knowledge production. It also accounts for the active contribution research producers can make to knowledge mobilisation processes. These processes of transfer and integration can, in turn, lead to the creation of new knowledge. Figure 2.2 presents a simplified version of knowledge mobilisation through the lens of this more sophisticated way of thinking, with the interaction between the elements in the system being one of its most relevant characteristics (OECD, 2000[7]).

Finally, the *systems model* builds on and extends the diffusion, dissemination and relational processes of the former models. It builds on both systems theory and complexity theory, which postulates that systems consist of individual actors who create relationships among each other, which in turn are formed in

response to feedback. New structures and behaviours emerge as a result of actors' actions and interactions (Snyder, 2013[11]). Self-organisation, the emergence of patterns and multi-directional flows of knowledge are thus inherent to systems models. Here, the presence of constant feedback loops and the understanding of the roles, actions and contexts of key stakeholders, and how they shape – and are shaped by – the system are key.

Figure 2.2. Knowledge mobilisation relationships model



Source: OECD (2000[7]), *Knowledge Management in the Learning Society*, https://doi.org/10.1787/9789264181045-en.

Systems theory sees systems (e.g. the education research system) as containing interdependent components, structured in a hierarchical order. Organisations within these systems are also interdependent and must maintain permeable boundaries in order to receive, transform and export knowledge. During these processes, systems engage in negative and positive feedback loops. These feedback loops serve to correct errors or improve the system as a whole or one particular element of it. These different processes allow a whole system to be greater than the sum of its parts (Lai and Huili Lin, 2017[12]).

This type of model considers the presence of multiple sources of knowledge and interrelated circuits of knowledge linking locally generated knowledge to knowledge developed through more systematic coordination. All the relevant stakeholders actively participate in the production and/or the use of knowledge. Researchers, practitioners, policy makers and other actors influence one another, directly and indirectly, within dynamic systems.

Through the systems lens, strategies to coordinate the use of research knowledge have to take into account all the key actors and factors that could affect processes in educational systems. The success of these strategies will depend on their coordination across multiple levels; skills and capacities of the actors; the existence of leadership spread across various actors; the effectiveness of communication channels; and well-placed structures of accountability. It is the interdependencies of these elements that make it difficult to capture the complexity of education research dynamics in a model.

Three ways of thinking about knowledge mobilisation – linear, relational and systems – guide the analysis of the selected frameworks in this chapter. This point hides an important caveat: That a model is a simplified description of a system and/or its processes. When the system it depicts is highly complex, certain elements are not represented or minimised and some others are emphasised. The models

representing knowledge mobilisation, and the elements their authors chose to include, have an impact on which, and how, different actors within the system are represented and where the efforts will be focused (Sharples, forthcoming[13]). Thus, it must be recognised that an analysis of the evolution of these depictions also maps changes in the *perceptions* of the education research system and the components of it that are most valued.

Knowledge mobilisation models

The next two sections will briefly present the four selected models, and compare and contrast them. The selected frameworks and models reflect the evolution of knowledge mobilisation perspectives over time. Rather than a comprehensive review, the following four models have been selected because they are widely cited, highly recognised by leading experts in the field and/or add a new perspective and elements to consider on the subject.

The section starts with a brief description of each model, which is followed by a more in-depth analysis summarised in Table 2.1.

Knowledge-transfer strategy framework

Lavis and colleagues (2003[14]) provide an organisational framework for a knowledge-transfer strategy in both the applied health and economic/social policy sectors, represented by Figure 2.3. This framework considers five elements, which are laid out in the form of answers to the following questions.

- What should be transferred to decision makers? **The message**

  Research organisations have to transfer actionable messages coming from a broad body of research and not simply from a unique study. The authors highlight that not all research can or should have an impact. The work can help with identifying problems, generating hypotheses, and developing new methodologies rather than solely informing decision making.
- Whom should research knowledge be transferred to? **The target audience**

  The clear identification of a target audience is key. The audience, its environment and the decisions they face define the specific strategy for the message's transfer. Thus, the target audience directly affects the nature of other elements in the framework. The authors describe four types of audience: General public or service recipients; service providers; managerial decision makers; and policy decision makers. These different audiences with their different characteristics and objectives influence the format in which the message is delivered.
- Who should transfer research knowledge? **The messenger**

  The messenger can be an individual, group or organisation. What is most important is that the messenger has credibility in this role as this can affect the potential success of knowledge-transfer strategies. Building this credibility is time-consuming and skill-intensive, and having the right messenger for a particular strategy depends on the capacity of other elements of the framework. For instance, a credible messenger who is known among policy makers in the health sector would not be the best choice for transferring research knowledge to teachers.
- How should research knowledge be transferred? **Knowledge transfer processes and supporting communications infrastructure**

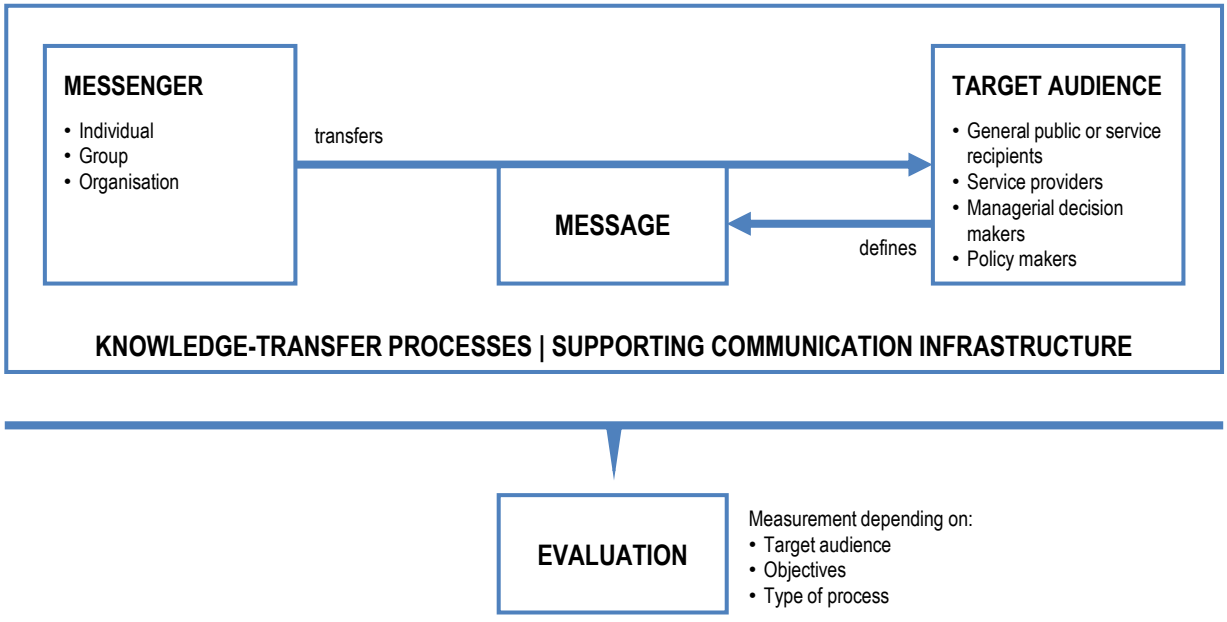
  Regardless of the target audience, active rather than passive engagement processes are the most effective. One-way processes such as "producer-push" efforts that are, for example, led by research producers who push research out into policy or practice (Davies, Powell and Nutley, 2015[15]) are less desirable than "user-pull" approaches in which, for example, research users reach out to researchers to obtain information (Davies, Powell and Nutley, 2015[15]). Bi-directional processes

that place value on what research producers and users can learn from each other are optimal for generating an actual change in decision-making cultures, regardless of the audience. The mode of interaction between actors requires significant attention and, consequently, so does the communications infrastructure that supports it.

- With what effect should research knowledge be transferred? **The evaluation**

  The expected results and measurement of a knowledge-transfer strategy's outputs depends on the target audience, its objectives, and the types of processes analysed. In the case of education, the objective could be changing a particular teaching practice (or the practice of a health professional in the original focus) whereas for policy makers, it could be informing debate on the selection of a possible course of action.

Figure 2.3. Knowledge-transfer strategy framework



Source: Own elaboration, based on Lavis, J. et al. (2003[14]), "How can research organizations more effectively transfer research knowledge to decision makers", *The Milbank Quarterly*, Vol. 81/2, pp. 221-248.

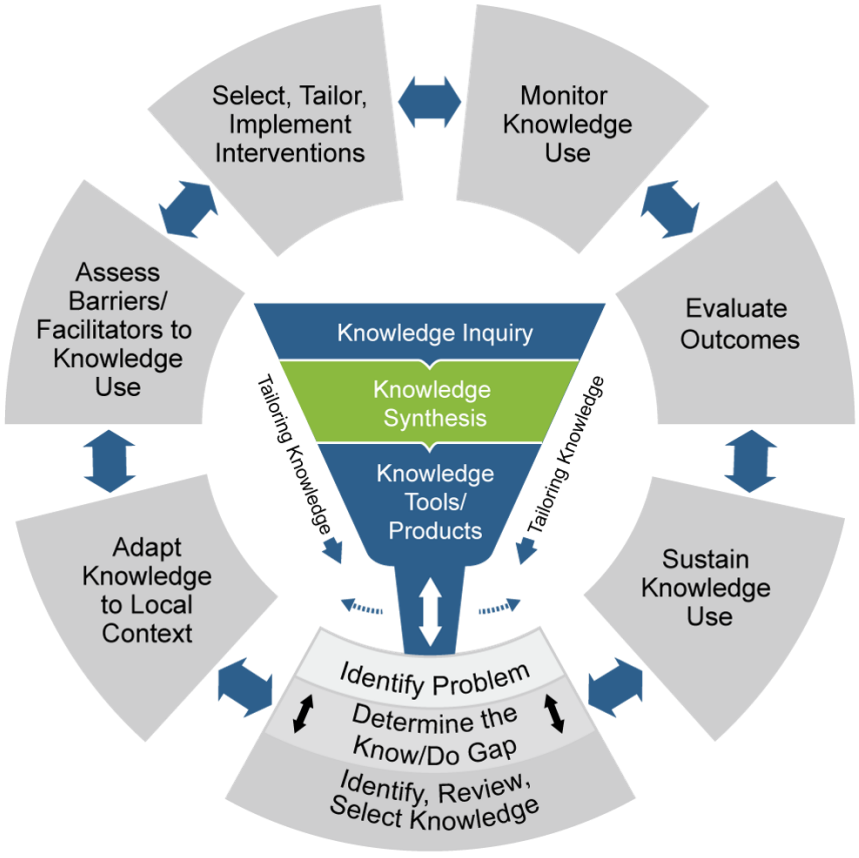
Knowledge-to-action framework

Graham and colleagues (2006[16]) offered a framework to elucidate the key elements of the knowledge-to-action (KTA) process in the health sector with *action* encompassing the use of knowledge by practitioners, policy makers, patients, and the public. This framework is represented in Figure 2.4.

Conceptually, the KTA process is divided into two main components: Knowledge creation, represented in the figure by the funnel, and the Action cycle, with each of them comprised of ideal phases. However, the authors acknowledge that the actual process is complex and dynamic, and the hierarchy and limits between the components and their phases are fluid and permeable, occurring in sequence or simultaneously and influencing each other.

In this framework, knowledge is mainly research-based but also includes other forms of knowing such as experiential knowledge. The Action cycle represents the activities and processes related to the use or application of knowledge.

Figure 2.4. Knowledge-to-Action framework: Knowledge creation and Action cycle



Source: Crockett, L. (2017[17]), "The Knowledge-to-Action Framework", https://medium.com/knowledgenudge/kt-101-the-knowledge-to-action-framework-7fbe399723e8 (accessed on 27 August 2021), based on Graham, I. et al. (2006[16]), "Lost in knowledge translation: Time for a map?", http://dx.doi.org/10.1002/chp.47.

Knowledge creation

The knowledge creation component of the KTA framework considers the major types of knowledge that exist and can be used. It starts with the phase of knowledge inquiry, which represents the broad body of primary research or information of variable quality, relevance and accessibility. The next phase, knowledge synthesis, represents the aggregation of existing knowledge through the identification, appraisal, and synthesis of studies or information relevant to specific questions. This synthesis often takes the form of systematic reviews, including meta-analysis and meta-synthesis. Lastly, the third phase considers the creation of knowledge tools or products such as synopses, practice guidelines and decision aids, which aim to present knowledge in clear, concise, and user-friendly formats to ideally influence what research users do.

Knowledge producers can adapt their activities to the needs of potential users in each of the phases, tailoring their research questions to address the problems identified by users or customising the message for the different users.

Action cycle

The authors consider the Action cycle of the KTA framework as a process leading to the implementation of knowledge, representing the activities needed for this application. These phases, summarised in

Figure 2.4, are dynamic and can influence each other, leading to permanent feedback between them. They can also be influenced by the knowledge creation phases.

Research knowledge mobilisation model

Levin (2004[18]) developed a framework on research impact in the education sector, which would later be used by several authors to conceptualise knowledge mobilisation and later formed the basis of Levin's own knowledge mobilisation model. In this framework, the author considers research impact to have four core elements.

First, the context of research production. This includes what and how research gets done, who does it, and the communication activities undertaken. It assumes that the production is mainly located in the academic world but that it also takes place in a variety of organisations.

Second, the context of research use. This includes governments, educational organisations, teachers, the school community, students and all contexts that have an interest in the application of research. It considers the views, capacities and structures enabling these organisations to find, understand and use research or limiting them.

The framework emphasises all types of connections and interactions between these two contexts – direct or mediated; formal or informal; face-to-face or digital; strong or weak – which should enhance impact over time. These connections tend to happen through third-party mediation – the third element. This extends to varying degrees in both directions as research production and mediation can be influenced by research use. The author suggests that the contexts of mediation and use are larger than the research production context, as they bring together a wider set of institutions, organisations and individuals.

Finally, these three elements are situated in a larger social context – the fourth element – which is itself in constant flux. This suggests that the actions of research producers and users, while important, are not the only ones affecting ideas and social practices. Furthermore, a variety of people and organisations work in both research production and use contexts, with individuals moving between research posts and educational practice.

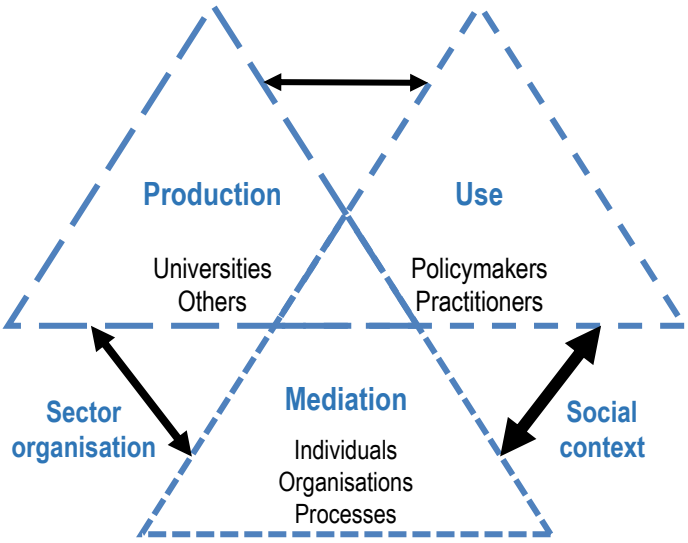
Levin (2011[19]; 2013[9]) would later present his research knowledge mobilisation model based on the above-mentioned framework. It represents three overlapping contexts: The production of research; use of research; and all mediating processes between these two (see Figure 2.5). In Levin's model, which is based on systems theory, knowledge mobilisation happens where two or more of these contexts interact.

These contexts do not refer necessarily to structures or organisations but, rather, to functions. The model acknowledges that some people and groups can operate in more than one context, which is why the triangles in the representation overlap. Within each context there is a wide range of connections and feedback loops with other parts of the system. The multiple organisational and personal connections between the contexts are represented by two-way arrows of different thicknesses, indicating the strength or the intensity of these relationships.

While research production mainly (though not only) takes place in academia, research use considers both policy and practice settings such as schools and governmental organisations where the knowledge can be applied. Research mediation considers all the individuals or organisations attempting to connect research production and use such as think tanks, lobby groups, the media and professional organisations.

The three contexts and the knowledge mobilisation processes taking place among them are influenced by institutional and organisational settings, and the social context in general. The structure of the system – e.g. the institutions, legal constraints and governance arrangements – also strongly shapes the mobilisation of research knowledge.

Figure 2.5. Research Knowledge Mobilisation model



Source: Levin, B. (2013[9]), "To know is not enough: Research knowledge and its use", http://dx.doi.org/10.1002/rev3.3001.

Evidence use analytical framework

Gough and colleagues (2011[1]) developed a first framework to classify activities linking research evidence with policy making. Their model focuses on components already described by some of the other selected frameworks. In particular, it refers to the production of evidence, its use, and the mediation between these two as outlined by both Graham and colleagues, and Levin.

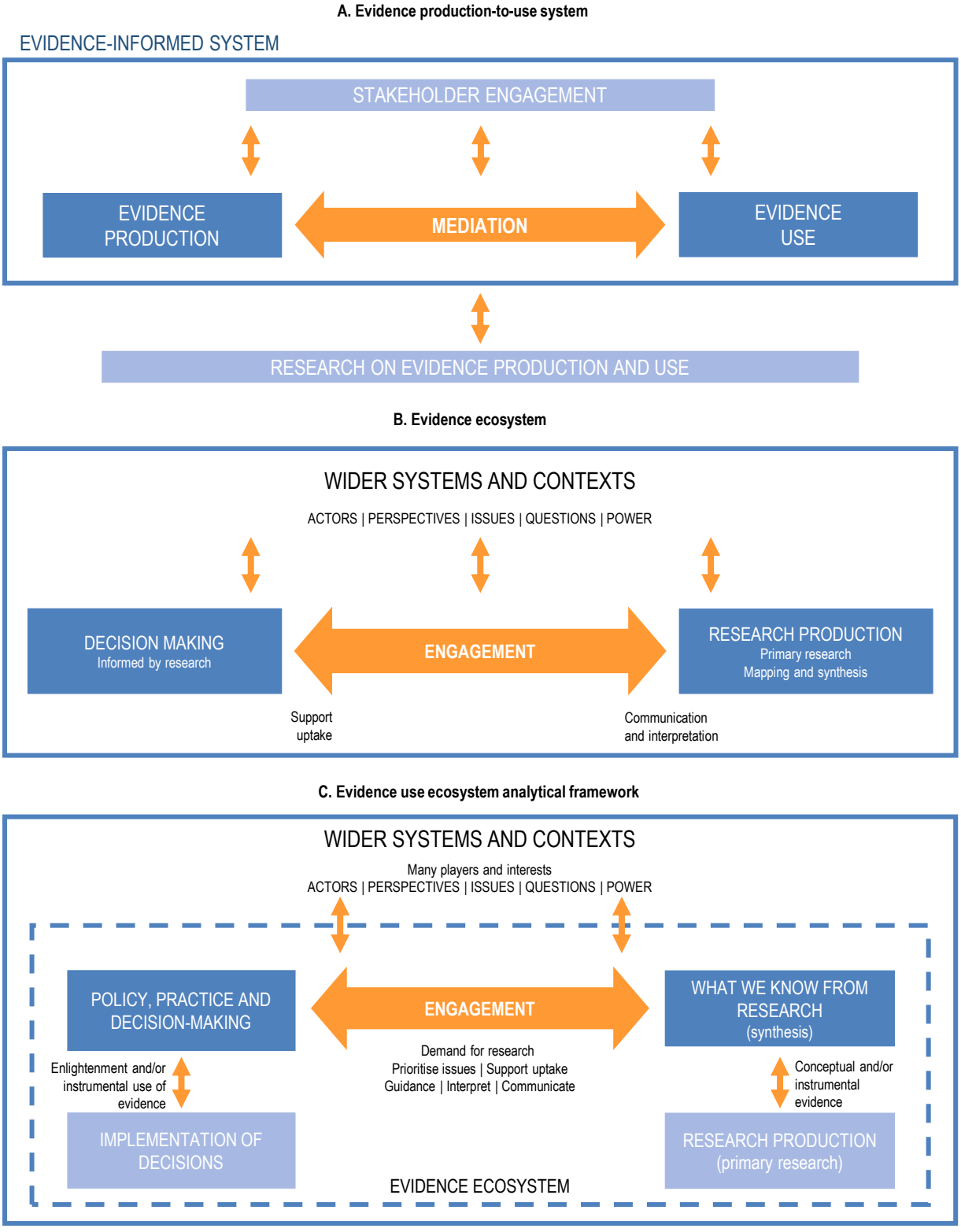
The production of evidence includes not only *producing* relevant research but also *enabling* its production (e.g. individual and organisational conditions that facilitate the research production) and *communicating* its results. The use of evidence encompasses the direct use – i.e. the change of policy makers' behaviour and ultimately of policy itself – and the indirect use – i.e. the shape of policy makers' knowledge and attitudes. Mediation of evidence refers to the connections that bring together evidence producers and users. These are all processes that may occur at the individual, organisational and structural or system level.

Although the terms "producers" and "users" could imply a linear, unidirectional flow of information, the authors highlight that these relationships occur in multiple directions. In this sense, evidence users are active constructors of knowledge and not just passive recipients of the work of research producers. Despite the fact that the three components – evidence production, mediation and use – are usually shown as separated in models, the authors highlight that they are commonly intertwined. To reflect these complexities of the system, Gough and colleagues added three other dimensions:

- Engagement of stakeholders other than evidence producers and users that may be involved in the process, such as civil society organisations, employers' organisations, social partners and the media.
- Recognition that the components of the model work together as a system, emphasising the importance of coordinated and effective interventions.
- Research on evidence production and use itself, which informs the processes occurring within the system and its continuous improvement.

The framework developed by Gough and colleagues has evolved over time, and this evolution is discussed below and represented by Figure 2.6.

Figure 2.6. Evidence use ecosystem framework



Source: Panel A: Adapted from Gough, D. et al. (2011[1]), *Evidence Informed Policymaking in Education in Europe : EIPEE Final Project Report*, EPPI-Centre, Social Science Research Unit, Institute of Education, University of London; Panel B: Adapted from Gough, D., C. Maidment and J. Sharples (2018[5]), *EPPI-Centre*; Panel C: Adapted from Gough, D., J. Thomas and S. Oliver (2019[20]), "Clarifying differences between reviews within evidence ecosystems", http://dx.doi.org/10.1186/s13643-019-1089-2.

In 2018, Gough and colleagues (2018[5]) adapted this model to analyse the work undertaken by the United Kingdom's What Works Centres, enlarging its scope to evidence-informed policy and practice. Graphically, the swap between the two components of research production, commonly on the left, and the research use, commonly on the right, forces a new consideration of their non-linear relationship. As most countries read from left to right, the previous configuration emphasised a "research push" interpretation in which produced knowledge comes first and should inform decision making in practice and policy. The later model inverses the perspective to put greater emphasis on pull mechanisms and adopts a systems view indicating various interacting elements.

Regarding research use, the authors distinguished between use by policy makers and practitioners, directly making and implementing the decisions ("decision making" in the figure) and use by the Centres. This latter use acts as an enabler of the former, supporting individuals and organisations in the policy and practice contexts to use research ("supporting uptake" in the figure).

The dotted lines surrounding the core elements of the system, represented in a later work by Gough and colleagues (2019[20]), signifies two levels to the framework: On one hand, the narrow evidence ecosystem with engagement between research production and research use; on the other, the broader socio-political system and context within which the evidence ecosystem sits. The use of the term "ecosystem" points to a dynamic figure, with different components affecting each other, directly or indirectly, and with positive and negative feedback loops. Both systems affect the decisions made in policy and practice, the research produced and the connections and influences between these two.

Comparative analysis

Through the lens of the conceptual approaches developed by Best and Holmes (2010[6]), this section will analyse the above presented models. Table 2.1 summarises the main characteristics of the frameworks and sheds light on the evolution of the conceptualisation of knowledge mobilisation.

Table 2.1. Comparative analysis of knowledge mobilisation models

Author(s)	**Lavis et al.**	**Graham et al.**	**Levin**	**Gough et al.**
Name	Knowledge-transfer strategy framework	Knowledge-to-Action framework	Research Knowledge Mobilisation model	Evidence use ecosystem analytical framework
Year(s)	2003	2006	2004 – 2013	2011 – 2019
Academic relevance	1 467 citations	4 606 citations	949 citations (4 articles) Widely considered by experts.	123 citations (3 articles) Widely considered by experts
Sector	Health, Socio-economic sectors	Health	Education	Education
Context	Policy and Practice	Policy and Practice	Policy and Practice	Policy and Practice
Generation (Best & Holmes)	Linear	Relationship	Relationship-System	Relationship-System
Core elements	Message; Actors	Knowledge creation; Knowledge use	Research knowledge functions: Production, Use and Mediation	Research production; Multi-level research use; Ecosystems
Elements' interaction	Isolated	Permeable	Overlapped	Intertwined and influenceable

Author(s)	Lavis et al.	Graham et al.	Levin	Gough et al.
Key actors	Messenger and Target audience (potential users)	Producers and Users (practitioners, policy makers, the general public)	Producers, Users and Mediators	Producers, Users, Mediators and other Stakeholders
Activities (Actors' roles)	Knowledge Transmission (messenger); Knowledge Application (user)	Knowledge Creation (producers); Knowledge Application (users)	Research production; Research use; Research mediation. (Actors can operate in more than one particular context)	Research production and communication (producers); Research construction and direct and indirect use (users); Bringing together producers and users (mediators); Engagement (stakeholders)
Contribution	Tailoring of the message to the audience. Presence of evaluation.	Fluidity and permeability of components allowing feedback loops.	Overlapping of functions. Influence of larger setting and social context.	Consideration of evidence-informed system as a whole and its influence.

Note: Number of citations according to Google Scholar on 12 May 2022.

The analysis compares the frameworks across a few key characteristics. The first five rows of the table provide some basic information. The row "generation" refers to the Best and Holmes' conceptual approach that is reflected in the framework. "Core elements" refers to the elements that are at the centre of each considered model. "Elements' interaction" captures the relationships between the core elements. "Key actors" points to the actors identified as playing a role within the models, while "activities" depicts the roles assigned, if any, to each of these actors. Finally, "contribution" summarises the main outputs and novelties from the reviewed models.

Core elements and their interaction

Each of the presented models has a different set of core elements. These and their relationships indicate which "generation" of knowledge mobilisation they belong to.

The first difference is the way in which the models describe knowledge. Lavis and colleagues do not feature the "functions" of knowledge (production, use); rather they focus on the "message", a product to be formatted to fulfil the target audience's requirements by the "messenger". To a certain extent, this corresponds to a partial and static version of the "mediation" element of Levin's model, focused exclusively on the translation and formatting of knowledge. Graham and colleagues favour the terms "knowledge creation" and "action" (used as the title of their model) while the two most recent models prefer the terms "production" and "use". This vocabulary, while different, can be seen as roughly corresponding (i.e. production-creation and use-action), with some nuances. Creation has creativity as its root while production has product. The former perhaps more naturally implies the combination of different knowledge types (research and experiential) while the latter can be more easily associated to something thought to be used (as a product). On the other end, "use" could be much broader than "action" once we acknowledge that research can shape attitudes and knowledge, even when its use cannot be explicitly captured by discrete action.

The second difference relates to the relationships between the core knowledge elements. In Lavis et al., the message connects two groups of actors (messenger and target audience); however, research production and its use are clearly isolated from each other. In Graham et al.'s framework, knowledge creation is at the centre, surrounded by stages of action that may occur simultaneously. The fluidity and permeability of creation and action stages generate permanent feedback loops. In Levin and in Gough et al., production and use are connected through mediation, although quite differently. In the former, the three components appear to be equal whereas in the latter, the representation suggests that mediation is more of a process (rather than a knowledge activity) that connects production and use.

An additional difference is the explicit presence (or not) of knowledge mobilisation (or similar) in the models. Whereas Graham et al.'s model simply neglects it, Lavis et al. recognise the presence of knowledge transfer processes and that bi-directional efforts are considered to be more effective. Levin and Gough and colleagues consider knowledge mediation or engagement as core elements in their frameworks. Levin's mediation function regroups some of the connections between the contexts of research production and research use. It overlaps with and is influenced by these contexts. Gough et al.'s mediation component – later renamed "engagement" – also refers to the connections bringing together evidence producers and users.

Key actors and their roles

The studied frameworks also differ on how they represent – if at all – the actors involved in the knowledge mobilisation processes and the roles assigned to them.

The early-2000s conceptualisation of Lavis et al. identifies two main groups: The messenger and the target audience, and the potential users, with the former being key to the success of the transmission of the knowledge. Research producers are not considered, and research users are only considered as indirectly defining the communication strategy of the product – the knowledge – for its correct transfer.

For their part, Gough et al. identify producers and users of evidence as relevant actors, although they highlight that these actors are not necessarily the same in every sector and that actors can perform a variety of different roles. Research users can be active constructors of knowledge whereas research producers should be aware of the context of the users. Furthermore, Gough et al. recognise the presence and relevance of other actors who influence the evidence ecosystem in the wider systems and contexts surrounding production and use.

Graham and colleagues and Levin do not depict the actors as the central components of their models. Instead, Graham and colleagues consider knowledge creation and use processes, and Levin considers functions as the core elements. Whereas Graham et al. do not specify which actors are meant to be engaged in each process, Levin acknowledges that actors can be related to more than one context, and so their functions can overlap. Rather than a standard model focused on the relationships between the actors – an *actor-relationships model* – both frameworks are more of a *function-relationships model*, focused on the interactions and the influences between the functions. This allows consideration of actors beyond a single context, not solely linked to their prescribed primary function.

Generating knowledge mobilisation: linear, relationship and systems perspectives

The analysis of these four selected knowledge mobilisation models allows the evolution of the conceptualisation of this field to be traced over time.

There is a general move away from linear ways of thinking and towards relationship and system approaches. Although the evaluation of all the components as a whole in Lavis and colleagues' model may implicitly point to one of the main characteristics of a systems perspective, it is only with Gough and colleagues' model that the evidence ecosystem is explicitly attempted to be considered in its entirety. This system influences, and is influenced by, the different elements considered in the model, generating multiple and constant feedback loops.

Nevertheless, representation of some of the elements is highly influenced by linear and relationships ideas. Production and use of evidence are strongly differentiated with no overlap between them except in Levin's model. These functions tend to represent the relationship between research production and research use as a unidirectional or a bi-directional one, with research production commonly being independent from research use. This falls short of acknowledging and representing the multiple relationships within the system in practice.

Over time, there is also a stronger consideration of the contexts and wider systems surrounding the educational evidence ecosystem. Once again, both Lavis and colleagues, and Levin suggest it in their models but it is Gough and colleagues who make explicit this "two-level" system and the influence they have on the evidence ecosystem. This multi-level system characteristic, with system and sub-systems, has been also described as "nested" or "layered" (Sharples, forthcoming[13]).

Some of the selected authors have abandoned the process-product modelling, i.e. an input (research evidence) and an outcome (practices or decisions), with processes linking both. The former exclusive focus on "push" processes has now included the "pull" processes. Thus, the relationships shift from unidirectional to bi-directional. Some models even consider relationships as multi-directional, as is the case in the frameworks of both Levin and Gough and colleagues. Actors and contexts in these conceptualisations relate to each other in different ways and with different purposes.

Models have also shifted from a focus on actors to a focus on contexts and functions. Authors have recognised that functions can be fulfilled by different actors and that actors can belong to different contexts. This enriches the conception of both actors, contexts and functions by avoiding a one-dimensional characterisation of the actors. Frameworks range in terms of their level of detail and comprehensiveness from the specificity of Gough and colleagues' to the simplicity and broad potential use of Levin's.

It should not be the aim of frameworks to fully represent the complexity of systems, although non-linear models are able to capture complexity more effectively (Sharples, forthcoming[13]). However, there is room to improve the present conceptualisations of knowledge mobilisation. Models still struggle to jointly represent the different functions of the education research system and the different contexts in which they operate. They often lack consideration of the education research system as a whole and neglect the larger system surrounding the former. Additionally, the frequent segregation between the identified functions could suggest that the system and its elements are somehow perceived as isolated. These gaps may result in the need for strategic coordination being overlooked.

Whereas the reviewed frameworks attempt to capture the complex nature of knowledge mobilisation – with varying degrees of success – other models focus on some specific dimensions of the education research system. The same way the analysis of a cross-sectoral exercise can generate key lessons for the education sector (see Chapter 6), the analysis of models beyond knowledge mobilisation can provide useful insights and a new perspective towards this subject. The following section discusses models directly or indirectly related to knowledge mobilisation.

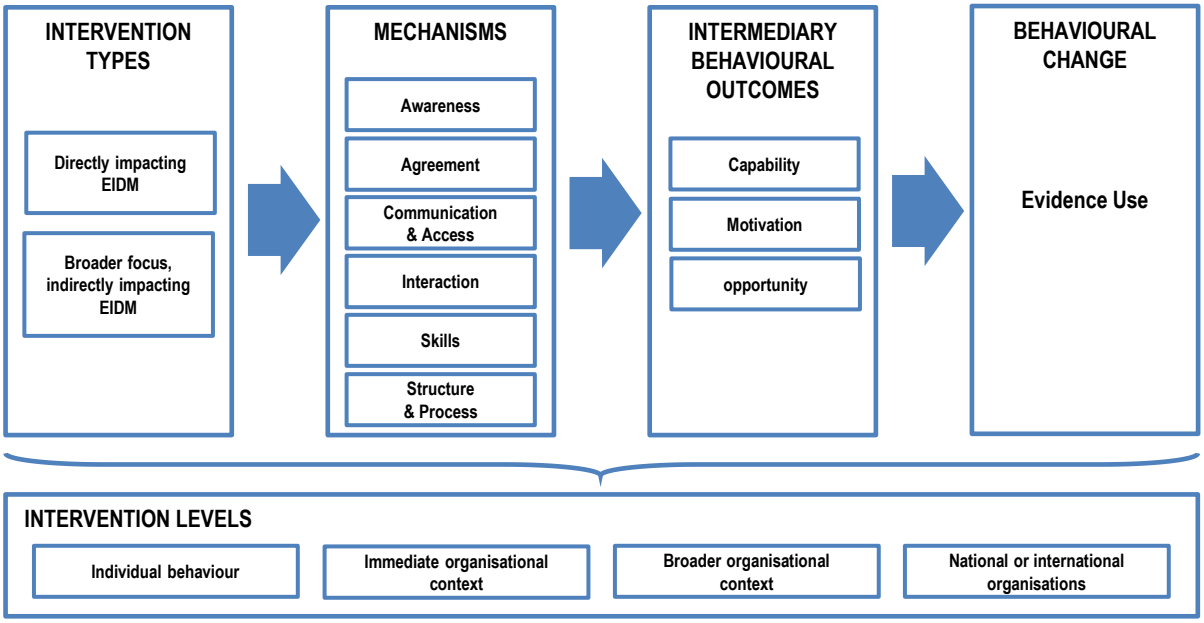
Other models relevant for understanding knowledge mobilisation

Scholars have developed knowledge mobilisation-related frameworks focused on particular aspects and processes of knowledge mobilisation. Such processes include, for example, the use of evidence by decision makers or teachers and the relationship between evidence and innovation. These conceptualisations can provide a different perspective when thinking about knowledge mobilisation, and may solve some of the shortcomings that the above-mentioned frameworks present. It is not the intention of this section to provide a thorough analysis of these frameworks. Rather, the section aims to highlight aspects that may enhance the understanding and conceptualisation of knowledge mobilisation in education systems.

Langer, Tripney and Gough (2016[10]) developed a conceptual framework of how evidence-informed decision making (EIDM) occurs. The authors define EIDM as the process in which multiple sources of information, in particular the best available research evidence, are consulted prior to making a decision to plan, implement and/or alter policies, programmes and other services. These interventions have the ultimate objective of changing behaviour through the use of evidence. The EIDM framework, represented in Figure 2.7, highlights the complexity in the use of evidence in decision making, characterising it not as

a straightforward action or function but, rather, as a process influenced by multiple factors such as intervention types and levels; mechanisms; and intermediary behavioural outcomes. Furthermore, this framework breaks with the dominant focus of thinking in knowledge mobilisation: research production (Levin, 2013[9]).

Figure 2.7. Evidence-informed decision-making framework



Source: Own elaboration based on Langer, L., J. Tripney and D. Gough (2016[10]), *The Science of Using Science: Researching the Use of Research Evidence in Decision-making*, http://eppi.ioe.ac.uk/cms/Portals/0/PDF%20reviews%20and%20summaries/Science%20Technical%20report%202016%20Langer.pdf?ver=2016-04-18-142648-770.

Cain (2015[21]) proposed a framework on teachers' use of research evidence. According to the author, teachers, faced with a research text, have the options to plainly ignore it, use it in different ways and with different objectives, or reject it after discussion. To illustrate this, Cain identifies three "voices." Teachers' own voice – the "first voice" – is composed of their values, previous experiences and ways of thinking and acting. Colleagues' voices act as a "second voice", often sharing some of the teacher's values. Research acts as a "third voice" in teachers' discussions, providing an external view often very different to the other two voices. The literature has shown that the first two voices are more important sources for teachers than the third one (Nelson and O'Beirne, 2014[22]; Nelson et al., 2017[23]). To become part of the discussion and influence the content and ways of teachers' thinking, knowledge from research has to be linked with knowledge from the other voices. This framework, represented in Figure 2.8, gives another insight into the use of evidence, considering the intentions and objectives of the potential user – in this case, the teacher.

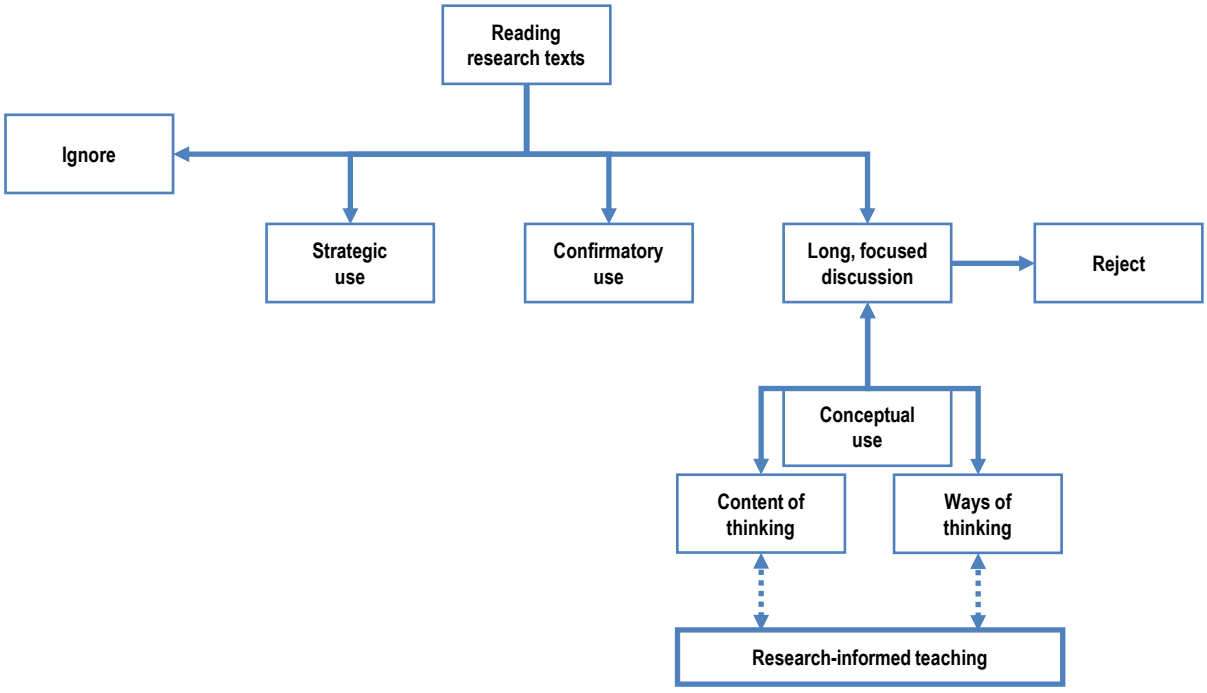
Rickinson and colleagues (2020[24]) developed a conceptual framework defining and elaborating what "quality use of research evidence" means in education. The emphasis here is on factors that enable the "thoughtful engagement and implementation of appropriate research evidence" (Rickinson et al., 2020, p. 6[24]). Chapter 9 deeply describes these elements. Rickinson et al. emphasise components at the individual, organisational and system levels, all represented in In the format of an OECD working paper, Révai proposed a representation of the knowledge dynamics around evidence and innovation in the education sector, represented in Figure 2.10. This work aims to "repair" the broken link in education between knowledge mobilisation for evidence and knowledge construction for innovation. It notes that policy questions today tend to relate to scaling innovation efforts or to increasing evidence use instead of acknowledging that the two often do and, indeed should, go together. The knowledge dynamics model

builds on existing innovation models in education. These traditionally begin with teachers diagnosing a situation, identifying their needs and challenges, and formulating these issues explicitly in terms of what additional knowledge they would need. This process may be facilitated by either knowledge brokers or researchers (as actors external to the school or internal such as teachers or school leaders) who can provide this external knowledge. Teachers then translate this into practice, adapting it to their context. Experimentation leads to the readjustment of practices and the creation of new knowledge. Thus, this knowledge mobilisation process involves knowledge creation, solving a practice-based problem by innovation. This new knowledge is consolidated and ideally diffused or disseminated, systematised and integrated into existing knowledge.

Figure 2.9, each of which can support quality research use and the interactions between the actors. These components and interactions influence, and are influenced by, multiple factors. By taking this approach, the framework implicitly adopts a systems approach.

In the format of an OECD working paper, Révai (2020[25]) proposed a representation of the knowledge dynamics around evidence and innovation in the education sector, represented in Figure 2.10. This work aims to "repair" the broken link in education between knowledge mobilisation for evidence and knowledge construction for innovation. It notes that policy questions today tend to relate to scaling innovation efforts or to increasing evidence use instead of acknowledging that the two often do and, indeed should, go together. The knowledge dynamics model builds on existing innovation models in education. These traditionally begin with teachers diagnosing a situation, identifying their needs and challenges, and formulating these issues explicitly in terms of what additional knowledge they would need. This process may be facilitated by either knowledge brokers or researchers (as actors external to the school or internal such as teachers or school leaders) who can provide this external knowledge. Teachers then translate this into practice, adapting it to their context. Experimentation leads to the readjustment of practices and the creation of new knowledge. Thus, this knowledge mobilisation process involves knowledge creation, solving a practice-based problem by innovation. This new knowledge is consolidated and ideally diffused or disseminated, systematised and integrated into existing knowledge.

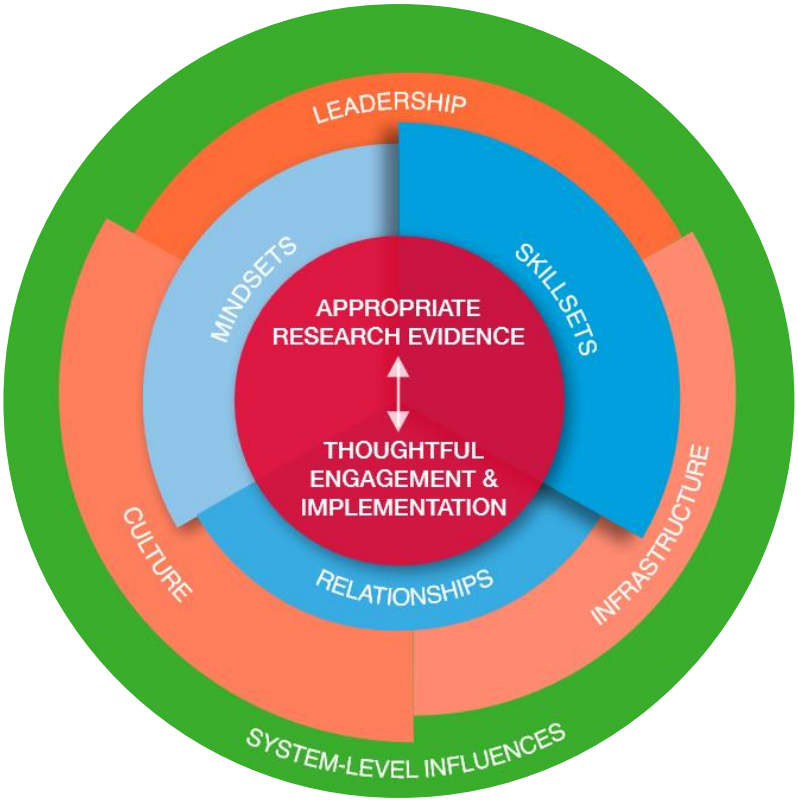
Figure 2.8. Research-informed teaching theory



Source: Cain, T. (2015[21]), "Teachers' engagement with research texts: Beyond instrumental, conceptual or strategic use", http://dx.doi.org/10.1080/02607476.2015.1105536.

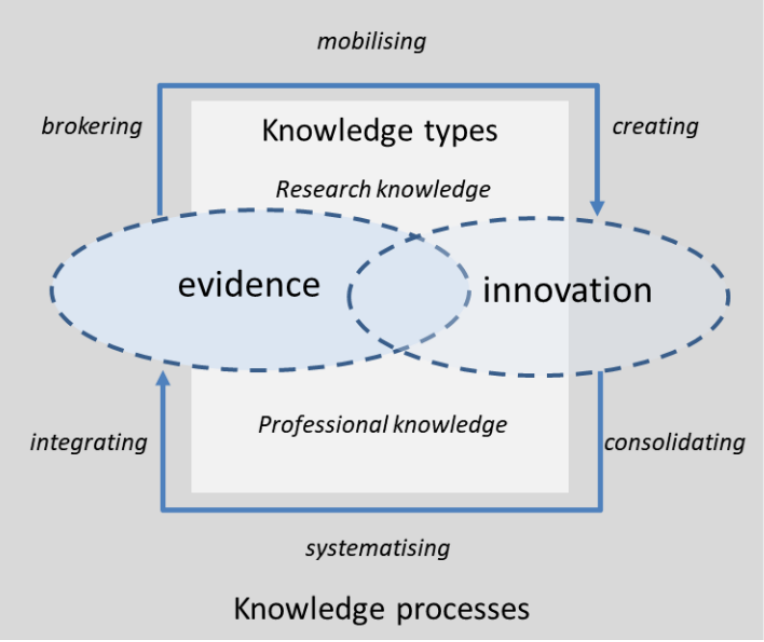
In the format of an OECD working paper, Révai (2020[25]) proposed a representation of the knowledge dynamics around evidence and innovation in the education sector, represented in Figure 2.10. This work aims to "repair" the broken link in education between knowledge mobilisation for evidence and knowledge construction for innovation. It notes that policy questions today tend to relate to scaling innovation efforts or to increasing evidence use instead of acknowledging that the two often do and, indeed should, go together. The knowledge dynamics model builds on existing innovation models in education. These traditionally begin with teachers diagnosing a situation, identifying their needs and challenges, and formulating these issues explicitly in terms of what additional knowledge they would need. This process may be facilitated by either knowledge brokers or researchers (as actors external to the school or internal such as teachers or school leaders) who can provide this external knowledge. Teachers then translate this into practice, adapting it to their context. Experimentation leads to the readjustment of practices and the creation of new knowledge. Thus, this knowledge mobilisation process involves knowledge creation, solving a practice-based problem by innovation. This new knowledge is consolidated and ideally diffused or disseminated, systematised and integrated into existing knowledge.

Figure 2.9. Quality Use of Research Evidence (QURE) framework



Source: Rickinson, M. et al. (2020[24]), *Using Evidence Better: Quality Use of Research Evidence Framework*, http://monash.edu/education/research/projects/qproject (accessed on 1 September 2021).

Figure 2.10. Knowledge dynamics in the evidence-innovation ecosystem



Source: Révai, N. (2020[25]), "What difference do networks make to teachers' knowledge?: Literature review and case descriptions", https://dx.doi.org/10.1787/75f11091-en.

These specific models provide fresh insights that may be complementary to the conceptualisation of knowledge mobilisation contained in the previously analysed models. For example, Langer and colleagues identified a concrete objective of knowledge mobilisation, which is commonly omitted in the related literature. Furthermore, the authors recognised and classified multiple factors, at multiple levels, affecting this outcome. Related work by Rickinson and colleagues, focused on how these factors influence the quality of the use of research. Whereas the recognition and classification of these causal mechanisms is one of the novelties of both models, the definition of quality use is an original contribution by Rickinson et al.'s study. For its part, Cain focuses on the teachers' perspective and considers the multiple sources of knowledge that teachers have, beyond research alone, and how research may influence the content and ways of teachers' thinking. Finally, Révai provides a perspective on how research is closely linked to innovation and how knowledge mobilisation in education can be influenced by other systems.

Table 2.2 summarises these models and the new perspectives they provide to the conceptualisation of knowledge mobilisation.

Table 2.2. Analysis of knowledge mobilisation-related models

Author(s)	Langer, Tripney and Gough	Cain	Rickinson et al.	OECD (Révai)
Name	Evidence-Informed Decision-Making framework	Research-Informed Teaching theory	Quality Use of Research Evidence framework	Knowledge Dynamics Model
Year(s)	2016	2015	2020	2020
Sector	Cross-sector	Education	Education	Education
Context	Policy and Practice	Practice	Practice	Practice

KMb specific aspect	Evidence use by decision makers	Research use by practitioners (teachers)	Research evidence use by practitioners	Evidence creation, mobilisation, innovation and use
Core elements	Interventions types and levels; Mechanisms; Behavioural outcomes and change.	Types of research use in school practice.	Core components (Evidence and Engagement); Enabling components (Individual- and Organisational-level); System-level influences.	Research, Innovation, Knowledge processes: mobilisation, brokering, creation, systematisation, integration.
Contribution	Identification of an ultimate objective. Influence of multiple factors.	Focus on teachers' perspective and work. Multiple sources of knowledge.	Influence of multiple factors enabling engagement with research evidence. Definition of "quality use".	Joint consideration of research and innovation. Knowledge mobilisation as knowledge creation.

Note: The row "KMb specific aspects" contains the terms "evidence", "research" and "research evidence". These terms are used by the authors of each model and taken to be interchangeable for the purposes of the analysis. For a definition of "research" in the *Strengthening the Impact of Education Research* project, see Chapter 1.

Towards a new approach

For over two decades, scholars have conceptualised and modelled knowledge mobilisation in diverse ways. These efforts have substantively evolved in terms of their sector of origin, focus, components and approaches, among others. Yet, there are still some shortcomings which may have important repercussions on initiatives that try to address deficits of research production and use.

Linear and relationship thinking still have a considerable influence on the representation of knowledge mobilisation processes. For example, consideration of the education research system as a whole and the existence of systems and sub-systems are commonly neglected elements in knowledge mobilisation models. Furthermore, the various elements in focus – whether functions or contexts – tend to be depicted as removed from each other, with a certain degree of mutual influence but without a clear idea of their interdependencies and overlaps. This artificial separation hampers a holistic vision and overlooks the need for any strategic coordination.

More recent knowledge mobilisation models tend to exclusively focus on research knowledge. While considering the entire spectrum of knowledge sources within a single model is unfeasible, it is important that future efforts recognise that research evidence is not the sole source of educational practitioners' and policy makers' knowledge. Their decisions are also affected by other types of knowledge, gained for example through professional experience or via exchanges with colleagues.

Most of the frameworks analysed in this chapter omit the main objectives that systems aim for. Committing to a specific goal, representing it graphically and putting it in writing can allow education systems and their actors to keep the ultimate goal in sight. In this case, if we think of educational research as something that has indirect and slow impact on student learning, this latter may appear as an unreachable goal on the horizon. And no matter how far we go, we can never reach that horizon. But that is the exact purpose of this seemingly unreachable goal: To make us move forward (Galeano, 2012[26]).

Framing the conceptual discussion on knowledge mobilisation is important because it shapes our understanding of what can be done to improve it. The way the education research system is conceptualised can drive thinking into new directions and break with traditional and outdated notions and practices. This includes moving away from one-way "push" approaches, the division between components and the one-dimensionality of actors. Future conceptualisations should represent a systems approach to research dynamics in education and try to address some of the limitations of previous models. Importantly, they should aim to drive the discussion forward and generate new ideas about reinforcing research production and use.

The dialogue between experts should continue and be extended to other actors who can bring fresh perspectives to this discussion. A shared language and understanding would ease the flow of information and collaboration between those specialised in knowledge mobilisation. Because of this, there is a strong interest in developing a new model collaboratively that can address the shortcomings identified above and drive an improved understanding of research dynamics in education. A new model, collectively developed, would make the different efforts in this field more efficient, and ultimately enhance student and professional learning.

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3 History and evolution of brokerage agencies in education

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Despite impressive advances in evidence-informed policy and practice, many of the same challenges remain. New challenges have also arisen, including a disdain for “experts” and a worry that science is being deliberately devalued. The chapter highlights three key changes in the debate. It looks at the evolution of education brokerage agencies and their diverse goals, audiences and methodologies. It highlights the importance of evaluating their effectiveness and impact and learning from other sectors. It ends with a call to go one step further: Just as research synthesis has moved beyond individual papers to systematic reviews of reviews, so too do the structures and processes of brokerage need to work together across institutions and systems. Only by doing so will we be able to establish a cumulative knowledge base that is quasi-universally acknowledged as well founded.

Introduction

In 2007, we published the report *Evidence in Education: Linking Research and Policy* (OECD, 2007[1]). At the time, we made the case for the importance of using evidence to inform policy by connecting the issue to a series of recent public crises that required rapid responses from governments to ensure the health and safety of the public and maintain their confidence in policy makers. The examples we gave – the 2001 foot and mouth crisis in the United Kingdom, and the 2003 outbreak of SARS in Asia and Canada – highlight the difficulties of decision making for policy makers and the importance of time-sensitive information on which to base those decisions. This urgency sometimes meant that decisions were taken that were later reversed or revealed to be less effective than had been hoped.

The report also pointed to climate change as an example of a very public debate where the research itself might be contested, further adding to the complexity of the process. And indeed, for all examples – crises or not – the information that was readily available was often not "perfect". As we stated: "This could be either because the rigorous research relevant to policy needs has not been conducted; or because there is a disjoint between policy and research communities such that the relevant information is not widely disseminated and so overlooked by the policy maker; or simply that the research that is available is contradictory and so does not suggest a single course of action that could be reflected in policy. Yet clearly it is crucial that policy decisions be made." (OECD, 2007, p. 17[1]).

Revisiting this report in the wake of the COVID-19 pandemic, the discussion seems surprisingly up-to-date. We have seen in real time the imperative of urgent decision making to protect health and lives, with a very specific impact on schools and education. We have witnessed the struggle to ascertain the quality and availability of evidence, and the tension involved in deciding between different policy solutions when research itself is emerging and contradictory.

However, time has not stood still. In the decade and a half since our volume was published, the arguments have evolved in at least three domains:

- The ubiquity of social media and the explosion of information, including fundamental questions about the nature of knowledge and expertise itself.
- A focus on practice (complementing and perhaps supplanting the initial focus on policy).
- The acknowledgement that simply providing access to evidence is not the same as ensuring its use, and it is the relational as well as structural elements that need attention.

The following sections will look at these three points more closely, building on personal reflections developed by following the discussions, policy decisions and literature across time and projects; the numerous efforts and spending in countries; and interacting with key players and institutions over time. We have benefitted particularly from open and honest discussions with researchers, policy makers and practitioners, including the OECD CERI Governing Board members, on both successes and failures.

Three key changes

The changing notions of evidence

One obvious change since our 2007 chapter is the ubiquity of social media. It has accelerated twin effects of greater access to information with less quality control. The online algorithms that sort us into groups of like-minded individuals and resulting echo chambers can serve to amplify our views while at the same time leaving us uninformed of opposing arguments. This abundance of information – or "evidence" as it is often referred to – has reshaped the policy and practice landscape in many countries.

In this context the 2007 report seems naïve in its trust in the generalised respect for evidence and objectivity of science. The quote above illustrates this well, operating as it does within the confines of a rational evidentiary system where the lack of evidence is due to either availability, access, or contradiction. The sense is that these are essentially solvable challenges and with effort we can sort out both access and availability. Contradiction is thornier, but, as with the rest of science, the belief is that with time the self-correcting nature of science will sort that out too.

However, the essential belief in science and objective truth has eroded in the last decade and a half. There are arguments that we are living in a "post-truth" world where reality has become fungible and viral reach is valued more than quality in the distribution of information. Recent elections continue to demonstrate the traction of claims that are demonstrably wrong; and although some erroneous claims are simply well-intentioned mistakes, others are deliberately misleading. A disdain for "experts" in some discourses has given rise to worries that truth and fact are losing currency, and that we could be witnessing an "evidence backlash" in which science and research are deliberately devalued (Lewandowsky, Ecker and Cook, 2017[2]).

These are alarming arguments. If they are true, then the lack of use of evidence in education practice and policy is not simply an issue of access or availability or better processes for ensuring that available evidence is actually used. The lack of use (or deliberate misuse) can no longer be considered as failures of individual or group cognition. As a result, it cannot be fixed by providing more access, more availability, or even by building capacity. Rather, if these arguments are true, we must recognise that the nature of the challenge has changed, and that prospective solutions need to look at the issue from both cognitive and technological perspectives.

We will come back to this point later in the chapter. For now, let's proceed with the shared understanding (hope?) that we are still playing the same game, that there is belief in the scientific method, and we can reasonably continue to push for evidence-informed practice and policy. Certainly, given greater access to information, less quality control and a more informed (and potentially misinformed) public, the need for clear, rigorous, and easily available evidence is more important than ever.

A focus on practice

Another major change has been the shift in focus from policy to practice. Our 2007 volume reflected the state of the discussion at the time, which focused almost exclusively on policy and its supporting actors, processes, structures and institutions. A search of the book for references to evidence-based (or evidence-informed, this shift in terminology was specifically addressed in our introductory chapter) *practice* reveals a few exceptions: Contributions from The Evidence for Policy and Practice Information Centre (EPPI-Centre)[1] in the United Kingdom and New Zealand's Best Evidence Synthesis programme[2] both mention it, although their focus skews heavily to policy. There was also a special chapter from the Netherlands' Minister of the Economy at the time, Maria van der Hoeven, with a formal plea: *Evidence-based Policy: Yes, but Evidence-based Practice as Well!* (Chapter 15 in OECD (2007[1])). However overall, issues relating to the use of research in practice remain underdeveloped.

This does not mean that there was not a lively field of study in the area (e.g. Cordingley et al. (2003[3])). The Centre for the Use of Research and Evidence in Education (CUREE),[3] for example, was one of the early centres that focused explicitly – and solely – on teachers and teaching. The EPPI-Centre in the United Kingdom, the WhatWorks Clearinghouse (WWC)[4] in the United States and New Zealand's Best Evidence Synthesis Programme, among others, were set up to address both policy and practice from the beginning. Rather, the heavy focus on policy reflects the preoccupations of the discourse at the time and, to some extent, the areas of targeted funding.

While this has now clearly changed, the shift to foreground practice took some time. As an example, in 2010 the European Commission funded the Evidence Informed Policy in Education in Europe (EIPEE) project. It operated between 2010-11 to identity the range of activities used across Europe to link research and policy making in education and build capacity in this area (Gough et al., 2011[4]). It was not until 2011 that this initiative was expanded to include the "P" of practice with the Evidence Informed Policy and Practice in Education in Europe (EIPPEE) initiative.[5] This was an explicit acknowledgment that teacher practice was a key area.

Since then, there has been an almost complete shift away from policy and towards practice. One of the most dramatic examples is the creation of the UK Education Endowment Foundation (EEF),[6] established in 2011 with a GBP 125 million investment from the UK Department of Education to help, among other things, summarise "the best available evidence in plain language for busy, time-poor teachers and senior leaders" (EEF website). Their Toolkit is aimed at practitioners, and a key measure of impact is uptake in schools and school networks. This focus on practice has facilitated the development of deeper relationships between research and practice, spurring change in schools and classrooms in England. Numerous other examples of the shift towards practice can be cited across countries, systems, and institutions.

The shift is so complete, in fact, that we are tempted to ask if policy makers have left themselves off the hook. Judging by policy documents, funding priorities and the set of initiatives emerging across the OECD, the policy side of the equation is no longer a prime focus, even though many of the issues that we struggled with in 2007 have only gained in importance. And yet a focus on policy is essential. It is policy (and politics) that has the ultimate responsibility for steering systems, setting accountability structures, and working with professional bodies to enact standards and requirements for the certification and licencing of practitioners. Policy also plays an essential role in setting priorities and guiding funding for research. Effecting meaningful change in the use of evidence across an education system requires extensive diffusion and impact on practice, as well as broad system-wide incentives, structures and mechanisms in policy. We will come back to this point a bit later in this chapter.

The complexity and importance of evidence use

Another important shift since our 2007 volume is an acknowledgement of the increasing complexity of education systems. Across the OECD, education systems have become increasingly decentralised (with some exceptions), involving a large number of additional actors, from local and state level authorities to school leaders and practitioners. These structural changes intersect (and are fuelled by) several other intersecting trends, such as more highly educated parents better able to use the power of networks and social media to advocate for their children (Burns, Köster and Fuster, 2016[5]). These changes mean that the traditional models of knowledge governance and their focus on three key groups: researchers, policy makers and practitioners are no longer adequate.

Relevant stakeholders now include not only the traditional research-policy-practice trio and extended vertical and horizontal governance actors but also, for example, funders of research; textbook publishers and EdTech platforms; think tanks and networks of researchers and practitioners; the media; students etc. (Burns, Köster and Fuster, 2016[5]). The links between these multiple actors are fluid and more open to negotiation. In addition, these groups are overlapping and individuals can be in more than one group at any given time (Best and Holmes, 2010[6]; Levin, 2011[7]).

As part of acknowledging the complexity of educational knowledge governance, there has been a growing recognition that *promoting* the use of evidence is not the same thing as ensuring its use. A number of realities intrude, including the limited time and capacity of policy makers and practitioners; the time and effort required to learn new habits and behaviours; and the interaction among different forms of knowledge when determining the best course of action (Burns, Köster and Fuster, 2016[5]).

Linear models of research production and use failed to take these realities into account. In addition, the rich variety of evidence available (e.g. descriptive statistics, student achievement and teacher assessment data, research results, etc.) can inadvertently complicate the process. In fact, the push to increase the availability of data to support transparency and accountability has had an unintended consequence: too much information. Loeb and Plank (2008[8]) illustrated this with the example of the California Education Code, which at the time included more than 100 000 articles and over 2 000 pages. As early as 2002, O'Day pointed out that the abundance of information may be counterproductive as "teachers and schools may metaphorically and literally close the door on new information, shutting out the noise" (O'Day, 2002[9]). The challenge – and volume of information – has only increased exponentially since that time.

When focusing on strengthening the use of research for policy and practice, the focus is moving away from a simple "push" model of research production (by researchers) and research adoption (by policy makers and practitioners) to capturing and nourishing the interactions between and within the groups. Efforts to promote and encourage the use of research-based knowledge as a tool for improving policy and practice must thus include three dimensions (adapted from Langer et al. (2016[10])):

- Access (do policy makers and practitioners have access to evidence in a form that is useable and understandable?).
- Skills (do policy makers and practitioners have the skills and capacity needed to make sense of the evidence?).
- Interactions (is interaction and collaboration between relevant actors facilitated?).

These questions can be applied to other actors (e.g. the media, research funders and more listed above).

The final point on interactions is crucial and speaks to the social nature of research use. It is not enough to build awareness, access and skills. Interactions contribute to motivation, key to developing and sustaining changes in behaviour. Effectively supporting use of evidence calls for an unusual combination of skills that is usually more easily acquired through accessing a network of colleagues rather than bilateral relationships. Such networks require structural encouragement and support from, for example, local districts and universities if they are to flourish (Cordingley, 2016[11]).

This process is not automatic. The strongest incentive for policy makers and practitioners to engage with research is its promise to help them address their challenges. For practitioners, evidence use thus involves a dialogue between formal research knowledge and the local, practical knowledge of teachers (Révai, 2020[12]). Importantly, teachers do not simply acquire and develop their own knowledge; it is through sharing and co-constructing knowledge that they also contribute to creating a collective knowledge base. Uptake of research is thus based on trust and personality as much as practical usefulness – networks, direct contacts and brokerage are important (Maxwell et al., 2019[13]). One open question we have is to what extent these issues map across practice to policy; and conversely, which do not.

Victims of our own success?

Since the early 2000s the "evidence-based policy" (and later evidence-informed policy and practice) movement has made huge inroads in shaping public discourse and expectations. In most OECD countries, it is now expected that policy be informed by evidence, and the use of research evidence by teachers is increasingly built into teaching standards and certification. More and more funding supports mechanisms to raise awareness, ensure accessibility and build capacity in and for the use of evidence. To those of us who have spent considerable time and effort working on the issue, this shift is exciting.

But are we victims of our own success? "Evidence-informed" is now also a buzzword, disconnected from its original intended meaning. Policy often prioritises particular forms of evidence (for example, media-friendly rankings, achievement and assessment data) that are important politically but do not represent the

depth and breadth of information necessary for making strategic choices for the long-term development of education.

The gap between the intended and actual meaning of "evidence-informed" is not entirely surprising: When a wide range of data becomes available, it becomes easier for individuals to pick and choose the indicators that will paint a more favourable picture (Blanchenay, Burns and Köster, 2014[14]). And as one of our interviewees for that case study remarked: "One cannot blame them for being rational" (2014, p. 32[14]).

The misappropriation of the terms has been noted elsewhere and in other sectors, notably the medical field (Greenhalgh, Howick and Maskrey (2014[15]); see also Box 3.1). In education there is clear scope to question how and when these terms are used and for what purpose. Is the ultimate goal improving student learning? If not, who or what benefits? Questioning the aims for both the production and use of evidence is important, and especially relevant with the increasing presence of private interests and education markets in our systems (including but not limited to EdTech) (Burns, 2022[16]).

Lubienski (2019[17]) takes these concerns a step further, asking whether instead of continued strengthening of objective brokerage between research and practice (the term he uses is "boundary spanners"), we will rather witness the rise of self-interested "spinners" and influencers intent on increasing their market share in whatever solution they are selling. In this scenario the banner of "evidence-informed practice/policy" becomes a tool for vested interests and is used more as a marketing instrument than an objective exercise to help improve teaching and learning.

So what can be done? Just as there are calls for "real evidence-based medicine" (Greenhalgh, Howick and Maskrey, 2014[15]), it is time for education to insist on a return to the original intended meaning of evidence-informed policy and practice. This requires demanding better evidence that is better explained and used without vested interests. It involves funders of research insisting on quality and useability. Objective, independent and trusted brokers – both formal agencies and networks as well as informal connections and relationships – play a key role in making this possible.

Brokerage agencies in education

This takes us to the heart of this chapter. Bridging the structural and relational gaps between internally and externally heterogeneous groups of researchers, policy makers and educators (among multiple other actors) is no easy task. Our 2007 volume was one of the first to highlight the variety of deliberate efforts across countries to invest and build capacity to use evidence to inform policy and practice.

This process of bridging the gaps and building capacity can be informal, e.g. the exchange among colleagues of research evidence and information related to a specific practice or policy challenge. It can also be formalised, e.g. the creation of ties between national research institutions and their policy/practice counterparts. These formal efforts can also be institutionalised, with the development of brokerage agencies to officially facilitate both the process of information sharing and ensure a certain level of quality control.

What term to use for this process – knowledge mediation, translation, brokering – is still contested. In our 2007 volume, we used "brokering" and "brokerage agencies", in part to try and distinguish the formal element of the process from the informal networked approach that had previously been the default. In order to link directly to the discussion from 2007 we will continue to use the same terms in this chapter, but it is important to note that these terms were and are contentious. They strike some as being too connected to business and financial institutions, far removed from education and social policy goals. Others criticise them as being too Anglo-Saxon, a reflection of a broader movement concerned with inputs and outputs concentrated primarily in certain countries (e.g. England and the United States). Certainly, they can be difficult to translate to other languages.

The belief that this is a primarily Anglo-Saxon movement (in education, at least) – is important to address. England and the United States did indeed play a driving role, backing up research efforts with substantial public contributions and funding. Canada and New Zealand have also been very active. However, not all English-speaking countries took this up at the same time (Ireland and Australia, for example, came to the table later). By the time of the 2007 publication, there was a variety of international initiatives included as chapters in the book. Notably (but not exclusively), in the Nordic countries and the Netherlands (examples from Denmark, The Netherlands and Singapore). In addition, European countries such as France, Germany and Switzerland highlighted the importance of research and evidence in decision making while using their own vocabulary and sets of relationships and structures. As part of the German Presidency of the European Union, the conference "Knowledge to Action" was held in Frankfurt in March 2007, bringing together researchers and policy makers in education from around Europe. Reducing these efforts to the label "Anglo-Saxon" is thus not only inaccurate, it potentially limits the kinds of initiatives and efforts considered.

As noted in Chapter 1, systematically mapping the diverse set of national and international actors and initiatives is key to understanding the history of brokering and brokerage agencies as well as the multiplicity of approaches across contexts and traditions. Including formal institutions as well as networks and the broad web of contributors that are an integral part of this process in different systems is also essential.

The diversity of brokerage and brokering

Brokerage agencies work to generate, assess and communicate research findings to and between interested parties. Brokerage agencies can be designed to aid a particular ministry to increase effective communication regarding the research and policy/practice interface, evaluate proposed changes and recommendations, and assess the implementation of these programmes. However, most brokerage agencies have a broader agenda and seek to collaborate with as wide a community of researchers, practitioners and policy makers as possible to broaden the relevance of their work and findings.

A number of different initiatives exist to both bridge the divides as well as assess the quality of evidence available. Since our 2007 publication, the numbers of brokerage centres have increased, with explicit aims to improve the links between research and policy as well as, crucially, practice. Our review identified three specific elements of the process (Burns, Köster and Fuster, 2016[5]):

- Knowledge *production* (e.g. directing funding and support through grants and sponsorship, performance measurement and target setting, and experimentation in policy implementation).
- Knowledge *mediation and dissemination* (e.g. personnel movement and training on the individual level; organisational and inter-organisational knowledge sharing).
- Knowledge *utilisation* (e.g. mandating the use of certain methodologies or tests, linking funding to research strategies in schools etc.).

Brokerage agencies are distinguished in their goals and functions (funding and relationship to Ministry, degree of autonomy, target audiences and activities) and the methodologies they use and promote. The section below sets out some examples of how this has played out in practice as illustrative examples.

The goals and functions of brokerage agencies can be broken into a number of subsections.

Relationship with the Ministry

One important aspect is the relationship of the institution with the Ministry in terms of autonomy of funding, operations and position in the education system more broadly. Some agencies or programmes are principally funded by the Ministry and are embedded with the Ministry itself. One example of this is New Zealand's Best Evidence Synthesis programme,[7] which traditionally provided hands-on guidance to those wishing to conduct a synthesis of available evidence (this function has now ended, and the focus has

shifted to brokering evidence already available). The Dutch *Knowledge Chamber (Kenniskamer)* was similarly located within the Ministry and designed to respond to Ministry goals and priorities.

Other agencies are principally funded by the Ministry/Government but maintain their independence, often located with or near the Ministry to facilitate alignment and coordination with policy goals. For example, the Japanese National Institute for Educational Policy Research[8] is independent yet located in the same building as the Ministry of Education. The Norwegian Knowledge Centre[9] is funded by the Ministry but is an autonomous institution, and in 2019 it moved from Oslo to the University of Stavanger as part of a more general decentralisation effort by the government of Norway. The Swiss Coordination Centre for Research in Education[10] is a stand-alone institution funded by the Swiss federal government and the Swiss Conference of Cantonal Ministers of Education. The now defunct *Canadian Council on Learning* was, similarly, federally funded but independent (geographically and formally) from the various federal and provincial ministries.

Still other brokerage agencies are formally and financially independent from the Ministry although, naturally, the Ministry and local administration remain important partners. The Education Reform Initiative[11] in Turkey, for example, is an independent organisation supported by leading foundations, located in Sabancı University. England's EEF is an independent charity established by the Sutton Trust.

Target audience

While most brokerage agencies aim to affect both policy and practice in education, some specialise more in one or the other. As mentioned earlier in this chapter, the original emphasis was very much on policy and policy making, shifting heavily in the last decade to practice.

Brokerage agencies generally have a commitment to disseminating research results to as wide an audience as possible, aiming to support both top-down and bottom-up change to the system. Initiatives focused on evidence-informed *policy* are aimed at decision makers, providing access to evidence, supporting rapid reviews on topics selected by policy makers, and building capacity within ministries and local administration to design, collect and use education data and evidence. They also connect to researchers and (at least, theoretically) practitioners as well as to a lesser extent, other players in the ecosystem including international organisations, textbook publishers, and, notably, the media.

For *practice*, the audiences have evolved to include school leaders, teachers, inspectors, school boards, parents and more. The efforts are largely similar to those in the policy sphere though adapted, e.g. providing access to research results in the local language (e.g. the Netherlands' Initiative for Education Research (NRO)'s knowledge portal[12] for practitioners that provides access to research, summaries of key research in accessible language, and even tailored help in Dutch through their "knowledge roundabout" [kennisrotonde]). Other efforts include developing rapid reviews on topics selected by practitioners (including co-creation of research questions with practitioners themselves) and building capacity within schools and teacher education institutions and communities of practice to design, collect and use education data and evidence. There are also increasing efforts to scale up the level of intervention and coordinate between networks of schools, for example, in the EEF's Research Schools Network,[13] launched in 2016.

It is also worth highlighting efforts to connect the media to high-quality evidence and experts. For example, the Science Media Centre[14] connects journalists, scientists and press offices to relevant medical and scientific research and expertise. Building on this model, the UK's Education Media Centre[15] targets not only media but also the broader public seeking to understand the evidence base for claims about education made in the media.

Ensuring quality and building capacity

In order to deliver on their mission, brokerage agencies also work to ensure the quality of research and provide tools and capacity building to evaluate what works and what does not work in education. An important first step in this process is the creation of a database of quality education research as well as providing clear goals and criteria for conducting and evaluating educational research. These criteria serve as a baseline for conducting reviews of research that can then be used to provide systematic evidence as to the effectiveness of particular policies or classroom practices.

A key component to this quality-mark process is the transparent exchange of findings: reviews must be widely available on the various brokerage agency websites to all users (i.e. not hidden behind a paywall or for members only). In addition, methodologies used by the review process must be defined in detail and any data must be publicly available where possible. Centres are increasingly requiring reviewers to commit to updating their work on a regular and pre-defined basis, to include new evidence and maintain a state-of-the-art synthesis on each topic.

Methodologies

The methodological debate about what constitutes good evidence and what kinds of evidence (and burden of proof) required to guide decision making is an old, and fraught, conversation. The 2007 volume addressed this specifically by highlighting the importance of multiple methods and showcasing a conversation between two leading methodologists in the field, Thomas Cook and Stephen Gorard (2007[18]). Despite their relatively broad agreement on key elements – that multiple methods are important and needed to answer the different types of questions policy makers and practitioners could have, and that causal evidence is needed to understand whether something works or not – the evidence arguments are still alive and well today.

In the randomised controlled trials (RCT) camp, the WhatWorks Clearinghouse[16] (United States) works in collaboration with a number of other institutes and subcontractors to provide information and databases of research syntheses of replicable high-quality interventions, with a particular focus on RCTs. The EEF[17] has developed a toolkit to provide policy makers and practitioners an accessible summary of the RCTs and the effectiveness of particular interventions, including the costs and strength of the evidence. Also fully committed to the RCT gold standard, the Campbell Collaboration[18] extends beyond the education sector and focuses on systematic reviews from multiple social interventions, including justice, well-being, demography, development and, of course, education. This is a sister organisation to the Cochrane Collaboration,[19] which has been producing systematic reviews in health care since 1994.

Deviating from a strict emphasis on RCTs, the EPPI-Centre[20] in England has been conducting systematic reviews that bring together different types of evidence, including developing a structured methodology for combining qualitative and quantitative evidence to input into the reviews. In a similar vein, the Norwegian Knowledge Centre[21] works with a broad set of additional actors in parallel review processes to make sure the views and priorities of practitioners are included in their summaries of evidence. And, most uniquely, the Swedish Education Act considers “teacher knowledge” as separate but equal to knowledge derived from formal research processes, although the mechanisms for combining these disparate sources of evidence are not clearly specified.

Despite these diverse initiatives, there is still serious disagreement about what counts and what should count as evidence, and the kinds of evidence that meet the standards required for decision making. Many of the same arguments set out in our 2007 volume still hold. So too does our basic proposition that *there is no single best method for or type of evidence-based policy [and practice] research* (OECD, 2007[1]). Using different methodologies for different questions – and combining methodologies to understand not only *whether* something works but *how* and in *which contexts*, is key. But how to do this in a way that

insists on the rigour of evidence and the quality of the research (including its relevance to the specific policy or practice question) is still hotly debated.

Understanding what works and what does not (and under which conditions)

Brokerage agencies can and do play a key role in bringing together the disparate communities and bridging the gaps in the use of evidence in policy and practice. They have provided resources and tools for researchers, policy makers, and educators to openly engage in the discussion of what works in education and allowed for capacity building in each of those domains. Increasingly they also work to synthesise discrete findings by different agencies and evidence producers to contribute to a cumulative knowledge base.

Formal brokerage agencies have been around on the research side since the 1970s, and we continue to see high-profile public investments in new organisations (e.g. Australian Education Research Organisation,[22] incorporated in 2021). Despite the focused funding, these agencies tend to struggle with a series of standard challenges (OECD, 2007[1]; Blanchenay, Burns and Köster, 2014[14]), including how best to:

- Incorporate all stakeholders into the process.
- Address the tension between the time required for solid research and the necessity of quick results for policy making.
- Disseminate findings to all stakeholders, including media, parents, and students.
- Ensure sustainability and stability of funding.

This last point is particularly challenging. Of the six education-specific brokerage agencies highlighted in our 2007 publication, only two are still fully active: the What Works Clearinghouse in the United States and the EPPI-Centre in England. New Zealand's Best Evidence Synthesis programme still exists but funding for new syntheses has been discontinued; the programme now illustrates evidence in action through videos that show what transformative action is possible when evidence is used. The remaining three brokerage agencies are no longer active:

- the Canadian Council on Learning (closed)
- the Danish Clearinghouse (closed)
- the Dutch Knowledge Chamber (hibernating).

We might assume that the initiatives that were discontinued were simply not delivering as intended, as clearly any intervention funded by public money should be evaluated for its impact and effectiveness. This would imply that their funders and constituents were able to understand what was successful, under which circumstances, and what interesting and useful measures of impact would look like.

However, it is also possible that the decisions were made for political as well as practical reasons. We have not yet touched on this point in this chapter, but evidence does not take the politics out of policy making. Indeed, previous OECD work on systemic innovation found that decisions about whether to continue to fund a particular initiative are often taken before results of a programme evaluation are available, and that the evaluation step is the most likely to be skipped or omitted if there are time or financial constraints (OECD, 2009[19]). Among the examples above, funding cuts were more related to changes in government rather than impact or performance measures.

Although we have been discussing evidence-informed policy and practice, we ignore politics at our peril. Budget timeframes and grant agreements often are set to two- to three-year cycles, which research suggests is not long enough to see the effect of a particular reform in its entirety (Borman et al., 2003[20]). Our work on education governance points out that deciding whether an initiative should be considered a

success or failure is a serious empirical, political and ethical challenge, particularly in a fast-paced world where expectations are likely to rise faster than performance (Burns, Köster and Fuster, 2016[5]).

How, then, to resolve these tensions? Evaluating the functioning and impact of brokerage agencies is clearly important, and yet under-specified. So too is developing a clear understanding of how these agencies might work together to create a cumulative knowledge base, one that is both useful and used. But how these efforts are prioritised, sustained and funded are political as much as empirical questions.

Learning from other sectors

One way to address these long-standing challenges is to look for inspiration from other sectors. Annette Boaz's contribution to this volume (Chapter 6) does precisely this, highlighting original research mapping intermediary organisations and mechanisms across sectors. Learning from other sectors – both their successes and failures – is an important way to move the discussion forward. Box 3.1 highlights a set of critical observations in evidence-based medicine.

Box 3.1. Learning from other sectors: A crisis in evidence-based medicine?

Despite the advances in evidence-based medicine, Trisha Greenhalgh and colleagues have highlighted five unintended consequences that are affecting the quality of patient treatment (Greenhalgh et al, 2014, order slightly changed from original):

- The evidence-based "quality mark" has been misappropriated by vested interests.
- The volume of evidence, especially clinical guidelines, has become unmanageable.
- Statistically significant benefits may be marginal in clinical practice.
- Evidence-based guidelines often map poorly to complex multi-morbidity.
- Inflexible rules and technology-driven prompts may produce care that is management-driven rather than patient-centred.

The authors argue for a "renaissance" in evidence-based medicine with the goal of providing useable evidence that, combined with context and professional expertise, will help patients receive optimal treatment.

Although comparing education to medicine is not always straightforward or, indeed, helpful, the criticisms of Greenhalgh, Howick and Maskrey (2014[15]) are (perhaps surprisingly) pertinent. Certainly, it is clear that the terms "evidence-based" and "evidence-informed" are now applied broadly by many educational actors to suit their own purposes. The link to the ultimate goal of using evidence to help improve student learning is not always clear. We argued earlier in the chapter that the rise in awareness of the terms and the popularity of the discussion has had mixed consequences, including, to some extent, becoming victims of our own success.

Similarly, many scholars have made the argument that the volume of evidence in education is unmanageable. How does a policy maker or practitioner make sense of the sheer amount of (often contradictory) evidence at their disposal, particularly in a field like education which does not have a knowledge base that is quasi-universally acknowledged as well founded? Better tools to highlight quality research and improve the accessibility of reviews (as a way to summarise across multiple studies and findings and continuously update the cumulative knowledge base) are useful, but clearly they have not solved the problem. It must also be admitted that education is not immune to the challenges of large-scale

datasets that can overpower studies, revealing significant differences that have little real-life relevance (Orben and Przybylski, 2020[21]).

Likewise, just as evidence-based medical guidelines often map poorly to complex multi-morbidity (the coexistence of multiple health conditions), strict recipes for learning and teaching cannot capture the complexity of the social and educational environment (Thompson and Wiliam, 2008[22]). Research evidence is just one of many sources of information used by policy makers and teachers in their practice (Farley-Ripple et al., 2018[23]; Cain et al., 2019[24]).

These are all well-known challenges, and it is important to continue to address them. In addition, we must also consider the last point: That *inflexible rules and technology-driven prompts may produce care that is management-driven rather than patient-centred*. Greenhalgh, Howick and Maskrey (2014[15]) highlight the "well-intentioned efforts to automate use of evidence through computerised decision-support systems, structured templates…[which] can crowd out the local, individualised, and patient-initiated elements of the clinical consultation". They argue that mechanical reliance on rules can stifle "the development of a more nuanced clinical expertise that embraces accumulated practical experience, tolerance of uncertainty, and the ability to apply practical and ethical judgement in a unique case".

This sounds surprisingly familiar. While education has not hitherto relied on the intense use of computerised decision-support systems, we are seeing increased digitalisation of education as part of a move away from a traditional industrial model and towards a more student-centred approach (Schleicher, 2018[25]). Collaborative tools and technologies such as classroom analytics and AI-powered assessments are expected to help teachers to teach more effectively, reducing the amount of time spent on administrative and management tasks and allowing them to orchestrate their teaching more effectively (OECD, 2021[26]).

Unfortunately, digital technologies do not yet seem to deliver on these promises. Facer and Selwyn (2021, p. 8[27]) provide an overview of the challenge, including "seemingly 'automated' and 'data-driven' processes [that] actually require considerable amounts of behind-the-scenes work from teachers in order to ensure the continued functioning of systems as well as the production of data and other inputs." They further argue that the "unbundling" of teacher's work into discrete units to be automated also unintentionally reduces teacher professionalisation, fragmenting the role into disconnected work processes that require little conceptual ability (Facer and Selwyn, 2021[27]).

CERI/OECD has spent a considerable amount of effort arguing for the importance of understanding teaching as a knowledge profession (Guerriero and Révai, 2017[28]; Révai, 2020[12]; Ulferts, 2021[29]). Thinking through how formalised pedagogical knowledge interacts with practical experience and teacher judgement helps conceptualise not only the skills required for quality teaching but how initial teacher education and ongoing professional development might help improve them. Despite this, and connecting to Greenhalgh, Howick and Maskrey's (2014[15]) point about management-driven rather than patient-centred care, there is also increasing concern that emphasis on rigid accountability mechanisms work against the development of teacher expertise, undermining practical experience and teacher judgement. This has an impact not only on the quality of teaching but also the status and attractiveness of teaching as a profession (OECD, 2020[30]).

We can learn a lot from the efforts taken in other sectors to address some of the weaknesses in education. But we must also insist on developing education-specific solutions to our long-standing challenges.

Building a cumulative knowledge base

Unlike medicine, education is conspicuously weak in its ability to continuously develop and refine a body of knowledge that is quasi-universally acknowledged as well founded. Designing and supporting an

effective educational R&D system is one step to achieve this. Brokerage agencies can play a major part in designating the most recent authoritative additions to the knowledge pile and connecting between them.

While ensuring the quality and effectiveness of individual agencies and initiatives is important, it is not enough. Just as research synthesis itself has moved beyond a focus on individual research papers to systematic reviews of reviews, so too do the structures and processes of brokerage need to work together across institutions and systems to support a cumulative effort.

For this to work, action must be taken on multiple levels. On the level of individual brokerage agencies, we must continue to ensure that:

- The quality and effectiveness of brokerage efforts can be sustained and improved (building knowledge, capacity and relationships in the local community and language takes time and sustained effort, so too does change in behaviour).
- Outreach and interactions must be increasingly scaled up to include more actors with multiple needs and in diverse contexts (i.e. going beyond the early adopters and the excited champions to support a broad set of actors, and covering both practice and policy).
- The methodologies and processes of brokerage must continue to evolve and improve, addressing thorny questions (e.g. how best to combine disparate sources of information; what aspects of synthesis can be automated or not, how to go beyond engagement to quality use of research, etc.).

In addition, brokerage agencies and networks need to collectively:

- Link to and build on the work of other brokerage agencies and networks, connecting across different languages, research traditions and contexts to the extent possible.
- Work together to continue to advance the science of evidence synthesis, quality use of research in policy and practice, and long-standing methodological and relational challenges.
- Think through measures of impact and effectiveness of their interconnections and joint collaborations.

Collective work is essential to developing a cumulative knowledge base and to ensuring that quality research is supported and widely available in useable form. It is also a necessary precondition to the elaboration of a body of knowledge that is “quasi-universally acknowledged as well-founded”. For this to happen, the knowledge must be supported across contexts; have been tried and adapted as necessary so that a core element is clearly generalisable and (potentially) a certain set of adaptations set out for different contexts. Ideally, this would be cross-sectoral and cross-disciplinary, connecting education research to the broader social sciences and beyond. But even if it remains education-specific, there is important work to be done connecting different research traditions, brokerage agencies, and types of impact.

Brokering the brokers

Previous efforts to bring brokerage agencies together on a regional level include the European Commission-funded *Evidence Informed Policy in Education in Europe (EIPEE)/* Evidence Informed Policy and Practice in Education in Europe (EIPPEE) initiative.[23] Between 2010 and 2013, EIP[P]EE brought together 36 partners from 23 different countries across Europe. A further seven organisations from four countries outside Europe joined the project as international affiliates. Many of the lessons learnt from this initiative still resonate today, including (Gough et al., 2011[4]):

- Although there was a high level of interest and activity, very little empirical research on which interventions worked (and in what context) was identified.
- Most of the activities were concerned with producing or communicating research, with little focus on the use of the research itself and even less on the “entire evidence to policy system”.

- Most brokerage initiatives were governmental in nature and focused on the national system. Very little collaboration and coordination existed at a trans-European level (other regions were not covered).

Although the European Commission funding ended in 2013, this initiative continued as the EIPPEE Network, with large-scale international conferences and seminars bringing together national actors and the international EIPPEE partners. The opportunity to exchange ideas and share challenges with other leaders in the brokerage field was as welcome as it was rare, demonstrating the dearth of cumulative activities in this space.

One of us (TB) was a partner of the EIPPEE network throughout this time. A consistent observation was the tension between the two major goals of broadening and deepening the initiative. *Broadening* and opening to new partners required raising awareness and building capacity for new members to participate in the discussions. *Deepening* and building on the collective expertise of existing members required the space and time to address difficult challenges and engage in expert methodological discussions. This tension was solved by creating two different activities: 1) EIPPEE network meetings and conferences, which took place over a full day or two and included as broad a set of actors and agencies as possible, and 2) EIPPEE partner meetings, which were often held just before or after the network meetings and addressed shared challenges and solutions of experienced brokers.

There was - and continues to be - a need for building and sharing cumulative knowledge on brokerage, brokering and the processes of quality research use. Despite the lack of funding support, a core group of institutions and individuals met once or twice a year for EIPPEE partner meetings until interrupted by the COVID-19 pandemic in 2020. The warm reception to the new CERI/OECD project when it started in 2021 was an additional indication of the interest and appetite for this kind of initiative.

We have argued – hopefully uncontentiously – that brokerage agencies play a vital role and there are valuable formative lessons to be learnt from their individual and combined experiences. They are potentially a fundamental mechanism in aligning supply and demand, and there are valuable formative lessons to be learnt from their experiences to date.

Despite this, and despite the extensive funding that has gone into the creation and support of such agencies, the monitoring and evaluation of the work and impact of these centres is limited. There is even less work on understanding how these agencies might work together to create a cumulative knowledge base (although see Gough, Maidment and Sharples (2018[31]) for an example from the United Kingdom). This is a serious failing.

Concluding note

This chapter set out to revisit the discussion of evidence-informed policy since the publication of our 2007 volume, with a specific focus on brokerage and brokerage agencies. It has argued that although there have been many impressive advances in the field in the last decade and a half, many of the same challenges remain.

In addition, new challenges have arisen, including quality control on social media and a perceived disdain for “experts” and a worry that science and research is being deliberately devalued. Fabricators of “fake news” and alternative claims (for example, contradictory evidence on climate change) often do not aim to logically challenge the science; rather, they seek to erode trust in facts to the point where they no longer matter. This allows “people to choose their own reality, where facts and objective evidence are trumped by existing beliefs and prejudices” (Lewandowsky, Ecker and Cook, 2017[2]).

Addressing this challenge – and other future challenges as yet unknown – will require new forms of intervention. Lewandowsky, Ecker and Cook (2017[2]) argue that the best approach is "technocognition", an interdisciplinary approach that uses findings from cognitive science and design to combat misinformation as well as technological solutions such as algorithmic fact checkers, automatic alerts for suspected disinformation, and increasing the variety and kinds of suggested content (i.e. broadening what is received as "you might also like") to extend the filter bubble.

If we are to build a cumulative knowledge base of quality education research to inform policy and practice, we must address both existing and emerging challenges. We must continue to learn from the successes and failures of the rich work that has been done. We must insist that the "evidence-informed" quality mark is used to support better education and improved student learning, not misappropriated by vested interests. We must continue to fund and deliver high-quality and relevant research that is useable and accessible, and that can be synthesised across individual studies. We must solve the difficult methodological challenges involved in combining different types of evidence and knowledge. We must also broaden our understanding of how this process plays out in different contexts and the important role of funders in prioritising and supporting research quality and synthesis.

In addition, we need to continue to focus on efforts to understand quality research use for policy makers and practitioners alike. The attention to practice has been important and useful, but work on evidence-informed policy needs to be brought back into the mix to effect system-wide change. While we continue to build a good understanding of what works between and across agencies (that is, how can brokerage efforts be most effective), we must also insist on deepening collaboration to systematically build a cumulative knowledge base. That is, we must push for larger efforts to "broker the brokers", building and scaling knowledge about what works in brokerage itself. These must extend beyond Europe and the OECD to include efforts from across the world.

And lastly, we must design teacher education and public servant training to hone the capacity to critically engage with and use research of various kinds and from multiple methodologies. This is an essential step in defending scientific literacy as a basic democratic right (Chalmers et al., 2018[32]), key to asserting the importance of and trust in science and the scientific process in education and beyond.

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Notes

[1] For more information, see https://eppi.ioe.ac.uk/cms/.

[2] For more information, see http://www.minedu.govt.nz/goto/bestevidencesynthesis.

[3] For more information, see http://www.curee.co.uk/.

[4] For more information, see http://www.whatworks.ed.gov/.

[5] For more information, see http://www.eippee.eu/.

[6] For more information, see https://educationendowmentfoundation.org.uk/.

[7] For more information, see http://www.minedu.govt.nz/goto/bestevidencesynthesis.

[8] For more information, see http://www.nier.go.jp/English/index.html.

[9] For more information, see https://www.uis.no/en/research/knowledge-centre-for-education.

[10] For more information, see http://www.skbf-csre.ch/en/.

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[12] See https://www.nro.nl/en/knowledge-practice.

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Part II

Actors and mechanisms facilitating research use in policy and practice

4 Who is facilitating research use in education systems?

Jordan Hill, OECD

This chapter describes which actors are active in facilitating the use of research evidence in the education sector at the organisational and individual levels. It develops key dimensions for assessing interactions between ministries of education and relevant actors in order to advance discussion on strengthening the use of research evidence. It also analyses practitioner involvement in research production and the provision of incentives. Finally, the chapter looks at the nature of policy makers' relationships. The discussion is based on a review of the available literature and analysis of the OECD's *Strengthening the Impact of Education Research* policy survey results.

Introduction

Over the past decade, there has been increasing attention on actors who facilitate research use in education systems and the interactions between them. This is the result of a conceptual shift towards relationships and systems thinking, as put forward by Best and Holmes (2010[1]). A systems approach calls for a better understanding of the interactions that govern the production, dissemination and diffusion of knowledge between actors. This chapter aims to understand actors and relationships at the organisational and individual level, which are crucial for the effective use of research evidence.

Interpersonal relationships, whether they are built through formal organisational connections or informal interactions, are key to shaping research use in policy and practice (Levin, 2011[2]; Ion and Iucu, 2014[3]; Wiggins et al., 2019[4]). Catalysing interpersonal relationships supports the efficient mobilisation of resources, both human and financial (Ward, House and Hamer, 2009[5]). Interpersonal relationships are also crucial for facilitating mutual understanding of the different knowledge needs of policy makers, practitioners, researchers and other actors (Burns and Köster, 2016[6]). These two features of relationships, among others, have long been held as a way to enhance the impact of education research (Mitton et al., 2007[7]). Rickinson and colleagues (2020[8]) summarise the reasons why relationships between actors who can facilitate the use of research still require a larger amount of attention from scholars, policy makers and practitioners alike:

- They result in the development of interpersonal skills, making it possible to explore deeper meanings of research evidence.
- They are vehicles for enhanced communication and collaboration to give the breadth of voices needed to use evidence.
- Relationships, when they are built on mutual trust, allow the consideration of appropriate instructional, structural or policy changes.
- Connections between individuals can foster stimulating debates around evidence leading to sustained changes in practice.

The increasing recognition of the importance of relationships runs in parallel with an increasing number of initiatives focused on building these connections within education systems to improve evidence use (Coe and Kime, 2019[9]). Among these initiatives, establishing networks has become a popular tool for building relationships at both individual and organisational levels (Best and Holmes, 2010[1]). However, networks do not automatically facilitate innovation and research mobilisation (Révai, 2020[10]). For such initiatives to be effective, a deeper understanding of the nature, quality and processes of interactions is necessary.

With this in mind, this chapter focuses on two central questions:

- Who are the actors in this landscape and to what extent do they facilitate the use of education research in policy and practice?
- What do the relationships between these actors look like and how do they connect research production and use?

The chapter addresses these questions through international data collected in the *Strengthening the Impact of Education Research* policy survey and follow-up interviews conducted with a number of respondent countries.

The chapter is structured in two parts. The first part looks at different organisational-level actors and their perceived levels of research mobilisation activity. It then assesses the relevance of ministry relationships. The second part looks at the nature of individual actors such as practitioners, policy makers and researchers. Since the survey only gathered data on how policy makers use research, an assessment of the quality of individual relationships is offered from the perspective of policy makers.

Key dimensions

This section reviews a number of dimensions to identify the scope of the analysis of actors and their relationships. Actors do not sit within a vacuum and any analysis must take into account the wider context of structures, incentives and resources that facilitate or hinder research use.

The key dimensions for this chapter are explained below, and have been summarised in Table 4.1. The term "activeness" was purposefully kept open in the survey to allow for richer data, and defined only through a five-point Likert scale ranging from "not active at all" to "very active".

Table 4.1. Key dimensions summary

Key dimensions	Sub-dimensions/Categories	Indicators
	System level	
Context (can be at organisation or individual level)	Structures, priorities and resources of organisations	Presence of educational research strategy or other mechanisms/incentives such as salary supplement for a teacher to be involved in research production
	Organisational level	
Actor relevance for facilitating the use of research	Policy organisations	Activeness of ministries of education, government funding agencies and policy networks in facilitating research use
	Research organisations	Activeness of universities, public research organisations and academic networks, in facilitating research use
	Practice-oriented organisations	Activeness of teacher unions, school networks, other professional groups, teacher education institutions and professional development providers in facilitating research use
	Intermediary (brokerage) organisations	Activeness of university-school partnerships, education consulting firms, official brokerage agencies and think tanks in facilitating research use
	Other system stakeholders	Activeness of media outlets and businesses in facilitating research use
Relationships of ministry	Size of the ministry's network	Number of actors regularly solicited
	"Strength" of connections between the ministry and actors	Frequency and intensity of interactions
	Relevance of ministry relationships for research use in policy	Strength of ministry connection to actors seen as active in facilitating research use in policy
	Relevance of ministry relationship for feedback loop	Strength of ministry connection to actors seen as active in facilitating research across policy and practice contexts
	Individual level	
Actors	Individuals with a research background	Embedded researcher, research fellow, research champion, research advisor, government researchers, academic researchers, independent researchers
	Individuals in the practice context	Teachers, school leaders, teacher educators
	Individuals in the policy context	Policy makers
Individual relationships	An individual culture and mindset which supports relationships for research use	High levels of trust, respect and shared understanding between individuals
	Presence of collaborative activities between individuals	How policy makers access, evaluate and use education research during the policy process

Organisations

The primary stakeholder groups most relevant for research mobilisation are policy organisations, research organisations and practitioner organisations (OECD, 2007[11]). Yet, evidence shows that similar types of organisations can have very different knowledge mobilisation roles in different systems (Powell, Davies and Nutley, 2018[12]). Understanding which organisational actors are key "evidence intermediaries" that bridge research use with policy and practice in individual systems is crucial. Recent research has provided a framework for understanding the variety of organisations that fulfil this intermediary role in different contexts. They are broadly defined as either research-producing or non-research producing intermediaries (Global Commission on Evidence to Address Societal Challenges, 2022[13]).

Organisational relationships

The survey asked ministries about their relationships with other organisations. Taking a systems approach necessitates consideration of both the variety of connections and flows of evidence use between organisational actors (Best and Holmes, 2010[1]). In high-quality organisational relationships, information, materials, resources, services, and social support should flow reciprocally between policy, practice and research (OECD, 2007[11]). Since the survey data contains only the ministry perspective, the reciprocity of organisational relationships and direction of information flows remains an open question. However, the survey data does contain information regarding the size of the ministry's network and the strength of relationships between the ministries of education and different actors in the policy, practice and research contexts.

Taking into account the size and strength of ministry relationships, the relevance of these relationships for facilitating research use must be assessed. Speaking from the perspective of healthcare policy, Brown and colleagues (2018[14]) argue that evidence-informed policy occurs through relationships between policy and research organisations. While this is true, it must be recognised that policy and practice are deeply interdependent and interconnected. While it is essential to map the ministries' relationships with organisations working to facilitate research use policy, it is also crucial to map relationships with those working in multiple contexts.

Individuals

The survey asked a number of questions about specific individuals relevant to research production and use within systems. These included teachers, school leaders, policy makers, embedded researchers, research fellows and advisors. As discussed in Chapter 1, policy makers in the context of the survey refer to the highest level of decision making in education (ministry/department of education), with some variation in survey respondents' interpretation of the term. Those with a research background embedded in different contexts (e.g. policy or practice) are particularly relevant for knowledge mobilisation (Gough, Maidment and Sharples, 2021[15]). The distinction between having a research background and being a researcher is an important one as those who facilitate the use of research can occupy various roles in an organisation, and do not have to be formal researchers (Bednarek et al., 2018[16]). In that sense, they are characterised by their skills more than their title.

Individuals' relationships

At the individual level, scholars have defined relationships in the education context as "the interpersonal processes and connections that are required to thoughtfully engage with and implement appropriate research evidence" (Rickinson et al., 2020, p. 14[8]). Researchers have tried to understand and categorise individual relationships in a knowledge mobilisation context and often regard the culture and mindset of research use as connected to productive individual relationships (OECD, 2007[11]; Oliver et al., 2014[17]). This culture and mindset necessitate high levels of trust, respect, and mutual understanding between

individuals. In addition to culture and mindset, Rickinson and colleagues (2020[8]) argue that the right skills and knowledge are needed to facilitate the collaborative relationships between practitioners around research use. When deploying their framework for a review of evidence use in Australian schools (see also Chapter 9), one of the most common forms of research use was discussing best practices with colleagues (Rickinson et al., 2021[18]). This also shows how tightly intertwined intrinsic factors such as skills, culture and mindset are with relationships for research use.

In addition to these intrinsic aspects of individual relationships, the presence of collaborative activities must also be taken into account. Here, Gough and colleagues (2011[19]) provide three key activities related to research use, based on an analysis of 269 different initiatives in 30 European countries. These activities are: Use of evidence for social influence and/ or persuasion; seeking evidence from others and/or interpreting evidence with external input and; facilitating interaction and/or collaboration with others.

Organisational actors

One of the central questions of this chapter asks who the actors are in the landscape and to what extent they facilitate the systematic use of education research in policy and practice. In the survey, respondent systems were asked which actors were active in their systems on a scale from 1 to 5: ‘’Not active at all’’, “slightly active”, “moderately active”, “active” and “very active.’’ They were asked to provide this rating for each actor in the areas of research production, facilitating research use in policy and facilitating research use in practice. These last two will also be referred to as “research mobilisation” in this chapter.

Education systems vary greatly in terms of the overall levels of activity of organisations. On one end of the scale, Finland perceived its organisations as, overall, very active, with an average of 4.94 (facilitating research use in policy), 4.59 (facilitating research use in practice) and 4.88 (research production). On the other end, Switzerland (Uri) perceived its organisations as only slightly active, with an average of 2.14 (facilitating research use in policy) 1.86 (facilitating research use in practice) and 1.64 (research production). An overview of system-level profiles can be found in Annex 4.A. Most respondents to the survey did not report large differences within the system in terms of average levels of actor activity across the three areas.

Number, type and distribution of organisations

The survey data revealed that a large number of different organisations are seen as active to some degree in producing research and facilitating its use in policy and/ or in practice in each of the respondent systems. The maximum number of actors that systems could report as active in the survey was 17. The average number of actors reported as at least “slightly active” in systems was 14. Just under 1/3 of respondent systems reported that the maximum number of actors (17) were active to some degree in their system. Table 4.2 shows the number of systems reporting each actor to be very active or active (henceforth “active”) in each of the three areas.

Table 4.2. Number of systems reporting organisations to be active in facilitating the use of education research and in research production

	Universities/ Faculties of Education	Ministry of Education	Teacher education institutions	Other public research organisations	Academic or research networks	Government funding agencies	University - School networks	Pro. devt.. providers for teachers	Other professional groups	Policy networks	Education consulting firms	Teacher unions	Brokerage agencies	Think tanks	Media	School networks	Businesses
Facilitating research use in **POLICY**	32	32	17	20	21	18	17	12	14	11	13	13	8	10	11		6
Facilitating research use in **PRACTICE**	24	21	21	17	13	16	14	19	13	10	9	12	10	4	2	12	7
Producing education **RESEARCH**	30	26	22	20	22	21	14	13	5	10	8	4	9	6	6	7	4

Note: Data was collected at national and sub-national levels. School networks did not feature as an option when ministries were asked about facilitating research use in policy. This was building on the assumption that school networks are not focused on increasing the use of research in policy.
"Pro. devt. providers for practitioners" refers to professional development providers for school practitioners.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

Education ministries

Overall, the data suggest that, while ministries often see a wide range of actors as active, certain actors are more relevant when it comes to facilitating the use of research. Universities, faculties of education and the ministries of education themselves were seen as the most active organisations in both the production and mobilisation of education research across the systems. Fourteen education systems viewed the education ministry as the most active overall in all three areas. In four of these systems – Belgium (French community), Switzerland (both Zurich and Uri) and Turkey – the ministry was reported as more active than any other organisation. In terms of facilitating research use in practice, ministries of education often perceive themselves to be as active in facilitating research use as, for example, teacher education institutions. This may reflect ministries' investments in initiatives that facilitate research use in practice. In a small number of systems, the ministries of education perceived themselves to be the most active organisation in the production of research. This was the case in New Zealand and Belgium (French community).

Some scholars maintain that departments and ministries of education remain quite weak in knowledge mobilisation (Levin, 2013[20]; Cooper, 2014[21]). However, the presence of "in-house" brokerage units that support particular ministries in research gathering, translation and communication efforts has been reported for some time (OECD, 2007[11]). This process has become more formalised over the past decade within certain national administrations through the establishment of strategic intelligence units in ministries of education (Gough et al., 2011[19]). The follow-up interviews confirmed the presence of these research and analysis units in several systems (see Box 4.1 for two examples).

Box 4.1. Policy and analysis units in ministries of education

Slovenia

In July 2021, the **Slovenian government** established a new Quality and Analysis Unit within the Department of Educational Development and Quality of the Ministry for Education, Science and Sport. The aim of this unit is to improve the production, analysis and use of data and educational research in policy development and practice. In this way, it operates as an internal knowledge broker within the ministry through the commissioning of educational research and by participating in international studies. Key outputs are expected to be best practices in both policy and practice, and enhanced involvement in international surveys and studies. It also performs a matching function, gathering, translating and disseminating educational research and data in response to questions around education posed by policy makers across government. The unit is staffed by a mixture of professional civil servants and experienced researchers.

Norway

The **Norwegian Ministry of Education and Research** has a special unit: Section for Policy Analysis. The section has a specific mandate to provide educational research and data to support policy making in cooperation with all departments at the Ministry. The section works as a "knowledge broker" through dissemination of relevant research, and by offering analytical support to the departments and to the political and ministry leaders. Furthermore, the section works to develop and increase the evidence base for kindergartens, schools, higher education and research in Norway. To this end, it follows international research, facilitates strategic discussions in the field of educational research and works long term to strengthen educational research. It also coordinates research initiatives with the Norwegian Research Council, the Norwegian Directorate for Education and Training, the Norwegian Directorate

for Higher Education and Skills and the Knowledge Center for Education – the allocation of budget means to educational research being one of these tasks.

Source: Follow-up interviews with respondent countries and data submitted in open questions of OECD *Strengthening the Impact of Education Research* policy survey.

Brokerage agencies

Official brokerage agencies (i.e. formal agencies with a specific mandated function to support the use of research in policy/practice) were reported as being active to some degree in 16 systems that responded to the survey. Two systems reported they exist but were not active (Austria and Switzerland [Zurich]). As more brokerage agencies have been established across OECD countries, they have taken a wide variety of forms, with different goals and means (OECD, 2007[11]) (see more on the changing landscape and challenges of brokerage agencies in Chapters 3 and 7).

Although 16 systems reported that official brokerage agencies were active, only one system (England) reported this agency to be the most active organisation across research production and facilitation of use in policy and practice. As outlined in Chapters 5 and 7, England has a particularly well-developed brokerage system. In the other 15 systems, such formal agencies often received much lower overall activeness ratings and were very diverse in terms of the focus of their activities.

It is possible to draw out two distinct activity profiles for these agencies. Some systems report them to be active in producing research and facilitating its use in both policy and practice. This was the case for six systems (Costa Rica, Chile, Finland, Norway, Portugal and UK [England]). While others see them as active in only one or two areas. This was the case in seven systems (Columbia, Denmark, Hungary, New Zealand, Sweden, Switzerland [Obwalden] and Turkey). New Zealand for example reported them as only active in facilitating the use of research in practice. Furthermore, five systems reported the *presence* of brokerage agencies but also reported that they were mostly or entirely inactive in producing research or facilitating its use (Austria, South Africa [Pretoria], Switzerland [Lucerne], Switzerland [Zurich], Switzerland [Appenzell Ausserrhoden]).

The range of brokerage agencies reported in the open questions of the survey indicates that ministries do not perceive a standard model for these organisations (see Annex 4.B). Some have a more traditional set of educational stakeholders (e.g. teachers, educational establishments and decision makers in the promotion of learning and development of education). Others, such as the EDULOG initiative[1] by the Belmiro de Azevedo Foundation in Portugal, have a much broader mandate to build bridges between education, politics and society as a whole. Many have a classical set of brokerage goals, such as the Knowledge Centre for Education,[2] established by the Norwegian Ministry of Education and Research in 2013, or the United Kingdom (UK) "What Works" Centres,[3] both of which carry out and disseminate research syntheses to support the use of research by practitioners, researchers and policy makers. However, others also provide statistical services or access to data, for example Statistics Finland,[4] which produces statistics for the entire education system from pre-primary to adult education. Some brokerage organisations reported in the survey are tasked with the creation of specific educational products, such as the Costa Rican National Dean Council (CONARE),[5] which produces a bi-annual General State of the Education Report. Overall, the diversity in both levels of activity and organisational structures and goals indicates that there is the potential for a large amount of knowledge exchange and shared learning between the different models.

Networks

Education consulting firms, policy networks, school networks and businesses were reported to be active in the fewest number of systems. Looking specifically at **networks**, they were seen as active to very different extents in education systems. In particular, policy networks and school networks are not active in a large number of systems (7 and 8, respectively). This is interesting given the huge investment that has gone into establishing networks across different research disciplines and sectors (e.g. EC (2013[22])). In the survey data, networks with direct involvement of academia, such as academic networks and university-school partnerships, were seen as the most prevalent and active in both the production and mobilisation of education research. However, the specific areas of university-school partnership activity were quite unique to each system. Crucially, a diverse range of education systems (e.g. Colombia and Canada [Quebec]) report that university-school partnerships and networks are not active in facilitating research use in practice, which is not quite in line with their supposed and reported function (Farrell et al., 2021[23]). Some systems also reported that these networks are only active in research production, as is the case in Austria and the Slovak Republic. The varying levels of activeness of such mixed-profile partnerships and networks suggest that these are not yet consistently adopted as institutionalised forms of collaboration across OECD countries. This is in spite of their large potential in strengthening research use in education policy and practice (Farrell et al., 2021[23]).

Looking specifically at school networks, research on teachers' professional relationships has shown that those who have more frequent interactions with other teachers also report more use of research evidence in their schools (Brown, Daly and Liou, 2016[24]). However, school networks as a vehicle to connect evidence and innovation in education have only recently become more widely recognised worldwide (Révai, 2020[10]). These networks traditionally focus more on practice-based knowledge sharing, joint activities for students, teaching and learning-related collaboration and innovation. Harnessing research use is thus not a strong/specific focus of such networks, as illustrated by the example of the European eTwinning network.[6] This may explain why school networks in particular are perceived as less active by the ministries in facilitating the use of education research.

Relationship between research production and mobilisation

As noted in the key dimensions section, evidence intermediaries may be active in both the production of education research and facilitating its use, or may only be active in the latter (i.e. in research mobilisation). This section will uncover those two kinds of evidence intermediaries in the survey data.

There is a large variation in terms of the total number of organisations active across research production and mobilisation across systems (Figure 4.1). On one end of the scale, Chile, Finland and Spain, reported a large number of organisations to be active in all three areas. On the other end, some systems – including Switzerland (Uri and Lucerne), Belgium (French community), and South Africa – reported very few organisations that are active in producing or facilitating research use.

In most of the systems, the number of actors reported as active was different for each of the three areas. Some systems reported very large differences in terms of the number of active organisations in each of the three areas. For example, New Zealand and England both reported significantly fewer actors to be active in producing research (New Zealand also reported far fewer to be active in facilitating research use in policy). Interestingly, research production is the area where most systems have the largest number of active organisations.

When it comes to **research-producing intermediaries**, 13 systems reported one or more actors to be very active across research production and mobilisation in both policy and practice. This was most commonly ministries of education, universities and teacher education institutions. These organisations can therefore be seen as key intermediaries in many systems, often spanning the boundaries between

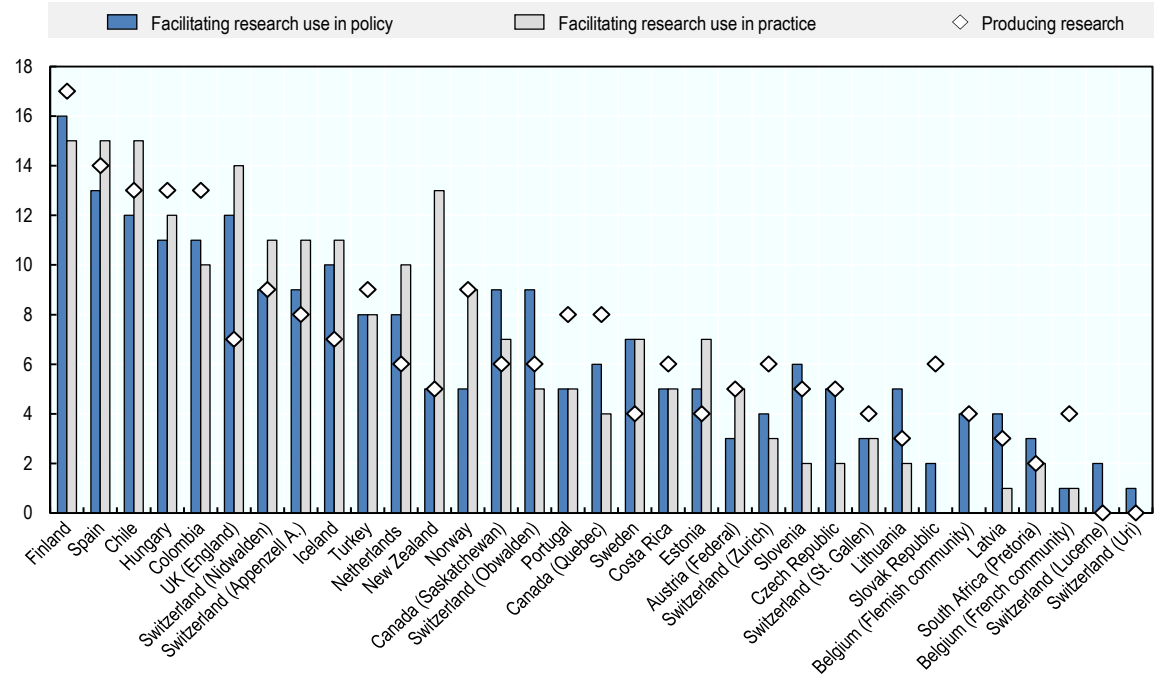
research, policy and practice. There are some interesting exceptions, such as the Czech Republic, where think tanks were the only actor seen as active in all three areas.

While evidence intermediaries often produce and use research, there are also **organisations** that are **only focused on research mobilisation** and less, or not at all, on production. Overall, 12 systems reported at least one actor to be active in facilitating research use in both policy and practice but with low levels of research production. These systems most commonly reported education consulting firms and teacher unions in this way.

Some actors were only active in facilitating research use in policy: 15 systems reported at least one such actor. These were most commonly media and think tanks but other professional groups, and interestingly, even school-university partnerships, were also mentioned. Even more systems (17) reported actors only active in facilitating research use in practice. The most commonly reported "practice intermediaries" were school networks and professional development providers.

The data also suggest that the profiles of different organisations is highly system-specific. For example, public research organisations other than universities or teacher education institutions were only perceived to be active in producing research in some systems (e.g. Iceland and Latvia) while they were very active in producing and facilitating use in both policy and practice in others (e.g. Austria). An overall trend is that most organisations that were seen as active in facilitating the use of research in both policy and practice were generally also rated as active in the production of education research. In the future, it will be important to better understand how each of these organisations actually facilitates research use and if there are configurations that are more effective than others.

Figure 4.1. Number of actors reported as active in systems



Note: Data collected shows the number of actors reported as active in each of the three areas. An organisation is considered active when the ministry perceives them to be either ''active'' or ''very active'' in their response. Data collected at national and sub-national levels. "Appenzell A." refers to the Swiss canton of Appenzell Ausserrhoden.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

StatLink https://stat.link/junafy

Quality of ministries' relationships

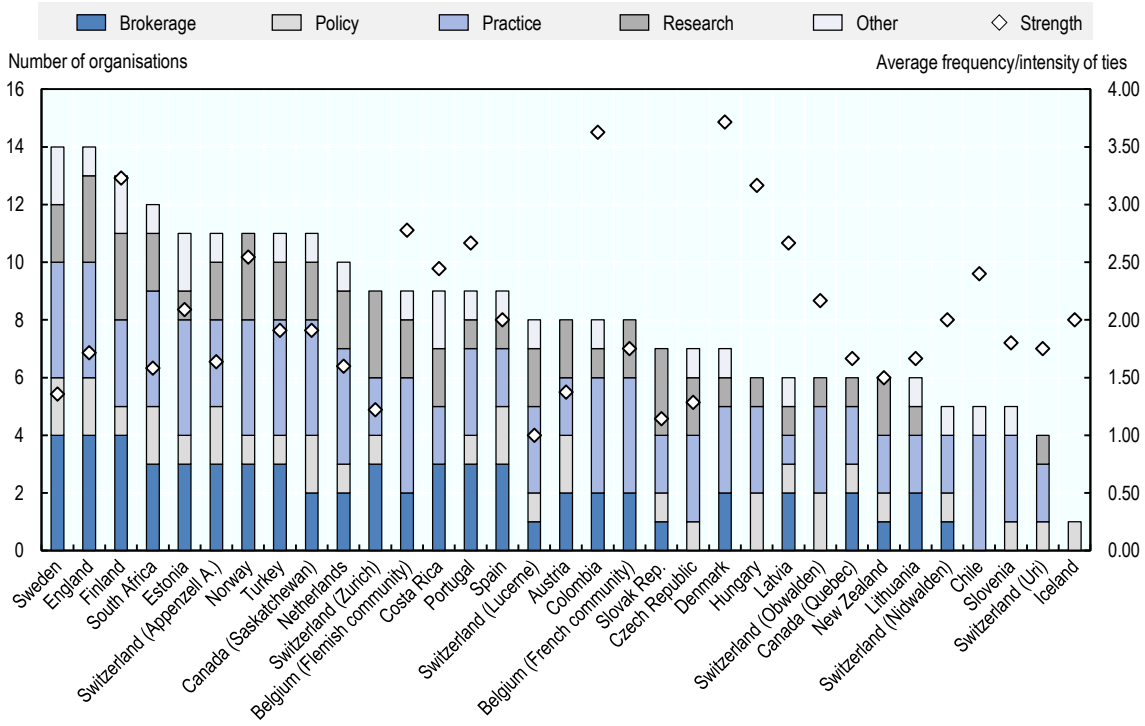
No actor alone can foster the use of research; they must be connected to others to facilitate an exchange of ideas and the construction of knowledge. The policy survey looked at the relationship of ministries with various types of organisations. This section describes the breadth and relevance of these relationships.

Number and strength of connections at the landscape level

In the survey, ministries of education were asked how frequently and intensively they solicited different organisations to facilitate the use of research in policy; for example, by seeking ad-hoc advice on research, commissioning research based on policy needs or coordinating research production. The respondents were given six potential options ranging from ''never'' to ''very frequently".

While there is some variation in the number of organisations ministries solicit to facilitate research use in policy, over half of the systems indicated they have connections to at least ten types of organisations. On the lower end of the scale, Iceland, Switzerland (Uri) Slovenia and Chile all indicated five or fewer, with a wide range of relationship intensities. Figure 4.2 does not indicate any particular relationship between quantity and quality. Some countries, such as Finland, have strong and extensive relationships. Others, such as Chile and Switzerland (Nidwalden), have fewer but stronger ties.

Figure 4.2. Size and strength of ministries' networks



Note: Size refers to the number of organisations ministries reported soliciting to facilitate research use in policy. Strength refers to the average frequency/ /intensity of the interactions with the different organisations that respondents rated on a 6-point Likert scale. Data was collected at national and sub-national levels. "Appenzell A." refers to the Swiss canton of Appenzell Ausserrhoden.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

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Looking at absolute numbers, relationships with practice-oriented organisations (teacher unions, school leaders' unions, subject teacher associations, teacher education institutions, professional development providers etc.) were reported most often by ministries but were generally the weakest connections. For example, 65% of systems reported having some contact with teacher unions. However, 92% of the systems reporting these connections reported them as "very rare" or "occasional".

The most commonly reported strong relationships were with research actors (universities, public research organisations and academic or research networks). This was most often the case with universities and faculties of education, where 11 systems reported "quite frequently" soliciting their input to facilitate the use of research in policy. Important to bear in mind is that no ministry in the survey reported "very frequently" soliciting any of the organisations to facilitate the use of research in policy.

Relevance of ministry connections

This section looks at the relevance of ministries' relationships, i.e. whether they interact with the actors they see as active in the mobilisation of education research. The section explores the relevance of relationships from two perspectives:

- Relationships the ministry has with organisations most active in facilitating research use in policy.
- Relationships the ministry has with organisations that have a strong research-policy-practice intermediary role in their system.

At the *landscape* level, the activeness of organisations in facilitating the use of education research in policy roughly corresponds to the frequency of the ministry's connections with those organisations (Figure 4.3).

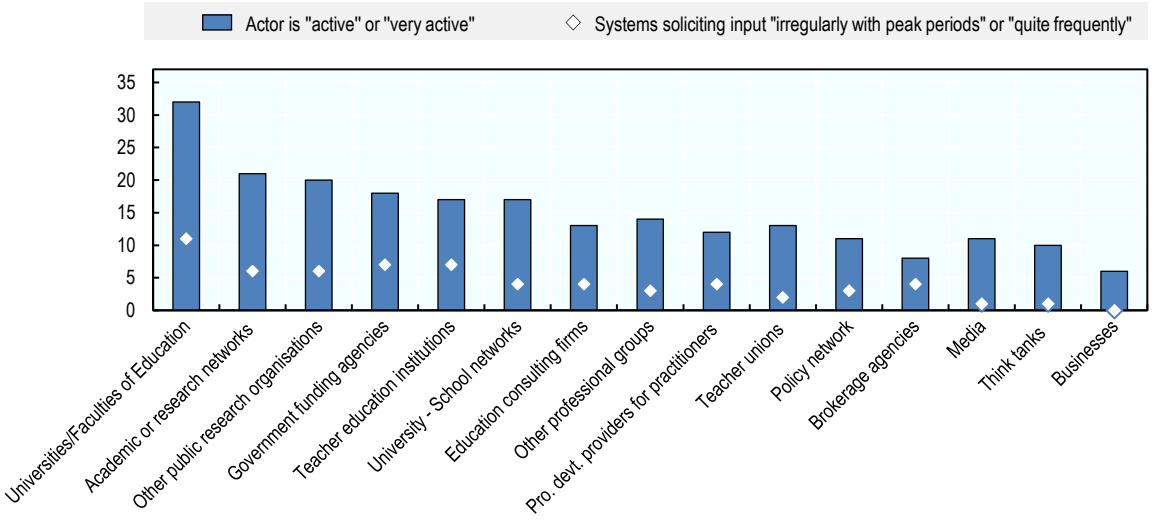
While ministries generally do not have connections to every single relevant actor in the system, many appear to have overall fairly strong connections to at least one of the actors who are active in facilitating research use in policy. This suggests that, overall, the relationships the ministries have with organisations facilitating research use in policy are quite relevant, albeit incomplete. There are some instances where the relationships do not match the levels of activity. For example, think tanks often have much less frequent ties with the ministries despite a number of systems reporting them to be active in facilitating research use in policy.

It appears that, for some organisations, ministry awareness of their activeness in facilitating research use often, but not always, translates into a relationship. This brings in a wider question around the role that an organisations' informal *influence* plays on research use in policy making without an actual relationship being established. In their analysis of relationships promoting evidence-informed policy and practice, MacGregor and colleagues (2022[25]) found that although actors in education systems often had formal networks, many wielded indirect or invisible influence, which can still create the conditions for educational improvement.

The data at the landscape level, presented in Figure 4.3, hides an important nuance at the level of individual systems.

It may be the case that ministries are heavily connected to organisations because they are research producers rather than because they are active in facilitating the use of research in policy. This is difficult to determine because, as already noted, activeness in research mobilisation is often intertwined with research production. For example, Belgium (Flemish community) reported having quite frequent connections to universities and teacher education institutions, both seen as active in facilitating research use in policy but also in producing research. One way of clarifying the interplay between production of research and facilitation of use in policy is to look at individual ministry relationships with organisations who were less active or not active in producing research but still active in facilitating its use in policy (i.e. **policy intermediary actors**).

Figure 4.3. Relevance of ministry connections to organisations active in facilitating research use in policy



Note: Data showing the number of systems reporting that a given actor was active in facilitating research use in policy compared with the number of systems regularly soliciting input from that actor in the policy-making process. Data was collected at national and sub-national levels. "Pro. Devt. Providers for practitioners" refers to professional development providers for school practitioners.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

StatLink https://stat.link/1fgnzu

In the vast majority of cases ministries did not report strong **connections to "policy intermediary" actors**. In a number of cases this actor was the media, where it is natural that ministries solicit them less for research advice or commissioning research. However, the pattern is similar with other "intermediary only" actors, such as think tanks and professional groups. In fact, only two systems reported working "quite frequently'' or "occasionally" with an actor who was active in facilitating research use in policy but with low, or no, activity in research production (Colombia with teacher unions and Slovenia with professional groups).

Given that the purpose of education policy is to improve education practice, policy organisations also need relationships with organisations working across multiple contexts rather than just those focusing on research production for policy making. These relationships can support research use in practice indirectly and reinforce the impact of policy ideas on the practice context. They are also important as practitioners seek and share evidence from multiple sources, including ministries of education. As argued by Bednarek and colleagues (2018, p. 1179[16]), "creating and nurturing this knowledge exchange infrastructure can help actors in the process (including scientists) absorb new information and account for conflicting evidence without derailing an entire [policy] process." In this way, having a "feedback loop" with actors who use research but are active in areas beyond producing it can also be seen as a crucial part of research-informed policy making.

Encouragingly, systems generally reported having connections to actors seen as **the most active intermediaries** working across the research, policy and practice contexts. However, there are some exceptions within ministry networks. For example, Switzerland (Obwalden) reported academic or research networks to be active in producing research and facilitating its use in policy and practice but reported that it never solicits their research-related input to policy making. As previously mentioned, the Czech Republic reported think tanks as key organisations but did not report any relationship with them. In some cases the inverse was true: Ministries reported connections to actors who were not seen as very active in producing

research or facilitating its use. Sweden, for example, reported policy networks to be only "moderately active" in both the production and mobilisation of research in policy. However, the ministry reported very frequent and intense ties with these networks.

The ministries' **connections to brokerage agencies** are also important since these are often intended to be broad evidence intermediaries in most systems where they are active (see Chapters 3 and 7). Of the 16 systems where brokerage agencies are active, only nine reported having connections to them. Generally, the more active these agencies are, the stronger the ministry connection to them is. There is one exception: The ministry of education in the United Kingdom (England) reported having the strongest relationships with universities and faculties of education as well as reporting strong links with other public research organisations. The ministry perceived the most active organisation overall in the system to be official brokerage agencies, yet it only reported occasional interactions with them. The main brokerage agency in the United Kingdom, the Education Endowment Foundation (EEF), was established with a 15-year funding plan and is intended to be independent, autonomous and free from political pressures or influence from the United Kingdom Parliamentary cycle (Education Endowment Foundation, 2012[26]). However, this set up does not mean a strong relationship with the ministry is unnecessary since the purpose of the agency is to influence decision making with evidence.

Seven systems did not report any connection to brokerage agencies despite their being active in the system. In Chile and Denmark, for example, these agencies are seen to be very active in facilitating research use in policy but the ministry did not report a relationship with them. Furthermore, in some systems, the opposite pattern can be seen. The ministry in Colombia reported having the strongest relationship with brokerage agencies. However, actors seen to be the main evidence intermediaries in the system were, in fact, universities, education consulting firms and policy networks. It is remarkable that the ministry did not report having any relationship with these three actors in the survey.

Overall, in looking at the strength of ministry connections to actors with different activity profiles, two conclusions can be drawn.

- Firstly, whether an organisation is active in research production appears to have more bearing on how strong the ministry connection is rather than whether they are active in facilitating the use of research in policy.
- Secondly, actors that have a strong research-policy-practice intermediary role often have strong connections to the ministry but not always. This variance is especially pronounced for brokerage agencies, which often have a unique system context.

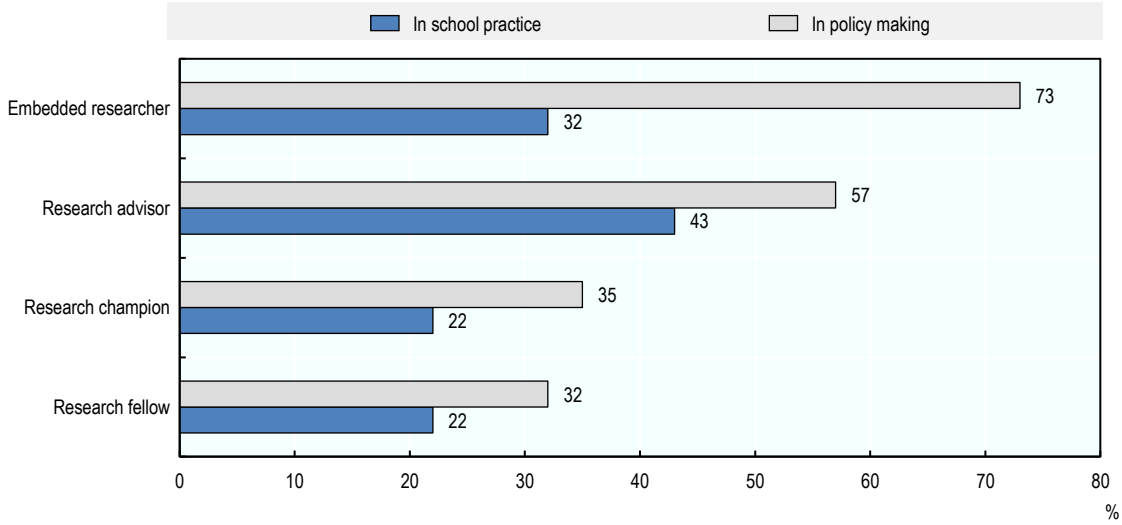
Individual actors

Organisations contain a variety of individual profiles and roles, which affect the use of research to different extents. This section looks at a number of individual roles across policy, practice and research to understand the nature of their involvement in facilitating research use.

The landscape of individuals relevant to research use

Three questions from the survey asked systems about the types of individual roles in their context. One question asked whether specific individuals (embedded researchers, research advisors, research champions and research fellows) existed to facilitate the use of research (Figure 4.4). These individuals were perceived to be far more prevalent in policy making than in school practice. Two further questions asked how active different individuals were in research production (Figure 4.5) and at which stages (Figure 4.6).

Figure 4.4. Systems reporting the presence of individual roles to facilitate the use of research



Note: Figure shows the percentage of systems reporting the given role is present in their system. Data collected at national and at a sub-national level.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

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Some systems maintain or increase the numbers of individuals with a research background through PhD schemes in both policy and practice contexts (see Box 4.2). While research skills are key to increasing the systematic use of research in policy making, data from the survey suggests that there are important variations across systems in terms of research skills in the civil service. Embedding researchers in ministries is often seen as a way of building relationships between the research and policy communities (Gough, Maidment and Sharples, 2021[15]). Data from the survey indicates that the number of these researchers varies depending on the ministry and unit. Latvia, for example, reported in the open questions of the survey that 7.4% of employees at the ministry had a PhD in 2021. Norway stated in a follow-up interview that around 50% of employees in the special unit Section for Policy Analysis have a PhD and/or research background.

Box 4.2. Two models of integrated doctoral training programmes focused on the production and use of educational research

Public Sector PhD Scheme in Norway

In public administration, the **Norwegian Public Sector PhD Scheme (OFFPHD)** has the specific goal of expanding research activities in public sector bodies to increase researcher recruitment within the public sector and promote greater collaboration between academia and the public sector. It is only open to permanent employees in the public sector body. Approximately ten projects have been awarded in the area of education policy and practice on topics including curriculum renewal, inclusive education, English-language teaching, and new pedagogical models in citizenship education, school management and leadership, and sports education.

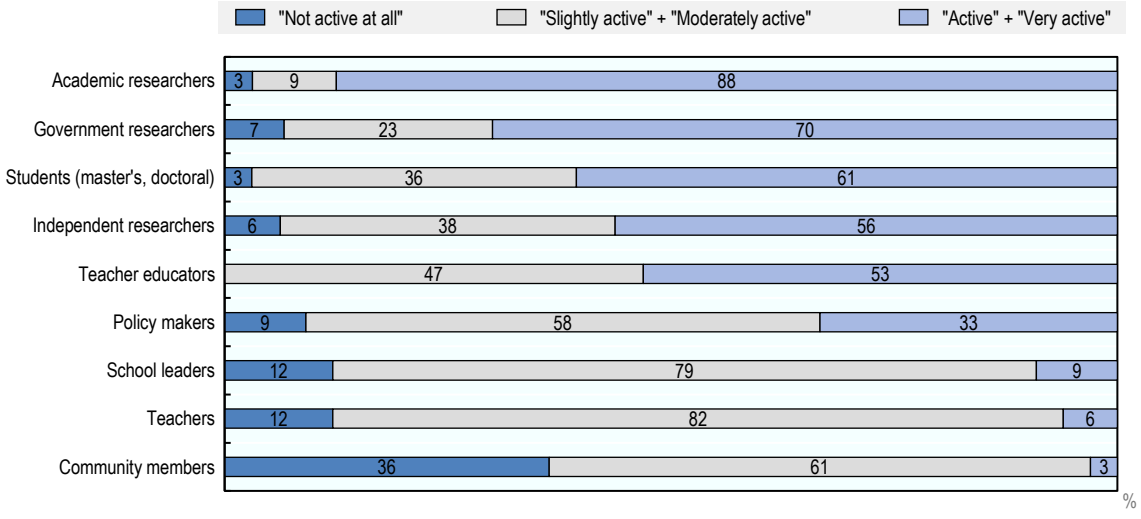
Doctoral Grant for Teachers programme in the Netherlands

Related specifically to facilitating the use of education research in practice, the **Dutch Research Council** has been organising calls for their Doctoral Grant for Teachers programme since 2010 and awarded almost 500 projects. The grant is aimed at teachers in primary, secondary, vocational, higher vocational and special education. The focus of the studies is very open, and the grant includes the costs of a replacement teacher up to the equivalent of a maximum of 0.4 full time for a maximum of five years.

Source: OECD *Strengthening the Impact of Education Research* policy survey data; Research Council of Norway (n.d.[27]) https://www.forskningsradet.no/en/apply-for-funding/funding-from-the-research-council/public-sector-phd-scheme/; Dutch Research Council (n.d.[28]), *Doctoral Grant for Teachers*, https://www.nwo.nl/en/researchprogrammes/doctoral-grant-teachers#:~:text=The%20Doctoral%20Grant%20for%20Teachers,ties%20between%20universities%20and%20schools.

Regarding the specific levels of activity in research production (Figure 4.5), at one end of the scale academic researchers and government researchers are most frequently reported as “active’’ or ‘’very active’’. Policy makers, school leaders, teachers and community members sit at the other end of the scale, and are seen as, overall, less active or not active at all. Teacher educators are the only stakeholder group involved in producing research to some extent in all systems. This is in line with the high involvement of teacher education institutions in producing research and the strong relationships reported by the ministries with them. One further element to consider is that teacher educators are, in many systems, embedded in faculties of education within universities. It is therefore not necessarily straightforward to separate them from academic researchers.

Figure 4.5. Levels of individuals’ activity reported by systems in research production.



Note: Data showing the percentage of systems reporting a given individual profile was active in research production at a given level. Data collected at a national and sub-national level.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

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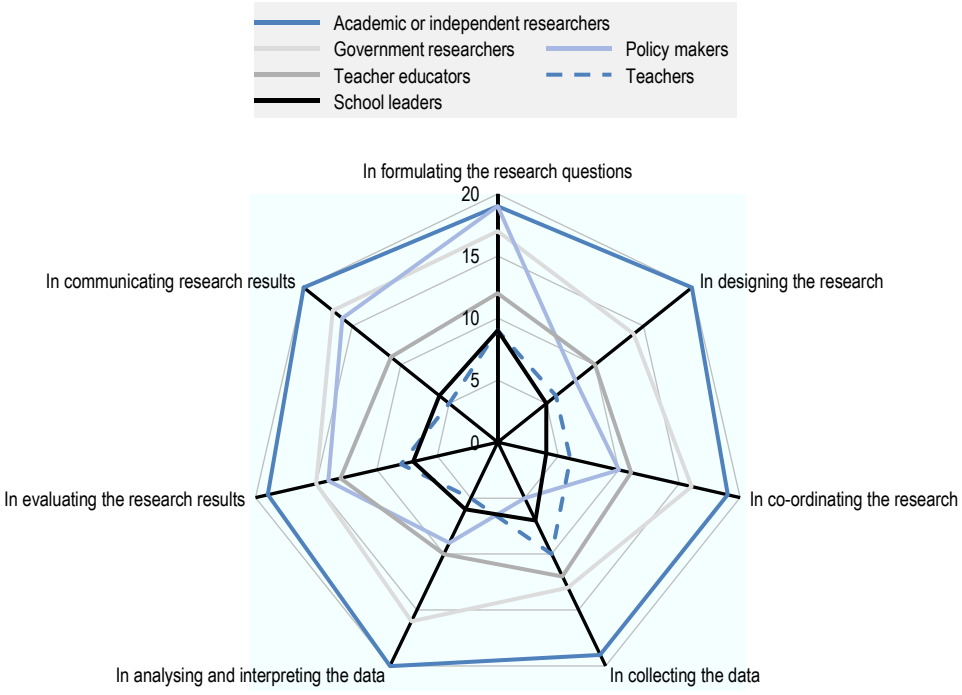
Who is involved in the various stages of the research production cycle is also highly relevant for assessing the impact of research (Figure 4.6). Unsurprisingly, academic and independent researchers are perceived as active across all stages of research production. In contrast, practitioners (teachers and school leaders) were least frequently reported to be involved across the whole research production cycle, and most heavily associated with data collection. This may suggest that practitioners' involvement in the different phases is primarily a passive involvement (as "objects" of research) rather than being meaningfully involved in the production of research. The nature of co-production is also discussed in Chapters 8 and 10 of this publication.

Figure 4.6. Individuals' involvement in the different stages of research production



Note: Data showing the number of systems reporting that the given group is involved in the given stage of research production. Data collected at a national and a sub-national level.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

StatLink https://stat.link/posudq

Incentives for (co-)production?

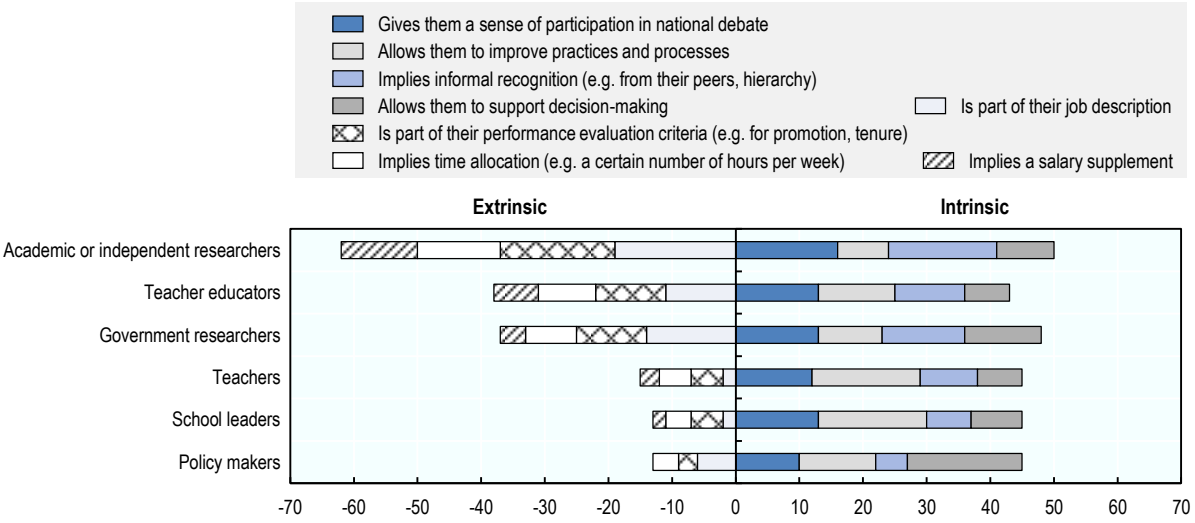
It has been clear for decades that a strictly "push" approach to research use does not work alone. For research to be relevant for practice and for teachers to have ownership of research, co-producing research has been promoted by many. While co-production is a fundamental form of evidence-use infrastructure (Gough, Maidment and Sharples, 2021[15]), it is still far from being a mainstream instrument in education (Honingh, Bondarouk and Brandsen, 2018[29]). This is also clear from the data.

Incentives are a key tool for driving co-production. A research-engaged school can provide the values, resources and structures to mobilise knowledge (Rickinson et al., 2020[8]). When looking at the incentives for research production, ministries reported more "intrinsic" motivators than "extrinsic" incentives (Figure 4.7). Furthermore, when comparing the total number of incentives for researchers to those of practitioners, researchers have a higher number and far more "extrinsic" incentives than practitioners.

Systems reporting a greater number of incentives for practitioners to be involved in research production generally also reported that practitioners were more active in producing research. In that sense, incentives do seem to be connected to the deeper involvement of practitioners.

It should be noted that the survey data cannot show whether the involvement of individuals across the different stages of the research cycle indicates actual co-production. It may indicate co-production or it may simply indicate that different stakeholder groups produce research in isolation. What the data does show is that broader practitioner involvement in many stages of the research production cycle does not necessarily mean that practitioners are overall perceived as deeply involved in research production. For example, the Netherlands, Latvia and Spain reported that practitioners were involved in nearly all stages of research production; however, they also reported that both teachers and school leaders were only slightly active in the production of research overall. Furthermore, it must be recognised that incentives may encourage different kinds of practitioner involvement in certain systems although more research is needed to understand how these may work. Mechanisms can be aimed at incentivising research production more intensively with a specific subset of practitioners rather than practitioners on the whole. This is, for example, the case with researcher teachers in Hungary (Box 4.3).

Figure 4.7. Individuals' extrinsic and intrinsic incentives to produce education research



Note: Numbers refer to the number of systems reporting the given incentives are present in their systems for each group of individuals. Data collected at a national and at a sub-national level.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

StatLink https://stat.link/6qolam

Box 4.3. Researcher teachers in Hungary

Hungary launched the current pedagogical career model and related evaluation system in 2013. The aim of this model is to support the effectiveness of teacher's pedagogical work and identify areas for improvement. In addition to professional recognition, this assessment can lead to career advancement and therefore also has a financial incentive. In this pedagogical model, the following levels exist:

- Trainee.

- Teacher I.
- Teacher II.
- Master teacher and/ or Researcher teacher.

The "Master" and "Research Teacher" categories are not simply a higher degree of a linear progression, they are an invitation to teachers who wish to pursue a specific path. It is possible to be a researcher teacher without being a master teacher, although a researcher teacher requires a PhD.

The research undertaken by these categories can be about a subject matter or about teaching and pedagogy, although teaching and pedagogy is a more common research area. Teachers working under these two classifications are expected to contribute actively and intensively to the development, research, and innovation processes in the public education system.

A researcher teacher is different to a master teacher in that the researcher teacher is tasked with sharing their research results more widely. This can be outside their own school. Researcher teachers therefore offer solutions to improve public education in general while master teachers integrate their innovative practices into their own school.

In 2021, there were 35 researcher teachers in Hungary and 1337 master teachers. Each of these categories has a five-year research programme, which is renewable.

Source: Information provided by National Education Authority of Hungary.

Quality of individuals' relationships

Individuals working in siloes are less able to access research or advocate for its use among colleagues. Understanding the current nature of policy makers' relationships can provide insights into what already facilitates the use of research and what can be improved.

Culture and mindset

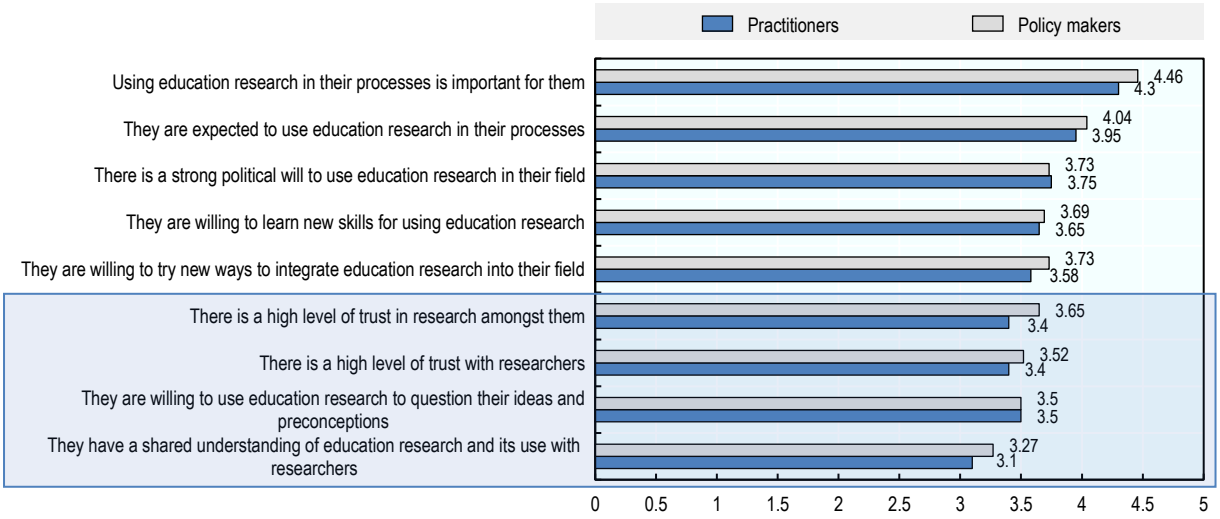
A strong culture and mindset of research use requires trust between individuals, a shared understanding of the purpose of research and a willingness to engage with and implement it (Rickinson et al., 2020[8]). As discussed in Chapter 9, culture and mindset are key components not just of using research but of using research *well*.

Willingness - both to use research and to engage in conversations about it - is seen by scholars as a primary precondition of engaging in research mobilisation (Wehn and Montalvo, 2018[30]). Having a shared understanding of what education research is and what it can be used for is also an important predictor for research use. Research has shown that a shared understanding supports the identification of interdependencies and trade-offs, and facilitates negotiating different interests (Best and Holmes, 2010[1]). Levels of trust, which can be facilitated through specific initiatives, are also crucial for greater systematic connectivity between individuals involved in evidence production and use (Oliver, Adie and Boaz, 2022[31]). Research on evidence use commonly recognises that trust is crucial and can be built through sustained individual interactions (Oliver et al., 2014[17]). However, studies have shown that interventions focused on interactions between decision makers and researchers often lack conceptual clarity of what actually constitutes trust, which may limit their effectiveness (Langer, Tripney and Gough, 2016[32]).

Figure 4.8 shows that ministries perceive individual attitudes, practices and processes relatively positively. However, they seem to be less positive about the quality of relationships *between* individuals in the policy

and research communities (highlighted in the figure). This data also shows little variation perceived between policy making and practice.

Figure 4.8. Average degree of ministries' agreement with statements about the culture and mindset of using research in policy and practice



Note: Respondents rated their degree of agreement with the above statements on a Likert scale of 1 to 5. Five indicates strong agreement with a statement and 1 indicates strong disagreement. Data collected at a national and at a sub-national level.
The highlighted responses are those that involve relationships with colleagues or others outside the ministries.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

StatLink https://stat.link/abl0vd

Collaborative activities and research use in policy

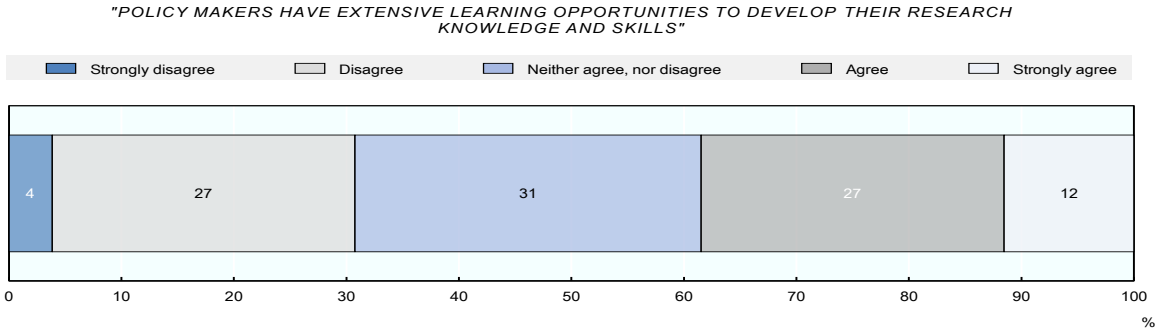
Research evidence plays an important role in building and sustaining relationships for many reasons. As outlined by Gough and colleagues (2011[19]), relationships between individuals can improve access to, and interpretation of, quality research evidence. In the survey data, this reliance on others for access appears particularly important. Over half of respondent systems expressed uncertainty or disagreement about whether policy makers have access to the right learning opportunities to develop their own research skills (Figure 4.9).

As shown in Figure 4.10, relationships with external experts and in-house researchers are the primary method of accessing research. This suggests that, on the whole, policy makers do have relationships with relevant individuals who can support the use of education research in the policy process.

The right relationships are needed to access research evidence; however, in order to actually use research evidence in policy making, relationships require certain characteristics. Influencing others, persuading them to collaborate and facilitating new interactions between individuals are seen as key enablers of research-informed policy making (Gough et al., 2011[19]). With this in mind, Figure 4.11 shows the ways in which policy makers use education research. Overall, the data reveals that the use of research to stimulate debate, earn trust and leverage political influence was least-commonly reported by systems. When contrasting this data with how policy makers access research evidence, existing relationships may still be described as rather transactional in nature (i.e. while research is systematically accessed through relationships, it is not systematically used when interacting or discussing policy options with others).

The above discussion suggests that a typical research use scenario in policy involves a policy maker who finds a piece of research, via an academic researcher for example, and validates its usefulness through a discussion with a colleague, possibly a public servant with a research background. However, in many systems, the actual use of this research on an advocacy level to influence, build trust and stimulate debate appears to be weak. Thus, its impact on policy is by no means assured.

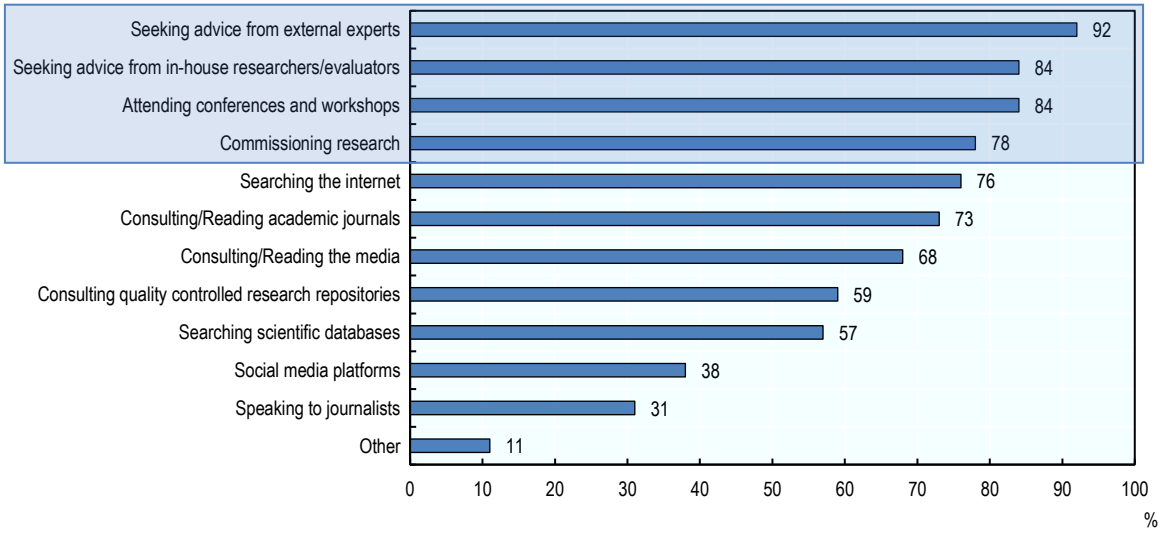
Figure 4.9. Overview of policy makers' learning opportunities



Note: Percentage indicates the number of systems reporting a given level agreement with the statement. Data collected at a national and at a sub-national level.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

StatLink https://stat.link/pqhr08

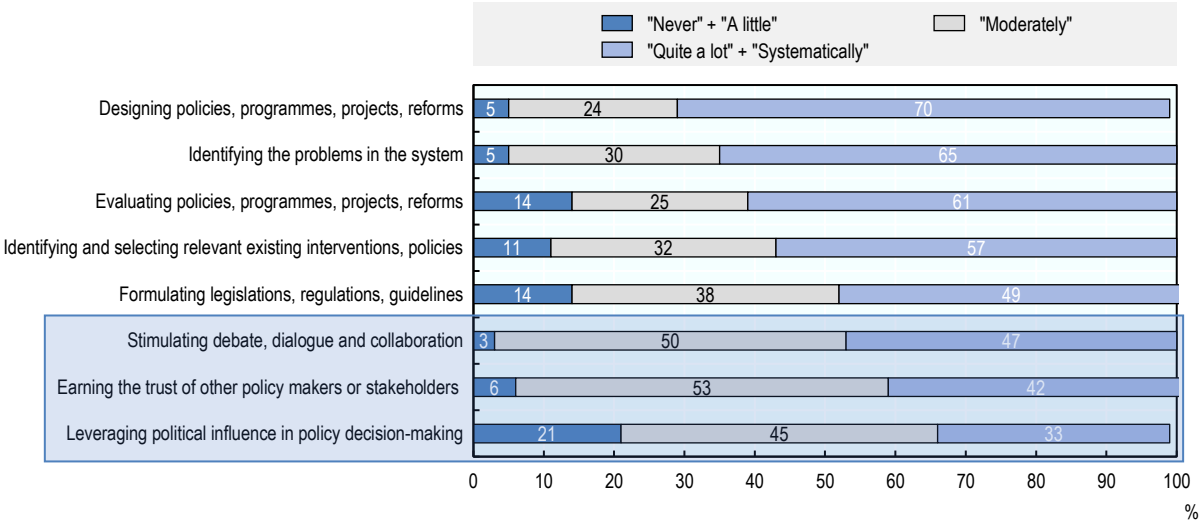
Figure 4.10. How policy makers access education research



Note: Percentage indicates the systems reporting that policy makers access education research in a given way. Data collected at a national and at a sub-national level.
The highlighted responses are those that involve relationships with colleagues or others outside the ministries.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

StatLink https://stat.link/sdvcgz

Figure 4.11. How policy makers use education research during the policy process



Note: Percentage indicates the number of systems reporting that policy makers use education research in a given way. Data collected at a national and at a sub-national level.
The highlighted responses are those that involve relationships with colleagues or others outside the ministries.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

StatLink https://stat.link/42qj7y

Conclusion

A number of overall messages are emerging on actors' involvement in research production and facilitating its use in policy and practice.

The field of actors facilitating the use of research is diverse

Overall, a large number of organisations are active in producing research and, in most cases, also facilitating its use in policy and practice across the OECD. The landscape appears to be dominated by research producers in many systems, most commonly universities and teacher education institutions. Networks with direct involvement of academia such as research networks and university-school partnerships are the most prevalent and active in both the production and mobilisation of education research. This shows how tightly intertwined research production is with mobilisation (i.e. facilitating research use). For this reason, it will be important to better understand how each of these organisations actually operates in a knowledge mobilisation context to uncover concrete configurations or practices in OECD countries that are more effective than others.

While universities and teacher education institutions generally have a consistent role across systems – often active in the production of research as well as its mobilisation in policy and practice – most organisations' activities are highly system-specific. For example, the ministry of education's role was quite diverse within systems. Some are only active in facilitating research use in policy and practice and not production whereas others are the most active research producers in the whole system. The diversity also extends to systems reporting the presence of brokerage agencies.

This diversity in both levels of activity, and organisational structures and goals indicates that there is a huge potential for knowledge exchange and shared learning between the same types of organisations operating in different systems and contexts.

Relationships of education ministries are relevant but there are some missing pieces

In the majority of systems, ministries solicit a large number of different types of organisations in matters of research, although the intensity of these relationships varies. The most commonly reported strong relationships were with research actors (universities, public research organisations and academic or research networks). This again paints the picture that the landscape is dominated by those producing research despite the presence of non-research producing evidence intermediaries.

Interestingly, some systems did not report any connection to brokerage agencies despite their being active in both the production of research and facilitating of its use in policy and practice. Further work is needed to understand the precise role of these brokerage agencies in specific systems, the ways in which ministries work with them and how this can improve research use.

Co-production is not yet a mainstream instrument across OECD countries despite its potential role in facilitating research use

Co-production is a fundamental form of evidence-use infrastructure but it is still far from becoming a mainstream instrument in education. Teachers and school leaders are most heavily associated with data collection and more rarely involved in other stages of research production. This suggests that practitioners' involvement is primarily passive rather than active in the production of research evidence. Encouragingly, systems reporting a greater number of incentives for practitioners to be involved in research production reported that practitioners were more active in producing research.

Policy makers' relationships should be further leveraged to improve research use

There is a large recognition that research use is both important and expected for policy makers and practitioners. Ministries also perceive individual attitudes, practices and processes related to research use positively. However, they seem to be less positive about the quality of relationships between individuals in the policy and research communities. Policy makers appear to already have relationships that could support greater use of research but these relationships remain transactional. As such, the extent to which research is actually used is unclear.

Further research would be useful in understanding how building the capacity of policy makers to become ''research advocates'' and improve the quality of their existing relationships may result in a more systematic deployment of evidence in policies, programmes, projects and reforms. Concurrently, one method of increasing the use of education research in public administration could be linked to a shift in the self-conception of civil servants and policy makers towards being autonomous agents or empowered owners of education research. This may be supported by moving away from the view that research *use* is chiefly the responsibility of those with a research background.

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[4] For more information, see https://www.stat.fi/til/kou_en.html (accessed on 16 May 2022).

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[6] For more information, see https://www.etwinning.net/en/pub/index.htm (accessed on 31 January 2022).

Annex 4.A. Average activity levels reported by systems in survey

The OECD Strengthening the Impact of Education Research policy survey data asked systems to rate the levels of organisational activity in research production and mobilisation for 17 actors on a Likert scale of 1 (not active at all) to 5 (very active). From this, the following averages have been calculated showing the average levels of activity within each system for each area.

System	Facilitating research use in policy	Facilitating research use in practice	Producing research
Finland	4.94	4.59	4.88
Switzerland (St. Gallen)	5.00	4.67	4.50
Iceland	4.27	4.45	4.11
Chile	4.40	4.18	4.18
Colombia	3.88	4.00	4.29
Spain	4.00	4.07	4.00
Hungary	4.07	4.00	3.94
UK (England)	3.88	3.88	3.35
Sweden	3.81	3.88	3.41
Switzerland (Obwalden)	3.92	3.88	3.17
Switzerland (Nidwalden)	3.60	3.69	3.56
New Zealand	3.29	4.19	2.94
Turkey	3.56	3.29	3.47
Netherlands	3.53	3.67	3.00
Canada (Saskatchewan)	3.73	3.13	3.13
Portugal	3.07	3.36	3.47
Norway	3.00	3.35	3.24
Costa Rica	3.06	2.94	3.47
Estonia	3.08	3.62	2.67
Switzerland (Appenzell Ausserrhoden)	3.13	3.35	2.76
Slovenia	3.40	2.55	3.00
Latvia	3.25	2.83	2.85
Canada (Quebec)	3.20	2.64	2.94
Czech Republic	3.23	2.64	2.86
Slovak Republic	2.62	2.55	3.38
Lithuania	3.25	2.50	2.69
Austria (Federal)	2.25	3.29	2.88
Switzerland (Zurich)	2.75	2.59	2.94
Belgium (French Community)	2.30	1.92	3.80
South Africa (Pretoria)	2.56	2.53	2.71
Belgium (Flemish Community)	2.75	2.43	2.50
Switzerland (Uri)	2.14	1.86	1.64

Annex 4.B. List of official brokerage agencies reported by systems in survey

The survey asked systems to describe the brokerage agency(ies) in their systems as part of the open questions. They were also asked to describe the funding, audience and activities. These descriptions can be categorised as follows:

Private organisations

- "Edupreneurs": business actors offering products and services to schools [Sweden]
- Educational consultancy groups [South Africa]

Not-for-profit organisations

- Teacher-trainers not-for-profit organisations [South Africa]
- NGOs and Foundations [South Africa, Colombia, Portugal]

Academy

- Universities and Teacher Education Faculties [Finland, Norway]
- Scholars and students groups [South Africa]

Research bodies

- National institute for educational research [Finland, Costa Rica]
- Centres for research on learning and education [Finland]
- Research units on education [Finland, Norway]
- Centre for social science research [Denmark]
- Government's analysis, assessment and research activities [Finland]
- Economic advisory bodies overseeing education research [Denmark]
- Research institute for economic analysis and modelling, with exploration and development of education projections [Denmark]

Evaluation bodies

- Independent agencies responsible for the evaluation of national education [Finland]
- Centres for educational assessment [Finland]
- Education statistics open sites [Finland]
- System for monitoring the performance of the education system [Costa Rica]

Other government bodies

- Edu-political apparatus (teacher certification, school inspections, new curricula) [Sweden]
- National agencies for education [Finland]
- School leadership centres supported by the Ministry [Chile]

Independent bodies

- Partially or fully public-funded independent brokerage agencies [Denmark]
- Grassroots organisations [Colombia]
- National and international experts [Colombia]

5 Facilitating research use: Scary Barriers (and Super Mechanisms)

José Manuel Torres, OECD

This chapter presents the results of the OECD *Strengthening the Impact of Education Research* policy survey with regard to the various mechanisms countries are using to facilitate research use. It presents a framework for classifying factors that influence research use, based on a review of literature. It then describes and contrasts mechanisms and barriers reported by the 37 survey-participating education systems. The chapter concludes by noting the importance of system-level coordination of the various mechanisms and research production.

Introduction

At the beginning of the 20th century, John Dewey, one of the founding fathers of the scientific tradition in education, considered that scientific knowledge had the enormous mission of influencing teachers' practices. But the abstract world of researchers, their simplification of the classroom for the study of phenomena, and the intricate social world that teachers live in made such study complex and challenging (Berliner, 2008[1]).

Close to 120 years later and despite a constant growing body of literature on the benefits of evidence-based practice and policy making for education, educational research remains under-used. Instead, what has become clear is that research alone does not inform or have direct effects – such as immediate adoption – on practice and policy (Jones, Procter and Younie, 2015[2]; Levin, 2011[3]). Communicating research findings is not enough to increase their use (Langer, Tripney and Gough, 2016[4]). And promoting the use of research is not the same as ensuring it (Fazekas and Burns, 2012[5]).

Governments around the world have much enthusiasm and expectations about educational research providing teachers "with evidence about what works" and thus improving the quality of teaching (Cain, 2015, p. 1[6]). However, this is not an easy task. Despite strong interest in research findings, decision-making practitioners and policy makers do not appear to be heavy consumers of education research, especially in its original format (Levin, 2013[7]). Many countries in the OECD have invested in remedying this situation in the past decade. As mentioned in the introduction to this volume, efforts have included the production of evidence synthesis for teaching practice and schools; partnerships between practitioners, policy makers and researchers for the sustainability of knowledge generation; and capacity building for research use.

The gaps between research production and its use in policy and practice (the so-called research-policy and research-practice gaps) together with interventions to bridge them have been the subject of recent research in a variety of sectors, including health, education, criminal justice and environmental conservation (Walter, Nutley and Davies, 2003[8]; Nutley, Walter and Davies, 2009[9]; Humphries et al., 2014[10]; Oliver et al., 2014[11]). Knowledge mobilisation in the education sector refers to processes aimed at improving the use of evidence to inform school leaders and teachers' practices, and policy makers' decisions. It has become a research field in its own right, and yet, the mechanisms that effectively mediate between research, practice and policy are not yet properly established (Révai and Guerriero, 2017[12]).

It is now time to take stock of the various mechanisms that scale up research use, making them accessible to educational researchers, policy makers, school leaders and teachers for effective evidence-based practices and policies (Jones, Procter and Younie, 2015[2]). Collaborative mechanisms that increase research use are also included. The momentary, unique and specific nature and context of each system makes it difficult to build generally applicable solutions. But common problems exist across different contexts and the sharing of this knowledge can reduce redundancy (Boh, 2007[13]).

This chapter presents factors that facilitate or hinder the use of educational research in policy making and in school and teaching practice. It starts by defining key concepts and suggests an overarching framework based on a cross-sectoral literature. This is followed by the presentation and analysis of the OECD *Strengthening the Impact of Education Research* policy survey results on mechanisms of and barriers to the use of educational research in national and sub-national systems. The last section discusses coordination of the educational research production system and identifies potential risks. The chapter ends with a brief conclusion that summarises the main findings.

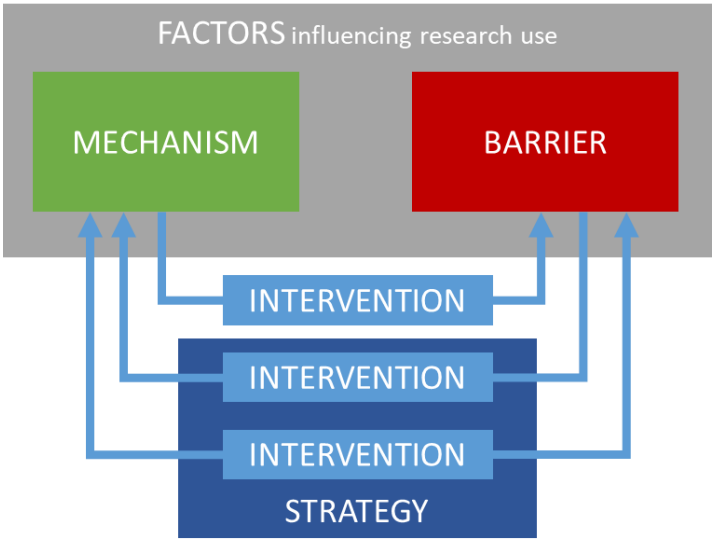
What influences the use of research? Framing the discussion

The use of evidence in educational policy and practice depends on a variety of elements (Levin, 2013[7]). The literature defines and uses concepts such as factor, mechanism, facilitator, intervention and strategy in a variety of heterogeneous ways that commonly overlap each other. The following definitions attempt to introduce more uniformity into the understanding and use of these concepts in this chapter.

- **Factors** are processes or means by which the particular activity influences research use. Mechanisms enable and barriers hinder the use of evidence in policy making and practice (Gough et al., 2011[14]). These factors can be intentionally created, such as mechanisms specifically designed to bridge the gap between research and its use. They can also be unintentionally created, such as organisational structures or cultures that may act as mechanisms or barriers without this being its original, intentional goal. They can also be formal or informal.
- **Intervention** is a deliberate action or plan to enhance the use of research evidence, addressing genuine barriers to research uptake and drawing on mechanisms which are likely to affect it (Oliver et al., 2014[11]).
- **Strategy** is a concrete and wider action plan commonly based on more than one of these interventions in order to encourage better use of research (Nutley, Walter and Davies, 2009[9]). This can also be the other way around, with designed interventions based on a previously established broad strategy.

Figure 5.1 represents graphically these concepts, and their link to each other, to ease their comprehension.

Figure 5.1. Mindmap of concepts



Mechanisms and barriers influencing research use

Mechanisms vary according to the different levels at which they act: individual, organisational and system (Nutley, Walter and Davies, 2009[9]). On the one hand, organisational mechanisms, also referred as institutionalised mechanisms, are collective and formally embedded into the processes, structures and culture of organisations. These mechanisms enable a more effective mobilisation of knowledge to a larger number of individuals and allow organisations to select the knowledge to be mobilised. They are, however, costly in terms of time and resources. On the other hand, individualised mechanisms are casual, unstructured, and informal. These mechanisms have limited reach as they are unique to individuals or

small groups but free of the organisations' interests and structured forms. For the same reasons, they can suffer from problems of scalability (Boh, 2007[13]).

Another widely used categorisation of knowledge mobilisation activities is based on three conceptual approaches described by Best and Holmes (2010[15]) (see Chapters 1, 2 and 6 for further details): linear, relational and systems. Linear models focus on the dissemination of research findings. This includes making research available for users in terms of format and accessibility. Relationship models emphasise strengthening relationships among stakeholders in order to facilitate the research-practice-policy link. And finally, systems models recognise that actors are part of a complex system. They aim to activate this entire system rather than just a few elements of it.

Humphries and colleagues' (2014[10]) categorisation of factors fairly and consistently represents the variety of levels present in the research production and use system. For the purposes of this chapter, this framework has been adapted and enriched with the work of other authors who have studied factors of research use beyond the healthcare sector to propose a new typology (see Table 5.1). It broadens the definition and applicability of the categories in the education sector and considers both practice and policy contexts. This proposed typology and the above-mentioned Best and Holmes' conceptual approaches will frame further analysis in this chapter.

Table 5.1. Typology of factors influencing research use

Type	Definition
Information	Factors related to the existence and quality of relevant research evidence, its availability, accessibility, format, presentation, and the characteristics of its level and channels of circulation and dissemination.
Interaction	Factors related to the contact, collaboration and flow of information between researchers, practitioners and policy makers through formal or informal, intended or unplanned relationships, as well as the values associated with them, such as trust and mutual respect.
Individual characteristics	Factors related to researchers' understanding of the policy and practice processes and context, and to practitioners and policy makers' skills and capacities to use and apply research, and their formal education and/or training experience for this. It may also consider the presence of other actors influencing the use of research evidence.
Structure and organisation	Factors related to the existence of system and/or organisational support for the production and use of research, manifested in their formal structure (e.g. provision of time, funding, learning opportunities, formal training) and/or processes (e.g. the presence of guidelines and financial incentives).
Culture	Factors related to: researchers, practitioners and policy makers' priorities and their alignment; practitioners and policy makers' attitudes towards research and will to use it; and system and/or organisational values, principles, beliefs, and valorisation of research production and use.

Source: Adapted from Humphries, S. et al. (2014[10]), "Barriers and facilitators to evidence-use in program management: A systematic review of the literature", https://doi.org/10.1186/1472-6963-14-171.

Annex Table 5.A.1 summarises the mechanisms and barriers identified by the literature and classified by the proposed framework. It is important to mention that these categories are not exclusive as a mechanism or a barrier can be classified in more than one category, depending on the lens through which it is studied.

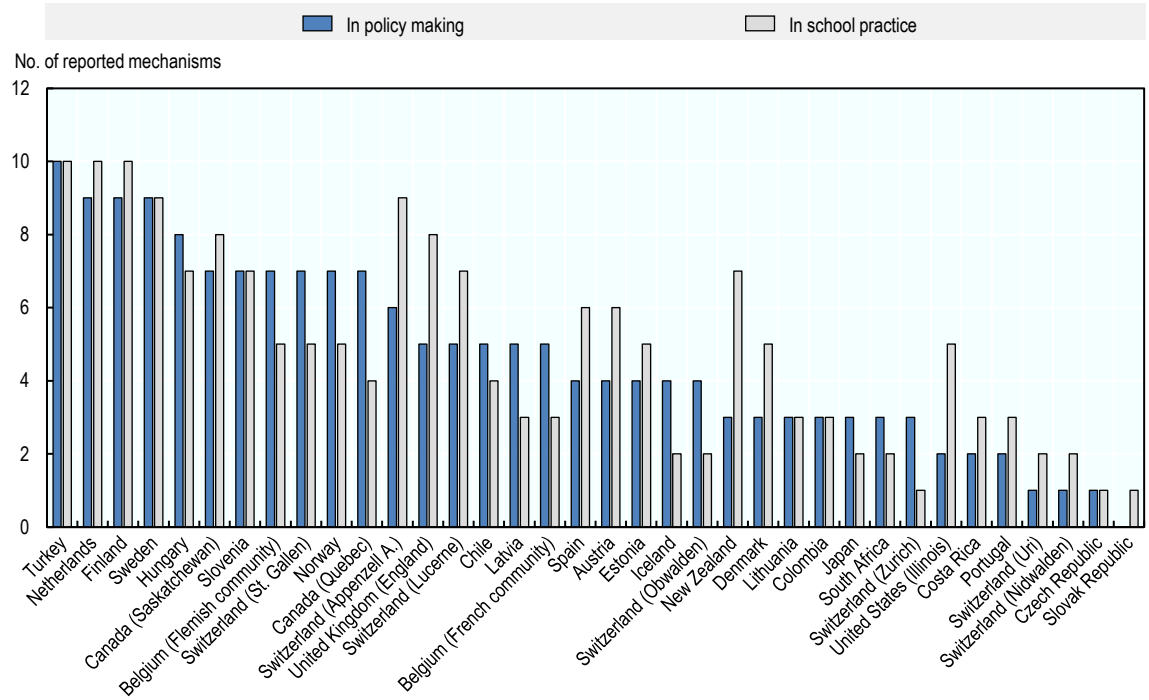
How do systems facilitate the use of research? Findings from the survey

The presence of mechanisms and barriers provides valuable information on the level of relevance and priority research, research use, and research mobilisation have for different education systems and their communities. Few mechanisms and many barriers indicate that facilitating research production and use is a low priority for an education system (Levin, 2011[3]).

Strengthening the Impact of Education Research surveys 37 education systems in 29 countries about the production and use of educational research in policy making and practice. Six countries were selected for further data collection through semi-structured follow-up interviews. The following three sections analyse the results related to factors that facilitate or hinder the use and production of education research in these systems.

The survey proposed a dozen mechanisms for and barriers to research use in participating systems. These are classified conceptually based on the work of Best and Holmes (2010[15]) and the proposed framework of the preceding section in Annex Table 5.A.2 and Annex Table 5.A.3, respectively.

Figure 5.2. Number of mechanisms by system, 2021



Note: Data refers to the number of reported mechanisms out of a dozen options, by system and context. Data was collected at national and sub-national levels.
"Appenzell A." refers to the Swiss canton of Appenzell Ausserrhoden.
Source: OECD *Strengthening the Impact of Education Research* policy survey data

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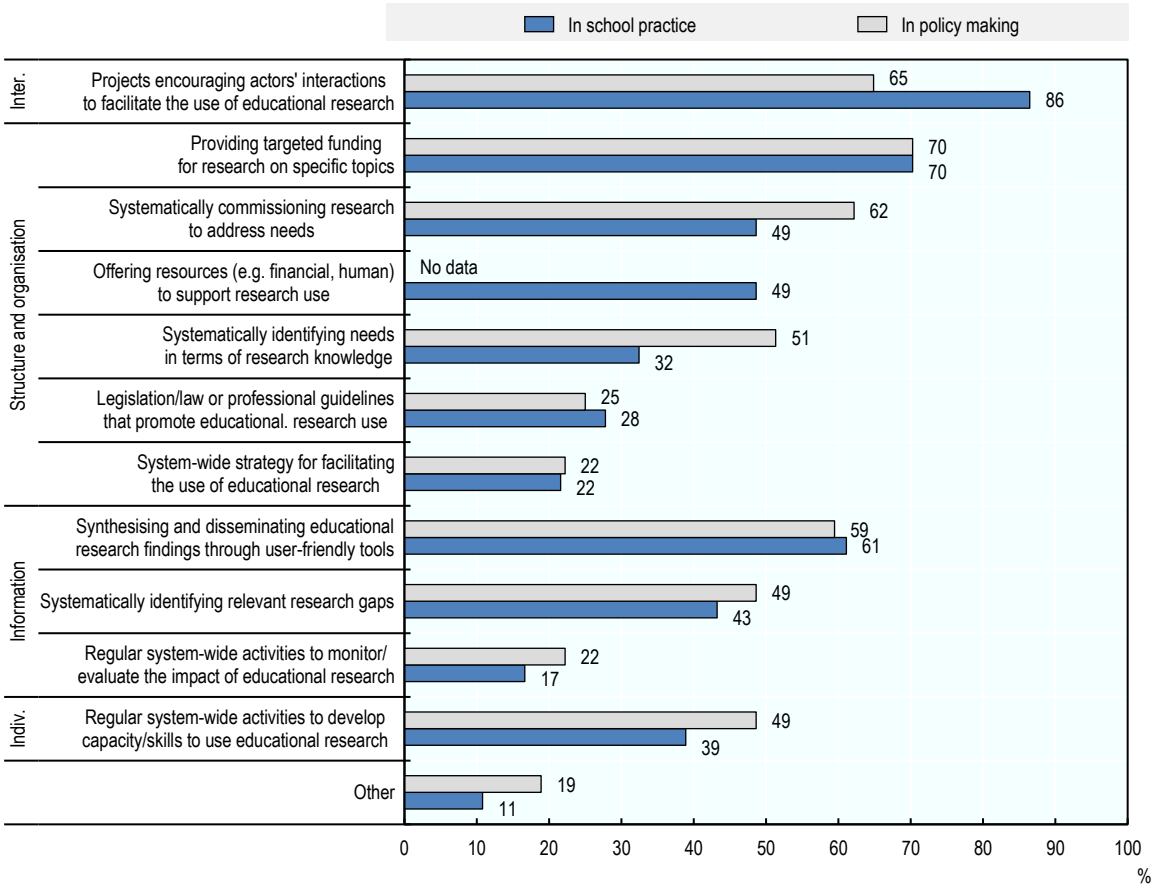
Survey-participating education systems reported an average of 4.7 mechanisms in policy and 4.9 in practice out of a dozen suggested options, with more systems reporting more mechanisms in practice than in policy. Although it is a small difference, this could be linked to the slightly stronger focus on facilitating research use in practice as opposed to policy in the past 15 years (see also Chapter 1). For example, New Zealand reported (in a follow-up interview) that this stronger focus could relate to the larger amount of funds available to improve practice. Historically, there have been more activities, projects and studies on research use in practice than policy.

However, results from the survey showed strong dispersion in the number of reported mechanisms (see Figure 5.2). Whereas Turkey, the Netherlands, Finland and Sweden declared at least nine mechanisms

that facilitate research use in both policy and practice, systems like the Swiss cantons of Uri and Nidwalden, the Czech Republic and the Slovak Republic declared two or fewer mechanisms for both. Within the same systems, there is some strong variation: on the one hand, New Zealand, England (UK), the Swiss canton of Appenzell Ausserrhoden, and Illinois in the United States reported significantly more mechanisms in practice than policy. On the other hand, Quebec (Canada) reported significantly more mechanisms in policy than practice.

Types of mechanisms

Figure 5.3. Presence of mechanisms facilitating the use of educational research, 2021



Note: Data refers to percentage of systems reporting the existence of a given mechanism, by type of factor and context. Data was collected at national and sub-national levels. Data was not collected for the mechanism "Offering resources to support research" in policy making. "Indiv." refers to mechanisms targeting individuals and "Inter." refers to mechanisms aiming to facilitate interaction between individuals.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

StatLink https://stat.link/jswge5

One of the most reported mechanisms facilitating evidence use are projects encouraging actors' interactions (see Figure 5.3), which is line with the reviewed literature (Oliver et al., 2014[11]). This mechanism has a greater presence in school and teaching practice than in policy by more than 20 percentage points. This suggests that policy makers, despite opportunities to interact with researchers, still have fewer opportunities than practitioners do. The New Zealand Teaching and Learning Research Initiative is an example of the efforts encouraging research-practice connections (see Box 5.1).

Interaction has been reported to generate an increase in research impact but differences in culture, goals, timescales and information needs remain barriers (Walter, Nutley and Davies, 2003[16]). Interactive mechanisms, although promising and necessary, are not sufficient for increasing evidence use. They must be supported by an increase in motivations, opportunities and capacities for the use of evidence in practice or have a more comprehensive strategy (Langer, Tripney and Gough, 2016[4]).

Capacity-building activities are fewer among surveyed systems, with about half of systems reporting them in policy and only 39% in practice. In contrast to projects encouraging interaction, capacity-building activities are slightly more common in policy making than in school practice. Systems seem aware of the co-dependence between these two mechanisms. Those reporting projects encouraging interaction between actors reported more regular system-wide activities to develop skills and capacities for research use in both policy and practice.

Box 5.1. Teaching and Learning Research Initiative in New Zealand

New Zealand's *Teaching and Learning Research Initiative* (TLRI) is a government fund established in 2003 for collaborative research about teaching and learning in the early childhood, school and tertiary sectors. It aims to enhance the connections between educational research and practice, to accumulate a body of knowledge linking teaching and learning, and to build research capacity in learning and teaching. Their 2021 funding of NZD 1.5 million was allocated to five projects.

The TLRI's objectives are achieved through research projects awarded with TLRI funding if they show that a robust partnership between researchers and practitioners is at the core of the envisioned project. Thus, it enables practitioners to critically reflect on their work and researchers to gain insight into the context and challenges of teaching and learning. The funded-project leaders are key actors as they are responsible for involving researchers and practitioners, shaping their research and practice capacities and encouraging a true co-production of research.

One of their most recent funded projects is focused on transforming the pedagogy of Early Child Education teachers by improving sustainable and comprehensive outcomes for indigenous infants and toddlers. It aims to develop a rigorous and robust conceptual framework of pedagogy that supports the cultural well-being and the sense of belonging of Samoan infants and toddlers. The project is a collaboration between the University of Auckland, Massey University, and Samoa Aoga Amata I Incorporated (SAASIA), an organisation comprised of early childhood centres nationally, representing Auckland, Napier, Palmerston North, Wellington and Christchurch.

Currently, the Teaching and Learning Research Initiative encompasses 167 funded projects, more than 150 published research reports, and is composed of over 400 researchers and practitioners. Its impact, measured through a survey answered by a randomly selected sample of past research projects and some additional interview data, is mainly self-reported, with participants describing a profound and positive change to their practices.

Source: Hipkins, R., J. Whatman and R. Felgate (2017[17]), *Exploring the Impact of the Teaching and Learning Research Initiative*; TLRI (2022[18]), *Teaching and Learning Research Initiative*; TLRI (2021[19]), "Pepe meamea in the spirit of the collective: Embedding Samoan indigenous philosophy in ECE for Samoan children under two", http://www.tlri.org.nz/tlri-research/research-progress/ece-sector/pepe-meamea-spirit-collective-embedding-samoan-indigenous (accessed on 20 April 2022).

Capacity-building interventions have significant positive benefits and outcomes on engagement in and with research for both pupils and teachers. In particular, studies have positively linked these strategies with pupils' motivation, their attitudes to subjects, test performance, specific skills, pupils' self- and group-organisation, their approaches to collaboration and selection of learning and problem-solving strategies

(Cordingley, 2016[20]). These interventions have also reportedly improved decision makers' skills to access and make sense of evidence. Nevertheless, these effects are, once again, conditioned by intervention design (Langer, Tripney and Gough, 2016[4]).

Another widely reported mechanism was targeted funding for research on specific topics: In both policy and practice, 70% of respondents reported the existence of this mechanism within their system. Interestingly, the literature does not report the use of targeted funding in educational systems as a mechanism to promote research use but, rather, the lack of funding mechanisms as a barrier, although not widely (Oliver et al., 2014[11]).

Other mechanisms in the "Structure and organisation" category have varying results among surveyed systems. Strategies formalising and embedding research-use mechanisms within existing decision-making structures and processes have been reported to have positive effects although the evidence is not robust enough (Langer, Tripney and Gough, 2016[4]). In that line, South Africa reported during follow-up interviews that until they become embedded in organisational processes, projects enhancing the use of research in education have little influence on policies. Thus, support at all hierarchical levels is a key condition of the success of this type of project.

The majority of identified mechanisms in a 2014 systematic review in health sector organisations (Humphries et al., 2014[10]) was informational. Although such mechanisms are also highly reported in the OECD survey of the educational sector, they are not as dominant. The presentation and circulation of research findings in suitable formats is reported as a common existing mechanism in both policy making and school practice, with 60% of the systems declaring its presence. One of the best-known examples of this mechanism is the British Education Endowment Foundation's Teaching and Learning Toolkit (see Box 5.2). The other two informational mechanisms – systematically identifying research gaps and system-wide monitoring of research impact – were rarer. This might be caused by both mechanisms referring to regular, systemic activities whereas in some systems these mechanisms may only exist sporadically.

Box 5.2. EEF's Teaching and Learning Toolkit

The *Teaching and Learning Toolkit* of the British Education Endowment Foundation (EEF) aims to support teachers and school leaders' efforts to improve learning outcomes, particularly for disadvantaged children, through the provision of summaries of education research in a systematised and accessible way.

The Toolkit synthetises research evidence from 30 pedagogical, institutional and relational approaches focused on enhancing teaching and learning at classroom and school levels in general. The studies are selected based on a systematic review, which stipulates the inclusion criteria in advance in order to avoid biased results. They are continuously updated in light of new research evidence, making it a live and dynamic resource.

The summary of evidence on each approach includes:

- Description of the approach.
- Key findings.
- Average impact on attainment, measured by the number of months of additional progress made by pupils.
- Strength of evidence measured by the number of studies satisfying the inclusion criteria
- Average cost of a given intervention.
- Recommendations on implementation.

The Toolkit is meant to be a starting point for discussion between education professionals, relying on their judgement and expertise about what works in a particular school context and taking the Toolkit's interpretations with caution. This is complemented by other resources. As of 2017, 70% of secondary-school leaders used it to inform their decision making.

Source: EEF (2017[21]), "EEF launches updated Teaching and Learning Toolkit", https://educationendowmentfoundation.org.uk/news/eef-launches-updated-teaching-and-learning-toolkit (accessed on 28 March 2022); EEF (2022[22]), *Teaching and Learning Toolkit*, https://educationendowmentfoundation.org.uk/education-evidence/teaching-learning-toolkit (accessed on 28 March 2022);

While informational factors are undoubtedly necessary for research use, by themselves they do not lead to improved use of evidence. Timely access to good quality and relevant research, and collaboration and relationships between research producers and users also have to be considered (Langer, Tripney and Gough, 2016[4]).

Systems tend to have the same mechanism in both policy and practice although this depends on the mechanism in particular. Projects that encourage interactions between actors, provide targeted funding for research, and generate tools based on research findings tend to exist in both contexts. This tendency could suggest that these reported mechanisms are comprehensive in both contexts. In contrast, regular system-wide activities to develop skills and capacities to use research or monitor and evaluate research impact tend to only exist in either policy or practice.

Mechanisms by approach: Linear, relational and systems

Reported mechanisms facilitating research use vary based on their approach as described by Best and Holmes (see Chapter 2 for a more detailed description).

Linear mechanisms such as the systematic identification of needs in research knowledge and the commissioning of research to address these needs are more widely present in policy making than in school and teaching practice. Surprisingly, respondents reported commissioning research more frequently than the systematic identification of needs in both policy and practice. This suggests that the determination of education systems' needs, which guides their demand for research, is not based on direct information from those who will benefit from it, such as students and teachers. When there is no systematic mapping of needs, questions arise about the basis of commissioned research and whether it is aligned to real needs.

System-level activities, and particularly system-wide activities (highlighted in Figure 5.3), are the least mentioned in both policy and practice. Only one-fourth of education systems reported the existence of legislation, laws or guidelines promoting the use of research while one out of every five systems has regular system-wide activities to monitor and/or evaluate the impact of educational research. Moreover, only 22% of respondent systems reported having a system-wide strategy for facilitating research use in policy and this proportion is the same in practice. Interestingly, systems that have a system-wide strategy reported a greater number of mechanisms than those without.

Linear mechanisms of dissemination and diffusion are incorporated into relationship mechanisms, which are the base for systems thinking (Best and Holmes, 2010[15]). But some education systems still lack basic linear mechanisms such as identifying actors' needs, commissioning research based on these needs and disseminating research findings. This is the foremost and most substantial barrier hindering the use of education-related evidence in policy and practice.

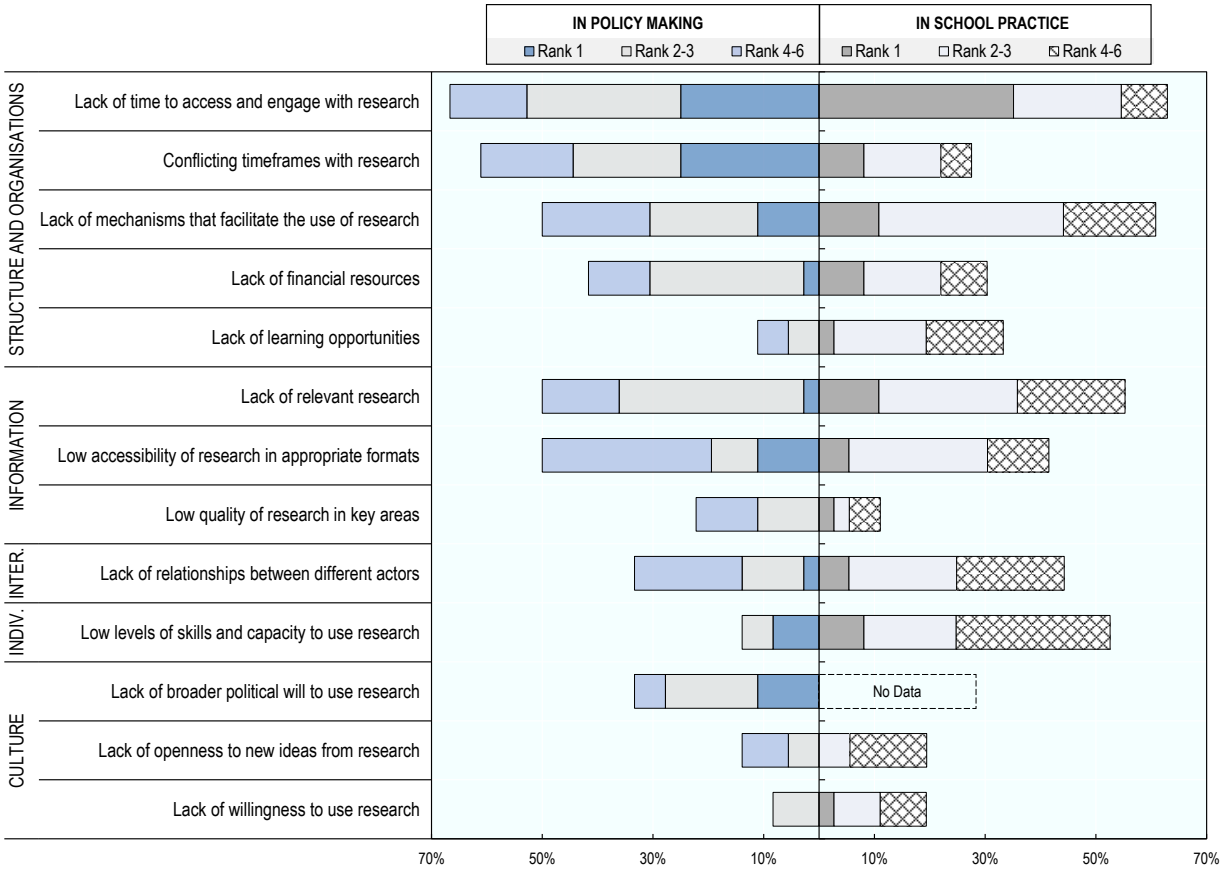
In sum, efforts lean towards generating interactions between research producers and users, and more so in practice than in policy. However, surveyed systems tend to not complement this with capacity-building activities and learning opportunities, which would improve the use of evidence (Langer, Tripney and Gough, 2016[4]). Despite some systems reporting the presence of reasonable number of mechanisms,

there remains a lack of system-wide strategies which could serve to enhance their coordination. This, along with systems reporting the identification of research needs more than commissioning research to address these needs suggests an insufficiently comprehensive strategy of effort to improve educational research use.

What prevents systems from using evidence? Findings from the survey

Education systems were asked to rank three to six barriers out of a dozen suggested options in order of importance. These barriers are classified by their conceptual approach based on the work of Best and Holmes (2010[15]) and by the proposed framework in Annex Table 5.A.2 and Annex Table 5.A.3, respectively. As with mechanisms, barriers and their perceived existence and relevance vary in relation to the category they belong (see Figure 5.4); their conceptual approach (see Table 5.2); and context.

Figure 5.4 Presence and relevance of barriers to the use of research, 2021



Note: Data showing the percentage of systems ranking the given barrier, by context, type of factor and rank range. Data was collected at a national and at a sub-national level. "Lack of broader political will" was not offered as an option in practice.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

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Types of barriers

Overall, the most widely reported barriers are linked to structures and organisation, followed by information-related factors. Interestingly, factors related to the culture of research use are perceived as less of a barrier in most education systems.

Low levels of skills and capacities in using research and the lack of learning opportunities are both perceived as being more of a barrier in practice than in policy. However, there are education systems that consider that there is a lack of training and learning opportunities for both practitioners and policy makers. This is true of Slovenia, which reported it during their follow-up interview.

Overall, the presence and relevance of both barriers and the perceived existence of corresponding mechanisms seem to match. These barriers are more widely reported in practice, and capacity-building mechanisms have a weaker presence, precisely, in practice. However, at a country or system level, there was no systematic matching between capacity-building mechanisms, and the lack of capacities and learning opportunities as perceived barriers. Some education systems perceived these barriers even though they have capacity-building mechanisms. This was true for both practice and policy.

Besides the lack of political will to use research, which was mentioned by 32% of education systems, cultural barriers were not reported in great number by respondents. This contrasts with some of the literature suggesting that the main barriers to research use arise in cultures that do not foster its use (Rickinson et al., 2020[23]). In that vein, during their follow-up interviews, New Zealand reported that one of their main interests was to develop its culture into an evidence-based one. Slovenia noted that they were reshaping the thinking of their Ministry of Education along the same lines.

Barriers by approach: Linear, relational and systems

With respect to the types of approach as described by Best and Holmes (2010[15]) (see Table 5.2), system-level barriers are the most mentioned and relational barriers the least in both policy and practice. Nevertheless, basic linear factors such as little availability of relevant research and low accessibility to appropriate formats were still significantly reported as major barriers in policy making and/or in practice.

Education systems broadly considered the lack of mechanisms facilitating the use of research as one of the most relevant barriers to research use: 11 systems considered it to be one of their top three main barriers in policy and 16 did in practice. Latvia and Slovenia considered this to be their main barrier in both policy and practice.

Contradictorily, these systems reported a higher number of mechanisms on average. This could imply that surveyed systems consider existing mechanisms to be insufficient in facilitating research use. The lack of connections between existing mechanisms or the lack of a system-level coordination of mechanisms could be the source of the problem, leading to the perceived need for more mechanisms.

In sum, data collected from the policy survey show some coherence. With linear mechanisms being highly reported and system-level ones only by a few education systems, system-level barriers are highly reported and linear barriers only a little. However, some inconsistencies are also observed. First, the large number of projects encouraging interactions coupled with a relatively large number of reports of the absence of relationships between actors suggest that these projects are not strictly focused on facilitating research use. Second, lack of mechanisms was reported to be an important barrier together with a relatively high number of reported mechanisms. This points to existing mechanisms having insufficient impact. This raises questions about the need for connections between mechanisms and comprehensive coordination strategies.

Table 5.2. Systems according to their main reported barriers by type of approach

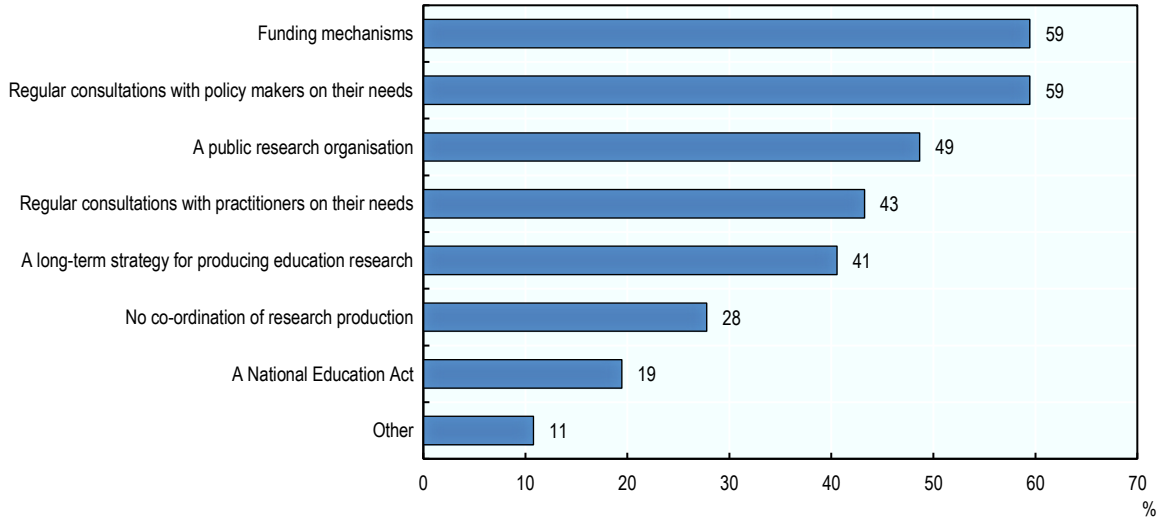
		School practice				
		Linear	Relationships	Systems		
Policy making	Linear	Spain	Sweden United States (Illinois)	Colombia Costa Rica		
	Relationships	Switzerland (Nidwalden)	Switzerland (Zurich)	Slovak Republic Switzerland (Appenzell Ausserrhoden)		
	Systems	Chile Belgium (Flemish Community) Czech Republic Norway Switzerland (Lucerne)	Austria Belgium (French Community) Lithuania Portugal	Canada (Quebec) Canada (Saskatchewan) Denmark Estonia Finland Hungary	Iceland Japan Latvia Netherlands New Zealand Slovenia	South Africa Switzerland (Obwalden) Switzerland (Uri) Turkey United Kingdom (England)

Note: Data was collected at a national and at a sub-national level. Switzerland (St. Gallen) did not provide data on this question.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

How do systems coordinate research production?

The OECD *Strengthening the Impact of Education Research* policy survey asked education systems how the production of education research is coordinated, regulated or managed (see Figure 5.5).

Figure 5.5. Presence of coordinating mechanisms of research production, 2021



Note: Data showing percentage of systems reporting the existence of a given mechanism for the coordination, regulation or management of research production. Data was collected at a national and at a sub-national level.
Source: OECD *Strengthening the Impact of Education Research* policy survey data.

StatLink https://stat.link/u9qiaz

One of the most cited methods of research production are funding mechanisms, with 59% of systems reporting them. These education systems reported more provision of funding for research in specific topics in both policy and practice. Funding mechanisms are active facilitators of both research production and research use, and are not focused exclusively on one or the other. The Norwegian Programme for Research and Innovation in the Educational Sector is an example of a system-wide institutionalised funding mechanism (see Box 5.3).

Regular consultations with policy makers on their needs was the other most cited coordinating mechanism for research production, with 59% of education systems reporting this. These consultations are mentioned 16 percentage points more than those with practitioners. Education systems reporting this type of consultation with policy makers also reported the systematic identification of policy makers' needs in terms of research knowledge more frequently as an existing mechanism facilitating the use of research. This is similar to consultations with practitioners as a mechanism for coordinating research production and the systematic identification of practitioners' needs. As with the funding mechanisms, it would appear that these practices, when present, tend to be used for both research production and research use.

Box 5.3. Programme for Research and Innovation in the Educational Sector in Norway

The *Programme for Research and Innovation in the Educational Sector* (FINNUT) is a long-term research and development programme for the education system carried out by the *Research Council of Norway* from 2014 to 2023. Its primary goal is to support high-quality research aimed at spurring innovation and informing practice and policy development at all levels of the education sector.

FINNUT provides funding for research projects across four main areas – teaching and learning; professional education and practice; management, leadership and organisation; and education and work – covering the entire sector, from early childhood education and care to adult learning. For the assessment of the future impact of these funded research projects, the programme considers some academic indicators such as the frequency of citations in international scientific journal and the inclusion in systematic reviews, among others.

The programme features three main types of calls for applications:

- **Investigator-driven projects**, aiming at developing high-quality, relevant knowledge and addressing research fragmentation. Allocated grants cover doctoral and post-doctoral research fellowships and projects related to national and international co-operation and mobility.
- **User-driven projects**, providing practice-based training and competence development to researchers within relevant topics for the development of practice and innovation in the education sector.
- **Projects with users' participation**, developed jointly by researchers and users who identify the needs of the latter. Collaborative research is seen to improve the sector-specific knowledge among the research community and develop research capacity among practitioners.

FINNUT also functions as a national cooperative arena for research groups, national and local public administration, and other organisations in the education sector while also strengthening the ties between strategic basic research, applied research and innovation in the field of education. Another major activity of the programme is targeted dissemination of findings and research results while individual projects are charged with informing target groups about their research activity through communication and dissemination plans.

Source: University of Stavanger (2022[24]), *The Knowledge Centre for Education*, https://www.uis.no/en/research/knowledge-centre-for-education (accessed on 23 March 2022); Research Council of Norway (2017[25]), *FINNUT Work Programme 2014-2023*.

In half of education systems surveyed, a public research organisation is in charge of the coordination, regulation or management of research production. However, only 41% of systems have a long-term strategy for producing education research. (See Box 5.4) There are twice as many education systems reporting such long-term strategies as those reporting a system-wide strategy for facilitating the use of research in policy or practice. Nevertheless, education systems reporting a strategy in research production report a higher presence of strategies facilitating research use in policy and in practice than those that do not. Hungary, the Netherlands, Sweden and Turkey reported having a system-wide strategy for research use in both practice and policy as well as a strategy for research production.

The data above suggest that there are systems that think in a "research dynamics" logic, i.e. that invest in various mechanisms to facilitate research use and acknowledge the importance of coordinating research production. However, given that research production is a necessary, although not sufficient, condition for increasing interest in the use of evidence, the number of systems that do not strategically coordinate the production of research is still high.

Box 5.4. Coordinating efforts at a system level

The Netherlands – NRO

The *Netherlands Initiative for Education Research* (NRO, a unit of the *Netherlands Organisation for Scientific Research,* the Dutch Research Council) is in charge of coordinating research education and its funding. The initiative aims to promote high-quality knowledge use and to enhance innovation in the education sector by promoting collaboration between researchers and practitioners at all education levels. The three core tasks of NRO include improving the coherence of education research, financing high-quality research and encouraging the use of research evidence in practice. The involvement of educational institutions and policy makers is encouraged throughout the research project cycle.

By identifying research gaps, NRO programmes upcoming research to improve the coherence of education research. This is done through:

- Gathering information from school directors, policy makers, research institutes and other key stakeholders to help formulate the subjects for the research programmes.
- Publishing calls for research proposals.
- Evaluating proposals according to prescribed criteria of practical relevance and scientific rigour.

Researchers can submit applications for funding in partnership with ministries, companies or other organisations. In addition, monitoring research projects helps to ensure that they keep in line with established priorities throughout the process. Disseminating results enables education to gain maximum benefits from scientific insights.

Wales – NSERE

In Wales, the National Strategy for Educational Research and Enquiry (NSERE) directs the coordination of research-focused policy activity and the development of officials' capacities to effectively use research in policy development work, aiming to educational policy and practice being informed by the best available research evidence.

This strategy was born after the commission of the UK Ministry of Education to the Welsh Government to "co-create a national education research strategy that provides a coherent and transparent framework for education research in Wales" in November 2018. The government then worked with organisations and individuals within the Welsh education research ecosystem and abroad to develop the NSERE.

Although the NSERE relates to all age groups, levels and sectors within the Welsh education system, it mainly focuses on "3 to 18 education" and educational research within higher education. The strategy's main objectives are to:

- Develop high-quality research capacity and volume within higher education institutions focused on the needs of the Welsh education system.
- Develop a national evidence-informed profession, where educational professionals use high-quality research evidence and are provided with opportunities to participate in its production.
- Support the development of evidence-informed policy through engagement with a wide range of research.
- Contribute to and learn from international research and evidence.

Source: For the Netherlands: PO-Raad et al. (2019[26]), "Smart Connections towards a strong knowledge infrastructure for education"; NRO (2022[27]), *About NRO*, https://www.nro.nl/en/about-nro (accessed on 24 March 2022); for Wales: Welsh Government (2021[28]), *The National Strategy for Educational Research and Enquiry (NSERE): Vision Document*, https://gov.wales/national-strategy-educational-research-and-enquiry-nsere-vision-document-html.

Impact: A missing piece

Despite evidence-based practice being one of the goals of public services in OECD member countries and several activities being developed for its promotion, there are too few consensual agreements on how evidence-based practices and policies are best promoted (Nutley, Walter and Davies, 2009[9]; Boaz et al., 2019[29]). Nevertheless, knowledge mobilisation interventions seem to work well when an appropriate mechanism is employed (Jasimuddin, 2007[30]) and they address the clear and genuine barriers preventing the research uptake (Oliver et al., 2014[11]).

The way in which researchers define and measure "evidence or research use" determines the effectiveness and impact of the mechanisms and repercussion of the barriers. The concept of "research use" has multiple dimensions (Levin, 2011[3]). Evaluations of research use interventions employ a wide range of indicators such as changes in access to research; in knowledge and understanding; in attitudes and beliefs; in behaviour; and/or in outcomes for services users (Nutley, Walter and Davies, 2009[9]). Thus, even though there are considerable literature results on the impact of existing mechanisms influencing decision makers' research use, their evaluation outcomes are often not comparable.

An analysis of What Works Centres in the United Kingdom (Gough, Maidment and Sharples, 2018[31]) assesses impact based on:

- Ultimate beneficiaries (e.g. pupils or pupils' attainment).
- Behaviours of intended users (e.g. practitioners' or policy makers' use of evidence to inform decisions).
- Intermediate outcomes (e.g. research users' knowledge of research findings).

The analysis reveals that these Centres, with the exception of the Education Endowment Foundation (EEF), undertake relatively little evaluation of impact of their work on ultimate beneficiaries (see also Chapter 7).

It is noteworthy that research can have impact in varying ways and that most of these do not yield direct application results in a short time frame. Its effects are often gradual and indirect, mediated through several social processes, and shaped by the larger socio-political context (Levin, 2011[3]). Research on the health sector considers that the time lag between the availability of research evidence and its application in practice is from eight to thirty years (Hutchinson and Johnston, 2006[32]). In the education sector, the EEF-

funded Research School Network project achieved a change in the practices of teachers and school leaders in its first three years of implementation but has not shown any sign of impact in terms of student outcomes (Gu et al., 2021[33]).

An extensive systematic review analysed the effectiveness of interventions focused on increasing decision makers' use of research. Regarding information and dissemination-related interventions, it pointed to positive effects on research use. However, these effects are "conditional on the intervention design simultaneously trying to enhance decision makers' opportunity and motivation to use evidence" (Langer, Tripney and Gough, 2016, p. 1[4]). Interventions aiming to enhance the use of educational research in policy making and/or school and teaching practice should consider multiple mechanisms to ensure and increase impact. Such a tendency is already observable: many strategies aiming to encourage research use draw on more than one mechanism (Nutley, Walter and Davies, 2009[9]).

Conclusion

Education systems are complex: Multiple actors operate at different levels and with different degrees of power, empowerment, autonomy and demands, and they interact with each other with different intensities. In such complexity, the sharing of knowledge between different elements of education systems and the coordinating efforts and mechanisms facilitating this become essential (Burns and Köster, 2016[34]).

System-wide coordination, involving a wide and diverse set of relevant actors, is necessary for effective modern governance. The goal of these coordinated strategies is to replace isolated interventions and align action to a system's specific context, actors and resources (Burns and Köster, 2016[34]). These strategies should aim to move the system from "single interventions and simplistic solutions to the recognition of the need for coordinated changes throughout the system and to its constraining and enabling contexts and resources" (Mason, 2016, p. 52[35]).

Data from the *OECD Strengthening the Impact of Education Research* policy survey provide insight into these strategies by mapping existing mechanisms for and barriers to the use of research in policy making and in school and teaching practice across education systems. There are three main and interrelated points that emerge from the analysis.

Efforts to enhance research use are misaligned with the specific systems' problems

Interventions focused on bridging gaps between research production and research use have to draw on mechanisms that are likely to affect genuine barriers to research uptake (Oliver et al., 2014[11]). Nevertheless, survey results show that there are misalignments between barriers and mechanisms in many education systems. Analyses such as this complemented with more detailed national data could point to areas for improvement. Once barriers to the use of education research have been identified, mechanisms to overcome them can be designed and implemented in a more targeted manner.

Lack of strategic coordination inhibits impact

Local efforts to improve the use of education research exist. They aim to transform teachers, school leaders and policy makers into critical research consumers (Jones, Procter and Younie, 2015[2]), and make research producers aware of the context of their potential users. However, isolated one-dimensional efforts are not enough. The lack of coordination between these initiatives at a higher level and the lack of a system-wide strategy can block their scale-up and fulfilment of their potential impact. Research has shown that the impact of certain mechanisms facilitating the use of educational research is stronger when these are combined (Langer, Tripney and Gough, 2016[4]). However, the "ideal" combination of mechanisms for each specific context and definition of this mix are, as yet, poorly understood.

Still some way to go for systems thinking

Systems thinking and system-wide coordination can have deep impact on policy, practice and research. Coordinated and effective interventions are relevant for change at the individual, organisational, and community level. Strategic communications have a critical role in coordinating these changes and effective coordination structures can speed uptake of innovations (Best and Holmes, 2010[15]). However, despite the unanimous view that governing education systems must take a systems approach, governments are struggling to figure out how that can be done in practice. An investigation of activities that encourage knowledge mobilisation found that while there is a large number of such activities, there is little overall coordination between them (Cain, Wieser and Livingston, 2016[36]; Gough et al., 2011[14]). The same picture emerges from the data presented in this chapter as well, with systems mechanisms being poorly reported.

Finally, there is a note of caution. The effects of coordinated mechanisms or of a system-wide strategy on facilitating the use of educational research have not yet been broadly studied. Further research should aim to analyse and evaluate this type of strategy; enabling conditions for its correct development and implementation in order to achieve its highest impact; and who should lead it.

A first step for education systems could be to carefully and thoroughly map the state of their educational research use system in order to identify the factors influencing the use of research. Doing so will allow them to align mechanisms and barriers, generating effective interventions under a holistic strategy to enhance research use. The coordination of this strategy and its evaluation are key pieces that are commonly neglected yet fundamental for strategic improvement.

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Annex 5.A. Additional tables

Annex Table 5.A.1. Factors influencing research use by type of factor

Mechanisms for and barriers to the use of educational research

Type	Mechanisms	Barriers
Information	• Research users' timely access to relevant information • Targeted and improved dissemination of good quality research findings to practitioners and policy makers • Complex intervention evaluation methods (in the case of empirical research) • High clarity, reliability and/or relevance of research evidence • Audience-tailored format of research findings	• Poor access to good quality relevant research (e.g. paywalls) • Lack of availability to research • Lack of relevance of research • Poor dissemination • Poor presentation (e.g. without synthesis or highly complex) • Negative perceptions of research by users
Interaction	• Local collaboration between the research and policy or practice communities enabling greater discussion on findings • Formal, constant, large-scale partnerships between research producers and users to support better connections between them • Trust and mutual respect among research producers and users	• Lack of personal and/or professional contact between research producers and potential users • Lack of structures and/or spaces for contact • Lack of incentives for contact and/or collaboration • Lack of support for collaboration • Cultural and/or linguistic mismatches and misunderstandings between research producers and users
Individual characteristics	• Researchers' skills and capacities related to effective dissemination of useful evidence • Researchers' good comprehension of policy processes and the context surrounding policy priorities • Researchers' good comprehension of educational structures and processes and teachers' professional practice • Policy makers and practitioners' skills and capacities related to research literacy, utilisation and application • Practitioners' skills development through career-long professional learning, beginning in initial teacher education • "Influencers" (experts, peers)' positive attitudes, behaviour and influence towards research use	• Lack or deficit of comprehension of policy processes and school contexts of researchers • The perception of research producers as partisan and producing biased results • Lack or deficit of research analytical skills, experience, literacy and awareness of practitioners and policy makers • Lack of formal training
Structure and organisation	• Technical support (e.g. guidelines, laws) • Financial support (e.g. funding) • Organisational support (e.g. time, rewards, incentives) • Provision of necessary human resources and training	• Teachers' lack of time to read research, to familiarise themselves with new evidence-based strategies and/or to interpret and adapt these approaches to their specific context • Conflicting timelines (e.g. political and research cycles), with research outputs being not available at the time when they are needed as input to decision making • Inadequate system and/or organisational support (e.g. lack of reward system) • Financial and/or human resource constraints • Lack of or poor formal long-term planning processes • Inflexible and non-transparent policy processes

Type	Mechanisms	Barriers
Culture	• Positive leadership and authority • Facilitation role of national and local governments • Support of school leaders for the use of research • System and/or organisational support to and commitment with evidence development and use • System and/or organisation underlining the value of research use	• Lack of senior management support for evidence-informed decision making • Perceived lack of authority to change procedures • Overall resistance to change • Negative perception towards research use • Difference on the priorities of research producers and users • Competing pressures (economic, political, social factors) • Highly politicised environment

Source: Humphries, S. et al. (2014[10]), "Barriers and facilitators to evidence-use in program management: A systematic review of the literature", http://dx.doi.org/10.1186/1472-6963-14-171; Oliver, K. et al. (2014[11]), "A systematic review of barriers to and facilitators of the use of evidence by policymakers", http://dx.doi.org/10.1186/1472-6963-14-2; Nutley, S., I. Walter and H. Davies (2009[9]), "Promoting evidence-based practice: Models and mechanisms from cross-sector review", http://dx.doi.org/10.1177/1049731509335496; Hutchinson, A. and L. Johnston (2006[32]), "Beyond the BARRIERS scale: Commonly reported barriers to research use", *JONA*, Vol. 36/4, pp. 189-199; Sutherland, W. et al. (2019[37]), "Building a tool to overcome barriers in research-implementation spaces: The conservation evidence database", http://dx.doi.org/10.1016/j.biocon.2019.108199; Hering, J. (2016[38]), "Do we need "more research" or better implementation through knowledge brokering?", http://dx.doi.org/10.1007/s11625-015-0314-8; Welsh Government (2021), *The National Strategy for Educational Research and Enquiry (NSERE): Vision Document*, https://gov.wales/national-strategy-educational-research-and-enquiry-nsere-vision-document-html; Rickinson, M. et al. (2020[23]), *Using Evidence Better: Quality Use of Research Evidence Framework*, http://monash.edu/education/research/projects/qproject (accessed on 1 September 2021).

Annex Table 5.A.2. Factors influencing research use by type of approach in the OECD *Strengthening the Impact of Education Research* policy survey

Type of approach	Barriers	Mechanisms
Linear	• Low quality of research in key areas • Low accessibility of research in appropriate formats • Lack of relevant research	• Systematically identifying relevant research gaps • Systematically identifying needs in terms of research knowledge • Systematically commissioning research to address needs • Synthesising and disseminating ed. research findings through user-friendly tools
Relationships	• Lack of willingness to use research • Lack of learning opportunities • Lack of openness to new ideas from research • Low levels of skills and capacity to use research • Lack of relationships between different actors	• Regular system-wide activities to develop capacity/skills to use ed. research • Projects encouraging actors' interactions to facilitate the use of ed. research
Systems	• Lack of broader political will to use research • Lack of financial resources • Lack of mechanisms that facilitate the use of research • Conflicting timeframes with research • Lack of time to access and engage with research	• Regular system-wide activities to monitor/evaluate the impact of ed. research • System-wide strategy for facilitating the use of ed. research • Legislation/law or professional guidelines that promote ed. research use • Offering resources (e.g. financial, human) to support research use • Providing targeted funding for research on specific topics

Annex Table 5.A.3. Factors influencing research use by type of factor in the OECD *Strengthening the Impact of Education Research* policy survey

Type of Factor	Barriers	Mechanisms
Information	• Low quality of research in key areas • Low accessibility of research in appropriate formats • Lack of relevant research	• Systematically identifying relevant research gaps • Systematically identifying needs in terms of research knowledge • Systematically commissioning research to address needs • Synthesising and disseminating ed. research findings through user-friendly tools
Interaction	• Lack of relationships between different actors	• Projects encouraging actors' interactions to facilitate the use of ed. research
Individual Characteristics	• Low levels of skills and capacity to use research	• Regular system-wide activities to develop capacity/skills to use ed. research
Structure and Organisation	• Lack of financial resources • Lack of mechanisms that facilitate the use of research • Conflicting timeframes with research • Lack of time to access and engage with research • Lack of learning opportunities	• Regular system-wide activities to monitor/evaluate the impact of ed. research • System-wide strategy for facilitating the use of ed. research • Legislation/law or professional guidelines that promote ed. research use • Offering resources (e.g. financial, human) to support research use • Providing targeted funding for research on specific topics
Culture	• Lack of broader political will to use research • Lack of willingness to use research • Lack of openness to new ideas from research	

6 Linking research, policy and practice: Learning from other sectors

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International learning networks, significant investments in new research, and research synthesis and methodological innovations have led the way in developing work on evidence use in the education sector, particularly at the practice level. However, work on research use can learn from other domains as well. This chapter considers themes across sectors and their implications for education. It is structured in three parts. The first part maps the interactions between research, policy and practice in various sectors. The second draws together the evidence from various initiatives that have had success in facilitating research use. The final part takes these lessons and frames them as five questions, which can help clarify implications for the education sector.

Introduction

Education has led the way in developing work on evidence use, particularly at the practice level. International networks (such as the European Union [EU]-funded Evidence Informed Policy and Practice in Education in Europe [EIPPEE] network) have developed research use for education improvement. So too have investments like the William T. Grant Foundation programme for use of research evidence in the United States and the United Kingdom government investment in the Education Endowment Foundation. And methodological innovations such as Research-Practice Partnerships between researchers and practitioners have added to furthering research use in improving education. A recent overview looking across sectors and geographies included two chapters focusing on learning from research use in education (Boaz et al., 2019[1]) and there are many more reports, books and journal articles disseminating learning from this work.

There have also been many initiatives and activities to improve links between research and policy from other domains but these tend to be overlooked (Oliver and Boaz, 2019[2]). This chapter considers what learning may be relevant and useful to education from other sectors. In particular, it draws on the cross-cutting analysis in What Works Now[1] (Boaz et al., 2019[1]) and a mapping exercise looking at initiatives designed to promote the use of research in policy (Hopkins et al., 2021[3]; Oliver et al., 2022[4]).

Mapping interactions between research, policy and practice

Many researchers and their partners in policy and practice have tried out new ways to promote engagement between decision-making and research evidence. These include secondments and fellowships; collaborative research projects and programmes; and networking and dissemination events. All have been undertaken to increase research use yet few have been evaluated. There is a need for more evidence of the value of investments by our funders, and we need a robust evidence base to help us make better decisions about how to improve research use.

To establish the quality and size of the existing evidence base, we focused on activities undertaken by research organisations, funders, decision making organisations and intermediaries with the goal of promoting academic-policy engagement. We mapped the activities of 513 organisations promoting research-policy engagement between October 2019 and December 2020. To identify relevant activities, we conducted systematic desk-based searches for eight types of organisations (research funders; learned societies; universities; intermediaries policy organisations and bodies; practice organisations and bodies; think tanks and independent research organisations; NGOs and non-profits; and for-profits/consultancies). The search was international but aimed to gather learning with relevance for our own context in the United Kingdom. For each organisation, we reviewed websites and strategy documents, and published evaluations to identify research-policy engagement activities. This systematic search was supported by a stakeholder roundtable, expert interviews and a survey sent to a subset of the sample. Both stakeholder consultation and the survey served to support the quality and robustness of our approach.

To categorise and analyse the data, we drew on the work of Allan Best and Bev Holmes (2010[5]). Best and Holmes identify three ways of thinking about improving research use: linear models, relational models, and systemic models. Within these three categories, we also drew on a large systematic review about evidence use to analyse initiatives (Langer, Tripney and Gough, 2016[6]).

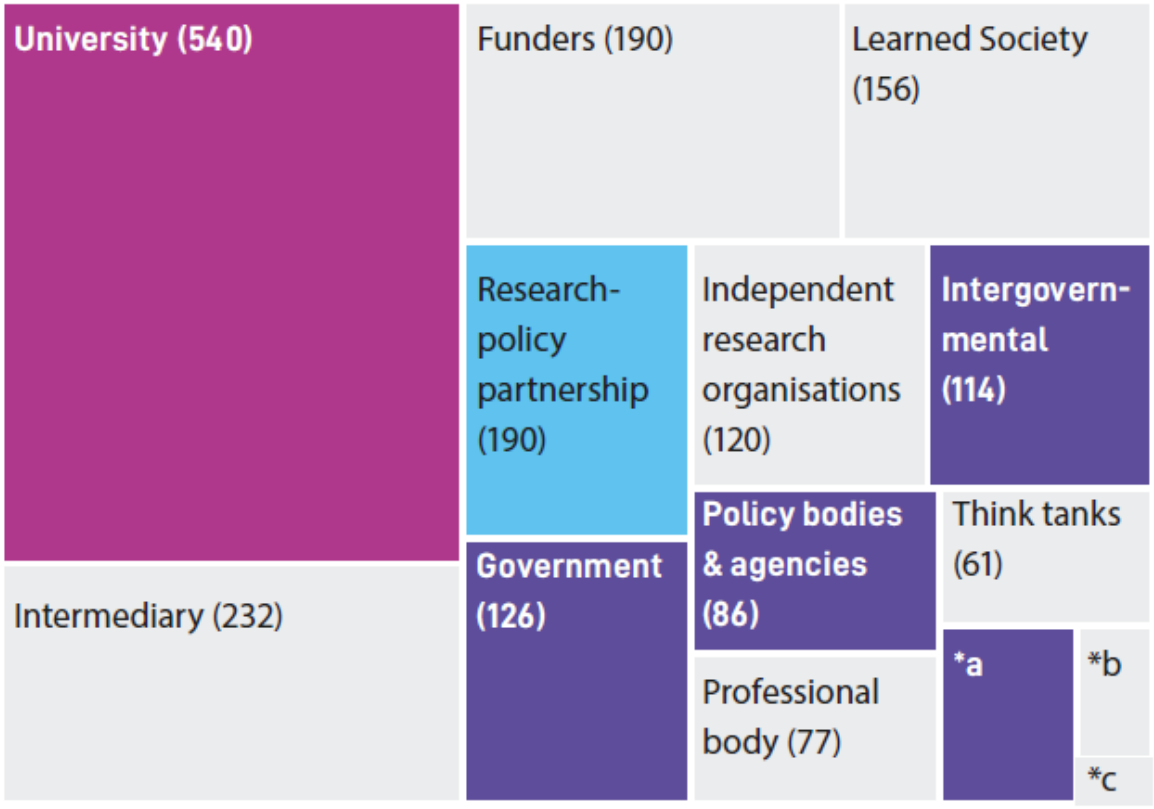
For each identified initiative, we collected data on:

- The initiative and its host organisation (who; where; when; at what cost; funded by whom).

- How it sought to promote academic policy engagement (what specific activities, and what types of practices they were engaged in).
- To what effect (whether there was any evaluation of their activities or other research indicating the impact of these practices).

We identified over 513 organisations around the world including universities, government departments, parliaments, learned societies, research funders, intermediaries, businesses. Their activities spanned a large range of policy areas (see Figure 6.1). While education is not the largest category, we did identify more than 20 organisations promoting academic-policy engagement in education and higher education (with 12 focusing specifically on school-based education).

Figure 6.1. Types of organisations that host academic-policy engagement

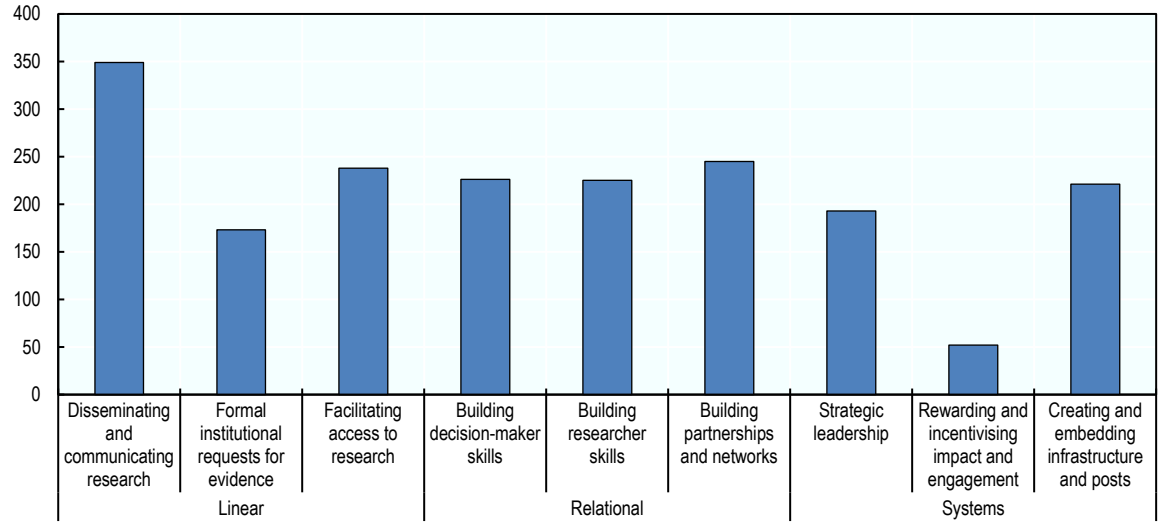


Note: a: Parliamentary initiatives (51); b: Business (21); c: Non-profit initiative (7)
Source: Adapted from Oliver, K. et al. (2022[4]), "What works to promote research-policy engagement?", http://dx.doi.org/10.1332/174426421X16420918447616.

We grouped these initiatives into **nine practices** (see the frequency of their use in Figure 6.2) which fall under the three models of improving research use mentioned earlier.

In the next section, we discuss some examples and describe how initiatives are using linear, relational and systems strategies to improve research use in different sectors and contexts. Many initiatives also combine linear, relational and systems elements as part of a multi-dimensional approach.

Figure 6.2. What do research-policy engagement initiatives do?



Source: Adapted from Hopkins, A. et al. (2021[7]), *Science Advice in the UK*, http://dx.doi.org/10.53289/GUTW3567, p 343.

Linear approaches

Practices 1-3 all follow the ***linear model***. Here, knowledge and research is seen as a commodity that is generated by researchers, turned in to products such as reports or toolkits, and used by decision makers. The process of applying knowledge is seen as a one-way exchange: people who produce research hand it over to research users, who are assumed to be in a knowledge "deficit". In this way of thinking, effective communication is essential for evidence use. Implicitly, linear models view the process of getting research evidence into policy or practice as fairly predictable and manageable.

We found that most activity and investment is focused on linear approaches. They either push evidence out from academia (*Dissemination and communication*) or pull evidence into government (through *formal evidence requests*, or *facilitating access*). Indeed, producing and disseminating research is the dominant activity and has increased since the late 1990s. Pull mechanisms are used by decision makers to address a particular need. They may use *formal institutional mechanisms* such as science advisory committees or requests for evidence issued through legislatures and consultations (Beswick and Geddes, 2020[8]; Hopkins et al., 2021[3]). While COVID-19 has made these processes more visible (OECD, 2019[9]; Cairney, 2021[10]), formal institutional mechanisms have been the primary way that research informs policy making from food safety to building regulation for a long time.

Initiatives may also *facilitate access to research* often through the (co-)commissioning of research and evaluation projects. Beginning in the early 2000s, there has been a large increase in the number of initiatives that support policy to commission more effectively and (mostly since 2015) co-create research or develop briefs through consultation. See examples of linear approaches in Table 6.1 and Box 6.1.

Table 6.1. Examples of initiatives using linear approaches

Organisation	Sector	Country/ Region	Activity
Government consultations and requests for evidence	All	Multiple	Governments may request evidence for policy by issuing consultations or other requests on specific policy areas or topics.

Organisation	Sector	Country/ Region	Activity
Scientific Advisory Committees	All	Multiple	Scientific advisory committees may be temporary or permanent, involve one type of scientific expertise, or combine expert advice from multiple disciplines to inform policy.
The Center for Rapid Evidence Synthesis (ACRES)	Health	Uganda	ACRES conducts rapid evidence synthesis on key policy topics and in response to decision makers' requests.
Partnership for Evidence and Equity in Responsive Social Systems (PEERSS) (Previously PERLSS)	Development	Multiple	PEERSS is trialling different approaches to improving evidence use in policy to support the UN Sustainable Development Goals, including: • Rapid evidence synthesis.
What Works Centres	Social Policy	UK	The 13 What Works Centres comprise a network of social policy evidence centres in the UK. Their work includes: • Conducting evidence synthesis. • Publishing evidence briefs, summaries, reports and practice guides. • Creating evidence toolkits and rating systems to help decision makers assess the strength of evidence supporting a programme or practice.
Danish Clearinghouse for Educational Research	Education	Denmark	Based at Aarhus University, the Danish Clearinghouse for Educational Research compiles, analyses and disseminates the results of educational research, including: • Conducting evidence synthesis. • Publishing evidence briefs, summaries and reports. • Maintaining a registry of Danish and Scandinavian educational research.
Sax Institute	Health	Australia	The Sax Institute has a number of support tools such as: • ChangeMap, an approach to helping service-delivery agencies understand and address local barriers to adopting best-practice care. • Analysis for Policy, designed to help health decision makers undertake policy-relevant research using the Institute's longitudinal research study. • Evidence Check, supports policy makers to commission evidence reviews. • Research partnerships including policy and practice stakeholders.

Note: Some of these initiatives, such as PEERSS and the Sax Institute, also use relational approaches.
Source: Data from Oliver, K. et al. (2022[4]), "What works to promote research-policy engagement?", http://dx.doi.org/10.1332/174426421X16420918447616.

Box 6.1. Demand-led rapid evidence synthesis at The Center for Rapid Evidence Synthesis (ACRES), Uganda

Based at the College of Health Sciences at Makerere University, the Center for Rapid Evidence Synthesis provides a mechanism for decision makers to more effectively "pull" evidence in to policy. The response service was the first in a low- and middle-income country and is now modelled in over 15 countries. It aims to engage with all levels of government and support decision-making processes with high-quality and timely evidence.

The service produces policy briefs in response to decision-makers' requests. An evaluation of the service focused on which formats of briefing documents were most useful and acceptable. Mijumi-Deve and colleagues conducted user testing with healthcare policy makers at different levels of decision making, collecting data on useability, usefulness, understandability, desirability, credibility and value of the document. The participants generally found the format of the rapid response briefs useable,

credible, desirable and valuable. However, they also highlighted some issues, including the need for recommendations and a lack of clarity about the type of document and its potential uses.

A process evaluation was also conducted, drawing on interviews with researchers, knowledge translation (KT) specialists and policy makers. This highlighted the different contextual factors that influenced the ability of the service to support health decision making. It found that key internal factors were the design of the service and resources available for it. Key external factors were the service's visibility, integrity and relationships. Finally, the authors pointed to environmental factors that affected its impact, including political will and the Ugandan health system and policy infrastructure.

Source: Mijumbi-Deve, R. et al. (2017[11]), "Policymaker experiences with rapid response briefs to address health-system and technology questions in Uganda", http://dx.doi.org/10.1186/s12961-017-0200-1; Mijumbi-Deve, R. and N. Sewankambo (2017[12]), "A process evaluation to assess contextual factors associated with the uptake of a rapid response service to support health systems' decision-making in Uganda", http://dx.doi.org/10.15171/ijhpm.2017.04.

Relational approaches

Practices 4-6 adopt the ***relational model***. Here, knowledge production and use is seen as embedded in social relationships and contexts. Initiatives focus on sharing knowledge among diverse stakeholders, and developing networks and partnerships underpinned by common interests and perspectives. Importantly, knowledge sharing is seen as a two-way process, with an appreciation of the different skills and areas of expertise brought by all. While decision makers can learn from researchers and their evidence, researchers also need to learn about policy contexts, issues and priorities.

Investment in relational approaches is more recent and growing. We identified two main types of initiative. Firstly, *building skills* for both policy makers and researchers. Training and professional development focused on academic-policy engagement is an expanding area. Most initiatives are one-offs and support for academics to do engagement is patchy. In the United Kingdom, more attention is now given to training opportunities for academics, government analysts and policy makers to support academic-policy engagement. These are often provided by government, funders or intermediaries. The content of training offers depend on the organisation, its stakeholders and aims. Several examples are included in Table 6.2.

Table 6.2. Examples of initiatives using relational approaches

Organisation	Sector	Country/ Region	Activity
Natural Environment Research Council CASE studentships	Environment	United Kingdom	CASE studentships provide doctoral students with research training experience within the context of a research collaboration between academic and non-academic partner organisations. Non-academic partners include those from industry, business, public and the third/civil sectors.
University Policy Institutes	Higher education / Policy engagement	United Kingdom	Policy Institutes aim to provide a "one-stop-shop" for policy enquiries and a more strategic approach to policy engagement expertise within universities. Activities may include: • Training researchers in policy engagement and communication. • Recommending experts to provide advice or expertise. • Circulating government requests for evidence and other opportunities. • Publishing blogs and policy briefs.

Organisation	Sector	Country/ Region	Activity
Cambridge University Centre for Science and Policy(CSaP)	Science / Science Policy	United Kingdom	CSaP aims to build policy makers" research understanding and create opportunities for networking and exchange through: • Public lectures and seminars. • Policy workshops. • Senior and Junior Policy Fellowship Schemes. • Services to Research initiative which helps researchers at the University build policy-relevant activities into their research proposals.
American Association for the Advancement of Science (AAAS) Science and Technology Policy Fellowships	Science / Science Policy	US	The AAAS aims to advance science and serve society through initiatives in science policy, diplomacy, education, career support, public engagement with science, and evidence advocacy. The Science and Technology Policy Fellowships provide opportunities for scientists and engineers to learn about policymaking and contribute their knowledge and analytical skills during a Fellowship placement in the policy realm.
Parliamentary Office of Science and Technology (POST)	Science and social science / Policy	United Kingdom	POST is the in-house science advice mechanism in the UK Parliament, which bridges research and policy. It provides: • Horizon scanning, reports and briefings. • Professional training to civil service staff. • Policy internship programme run with UK research councils and others. • Fellowship programmes for doctoral students and for established academics. • Knowledge Exchange Unit (KEU) to strengthen connections between research and policy.
Canadian Science Policy Centre (CSPC)	Science Policy	Canada	The Canadian Science Policy Centre supports stakeholder engagement by bringing together multi-sector expertise through: • Knowledge exchange activities (e.g. Science meets Parliament Program). • Conferences, policy workshop and events. • Science-Policy Interface programme provides departments with evaluation assistance. • Training, workshops and various knowledge exchange schemes for both scientists and policymakers. • Canadian Science Policy Awards of Excellence. • National science policy network.
ACED (Actions pour l"Environnement et le Développement Durable)	Environment, agriculture and sustainability	Benin	ACED aims to combine research, policy and local action to reduce poverty and hunger in vulnerable communities. It pilots solutions by collaborating with local communities and agricultural stakeholders. It runs capacity development for decision-makers as part of projects, as well as offering some stand-alone workshops e.g. the Knowledge Sharing and Policy Engagement workshop/
African Evidence Network (AEN)	Multiple	Africa	AEN aims to foster collaboration among those engaged in or supporting evidence-informed decision making (EIDM) and increase knowledge and understanding of EIDM. It does this through: • The AEN Network. • Advocating for evidence and for EIDM in Africa. • Knowledge sharing opportunities, seminars and workshops. • Publications. • Online learning space. • African Evidence Leadership Award.

Organisation	Sector	Country/ Region	Activity
UK Policy Research Units	Health and social care	United Kingdom	The UK"s 15 Policy Research Units (PRUs) undertake research to inform government and arms-length bodies making policy decisions about health and social care. They support short- and long-term policy development through: • Multidisciplinary teams. • Long-term partnerships with the Department of Health and Social Care (DHSC). • Rapid response services. • Policy liaison roles and oversight mechanisms aims to create alignment with long-term departmental priorities.
Collaborations for Leadership in Applied Health Research and Care (CLAHRCs)	Health	United Kingdom	The Collaborations for Leadership in Applied Health Research and Care (CLAHRCs) were partnerships between universities and local health service organisations. They trialled different approaches to long-term collaborative working between academic organisations and health services, continuous knowledge production and implementation cycles focused on health improvement, hybrid roles combining research, policy and practice expertise, and capacity building. See Box 6.3.

Source: Data from Oliver, K. et al. (2022[4]), "What works to promote research-policy engagement?", http://dx.doi.org/10.1332/174426421X16420918447616.

The UK Parliamentary Office of Science and Technology (POST) also runs the Parliamentary Academic Fellowship Scheme. It provides the opportunity for arts, humanities and social science researchers to be seconded to a parliamentary office to develop a project and work alongside, advise and influence parliamentarians. University policy institutes and teams offer training that ranges from communication and presentation skills, and the practicalities of engagement to building research "impact" and collaboration into projects. Commonly, training for researchers is aimed at early-career academics and is relatively short in duration (averaging 3 months in length). The US marketplace for impact and influence training appears to be the most diverse – a varied range of training, mentorship, advocacy and skills-building programmes are offered by research centres and institutes, independent consultancies and policy bodies (see example in Box 6.2).

Box 6.2. Science and Technology Policy Fellowships at the American Association for the Advancement of Science (AAAS)

The AAAS Science and Technology Policy Fellowships provide opportunities for scientists to spend time in government, contributing to federal policy making while learning about the intersection of science and policy. AAAS Fellowships are a long-standing example, running annually since 1973. Fellows spend one year in the executive, legislative and judicial branches of the federal government in Washington. The aim is to provide them with hands-on policy experience; support skills development; and foster a network of science and engineering leaders who understand government and policy making. Fellows receive a stipend of USD 80-105 000 per year, publish blogs, and convene thematic workshops and symposia.

In 2020, the programme was retrospectively evaluated.

The evaluation found generally high levels of Fellows" satisfaction with the programme. Over 80% felt it improved their understanding of the intersection between science, technology and policy, and 77% reported it encouraged them to explore a different career path. Fellows reported improved policy know-how and skills, including on the workings of government, policy and science integration and collaborative skills. It also showed that Fellows continued to be involved in policy-related activity after the end of the programme. Mentors based in host offices were also evaluated. It was found that they contributed to the overall office environment and gave their expertise to address complex problems, clarify data interpretations, summarise and translate scientific information, and provide technical input.

Source: Pearl, J. and K. Gareis (2020[13]), "A retrospective evaluation of the STPF program", https://www.aaas.org/sites/default/files/2020-07/STPF%20Evaluation%20Presentation%20PDF.pdf.

For decision makers, initiatives offer courses, fellowships and other opportunities that to aim to build research skills and awareness. For example, the Cambridge University Centre for Science and Policy offer Fellowships for policy makers in which Fellows are given opportunities to meet with a range of researchers from different disciplines, attend workshops and build relationships. Many universities offer support services through policy institutes or teams. Specialist training and capacity building offers are also developed by intermediary organisations that specialise in work across research, policy and practice. ACED (Actions pour l'Environnement et le Développement Durable) in Benin, for example, works collaboratively with local decision makers and offers tailored capacity-building as part of pilot environmental sustainability projects. It also provides stand-alone courses on knowledge sharing.

Secondly, relational initiatives aim to *build professional partnerships* – that is, long-term, non-transactional joint working relationships to foster mutualism and trust across sectors. This includes networking activities that support participants to leverage sustained and useful professional relationships. Examples of this approach include the African Evidence Network (AEN), an intersectoral network of over 3 000 people that has been running for over 15 years. In the last decade or so there have been some relatively rare attempts to develop more formalised partnership approaches in which research and policy or practice organisations come together on a shared work programme. Frequently cited examples in health and social care include the United Kingdom's Policy Research Units, which support short- and long-term policy development and partnership (PIRU, n.d.[14]). In practice, the Collaborations for Leadership in Applied Health Research and Care (CLAHRCs) provide a long-running example of collaborations that bring together universities and healthcare providers to test new treatments and ways of working (Box 6.3).

Box 6.3. Partnership and collaboration in the Collaborations for Leadership in Applied Health Research and Care (CLAHRCs)

The Collaborations for Leadership in Applied Health Research and Care (CLAHRCs) were funded by England's National Institute of Health Research (NIHR) in 2008 and 2014. The collaborations were partnerships between universities and local health service organisations and aimed to improve the quality of healthcare through the production and use of applied health research. The CLAHRC model was focused on experimentation and agenda setting at the local level. Each developed slightly differently, with key health service stakeholders and researchers shaping the focus of work within different local contexts. This aimed to create approaches to evidence production and use that took account of how health care is delivered across sectors and in a defined geographical area. The CLAHRCs drew on lessons from other countries, including Australia and the United States, and aimed to foster collective knowledge mobilisation processes to "improve care through a continuous cycle of knowledge production and implementation".

Central aims of the CLAHRCs were:

- To develop and conduct applied health research that is relevant across the National Health Service (NHS) in the United Kingdom, and to translate research findings into improved outcomes for patients.
- To create a distributed model for the conduct and application of applied health research that links those who conduct applied research to those who use it in practice.
- To create and embed approaches to research and its dissemination.
- To increase the country's capacity to conduct high-quality applied health research focused on the needs of patients and targeted at chronic health conditions and public health interventions.
- To improve patient outcomes locally and across the wider NHS.
- To contribute to the country's growth by working with the life sciences industry.

The NIHR commissioned independent longitudinal research evaluations of the early CLAHRCs in 2010 and a number of smaller evaluations were also conducted. In 2018, Kislov and colleagues synthesised the findings of 26 evaluations to draw out overarching learning about the CLAHRCs. The synthesis found that many evaluations focused on describing and exploring the nature of the partnerships, and the vision, values, structures and processes developed to facilitate sustained collaboration between academic and health partners. Evaluations also focused on the nature and role of boundaries between organisations, and the use of knowledge brokers and hybrid roles to support knowledge mobilisation. Some focused on capacity building such as secondment schemes.

Overall, the evaluation synthesis noted a lack of evidence about the impact of CLAHRCs on health care provision and outcomes. The authors highlighted the need for more studies on which knowledge mobilisation approaches work in research and practice partnerships; what the contexts were; and the reasons for success. A further round of funding has led to the creation of Applied Research Collaborations (ARCs) in the place of the CLAHRCs.

Source: Kislov, R. et al. (2018[15]), "Learning from the emergence of NIHR Collaborations for Leadership in Applied Health Research and Care (CLAHRCs): A systematic review of evaluations", http://dx.doi.org/10.1186/s13012-018-0805-y; NIHR (2019[16]), *About Us*, https://www.clahrc-eoe.nihr.ac.uk/about-us/.

Systems approaches

Practices 7-9 attempt to respond to the ***systems model*** by recognising that all activities and actors associated with knowledge production and use are embedded within wide and complex systems, working through dynamic systemic processes. Taking a systems-informed approach includes being aware of what needs to be in place to support research use in government, such as a positive culture of research use; rewarded and valued career pathways associated with promotion of evidence use; and a healthy and dynamic research production ecosystem. Systems approaches attempt to create a culture of evidence use that is sustained and productive. These include *strategic leadership and advocacy* for evidence use; the *rewarding and incentivisation* of engagement; and the *creation of infrastructure* to enable impact. Some initiatives work across all three practices. An example might be the research-practice partnerships fostered by the William T Grant Foundation, discussed in Chapter 10 of this publication. See Table 6.3 for examples of different initiatives.

Most initiatives we identified focused on *strategic leadership*; mainly through advocacy initiatives that aim to champion evidence use and engagement. The Bipartisan Policy Center's Evidence Project in the United States provides a good example of successful advocacy and influencing. At a practice level, the examples used most frequently are the Veterans Administration and the Kaiser Permanente health systems, which have sought to build evidence-infused services. There are many other potential aspects of strategic

leadership such as policy planning and cross-sector leadership of which, however, we found very few examples.

A small but growing number of initiatives aim to *reward and incentivise impact*; we identified prizes and professional incentives to recognise impact and engagement between research and policy. Some prizes celebrate "research impact"; for example, the Economic and Social Research Council's Celebrating Impact Prize in the United Kingdom, which has been running since 2013. Others focus on public policy; for example, the Federation of American Scientists (FAS) Public Service Award, which has been running since 1971 (FAS, n.d.[17]). The Irish Health Research Board Impact Prize competition is an example of a health-specific award, while the Africa Evidence Network's African Evidence Leadership Award (launched 2018) is unique in recognising leadership across sectors.

Creating and embedding infrastructure covers new roles and career pathways, and supports operations within and across organisations as well as different approaches to embedding expertise. There is little cross-sector activity at a system's level to promote the use of research. There are also some interesting examples of strategic collaborations between funders, like the EU Scientific Knowledge for Environmental Protection programme, and the Area of Research Interest programme in the United Kingdom.

The creation of new job posts and roles can contribute to the implementation of systems change. Examples include the creation of hybrid, intermediary, brokerage and "boundary spanning" roles. In environmental science and policy, for example, a literature on boundary spanning roles has described how these roles create and develop specialist skill sets that combine expertise about both research and policy, serving a whole host of functions (Posner and Cvitanovic, 2019[18]). Brokerage roles are central to the expertise of both government and research teams working together to improve research use. Attempts to embed researchers in practice and policy organisations have sought to make these, or at least the knowledge they generate, sustainable (Graham, Kothari and McCutcheon, 2018[19]; Gradinger et al., 2019[20]). However, like other initiatives that tackle systems-level challenges, they meet significant barriers in their attempts to change organisational cultures, incentives and infrastructures.

Table 6.3. Examples of initiatives using systems approaches

Organisation	Sector	Country / Region	Activity
William T Grant Foundation Research-Practice Partnerships	Education	United States	William T Grant Foundation funds long-term, mutually beneficial collaborations that promote the production and use of research called Research-Practice Partnerships (RPPs). RPPs are formal partnerships between research and practice, and can involve schools, education practitioners, researchers, designers and government bodies. They aim to leverage research to address persistent problems of practice by building relationships and trust, creating a shared research agenda, using the research and evidence generated to improve practice.
Bipartisan Policy Center's Evidence Project	Evidence in policy	United States	The Evidence-Based Policymaking Initiative was created to support the implementation of the US Commission on Evidence-Based Policymaking's initiatives and recommendations. The project published reports, convening and advocacy, and provided expertise on implementation strategies. It was housed within the Bipartisan Policy Center, a non-profit think tank (https://bipartisanpolicy.org/report/evidenceworks/).
Federation of American Scientists Public Service Award	Science and Security	United States	Established in 1971, the Federation of American Scientists (FAS) Public Service Award recognises a statesperson or public interest advocate who has made a distinctive contribution to public policy at the intersection of science and national security (https://fas.org/about-fas/awards/).
ESRC Celebrating Impact Prize	Science and social science	United Kingdom	The ESRC Celebrating Impact Prize is an annual award which recognises ESRC-funded researchers in achieving and enabling outstanding economic or societal impact from their research (https://www.ukri.org/publications/esrc-celebrating-impact-prize-2021).

Organisation	Sector	Country / Region	Activity
Irish Health Research Board impact prize competition	Health	Ireland	Established in the 2019, the Irish Health Board Impact Award recognises people who use their research to create real changes in health and care. The award looks at the impact of health research in relation to practice, people's health, patient care and health policy (https://www.hrb-crci.ie/2018/08/hrb-impact-award-2019/).
African Evidence Leadership Award	Evidence in policy	Africa	The African Evidence Leadership Award has been offered annually since 2018 to members of the African Evidence Network who demonstrate leadership in and an influential contribution to evidence-informed decision making in Africa. There are three categories, including evidence producers (e.g. researchers), evidence intermediaries (e.g. knowledge brokers or knowledge translators), and evidence users (e.g. decision makers, private sector leaders) (https://aen-website.azurewebsites.net/en/learning-space/article/6/).
EU Scientific Knowledge for Environmental Protection – Network of Funding Agencies	Environment	EU	The SKEP ERA-NET project brought together key funders of the national research programmes in different European states to take a forward-looking, strategic overview of the research needs of policy and regulation for environmental protection. It aimed to create structure for research coordination and co-operation between the 14 SKEP partners and provide for effective alignment of national programmes (https://ec.europa.eu/research/fp7/pdf/era-net/fact_sheets/fp6/skep_en.pdf). Activities included: • development and sharing of good practice in the management and dissemination of research • the identification and analysis of common strategic issues • the development and implementation of joint research activities.
Area of Research Interest	Departmental Policy	United Kingdom	Areas of Research Interest (ARIs) are produced by government departments to provide information about the main research questions they are facing. ARIs aim to align scientific and research evidence from academia with policy development and decision making, support engagement with researchers, and allow departments to access stronger policy evidence bases at better value for money, for example through shared research commissions. In 2019, two Academic Fellows working with the Government Office for Science identified a set of topics based on existing departmental ARIs that should be addressed as a priority during the COVID 19 pandemic. These ARIs were divided into nine themes, which were addressed by nine Working Groups consisting of researchers, funding bodies and policy makers (https://www.gov.uk/government/collections/areas-of-research-interest).
EVIP-Net, World Health Organisation Evidence-Informed Policy Network	Health	Multiple	EVIPNet was established by WHO in 2005 and is currently active in multiple regions. EVIPNet aims to promote a network of partnerships at the national, regional and global levels to strengthen health systems and improve health outcomes (https://www.who.int/initiatives/evidence-informed-policy-network). Activities include: • Capacity-strengthening strategies to enable policymakers, researchers and civil society representatives to combine political and policy analysis with evidence synthesis and stakeholder engagement. • Country-level teams who produce evidence briefs for policy conduct policy dialogues and undertake rapid evidence synthesis and dissemination.

Source: Data from Oliver, K. et al. (2022[4]), "What works to promote research-policy engagement?", http://dx.doi.org/10.1332/174426421X16420918447616.

How successful are these approaches? Learning from research and evaluation

Sharing and disseminating research can't improve research use on its own

Although most money is spent on disseminating and communicating research, accessibility alone is not enough to improve the use of evidence. We now have good evidence on which communications approaches are most successful in helping audiences understand research findings, and we also have an expanding national infrastructure for dissemination across multiple policy areas (Langer, Tripney and Gough, 2016[6]). "Push" mechanisms that aim to inform government advice or consultation may be hampered by the low academic and public visibility of Scientific Advisory Committees and Expert Committees (UK Parliament Cabinet Office, 2017[21]). Instead, access to formal mechanisms of influence in government occurs through multiple channels and in multiple ways.

Linear models underestimate the complexity of policy environments and evidence use processes

Linear activities are assumed to operate by providing "missing" evidence. This is what we call the "deficit model". The underlying logic is that if more evidence were made available, policy makers would act differently. However, it does not fit with what we know about policy processes from political science studies. Instead, policy is influenced by a range of knowledge types over time, which are delivered in different ways. For example, we know that greater dissemination does not equate with greater uptake and that single pieces of evidence are unlikely to change a policy decision. Evaluations suggest that linear approaches to improving evidence use do not address practical, cultural or institutional barriers to engagement.

Relationship building is important for producing useful research and supporting research use in decision making

Recent investments aim to support government to commission and co-develop research. These projects – as discussed in learning reports generated by the Policy Research Units and the Policy Knowledge Fund, for example – have more potential in conducting both short- and longer-term policy-responsive research. But there are still gaps as to how successful these knowledge production-supporting initiatives are in supporting knowledge use. Without rigorous evaluations we can learn little about the benefits of these substantial investments.

Regarding new training and development initiatives, there is little empirical evidence about what works best in the evidence-use literature. However, we can learn from other sectors. Notably, from evidence on the effectiveness of continuing professional development for teachers and other professional groups.

Networks and knowledge exchange opportunities are growing too. There are more diverse and greater numbers of organisations that provide these opportunities, and learning from other funders and societies will advance research use in decision making.

Collaboration is promising but lacks evidence

Collaboration appears promising but learning is difficult to capture. Initiatives that aim to build relationships over the long term through partnerships or networks are often limited by insecure or project-based funding. Evaluations of these approaches are limited in the United Kingdom but there is an evidence base on partnerships in the United States, particularly on structuring and embedding learning opportunities in professions and institutions. The CLAHRC evaluations highlighted challenges around embedding secondment schemes in organisations while the Royal College of Policing provides a strong example of embedding training within professional development structures (Hunter, May and Hough, 2017[22]).

Some learning has highlighted networks as a potentially powerful mechanism at the practice level (Boaz et al., 2015[23]). Few have been robustly evaluated, however, and none test the primary assumption that greater collaboration and co-working between academic and policy audiences will generate more useful, and more used, research. Evaluations do not, so far, support the notion that working in partnerships, which is sometimes costly, is always justified by the outputs, which are themselves hard to measure (Kislov et al., 2018[15]). Limited evidence about their effectiveness in sustaining new connections over the long term jeopardises networks, many of which are insecurely funded. There is much to be learnt, particularly from the United States and Africa, about how to run effective collaborations (Cornish, Fransman and Newman, 2017[24]) and research-practice partnerships yet little robust empirical evidence about how well these approaches might translate to others contexts, and indeed to government engagement.

Systems-level support can encourage evidence use and relational activity

What kinds of systems-level activities support activity at the relational level and fresh approaches to strategic leadership within and across sectors? What are the best ways of incentivising engagement and supporting brokers and boundary spanners, and infrastructures? Evidence from healthcare (Bornbaum et al., 2015[25]) and climate_science (Posner and Cvitanovic, 2019[18]) highlights several challenges in developing, supporting and measuring the success of intermediary and boundary-spanning roles.

What effective system supports look like across different sectors and contexts

Cross-sector initiatives are key in strategic leadership but they are rare or in the early stages of development. Higher education organisations are not set up to make the most of individuals who have policy experience. This requires systematic thinking about how to reward and incentivise this across the sector. Systems-levels approaches are hard to implement but allow a more comprehensive use of evidence culture to grow and individual investments to flourish.

Cross-cutting themes

There is a well-described literature on barriers to evidence use in policy and practice (see e.g. Verboom and Baumann (2020[26]), Orton et al. (2011[27]), Oliver et al. (2014[28])), and on policy and practice decision-making processes (Cairney, 2016[29]; Parkhurst, 2017[30]). However, many of the initiatives we identified in the mapping exercise do not draw on this literature. There are also very few robust evaluations of initiatives for us to learn from. Overall, we see increasing activity that is uncoordinated and unevaluated. We need to better understand the decision-making context before investing in new initiatives.

To reflect on what we have to learn, we draw on our wider work synthesising and analysing the evidence-use literature (Oliver, Lorenc and Innvær, 2014[31]; Boaz et al., 2019[1]; Oliver and Boaz, 2019[2]). We also reflect on the recent "wake up" call issued by The Global Evidence Commission. It promotes a whole system response to improve the use of evidence in tackling societal challenges (Evidence Commission, 2022[32]). The themes represent grand challenges for evidence use across different fields.

The first relates to what counts as evidence when we talk about evidence use for policy and practice. Some organisations and initiatives promote evidence of effectiveness drawn from randomised controlled trials. While this "what works" evidence is valuable to decision makers there continues to be a concern about the potential exclusion of a wide range of other evidence that helps to address the wide range of questions posed by decision makers. As a result, some initiatives, such as the Africa Evidence Network, were set up with an explicit cross-disciplinary approach, aiming to avoid association with a specific form of evidence.

We continue to be surprised by the inability of research to transform policy and practice. While the language may have shifted from evidence-based policy to evidence-informed we still shake our heads in despair that the research remains "on tap" rather than "on top". It is in this space that initiatives to increase research

literacy in policy and practice communities and vice versa have traction. They help us understand the differences between research, policy and practice environments, and the implications for the ways in which we produce, promote research and understand research use. This is also where we see a value in opportunities to move between worlds of research, policy and practice through work experience, secondments and fellowships. For example, the Cambridge Centre for Science Policy fellowship scheme provides an opportunity for civil servants to spend time at the university on their own programme of work and afterwards to join a growing network of fellows to continue to share learning. Fellows flow in the other direction as well as academics join government departments to learn about how government works.

The way we prioritise and carry out research is likely to impact on its usefulness and use. For example, there is a growing interest in engaging stakeholders in research through approaches such as co-production, action research and partnerships. This work includes both initiatives to include both professional stakeholders (teachers, nurses, government officials) and lay stakeholders (the public, students, patients and carers) in research processes. While some of this work might look tokenistic and focused on academic priorities, other initiatives seek to build deep and sustained partnerships that are mutually beneficial. An example of this is the work undertaken in the United States to build research-practice partnerships in education and in Australia and New Zealand to establish academic practice partnerships in social work. Another approach is to engage stakeholders more systematically in establishing research priorities. The James Lind Alliance in the United Kingdom has developed a process for bringing together patients, carers and clinicians to bring the issues that matter most to the attention of health research funders (James Lind Alliance, n.d.[33]).

The importance of thinking about evidence use from a systems perspective is gaining greater attention. We have already improved our approaches to dissemination and established better relationships between the users and producers of research. These efforts need to continue but the next step is to pay greater attention to the systems that produce research and those that use it to make sure they are designed to make the best use of research. This is the next frontier for evidence use. This is a challenging area. We often conclude that evidence use is being thwarted by “contextual factors” and leave it there. We do know about some important systemic factors such as the critical importance of leadership in supporting research use. In particular, the importance of strategic leadership by organisations aiming to promote evidence use (Oliver et al., 2022[4]) is a common feature of the literature. The role of individuals as champions and opinion leaders who can support (and also thwart) evidence use is also highlighted in the evidence-to-practice literature (Boaz, Baeza and Fraser, 2016[34]). Hopefully, in years to come we will be able to point to the key features of healthy systems to produce and use research (and the connections between them).

We need to pay more attention to concrete policy and practice contexts, and be willing to adapt. Researchers who study “evidence based policy making” (EBPM) tend to identify barriers between their evidence and policy, and describe what a better-designed model of research production and use might look like (Cairney, 2016[29]; Parkhurst, 2017[30]). In general, we need to get better at working with, and attending to, the policy and practice environments we aim to influence. For example, policy theories describe complex policy-making environments in which it is not clear who the most relevant policy makers are, how they think about policy problems, or the ability policy makers have in turning evidence into policy outcomes. Initiatives should carefully identify relevant policy makers, work (perhaps collaboratively) to frame problems in ways that are relevant or persuasive, and identify opportune moments to try to influence policy. Few initiatives are informed by these concerns, and much training for researchers relies on simplified (linear) models of policy processes.

There are important strategic choices to be made about investments in strengthening evidence use, including clarifying support for individuals, institutions, and systems. In general, initiatives focus on providing support for individuals – whether researchers or decision makers (for example, through training, support in responding to calls for evidence, or funding opportunities). But this fails to address the cultural, institutional and systemic factors that influence how research is produced and used in policy or practice. Moving towards a more systems-informed approach means recognising that different kinds of support will

be needed at different levels, and that we need to think through the relationships between these levels. A recent initiative focused on the institution highlights this point: the Universities Policy Engagement Network (UPEN) in the United Kingdom aims to influence the institutional rules and norms that shape policy engagement in universities, for example, through a focus on equality, diversity and inclusion (UPEN, 2021[35]). These issues have different implications – and require different strategies to address – when considered at the individual, institutional and systems levels. Taking a more strategic approach means considering the ends as well as the means of work to strengthen research evidence use.

Implications for the education sector

Our mapping study identified 25 organisations focused on education (including higher education). Many others addressed education as part of a broader or intersectoral agenda (such as children and young people or development). As with the whole dataset, most of these focused on dissemination activities. The Danish Clearinghouse, for example, provides an example of a registry of educational research while the Education Endowment Foundation (EEF) in the United Kingdom also runs evidence seminars and provides teaching and learning toolkits and support. Other examples focus on formal institutional mechanisms such as the National Foundation for Educational Research (NFER), which responds to consultation requests for expert input into government processes.

In practice, education initiatives provide some strong examples of relational approaches. In the United States, in particular, we found initiatives aiming to develop and support research-practice partnerships (or RPPs) and design-based education research collaboratives. These approaches emphasise bringing researchers and practitioners together across the life cycle of making and using research. Many models for these kinds of collaboration exist, one approach, funded by the William T Grant Foundation, is supported by a body of research and evaluation evidence that investigates the characteristics, processes and impacts of partnerships (see for example Henrick et al. (2017[36])). We found fewer examples of collaborative, partnership approaches for policy, although EEF, for example, has begun to focus more on work with teachers and practitioners to support implementation. We found a small number of examples of training and certification around evidence use and engagement skills in education (run by the Bloomberg and Mastercard Foundations) and in grant-making skills.

Several education initiatives describe systems-level activities. In higher education, this focuses on the monitoring and analysis of data to support policy and planning by, for example, the Research and Higher Education Monitoring and Analysis Centre (MOSTA) of Lithuania. Key international education stakeholders such as UNESCO play roles in global advocacy and thought leadership, establishing multi-country programmes and research initiatives, and investing in education, science and policy interaction at the international level.

In comparison to sectors such as health (which represents 21.1% of the evaluations we found), public policy (19.3% of evaluations) and the environment (8.8% of evaluations), we found comparatively little evidence supporting education interventions (3.5% of evaluations).

Five questions to strengthen evidence for education

We identify five questions to inform learning in the education sector, drawing evidence from initiatives in other sectors and the wider research literature.

1. How is research evidence made and shared with education stakeholders?

Our mapping found relatively few examples of education research being made and shared for education policy and practice stakeholders in demand-led, responsive ways. In health, rapid evidence response services (such as The Center for Rapid Evidence Synthesis [ACRES] in Uganda) facilitated commissioning

processes (for example, in Table 6.1) and long-term research-policy partnerships at the national level (including the United Kingdom Policy Research Units). These are examples of different mechanisms that support researchers to generate more policy-relevant research and policy makers to gain access to more timely evidence.

At a more local level, research-practice partnerships and other collaborative approaches in education provide strong examples of ways to involve professional stakeholders (teachers and managers) and lay stakeholders (the public, students and parents) in research processes. There is scope to share learning here as well as to consider which approaches work best in different contexts and why. Learning from education about collaborative approaches is proving useful in other sectors such as social care (Transforming Evidence, n.d.[37]).

2. What kinds of relationships can support evidence use in education?

Across sectors, a range of different relationships supports the production and use of research. These include relationships between the communities of research, policy and practice as well as relationships with intermediaries and "boundary spanners" of different kinds (see pages 13 and 16). We found relatively few examples of education researchers, policy makers and practitioners being brought together to learn, share ideas or work together outside of practice initiatives with a predominantly local focus. Fellowship opportunities, secondments, internships and exchange programmes all provide possible pathways to learning across these communities (see Table 6.2). Similarly, education networks might prioritise bringing research, policy and practice communities together to address decision-making priorities, an approach taken by NORRAG (the Network for International Policies and Cooperation in Education and Training in Geneva) for example. While we found a small number of skills-building initiatives in education, there is lots of scope for education to learn from other sectors in providing training opportunities for researchers and decision makers.

In the environment and health sectors, intermediary organisations and professionals play an important role in summarising, translating and curating evidence, supporting the production of policy-relevant research, and holding relationships across research and policy. While our mapping was limited in scope, we found very few examples of initiatives that aimed to foster these skillsets and cross-sector relationships in education (for example, the African Evidence Leadership Award, Table 6.3). Often, intermediaries can help identify who needs to be at the table to support the production and use of research.

3. What is the best way to support research use in (specific) education systems and contexts?

Education systems are highly complex and varied, involving multiple stakeholders and competing priorities at local, national, regional and global levels. Increasingly, those working on evidence use across sectors need to attend to the specifics of concrete decision- making contexts rather than adopting a linear model, which simplifies policy and evidence-use processes or takes a top-down, "one size fits all" approach. If a systems approach means attending to "contextual factors", then efforts to strengthen evidence use must be context-sensitive too. Examples such as the European Union Scientific Knowledge for Environmental Protection programme (Table 6.3) can inform education systems of evidence-use interventions. This can build strategic oversight and strengthened infrastructure while providing appropriate support for individuals, institutions and systems. Connecting with ongoing evidence-use initiatives and opportunities, and designing new complementary interventions to strengthen local systems may also be wise to focus on. Recent work using a systems framework to look at evidence-informed policy and practice in education has helped to build a richer understanding of research use in context (MacGregor, Malin and Farley-Ripple, 2022[38]).

4. What is the relationship between how evidence is produced and how it is used in education?

The evidence research community is paying increasing attention to how knowledge production impacts the uses of research evidence in policy and practice. This includes attending to who produces evidence, whose agenda evidence serves, and the values that underpin evidence and evidence-informed decision making. Education provides some strong examples of opening up knowledge production processes but these are unequally distributed in terms of geography and topic area, and have been used largely for practice improvements. As education, along with other sectors, aims to take a more strategic approach, stakeholders might benefit from considering other strategic agendas – such as Sustainable Development Goal 4 (SDG) 4 – that evidence for policy and practice might serve, and how. Finally, there is interesting work in Australia that looks at the quality of research use in education. It looks beyond dissemination to understand how teachers use research in their practice. On this note, it is worth referring to work by Rickinson et al. (2021[39]), which features in Chapter 9 of this publication.

5. Are we are investing in initiatives that work?

Across different sectors, we have much to learn about how to best improve evidence use, and how to measure success. Establishing the impact of research on policy and practice is challenging, and in general, evaluation has not been a priority for those with limited funds to support evidence use. This is now changing as the need to find solutions that can effectively support policy and practice becomes pressing. Important pockets of learning do exist across our different sectors and contexts as in, for example, the CLAHRC evaluations (Box 6.3). We hope that by investing in learning, and sharing our insights across disciplines and policy domains, we can take a faster route to more effective strategies.

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Note

[1] What Works Now is an internationally edited book bringing together key thinkers and researchers to consider what we know about evidence-informed policy and practice in different countries and policy sector. The text includes a sector-by-sector analysis, consideration of cross-cutting themes and international commentaries. This chapter draws in particular on the final chapter of the book, which considers cross-sector lessons from the past and prospects for the future.

7 Evidence on evidence-informed policy and practice

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Knowledge brokerage and knowledge mobilisation are generic terms used to describe activities that enable the use of research evidence to inform policy, practice and individual decision making. Knowledge brokerage intermediary (KBI) initiatives facilitate such use of research evidence. Drawing on examples from existing brokerage initiatives, this chapter is structured in five parts. Each part seeks to address areas where KBIs could be more evidence-informed in their work: 1. Needs analysis; 2. Integrating evidence use in wider systems and contexts; 3. Methods and theories of change; 4. Evidence standards; and 5. Evaluation and monitoring. For each area, questions are suggested that explore how the principles are being followed in practice. Recommendations for KBIs, policy makers and funders are provided at the end of the chapter. The chapter is adapted from an open-access paper published in *Evidence & Policy*.

Introduction

Policy, practice and individual decisions are informed and influenced by many factors. Research findings can be an important source of information.[1] Over recent years, there has been concern that research evidence has not always been used to its full potential in decision making (Boaz et al., 2019[1]) or has been used to justify decisions that have really been made on other grounds (Weiss, 1979[2]). A number of strategies have been used to enable the greater consideration and use of research evidence (Cooper, 2014[3]; Langer, Tripney and Gough, 2016[4]; Gough, Maidment and Sharples, 2018[5]). Knowledge Brokerage Intermediaries (KBIs) are individuals and organisations that aim to broker the intermediary space between the use and production of research evidence (see Box 7.1).

Box 7.1. Examples of KBI organisations and strategies

KBI organisations can include:

- Portals to communicate research findings to potential users of evidence.
- Knowledge brokerage organisations, including What Works Centres (WWCs) and research observatories (such as the International Public Policy Observatory on COVID-19).
- University offices to communicate research findings.
- Evidence advisory systems for governments.

Strategies to integrate research findings into decision making:

- Access: initiatives to raise awareness of research evidence and make it more available to potential users of research.
- Uptake: strategies to support and encourage decision makers to make use of research evidence in their work.
- Science advice: researchers' availability to advise decision makers as in expert advisory committees, academic secondments to government departments or in partnerships between universities, policy makers and professional practitioners.
- Co-production of research and its use: by researchers, users of that research, and intermediaries between the two.
- Impact: measures to encourage researchers to enable their work to influence decision making.
- Implementation: strategies to support changes in practice that are based on decisions informed by research evidence.

This paper builds on the work of Powell, Davies and Nutley (2016[6]) to contribute to and extend the debate on the importance of KBIs themselves being evidence-informed in how they go about their work. If KBIs do not take an evidence-informed approach to their own work, they may be less effective than they could be. They may also lose credibility and trust by not following their own advice on using research evidence in decision making. This chapter argues that a more overt focus on being evidence-informed can help KBIs reflect on and develop the theory, practice, and study of their work in at least five areas:

1. Needs analysis: appraisal of the pre-existing evidence ecosystem that initiatives wish to influence.
2. Integrating evidence use in wider systems and contexts.
3. Methods and theories of change: initiatives' activities and methods, and the basis for belief they will produce the outcomes desired.
4. Evidence standards: the quality and relevance criteria for evidence claims made by KBIs.

5. Evaluation and monitoring: KBIs' evaluation of their own activities and their contribution to the knowledge base on evidence use.

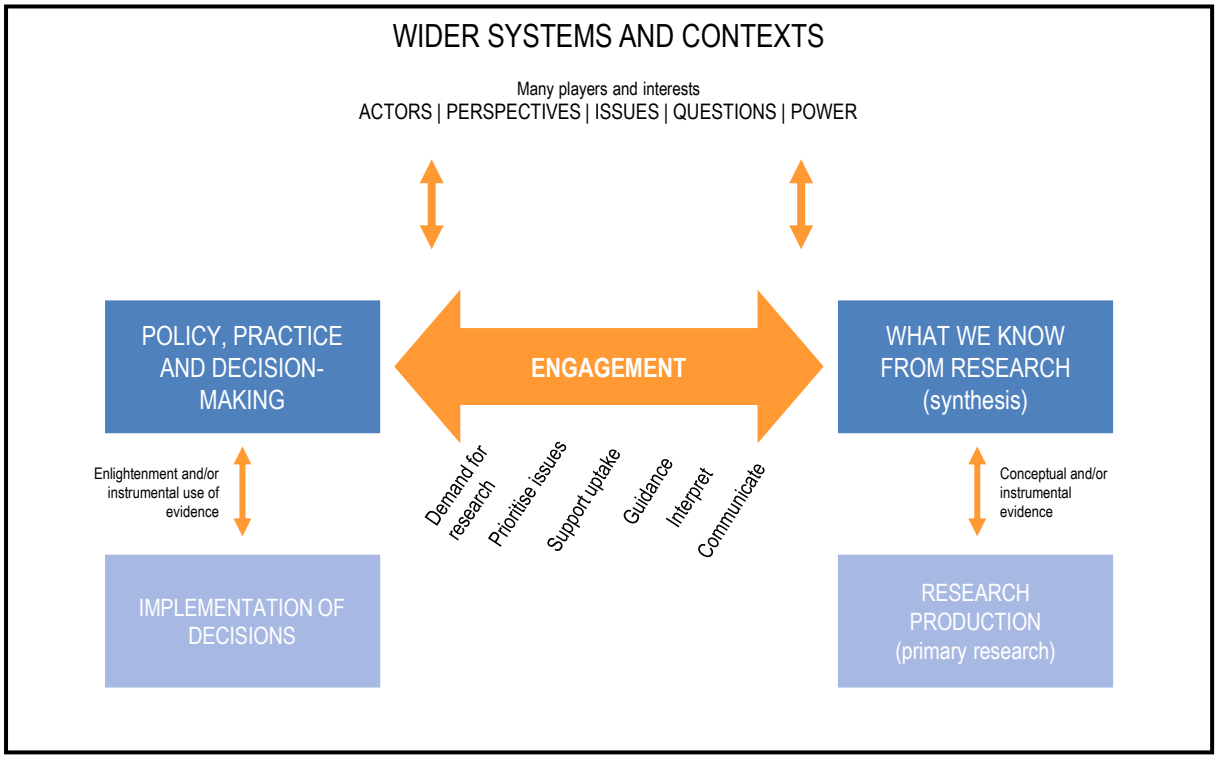
Although the focus is on the work of KBIs in the United Kingdom, the principles and considerations should be relevant to other countries' contexts.

Evidence-informed in their aims and needs analysis

Evidence-informed policy and practice is where relevant research findings are used in an appropriate and useful way to inform decision making. Evidence claims may be justified in some contexts but applied to decisions where they have no or limited relevance; for example, evidence about what works on average may be ineffective or even harmful in specific circumstances (and vice versa).

Matching the needs of the decision maker to the questions asked and the contexts in which they apply involves some engagement between decision making and research production. This can be conceived of as an evidence ecosystem operating within a wider system of various stakeholders influencing research production and research use (Best and Holmes, 2010[7]; Gough, Thomas and Oliver, 2019[8]). The main components of such an evidence ecosystem include decision making, research production, and some engagement between such decision making and research production. All of this activity interacts with wider systems and contexts. An awareness of the components and functioning of evidence ecosystems (as in Figure 7.1) can help KBIs and other actors plan and assess their work.

Figure 7.1. Evidence ecosystem



Note: In this model we have purposely placed 'evidence production' on the right-hand side to guard against evidence use being seen as a process of 'pushing' evidence from producers to users (typically represented as moving from left to right).
Source: Gough, D. et al. (2011[9]), *Evidence Informed Policy in Education in Europe: EIPEE Final Project Report*, http://www.eippee.eu/cms/Portals/41/EIPEE%20final%20project%20report_250711.pdf?ver=2011-11-17-135453-957.

KBIs aim to facilitate the functioning of evidence ecosystems. An obvious starting point, therefore, is to assess the functioning of the evidence ecosystem they are currently or plan to work within. What is the pre-existing nature of research production, engagement with that research by users, and actual use of evidence in decision making? This kind of assessment can inform the choice of strategies to promote the use of research evidence.

So, to what extent do KBIs systematically appraise the relationship between the use and production of research evidence in their field? And having made such an appraisal, what are their strategies for improving the functioning of that evidence ecosystem?

What Works Centres (WWC) are one type of KBI and evidence-use infrastructure. In a study of WWCs in the United Kingdom (Gough, Maidment and Sharples, 2018[5]), the most common aims identified were:

- Primary research base: development of primary research.
- Co-production: by researchers and users of primary and secondary research.
- Synthesis: clarifying the knowledge base.
- User access to research: communication of the evidence to professional practitioners.
- Supporting evidence uptake: enabling the consideration and uptake of research.
- Evidence-informed guidance: developing guidelines/recommendations for practice.
- Enabling implementation: of decisions that have been informed by research evidence, including the use of strategies informed by the behavioural needs of users.

The centres thought that it was important for decision makers to have access to research evidence or guidance informed by research. And, that it is more efficient for a national service to identify relevant research evidence than individual policy makers and practitioners. Nevertheless, it is not always clear why WWCs' predominant aim was to provide access to research evidence when other aspects of the evidence ecosystem could be attended to. At the time of the study, some centres took a more holistic approach to appraising and enabling all parts of their evidence ecosystems and the wider systems within which these existed (including political dynamics), though these might not be included in public descriptions of their work. There was also some explicit discussion of how different KBIs might relate to and interact with each other.

There are also differences in the type of policy and practice issues, and related research evidence that KBIs work with. Many KBIs focus on the identification and implementation of effective interventions or "what works". For some of these, the emphasis is on manualised programmes for intervention with a concern for fidelity of application. Others emphasise effective strategies and mechanisms that can be applied differently in different contexts (Gough, 2021[10]).

There has been development over time in the aims and methods of WWCs in the United Kingdom. Most started with a focus on the synthesis and communication of evidence, and then developed an increased focus on user engagement and implementation. The Education Endowment Foundation (EEF) in particular has invested in developing, and, most importantly, evaluating a number of different strategies for enabling the use of evidence (Sharples et al., 2019[11]), including how schools use research as a result of engaging with the Research Schools Network (Gu et al., 2020[12]), and the scale up of research-informed practice in regards to the use of teaching assistants in schools (Maxwell et al., 2019[13]). Another example is the Early Intervention Foundation's (EIF) work on "Supporting evidence-use in policy and practice" (Wadell, 2021[14]), which advocates a better understanding of the behavioural needs of users (Waddell and Sharples, 2020[15]). Bache (2020[16]) has also written about the role of evidence in the work of the What Works Centre for Wellbeing.

A similar principle applies to expert scientific advisory committees as to WWCs. They provide science advice to parliaments and government departments. What is less clear is the rationale for developing this type of structure. There are other ways governments can access research evidence, such as through academic societies and government research analysts (Gough, 2020[17]).

Ultimately, there are limits to what KBIs can achieve within their context, therefore making well-informed strategic decisions on how, and where, they place their effort and resources is important. KBIs should be more explicit about their analysis of the ecosystem in which they are intervening; what is needed to improve the functioning of this system; why they have chosen their specific strategy; and how their contribution fits into this wider picture. For questions to consider, see Box 7.2.

Box 7.2. Questions about being evidence-informed in aims and needs analysis

The following questions are worth considering by KBIs when establishing their aims and roles:

- **Analysis of the evidence ecosystem**: How has the KBI assessed the pre-existing relationships between the use of research and its production, and the ways in which it proposes to enhance this? The aims may be evident from a KBI's name but is there justification of why a particular approach has been chosen over others?
- **Specific aims**: Which particular parts of the pre-existing evidence ecosystem does a KBI wish to change? What does it wish to change? What type of user issues and what types of research evidence and evidence claim does it focus on?
- **Users and beneficiaries**: Who will use and/or benefit from the KBI's work?
- **KBI development over time**: What changes are there in the focus of their work overtime and the reasons for this (including changes in the wider evidence ecosystem or their position within it)?
- **Collaboration within the evidence ecosystem**: What interactions are there with the other actors (including overlaps with the aims and work of other KBIs and collaboration with them)?

Integrating evidence use in wider systems and contexts

A key consideration for KBIs as intermediary organisations is how they sit and work within wider systems and contexts. This includes not just the systems of evidence production, mobilisation and use they are part of but also the wider political and societal systems in which the benefits of evidence use will be realised. Evidence activities do not work in isolation. They sit within complex systems outside of research, with multiple actors and influences, each with their own priorities, processes, timescales and motivations e.g. policy, improvement, funding, accountability systems (Best and Holmes, 2010[7]). In this type of "systems" model, KBIs are effective when they integrate well with external organisations and the systems in which they operate. Put another way, you could, in theory, create an elegant evidence ecosystem with excellent, well-connected processes yet have little impact if those activities fail to achieve traction in the wider systems.

The study on What Works Centres in the United Kingdom found that all centres face challenges in impacting these wider systems. This should not come as a surprise. Firstly, the systems that WWCs are trying to engage with – such as accountability, funding, and policy systems – are often predominant influences in the sector. For example, the high-stakes accountability system in English education has a huge influence on the decisions schools make, meaning that the Education Endowment Foundation needs to find a way of complementing, rather than competing with, these accountability processes.

Secondly, the wider systems are not always structured in a way that is receptive to research evidence, and cannot naturally accommodate the work of the WWC. For example, the relatively short timeframes for government policy making are not necessarily commensurate with the longer timeframes of designing, conducting, synthesising, interpreting and using research.

A third, related, challenge for WWCs is that they typically operate in sectors with historically weak track records and cultures of engaging with research. Indeed, many WWCs see an important aspect of their work as encouraging a long-term culture shift towards research engagement and use as part of evidence-informed policy and practice. This challenge is even greater when the remit of a WWC includes changing perspectives and understandings on the focal issue itself, such as is the case for the What Works Centre for Wellbeing.

The challenges WWCs face is typical of most KBIs, research organisations, universities and funding bodies that are trying to influence wider decision making. In this respect, there are potential advantages to having a single organisation such as a What Works Centre acting as a focal point for evidence-informed decision making. By operating in the synthesis, communication and engagement domains of the evidence ecosystem (see Figure 7.1), WWCs process and coordinate a large, and, potentially, overwhelming, body of evidence. Consistent standards, processes and styles can help develop a brand where users expect a certain type of output, leading to increased confidence in the results.

However, if KBIs are working predominantly in only one element of the evidence ecosystem, how do they best go about influencing the wider, non-evidence systems? Where and how does that wider coordination take place?

In this context, the natural progression we observed for WWCs to take on a broader remit – such as supporting more active uptake of evidence – is a logical response in providing more coordination to the system by doing more functions. An alternative strategy is to retain a tighter remit and operate in a system where there is more overarching coordination (e.g. the National Institute for Health and Care Excellence [NICE] in the healthcare system). In this scenario, KBIs may attempt to manage some overarching coordination, influence it or stay largely removed.

Whatever the approach, KBIs need to be adept at identifying levers of influence, nimble in capitalising on opportunities as they arise, and persuasive in their approach. Doing so relies on being able to understand and influence the wider systems and contexts in which they operate. Some of this knowledge can be sophisticated without being explicit. Indeed, we noted that having an implicit awareness of, and influence on, wider systems at leadership level was an important strategic advantage for What Works Centres. At the same time, we saw few examples of attempts to explicitly analyse the evidence ecosystem and its relationship with the wider systems. It is notable that the model describing the What Works Network did not include a representation of the non-evidence systems (Cabinet Office, 2018[18]). See questions to consider in Box 7.3.

Box 7.3. Questions about awareness of the wider systems

The following questions are worth considering by KBIs in relation to their interactions with wider systems and contexts:

- **Analysis of wider systems:** Is there a receptive infrastructure for the work of KBIs? What is the relationship between a KBI and that infrastructure? What strategic choices are KBIs making to engage with the wider systems?

- **System-level coordination**: Whose responsibility is it to create a receptive infrastructure for the work of the KBIs? Who coordinates the overall evidence ecosystem and the wider systems?
- **Relationships**: What relationships exist between different actors in the evidence system and wider systems (e.g. government)? What is the quality of those relationships and how do they impact on the work of the KBI?

Evidence-informed in their methods and theory of change

In addition to, and highly related, to the aims of the KBIs, are the methods and theories of change by which these aims will be achieved. If the aim is, for example, to synthesise and communicate evidence, KBIs will likely state the methods they use to achieve this. The study of WWCs (Gough, Maidment and Sharples, 2018[5]) and another study of evidence web portals (Gough and White, 2018[19]) found considerable variation in the nature and extent of their description of KBI methods of work in terms of:

- The use of standardised specific methods, guidance that allows flexibility, or individual project specific methods.
- Explaining and justifying the choice of specific methods.
- The quality of reporting of those methods.

KBIs are increasingly developing Theories of Change i.e. an evidence-based rationale that builds on causal analysis and explains how a set of interventions is expected to lead to a specific change. In doing so, they are explicit about how their methods will achieve their fundamental aims (Bache, 2020[16]; Gough, 2021[10]; Wadell, 2021[14]). But there are still instances of KBIs assuming an approach will be effective and useful without being explicit about why.

This is well illustrated by the communication of research findings, a default approach to supporting user engagement and decision making (Davies, Powell and Nutley, 2015[20]). But evidence from "research on research use" shows that the communication of research findings on its own is not associated with increased use of those findings (Langer, Tripney and Gough, 2016[4]). EEF has shown this through its multi-armed randomised controlled trial of different ways to communicate research on literacy to teachers, where no evidence was found that any of these strategies were effective on their own (Lord, Rabiasz and Styles, 2017[21]). Communicating evidence does not guarantee it will be used.

There are behavioural factors to consider, such as the capacity (personal attributes), opportunity (environmental attributes) and motivations (psychological processes) that enable the use of evidence (Michie, van Stralen and West, 2011[22]). Research use activities can often be driven by a desire by researchers for their findings to have impact, rather than by user demand for research on particular topics and perspectives, or more nuanced interactions between evidence and policy (Boswell and Smith, 2018[23]; Langer, Tripney and Gough, 2016[4]). This can be addressed by KBIs, for example in the previously mentioned EIF project that designed KM strategies based on an understanding of the behavioural needs of research users (Waddell and Sharples, 2020[15]).

There are also strong examples of KBIs integrating user perspectives into their work. The National Institute for Health and Care Excellence (NICE), for example, has a stakeholder-driven process for identifying health and social care practice questions; commissioning systematic reviews to address these issues (including the cost/benefits of different actions); and then stakeholder-driven interpretation of this to make recommendations for practice. The process is supported by research on stakeholder engagement, synthesis of evidence, social values, and the importance of contextual information (Gough, 2021[10]; NICE, 2020[24]).

Some KBI strategies put an emphasis on building relationships between researchers and potential users of research, as in, for example, the secondment of researchers to government departments. However, "research on research use" indicates that such relationships are, again, a necessary but not sufficient condition. Relationships can have an effect on research use as long as it is accompanied by efforts to increase the capacity, opportunity and motivation for the evidence to be used in practice (Langer, Tripney and Gough, 2016[4]).

Similar questions about the nature of the brokerage activity can be asked of expert scientific advisory committees. There is not always clarity about how they identify and select experts to be members (including skills, topic areas, relationships with and perspectives shared with government). The functioning of the committees and how they make decisions is also unclear (Gough, 2020[17]; Geddes, 2020[25]). As the methods and processes are not explicit, theories of change about their outcomes (and how this would differ from other ways to provide science advice) lack clarity.

In sum, KBIs could build further confidence in their value and impact by demonstrating that their ways of operating are based on evidence on research use. See questions to consider in Box 7.4.

Box 7.4. Questions about methods and theories of change

The following questions are worth considering by KBIs when establishing their methods and theories of change:

- Has there been **overt consideration** of:
  - i) both the demand ('pull') as well as the production ('push') components of the evidence ecosystem
  - ii) the engagement of the planned users and beneficiaries in the work and their role and power in such decision making
  - iii) the capacity, opportunity and motivation of decision makers to use research evidence in their work
  - iv) potential negative effects and risks from the KBI's work and how will these be avoided or ameliorated
  - v) sustainability of the aims, methods and theories of change and capacity of the KBI to achieve this over time?
- **Theory of change**: What specific methods are being used and what is the causal chain by which these are thought to achieve the interim and ultimate aims of the KBI?
- **Fitness for purpose and effectiveness**: What is the basis for believing that the methods and theory of change are appropriate and effective and that this is supported by "research on research use"?

Credible standards for making justifiable evidence claims

KBIs aim to increase the use of research evidence by decision makers. In communicating selected research evidence, they are making claims about the trustworthiness and relevance of research evidence, and so the criteria they use for making such evidence claims are key. The strength of evidence required to inform a decision may depend, of course, on the importance of the decision and the opportunity costs of making a decision one way or another. A short-term response to an immediate crisis is not the same as a long-term policy strategy. Whatever the nature of the decision, there is the danger that if the evidence claims are based on weak or inconsistent standards (and so not justifiable), then the users of research

may be misled. Similar arguments can be made for the use of evidence provided by expert witnesses in courts (Ward, 2015[26]) and scientific advisory committees. The evidence claims need to be both justifiable from the research and relevant to the issue at hand.

An evidence claim may not be justified for many reasons including:

- Representativeness of the evidence base: The claim is made on the basis of research findings that are not representative of all of the relevant and trustworthy studies on an issue.
- Quality and relevance: The research is not of sufficient quality (methodologically trustworthy) and relevance to be relied upon.
- Extent of evidence: The research is of sufficient quality and relevance but is not sufficient in extent to make the specific evidence claim (for e.g. trustworthy relevant evidence may be available on a large population but it might not be able to make justifiable claims about some sub-populations).
- Interpretation and application: The research findings are not being applied appropriately to the issue under consideration.

When making a claim about what is known about a particular research question, it is, of course, important to consider all of the relevant evidence rather than individual studies that may not be representative of all of the relevant and trustworthy evidence. The appraisal of evidence, therefore, requires an assessment of: (i) the ways that the evidence has been identified and brought together; (ii) the quality and relevance of the studies included in such reviews including ethical issues; (iii) and the nature and extent of the totality of all of the relevant evidence (Gough, 2021[10]).

There can be dangers in only focusing on individual studies on their own. An example is the pressure that academics can be under for their research to have an impact. Their individual studies may be of high quality, but a decision maker would be better informed by knowing and being able to take account of all relevant justifiable research claims.

One way to examine the evidence standards of KBIs is to examine the evidence claims in their summaries of “evidence-informed” policy and practice interventions, as in evidence portals and toolkits. The recommendations of portals may have widespread effect. Results for the United States, for example, has produced an Economic Mobility Catalog, a web-based resource for local governments to identify strategies that are effective in driving upward social mobility. The ratings of “good enough” evidence are based on the ratings provided by a number of evidence portals that may have different evidence standards.[2]

The previously mentioned small international survey of 15 national and international evidence portals found that only six of the portals used a formal (systematic) method of identifying and synthesising evidence informing users of research about effective interventions (Table 7.1). In some cases, there was variation in the standards used within a single centre.

Two of the portals used expert reviews, where a researcher uses their knowledge of a field to provide an overview of what is known. Such reviews may be excellent but rely on the knowledge of the expert, which may not be systematic in the depth and detail that they are able to identify, evaluate and synthesise knowledge from different studies.

Five of the portals in the survey based their evidence claims on the basis of one or two good studies. The danger with such an evidence standard is that it is not considering the whole knowledge base and there may be many other good quality studies that found an opposite result. It is interesting that most of the portals using the “1 or 2 good studies” criteria were focused on the effectiveness of intervention programmes (a specific combination of intervention components) rather than evidence of particular intervention strategies. Specific programmes are useful for indicating efficacy where there is intervention fidelity but may be less adaptable to contexts that differ significantly from those in which the programmes were developed. Table 7.1 shows that for the five portals providing evidence on programmes, just one or two studies were enough for the evidence portals to inform users that the programmes were effective.

The evidence standards of at least one of these portals have improved since the survey but it is clear that the standards of some KBIs for making an evidence claim of effectiveness can be quite low.

Table 7.1. Web-based portals evidence standards for making evidence claims of efficacy

Basis for applying criteria	Intervention programmes	Intervention approaches
Systematic review	0	6
'Narrative/ expert reviews'	0	2
Listing studies and results	0	2
Vote counting	0	0
One or two good studies*	5	0
Total N=15	**5**	**10**

Note:
* Maybe plus no evidence of harms from the intervention.
Source: Adapted from Gough, D. and H. White (2018[19]), *Evidence Standards and Evidence Claims in Web Based Research Portals*, https://eppi.ioe.ac.uk/cms/Default.aspx?tabid=3743.

Specific standards will depend on the research questions being asked and the evidence claims made in response to these (Gough, 2021[10]). The nature of the evidence and the standards for making evidence claims vary between, for example, research evidence on the effectiveness of an intervention, and the evidence in support of a causal model by which it had its effect.

The term "evidence standards" itself can be problematic in that it is used to describe a range of different approaches to supporting or appraising research to make justifiable evidence claims. These approaches can include (Gough, 2021[10]):

- Methods standards criteria (methodological criteria for making an evidence claim).
- Methods guidance (advice as to appropriate research methods to make justifiable evidence claims).
- Internal quality assurance (processes for ensuring that research methods are performed appropriately).
- Reporting standards (criteria for transparent reporting of the execution of research).
- Methods appraisal (procedures for checking and reporting on the relevance and trustworthiness of research studies and the basis of their evidence claims).
- Stage of development, appraisal of effectiveness, and implementation of interventions (the extent that a certain policy or practice intervention has research evidence to justify its effectiveness and use).

All of these may be specified in extensive or minimal detail. There is, thus, much potential for confusion about what "evidence standards" means, as well as the bases or making judgements within each of these different types of standards. Clarity about these issues is an important area for KBIs to be clear, consistent and coherent.

In sum, inadequate or inconsistent evidence standards could lead to audiences misinterpreting or placing too much trust in the findings and guidance presented. See questions to consider in Box 7.5.

Box 7.5. Questions about the use of credible evidence standards for making evidence claims

The following questions are worth considering by KBIs when establishing and reporting their evidence standards:

- **Transparency**: Do the KBIs fully and explicitly report their specific methods and criteria for making evidence claims? Are these simple lists or are they manuals providing detailed explanations of the nature and basis of such judgements?
- **Consistency**: Are the KBIs consistent in their methods and criteria for making different evidence claims in different outputs?
- **Clarity**: Are KBIs clear about the nature of the evidence claim and how it is relevant and fits the needs of those to whom the claim is being communicated?

Evaluation of KBIs and contributing to the "use of research" knowledge base

For KBIs to be evidence-informed, it would be expected that they evaluate their progress in meeting their aims and modify their activity in response to their evaluations (as per Section 2 on the KBIs' theories of change). Such evaluation would also allow KBIs to provide research findings to contribute to the scientific knowledge of "research on research use".

KBIs are naturally focused on the activities that they have been funded for. There may be few resources available for them to commission external independent or internal self-evaluations. There are, of course, exceptions, with some KBIs formally evaluating most of their activities.

Where evaluation does take place, a distinction can be made between monitoring work activity, measuring the achievement of desired outcomes (KBI goals), and the processes by which these are achieved. Monitoring activity can be relatively straightforward, such as recording numbers of meetings or products produced. For measuring the extent of desired outcomes, a distinction can be made between interim and final outcome measures. Interim measures can be testing stages in a hypothesised theory of change and the processes involved.

Assessing detailed theories of change are rare and interim measures of assessing change can be very simplistic, such as web analytics of visits to KBIs web pages. These may indicate that users at least have had some contact with KBIs' resources, though this does not necessarily mean that this has then informed decision making, policy and practice. "Use of research" means that research evidence was considered though it may not always be easily apparent what role the research had in the decision-making process.

The case of expert scientific advisory committees for government is relevant as there do not seem to be clear methods by which they are evaluated. There has been a focus on how government uses advice to respond to health emergencies such as the Bovine spongiform encephalopathy (BSE) crisis (Hinchliffe, 2001[27]) and now the COVID-19 pandemic, with the latter subject to an inquiry by the UK parliament's Science and Technology Committee.[3] There is also research on the use of evidence by legislatures (Geddes, 2020[25]; Kenny et al., 2017[28]).

Final outcome measures are often weakly specified. If the overall aim of a KBI is to increase the use of evidence, then any data showing use has increased may be a measure of success (though in such "natural experiments" the data is correlational and one cannot be sure what the cause of the changes are). This does not necessarily mean that the research has been used wisely or appropriately – just that it has been used. Even where the research has been wisely used, it may have led a decision maker to stop a planned action and so the influence of the KBI may be difficult to measure.

A more detailed way of appraising outcomes is to assess the effects on the intended beneficiaries of a KBI's work. KBIs occasionally do measure changes in achievements of their ultimate beneficiaries (e.g. pupil attainment), although this is rare (for e.g. Sibieta and Sianesi (2019[29])). For expert scientific advisory committees, final outcome measures could be based on whether the advice was acted upon and by the nature of the outcomes ultimately achieved.

In sum, external or self-evaluation is important in determining whether and to what extent KBIs are meeting their objectives, and how they or others can better meet such objectives in the future. See questions to consider in Box 7.6.

Box 7.6. Questions about evaluation of KBI's work and contribution to the knowledge base

The following questions are worth considering by KBIs in terms of being evidence-informed in evaluating their work:

- **Rigorous evaluation**: Are KBIs indicating how they are meeting their aims (and other positive and negative effects) through the planned interim and final outcomes and appraisal of their theory of change?
- **Strategic development**: How do KBIs use their evaluations to adjust and develop their work over time?
- **Evidence of effect**: Are KBIs providing justifiable and relevant evidence claims about their positive contribution to the users and/or planned ultimate beneficiaries of their work?
- **Evidence standards**: Is there evidence for making any such claims (including the methods used to assess change and the use of subjective or objective measures of change)?
- **Research on research use**: Is KBIs' work contributing to the knowledge base on "research on research use"?

Discussion, implications and recommendations

There are relatively few studies of "research on research use" despite it being a key area of social science with major practical implications. The use of evidence is an issue for all sciences and its study is the one area of social science that applies to all other sciences.

This chapter contributes to the debate on how knowledge brokerage intermediaries (KBIs) can advance the study and practice of using research evidence by using evidence in their own decision making. It has provided some examples of how KBIs have become more explicit about being evidence-informed, particularly in regards to their aims, beneficiaries and methods to enable the uptake of research evidence. A number of recommendations are outlined in Box 7.7 below.

It is useful to consider why KBIs are not always evidence-informed in their work. One reason may be that the funders of new initiatives and the initiatives themselves are focused on action. The initiatives wish the tasks they undertake to progress, and they may be evaluated and obtain further funding on the basis of such activity, products and outputs. When KBIs are initiated, particularly when the focus is on providing access to research evidence, there may be an expectation of immediate evidence products. Evidence standards may then continue to develop organically rather than systematically and not be applied consistently.

The priorities of funders and initiatives is often on actions to increase research use rather than seeing the actions themselves as something that needs to be evidence-informed. There has only been limited research on KBIs. The Economic and Social Research Council (ESRC) in the United Kingdom, for

example, partly funds some What Works Centres (WWCs), as well as studies of their work, but such studies tend to be administrative appraisals and development work rather than academic studies of the nature and effectiveness of knowledge brokerage (ESRC, 2016[30]).

A second possible reason is that even though KBIs should be major players within evidence ecosystems, they may not fully take on board an ecosystem perspective. It seems common sense that research needs to be communicated to decision makers in order for it to be used and that the role of KBIs is to provide access to research evidence. Yet, it is the obviousness of this process that hinders reflections on the limitations of simply "pushing" research to users.

Similarly, developing relationships between researchers and decision makers, and seconding researchers in policy departments can seem indisputable. Yet, "research on research use" indicates that such mechanisms in themselves may not be sufficient. What is needed is a holistic approach to examining the evidence ecosystem and using evidence in judging how a KBI can most effectively contribute.

Neglecting "research on research use" jeopardises KBI credibility and effectiveness. The analysis and recommendations in this chapter are intended to help increase the coherence of the planning and evaluation of KBIs and further develop knowledge brokerage as a field. But we must also acknowledge that political issues within the wider ecosystem, within which evidence ecosystems exist, may, of course, have a larger impact than the rational arguments of being evidence-informed.

Box 7.7. Recommendations

Recommendations for KBIs:

- Examine the functioning of the existing evidence ecosystem and make informed decisions as to where best to intervene and how. Clarify the needs analyses and opportunity costs of different possible strategic choices.
- Undertake an explicit analysis of the wider systems and contexts in which the KBI sits, to inform Theories of Change and engagement strategies. Consider whether there is a receptive infrastructure for the work of the KBI and where responsibility lies to coordinate the evidence ecosystem. Seek to actively influence and shape the wider systems and contexts to build readiness and receptivity for the work of the KBI.
- Be explicit in specifying how the methods being used will achieve the interim and overall aims of the KBI e.g. theories of change. Outline the evidential basis for how the methods are appropriate and effective, and supported by "research on research use".
- Be evidence-informed in the use of credible evidence standards for making evidence claims in terms of:
  - Transparency: Explicitly report specific methods and criteria for making evidence claims.
  - Consistency: Be consistent in the methods and criteria for making different evidence claims in different outputs.
  - Clarity: Be clear about the nature of the evidence claim and how it is relevant and fits the needs of those to whom the claim is being communicated.
- Use external and self-evaluation to determine whether, and to what extent, KBIs are meeting their objectives, and how they or others can better meet such objectives in the future.

Recommendations for policy makers

- Recognise that evidence use and the work of KBIs cannot be considered in isolation but, instead, sits within the broader context in which schools operate. Consider how the wider

systems in education – accountability, school improvement, teacher training etc. – can enhance effective evidence use.

- Promote evidence use as a clear priority throughout the system to encourage alignment and consistent expectations at different levels of the system e.g. leadership, regional policy.
- Actively encourage and support the development of coordinated, trusted and fluid interactions and relationships between KBIs and other actors in the evidence system e.g. schools, policy makers.
- Consider where the responsibility lies to coordinate the overall evidence system, and provide active coordination and support if needed.

Recommendations for funders

- Work with policy makers and KBIs to consider the overall evidence ecosystem and where funding may be best directed to address weaknesses in that system.
- Encourage KBIs to establish clearly defined theories of change as part of funding agreements, specifying how the methods being used will achieve the aims.
- Recognise that short-term funding and budget inflexibility limit the capacity of KBIs to be strategic in the medium- and longer-term – where possible aim for longer cycles of funding and upfront endowments that encourage strategic flexibility.
- Fund monitoring and evaluation of KBIs' activities and outputs, as well as delivering services.

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Notes

[1] This chapter is adapted from an open-access paper published in *Evidence & Policy* (Gough, Maidment and Sharples, 2021[31]).

[2] See Results for America, *About the Economic Mobility Catalog*, https://catalog.results4america.org/about.

[3] For more information see https://committees.parliament.uk/work/91/uk-science-research-and-technology-capability-and-influence-in-global-disease-outbreaks/publications/

Part III
New approaches to understanding research use

8 Communication, collaboration and co-production in research: Challenges and benefits

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Based partly on the personal experiences of the author, this chapter suggests that research use and impact in education should be discussed in a perspective of co-construction. It presents various forms of cooperative knowledge production in which researchers and practitioners communicating bi-directionally support mutual learning and adaptation. Most of these forms require attitudinal and behavioural changes on the part of both researchers and practitioners. Innovation and knowledge-management approaches could add a positive dimension to research use and impact.

Introduction

The OECD Centre for Educational Research and Innovation (CERI) project on *Strengthening the Impact of Education Research* was prompted by concern that the use of educational research outcomes (by both policy makers and practising teachers) is not as effective as it should be. Many share the implicit assumption that *researchers* produce outcomes (new knowledge, evidence) that will have an impact on the behaviour of *users* (practitioners, policy makers).

This reflects what innovation researchers call the Science, Technology and Innovation (STI) mode in contrast to the Doing, Using and Interacting (DUI) mode (Jensen et al., 2007[1]; Lundvall, 2000[2]). In the STI mode of knowledge creation and innovation, the *researcher community* is seen as the protagonist while the *users* of the knowledge created by this community appear as secondary players. In contrast, in the DUI mode, knowledge creation is conceived as a cooperative process and both sides equally participate in creating innovations.

The strength of the STI approach lies in its simplicity. This way of thinking about research impact is also strengthened by the fact that the related communication is typically led by researchers: “Much of the academic research that studies research use places the researcher at the centre of the process” and “researcher-centric models and frameworks for research use” dominate the discourse (Lemay and Sá, 2012[3]). Challenging this approach is not made easier by terms such as “evidence-based” or “evidence-informed” policy and practice, which imply a clear distinction between those who produce the evidence (researchers) and those who “use” it or are “informed” by it (practitioners).

The increasingly popular term “knowledge mobilisation” (KMb), however, opens up space for a non-linear perspective that emphasises co-creation or co-production; that is, a form of knowledge creation in which researchers and practitioners work together to find solutions to challenges generated by practice. "Research knowledge is mobilised effectively when organisational leaders, practitioners, policy makers and researchers from different institutions and contexts learn together using research to inform thinking and professional practice" – write the editors of an oft-quoted book in their introduction on the impact of education research (Qi and Levin, 2013[4]).

Though it has not always received the emphasis it needs, the non-linear, co-creation approach implied in the DUI mode has been increasingly present in initiatives such as this CERI project. This is reflected in the formulation of research questions where “relationships and interactions” and the skills needed for “co-producing research” are among the key themes. This chapter argues that the DUI mode should receive more attention. Six existing practices based on this mode are explored in this chapter from a knowledge mobilisation perspective.

The author of this chapter uses, beyond the relevant literature, his own personal experiences as the former head of a government-affiliated national research and development institute; former leader of a doctoral school of education; former chair of a national body funding basic research in education and psychology; and long-serving member of the CERI Governing Board of OECD, who has often served on OECD review teams in various countries. This personal background is relevant to this chapter in that the author has experience in the continuous mediation between communities of researchers, school practitioners and policy makers and how they relate to each other. Because these three stakeholder groups each have their specific understanding of what relevant and valid knowledge is, how this knowledge should be created and how it can be used, there have been opportunities but also constraints in building bridges between them, examples of which the author recounts.

Use of evidence and knowledge mobilisation

The impact of research is very often interpreted as the effective use of evidence produced by researchers. This interpretation is present in many initiatives aiming to improve knowledge mobilisation, including the CERI project. It is well known that the role of research-generated evidence in education is not without controversies: This was visible in the earlier CERI project, *Evidence in education* (OECD, 2007[5]), launched a few years following the adoption of the No Child Left Behind Act in the United States (NCLB Act). It defined a hierarchy of evidence, placing randomised controlled trials at the highest level.[1]

David Berliner, former president of the American Education Research Association to the NCLB Act (2002[6]), affirmed that the bill mentioned over 100 times the terms "evidence-based practices" and "scientific research" as "code words for randomized experiments" and that this was causing harm because it "confused the methods of science with the goals of science" (Berliner, 2002, p. 18[6]). In a recent book about the use of research evidence in public policy in the United States, the authors highlighted that while "research-based evidence has an important role to play in many sectors in the US, including healthcare, mental health, child welfare, employment, environmental management and criminal justice (…) it is in education that many of the evidence debates are sharpest." (Nelson and Campbell, 2019[7]).

Among the many dilemmas and challenges the "users" of research evidence face, one of the most salient ones is that the evidence needed for answering specific questions is simply not available. This can be aggravated by insufficient behavioural flexibility among parties involved in the policy-making process when, for example, researchers cannot accept the constraints of the policy process or are indifferent to policy needs. This also happens when "users" (policy makers or practitioners) have unrealistic expectations about what research can provide. Such behavioural inflexibilities can block mutual learning and adaptation (see two examples in Box 8.1).

Box 8.1. When behavioural inflexibilities block policy making: Two examples

In the middle of the 2000s, following the creation of a system of general competence measurement in Hungary, a national body overseeing evaluation in the education sector was set up with members from both the decision maker and the researcher communities.[2] A debate emerged on the allocation of resources to improve the measurement system. Some members suggested that resources should be provided to improve the accuracy of measurements while others thought more investment should be made on improving schools' capacity to react to the feedback they received on measurement results. Researchers successfully convinced decision makers to use the resources for improving measurement accuracy and no money was spent on improving organisational capacity building. The author of this paper – also member of this body – perceived this as a failure but other researcher members saw this as a major success.

The other example comes from a similar mixed composition body in Hungary. Again, in the middle of the 2000s researchers were invited by the national development agency responsible for designing and implementing European Union (EU)-funded development programmes to participate in the design of interventions aimed at integrating children belonging to the Roma minority. Some members of the researcher community refused to give advice, arguing there was a lack of reliable evidence on the causes of Roma children failing in schools, factors that can cause it and those that can compensate for it. They insisted that 2-3 year-long research projects should be launched before any decision be taken to include interventions targeted to Roma integration into the national development plans though actors representing the policy side made it clear that if no positive decision was made in the next two months, development resources would be transferred to other policy areas.

Researchers, oriented by legitimate methodological considerations and reliability/validity concerns, are often indifferent towards policy needs and policy constraints. In both cases described in Box 8.1, considerations and concerns led to sub-optimal solutions: In the first case, the outcome was more accurate measurement without real impact on quality improvement and in the second, fewer resources spent on important development interventions. They both demonstrate a frequent attitude of the researcher community towards policy practitioners: "We know what the right solution is, you just have to do what we tell you," or "Wait until we produce reliable evidence."

In the DUI mode, where the emphasis is on mutual learning and co-creation of knowledge, the role of behavioural factors is particularly strong. This is visible especially when researchers are invited to work in "design mode"; that is, instead of producing context-free evidence they are invited to use their knowledge to support practitioners with challenging practical issues in specific contexts.

Design-based research

The article on design experiments written by cognitive psychologist Ann Brown, former president of the American Educational Research Association, demonstrates the complexity research encounters when it supports interventions into educational practice (Brown, 1992[8]). Brown's article talks about the science of education as one of the "design sciences", comparing it, among others, to aeronautics where there are "myriad possible ways that things can go wrong". Since the publication of this article, thousands of papers have been published on what we today call "design-based research", and it is still gaining popularity. The way those applying this approach think about the research-practice nexus is well illustrated by this definition:

> *This iterative design process allows the researcher to move beyond simply understanding the world as it is, and involves working to change it in useful ways with the broader goal of examining how these systematic changes influence learning and practice (Barab, 2006, p. 151[9]).*

What happens in the co-creation mode cannot be adequately described as "utilisation" and even the word "impact" might be somehow misleading. If we look, for instance, at the CERI project, *Teaching, assessing and learning creative and critical thinking skills in primary and secondary education*,[3] we see both research utilisation (e.g. using PISA-like tests to measure impact) and co-creation. The latter consists of the development of teaching instruments in collaboration between researchers and practitioners (Vincent-Lancrin et al., 2019[10]). This was a typical activity in the research and development institute led by the author of this paper during the 2000s. Researchers worked together with schools, teachers (and, also, pupils) to develop new pedagogical solutions. In these collaborative activities, teachers were not just "using" research but were active knowledge creators. It was natural for researchers to learn from them, to use their knowledge to improve the quality of research (Mayer, 2009, pp. 95-118[11]) (see three examples of co-creation in Box 8.2). Besides strengthening the impact of research on practice, we need to strengthen *the impact of practice on research* as well.

Box 8.2. Researchers and practitioners co-creating solutions: Three examples

Give and take between researchers and policy makers

An example from the Hungarian Institute for Educational Research and Development's practice is the co-design and "co-implementation" of research projects with policy makers. The institute pro-actively involved government officials in the design and implementation of research projects through small steering bodies operating in tandem with each project. Together, researchers and policy makers discussed every detail of the research in these steering bodies, including issues of research methodology. It is important to stress that this was made possible only through the strategic

development of an appropriate organisational culture – a process that lasted about two or three years. This allowed for a gradual rapprochement of different languages and the emergence of mutual trust. Both sides made many concessions. For example, government decision makers gradually accepted that they could not get immediate answers to their questions because methodologically sound research takes time. Researchers learnt that decision makers cannot always wait for research outcomes to be produced but have to make decisions on the basis of available, limited knowledge.

The importance of listening

The Hungarian national agency for educational curriculum research and development organised regular workshops to discuss research outcomes with practising teachers and school leaders. The first experiences were rather disappointing. Invited teachers remained passive: They listened attentively to the presentations made by the researchers without saying anything about their own knowledge and experiences, which they thought were irrelevant. We made an explicit request to our researchers to change their behaviour so that they would listen to what the teachers, i.e. practitioners had to say and encourage them to express their views. This resulted in a gradual change: Several months were needed to change the communication pattern. Researchers had to learn to "decode" the less structured discourse of practising teachers and distil the scientifically relevant elements from their stories.

Behavioural change takes time

The next example comes from a European Union-funded project aimed at developing a doctoral programme focusing on teacher education research. The author's university (Eötvös Loránd University) was responsible for the work package of building partnerships with external institutions, mainly schools. At the first partnership meetings, the school representatives had difficulties understanding the expectations of the doctoral school: They could not answer, for instance, the question of what benefits they could gain from hosting doctoral students to do their internship in their school. Again, more time was needed for change to happen. After about one year, school leaders started to propose more creative ideas about how having doctoral internship students at their school could build knowledge about their own institution and enhance school improvement. These developments were included in a guideline on partnerships between schools and doctoral programmes developed in co-operation between the two parties (EDiTE, 2016[12]).

Source: EDiTE (2016[12]) (2016), *Guideline for Building Institutional Links*, https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e5ab474665&appId=PPGMS.

The difference between the first and second example in Box 8.2 can be explained by the different attitudes and behaviours of researchers. In the second and third cases, they were led by the explicit intention of listening to practitioners and learning from them instead of looking at them as recipients of research-generated knowledge. They were committed consciously to move from the STI to the DUI mode.

Research-practice partnerships

The Triple Helix and Knowledge Triangle models of innovation in which three parties interact – typically, academia, industry and government was the inspiration for the school-university partnerships discussed earlier (Halász, 2016[13]). Originally such partnerships were used to improve teacher education (Tsui et al., 2009[14]) but in the example above it supported researcher training in a doctoral school (Baráth et al., 2020[15]). The strength of the partnership approach is that it can create highly institutionalised and prolonged researcher-practitioner collaboration in the form of a "third space", where partners work together

on an equal basis led by their common interest. A particularly advanced form of this model can be seen in the so-called research-practice partnerships of the 1990s in the United States.

A remarkable example of the DUI approach is the Consortium on Chicago School Research created in the 1990s to support city-level school reforms. What one can see in this initiative is the emergence of a dynamic ecosystem with intensive collaboration and communication between university-based researchers, schools and district-level decision makers. The activity of the Consortium was guided by a number of basic principles, summarised below:

> *(1) If research is to be effective, researchers must pay careful attention to the process by which people learn, assimilate new information and ideas, internalise that information, and connect it to their own problems of practice;*
>
> *(2) Research must be closely connected over time to the core problems facing practitioners and decision makers;*
>
> *(3) If research is to build capacity, the role of the researcher and the product of research must change from outside evaluator or expert to engaged and interactive participant in building knowledge of what matters. (Roderick, Easton and Sebring, 2009[16])*

The Chicago model has been replicated in several cities in the United States (Coburn, Penuel and Geil, 2013[17]; Farrell et al., 2021[18]). According to Coburn, Penuel and Farrell (2021[19]), research-practice partnerships (RPPs) have five distinctive characteristics:

1. Their duration is relatively long.
2. They focus on “problems of practice”.
3. They are “committed to mutualism”.
4. They use “intentional strategies to foster partnership”.
5. They produce “original analyses”.

These authors distinguish three major existing forms of RPPs:

1. Research alliances that are typically institutionalised partnerships between research organisations and local education agencies, focusing on ‘‘local policy and practice questions’’.
2. Design partnerships that aim at creating new pedagogical solutions ‘‘in real-world contexts’’, typically focusing on ‘‘developing and testing instructional materials’’.
3. Networked improvement communities that seek ‘‘to leverage diverse experiences in multiple settings” and ‘‘to understand what change strategies work, where, when, and under what conditions’’.

This way of connecting research with practice is in sharp contrast to the model in which the two sides remain in isolated spaces and are connected by brokering actors. The utilisation of research outcomes for researchers in such dynamic knowledge ecosystems is a natural element of the research process; it does not appear as a separate, supplementary task. Beyond the five characteristics listed above, RPPs typically include capacity-building components as well, and have transformative goals; that is, they have the intention to improve practice, often promoting radically new solutions (see an example in Box 8.3).

Box 8.3. Mutual learning through workshopping: An example

Mutual learning was in important spill-over effect of a research project exploring the impact of EU-funded development programmes on daily school practice led by the author of this paper in the middle of the 2000s (Fazekas, 2018[20]). During the four years of the project, workshops were organised

every month with the participation of policy makers and school practitioners with the aim of mutual knowledge sharing. The dissemination of research outcomes was only one of the goals of these workshops. More importantly, participants continuously informed the research, providing new evidence, leading often to the adjustment or refining of research questions. Researchers in this collaborative activity, incessantly learning from their partners, could not avoid "paying careful attention to the process by which people learn". They also adapted their language to their partners and were attentive to their needs.

Source: Fazekas, Á. (Fazekas, 2018[20]), "The impact of EU-funded development interventions on teaching practices in Hungarian schools", *European Journal of Education*, Vol. 53/3, pp. 377-392.

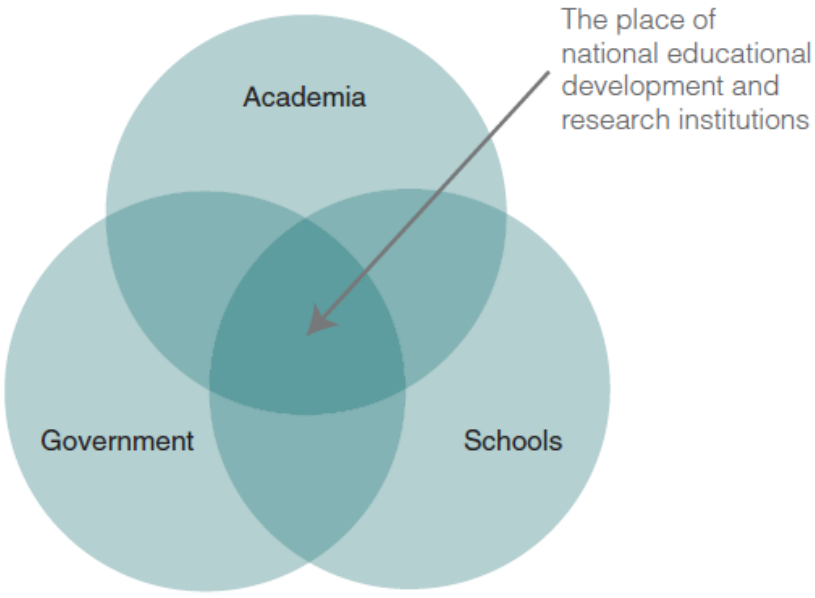
School-university partnerships (SUPs) are a typical and frequent form of institutionalised collaboration between researchers and practitioners. This multifunctional development tool can be used in all education systems, including low-income countries. Not only do they enhance quality in teacher education and professional development, they also promote research-practice dialogue (Halász and Thant Sin, forthcoming[21]). An advanced use of SUPs to enhance research impact could be observed particularly well in the influential Teaching and Learning Research Program of the United Kingdom. The SUPs created in this programme were highly institutionalised and multifunctional, and functioned in a project-based mode. An example is the Schools-University Partnership in Educational Research (SUPER) project, which was a collaboration between the University of Cambridge Faculty of Education and eight schools (McLaughlin, 2006[22]).

A key factor in research-practice partnership is the motivation of research organisations to devote time and energy to this kind of action. In the case of universities, this can be facilitated by institutional strategies promoting involvement in "third mission" activities and extending existing knowledge transfer operations to the social area, including education. Selling research outcomes for money and generating extra income through consultancy, as presented in the next section, can also be a driver. This is not always self-evident. Following the author's move from a government-run research and development agency to a research university it was interesting to see that while knowledge transfer mechanisms were clearly promoted, this was oriented only to provide research support for industrial technology development. Social services were not seen as a relevant target area.

In the faculty of psychology and education where the author taught, being involved in school development and interacting with schools was not a recognised activity taken into account in performance evaluations. This was in strong contrast with the government research and development agency where we developed an explicit organisational strategy in which equal distance and closeness to academia, policy and school practice was a guiding principle as represented in Figure 8.1. This strategic self-positioning of national government-led educational development and research institutes was dominant in most similar institutions and the model was presented at a conference of the leaders of such institutes, celebrating the 20th anniversary of the Consortium of Institutions for Development and Research in Education in Europe (CIDREE) consortium.

The organisational strategy that included the visual model presented in Figure 8.1 had direct and visible implications for the daily operation of our institute, as illustrated in the examples mentioned earlier. Policy relevance and usefulness for practice development would become the norm, as basic as following classical academic standards in writing research reports or publishing results. Our intention was to create *communities of practice* of researchers and practitioners.

Figure 8.1. Strategic self-positioning of national government-led educational development and research institutes



Source: Halász, G. (2010[23]), "The role of educational research and innovation in improving educational systems: A CIDREE perspective", in Stoney, S. (ed.), *Beyond Lisbon: Perspectives from Research and Development for Education Policy in Europe*, Consortium of Institutions for Development and Research in Education in Europe (CIDREE).

Consultancy

While research-practice partnership researchers appear as knowledge providers without business interests – which is not necessarily the case as partners often fund activities in common and researchers involved in these activities are paid – consultancy is considered to be an income-generating business. In consultancy work, researchers are selling their knowledge for money.

As the authors of an analysis of knowledge transfer activities in social sciences and humanities stated: Debates on knowledge transfer usually focus on technology transfer and commercialisation. They underlined that "the valorisation of academic results – making the results from academic research accessible to society – has been limited mostly to the economic contribution of universities through the licencing of intellectual property rights and spin-off creation" overlooking "the potential of the arts, humanities and social sciences" (Olmos-P.J., Castro-Martínez and d'Este, 2014, p. 697[24]). In a book on education consultancy, a whole chapter has been devoted to "researchers as consultants in and outside of universities", analysing the consultancy activity of four well-known educational researchers (Michael Fullan, Andy Hargreaves; Ken Leithwood and David Hopkins) who have contributed significantly to boosting the impact of educational research (Gunter and Mills, 2017[25]).

What we are doing when working, for example, as members of OECD examiner teams is providing a consultancy service to governments (who pay for this service). But we also create generalisable new knowledge or research. Many elements of what we do in these missions is not fundamentally different from what we do when implementing research projects funded by research funding agencies. Researchers contracted as project team members by private consultancy companies to design and implement research activities, funded by governments or international organisations, have similar experiences. This is a particularly effective way of using research-based knowledge to support the client of the contracting consultancy company.

Developing skills needed in consultancy work can be an important component of researcher training. The author, when leading a doctoral school, made deliberate efforts to help develop the transversal skills of doctoral students, enabling them to take on client-oriented consultancy activities (see example in Box 8.4).

Box 8.4. Honing researcher skills in the field

The principal of a private school contacted our doctoral school of education, suggesting that the external evaluation of his institution, earlier done by private consultancy companies, could perhaps be performed by our doctoral students. An agreement was made and a team of five doctoral students submitted a proposal to do this job. During the approximately year-long project, the student team pursued classic research activities in the school, interacted intensively with the client and produced, at the end, an academic book presenting the outcomes of this research-consultancy activity (Horváth et al., 2018[26]). When asked how useful they found this for their researcher skills, the doctoral students affirmed they had learnt more during this project than in many traditional programmes doctoral schools typically offer.

Source: Horváth, L. et al. (2018[26]), "Kutatási beszámoló az Alternatív Közgazdasági Gimnázium Pedagógiai Programjának beválás-vizsgálatáról", AKG as an innovative learning environment. Research report on the examination of the impact assessment of the pedagogical program of the Alternative High School of Economics, Akadémiai Kiadó. Budapest.

The involvement of doctoral students in consultancy activities can be encouraged by national research and innovation policies. This is the case, for example, in France, where the notion of "*doctorant-conseil*" describes "an activity carried out in the form of a mission carried out by a doctoral student in a company, an administration or a local authority, in parallel with his doctoral work within a research unit. The theme of this mission is in the field of skills acquired by the doctoral student throughout her/his career; it does not necessarily present a direct link with her/his research topic".[4] This kind of engagement of doctoral students in consultancy work is rare in the field of educational research although it could, directly and indirectly, enhance the impact of educational research.

An interesting example of directly using the knowledge and experiences of doctoral students to improve practice can be found in the Dutch Inspectorate inviting PhD candidates to study the organisation and prepare dissertations about its operation (Nusche et al., 2014[27]). In this case, a government agency with advanced internal knowledge-management strategy and mechanisms interacted with young researchers to generate new knowledge about its own impact and make its internal processes more innovative.

Using narratives and storytelling

There is abundant literature on the use of storytelling in science communication: Some authors defending this contested form of communication are highly reputed scientists. "Everywhere one looks in science, there are stories," wrote Nobel prize-winner Roald Hoffmann in his essay on the role of narrative in scientific discovery (Hoffmann, 2012[28]). He describes in another study the formulation of hypotheses as stories (Hoffmann, 2014[29]). Storytelling appears not only to be an effective way of communicating scientific content to a non-academic audience but an indispensable tool for making scientific discoveries and communicating them within the academic community. Authors analysing the role of stories in science, including Hoffmann, stress that when temporality and causality are treated there is always a story with a beginning, an unfolding and an end. They also emphasise that our brain needs stories: It has a "narrative hunger" (Morgan and Wise, 2017[30]; Norris et al., 2005[31]). And, they often stress that the use of narrative in science is not a way of talking about science but doing science: Narratives are an inherent characteristic

of scientific discovery and argumentation (Newman, 2018[32]). Research on storytelling shows us that science without stories cannot be real science and the lack of stories is a sign of imperfect science.

Transforming research outcomes into stories without distorting the content, however, is not easy: It requires skills that researchers do not often possess and that we tend to neglect when training researchers. Few teachers in doctoral programmes would react positively to an initiative in which doctoral students are asked to tell their research outcomes in a fictional story form, doing what some authors describe as "fictionalising research data" (Campbell, 2000[33]). However, it is a serious exercise that would reveal the coherence (or not) of their arguments and their understanding of the complexity of the object they are studying.

Story-telling was used as a dissemination tool, as well, in the two above-mentioned research projects (the Hungarian project in Box 8.4 and the Dutch case). When a publisher invited researchers to present the outcomes of the two projects in a larger volume – already publicly available through the project websites and also in several journal articles – they decided not to write a classic academic book but to experiment with an unusual hybrid form of dissemination with the hope of reaching practitioner readers.

They created a fictional character – Zita, the innovative teacher – who writes a diary in which she records her professional experiences, reading, doctoral studies, and conversations with her colleagues. To make Zita's experiences more colourful, another fictional character was created: Reijo, the Finnish scientific journalist who travels to Budapest to make a series of interviews with her. In order to present research outcomes related to policy implementation, a third character entered the scene: Xia, the development economist working for the Asian Development Bank, who designs and implements interventions in the education sector in low-income countries. And, to support the presentation of issues related to research methodology, a fourth character joined the story: Miriam, the Zambian educational researcher who acquired her PhD in Finland. The story is told by Reijo, who often meets with his three colleagues, has long conversations with them while travelling, and exchanges many emails with them. On the basis of his notes, he writes a book and finds himself in a controversy with his scientific publisher who hesitates about whether he should publish a book which does not follow the standards of classic academic genre.

After the publication of the book, entitled *The Birth of Knowledge* (Halász and Fazekas, 2020[34]), a sequel was written which came out one year later with the title *The Second Frontline* (Halász, 2021[35]).[5] The author of this chapter uses these books in his master's-level degree courses for students, practising teachers and school leaders. This has resulted in much feedback from readers, demonstrating the effectiveness of this kind of research communication. Many practising teachers affirmed that they could understand complex content through Zita's diary and the conversations of the characters, which they would not be willing to assimilate if presented in classic academic form. Some people reported on transformative effects: Inspired by the books they have enriched or plan to enrich their teaching practice with new elements.

Both research projects that inspired the writing of the two hybrid books used mixed methods that combined large-scale surveys providing quantitative data for complex statistical analyses and case studies providing qualitative data in the form of interviews, collected stories, informal conversations and notes on observed classroom and extracurricular activities. Both projects were accompanied by a deep, long and systematic analysis of the relevant literature accompanied with discussions about the readings in a professional community of researchers and practitioners (Halász, 2019[36]). Using a systematic review of the literature as an institutionalised communication framework is one of the many ways that can generate professional dialogue between researchers and practitioners: This requires a deep understanding of the authors' thinking and the immediate translation of what they present into practical conclusions. Many of the elements of the stories that later appeared in the books emerged during our case studies and literature analysing community events.

Using teaching to connect research with practice

The last way to connect research with practice, which we mention in this chapter, is by using research in teaching. This might seem banal at first glance but is worth exploring. It may be simply presenting research outcomes in higher education study programmes to future practitioners or to those who enrol in continuous professional development programmes provided by universities or other agencies linked with research. This is a natural practice in teaching in higher education. But it can also be realised in various forms of research-based teaching, which is, again, a common practice in higher education, especially at graduate or post-graduate level. Doctoral education deserves special attention in this respect, particularly in light of the fact that now the majority of doctorate holders in many European countries find employment outside the academic sector (Boman et al., 2021[37]); that is, many of them become – or remain – practitioners either in the private or public sector. There is a high level of probability that these people will develop a practice that is attentive and responsive to research and will promote research utilisation in their daily work.

Box 8.5. The researcher policy maker: An example

One of the author's doctoral students became a high-level official a few years after defending her PhD in a government agency with regulatory, development and policy implementation responsibilities in the field of higher education. In this position, she created a unit of analysis to support policy decisions and monitor implementation, recruiting several young researchers and launching a number of research and policy evaluation projects. Under her leadership research and the use of evidence became normal practice in a government agency where regulation and legal supervision were almost exclusive activities. This fundamentally transformed the administrative style and discourse in the organisation. Conversations with her made it clear: without the PhD experience, she would and could not have initiated these changes.

Many PhD-holding teachers have been promoted to a "researcher-teacher" status in the framework of a new career promotion system introduced in the middle of the 2010s in Hungary (see Chapter 4, Box 4.3). These teachers submit a research plan when applying to acquire or renew this status. As the reviewer of a number of such applications, the author of this chapter saw many examples of teachers using researcher skills acquired during their PhD studies.

Due to the status of the researcher teacher created by the new career system, this form of practitioner research has become a frequent phenomenon in the Hungarian school system. In addition, many of the "master teachers" (another special status) also do research, development and innovation activities.[6] Most research activities performed by practising teachers now focus on developing teaching and learning in schools, sometimes in specific disciplinary areas, sometimes in cross-curricular domains but they can also cover extracurricular areas or support school development and school evaluation.

This might have far-reaching implications on how to define the strategic goals of doctoral programmes and how to organise teaching and learning in these programmes. If educating practitioners equipped with professional researcher skills who have positive attitudes towards using research to improve practice become part of the mission statements of doctoral schools, this would directly impact doctoral education. It would impact the design and organisation of doctoral courses, the evaluation of performance, the allocation of credits, the involvement of practitioners in teaching and supervision, and the possible inclusion of internship periods in the process of becoming a doctor.

There is an interesting example of research-practice integration into teaching in an innovation management perspective in the "EIT label", awarded to higher education programmes by the European Institute of Technology. Of the award's seven principles *knowledge triangle integration* is foremost. This requires a

study programme design "where co-creation and collaboration between education, research and innovation, and business contribute to addressing societal challenges" (EIT, 2021, p. 12[38]). This configuration can be applied to the education sector as well, in which the "research" pole of the knowledge triangle would be educational research; the "education" pole would be the training of teachers, school leaders and policy practitioners; and the "innovation" (or "business") pole would be schools and other education sector institutions (including government-based policy-making or policy-implementation agencies). In this model, research is connected to practice through teaching or skills development with a strong emphasis on co-creation and collaboration.

Conclusions

The examples presented in this chapter can help revitalise projects that aim to strengthen research-policy-practice links such as the CERI project on *Strengthening the Impact of Education Research*. The six ways of enhancing research impact can be encouraged simultaneously in every education research and innovation system. Box 8.6 outlines some key recommendations for such initiatives.

Box 8.6. Recommendations for strengthening the research-policy-practice link in education

Use innovation management and knowledge-management approaches

The use of approaches applied in innovation management and knowledge management could significantly enhance knowledge utilisation in the education sector and education policies themselves could benefit from innovation policies. Include innovation in education into national innovations strategies or consider the design and adoption of specific education-sector innovation strategies.

Give equal focus to the DUI and STI modes

The intention to think in non-linear, co-creating, Doing, Using and Interacting (DUI) mode is reflected in research questions where "relationships and interactions" and the skills needed for "co-producing research" are among the key themes. This chapter argues that the DUI mode could receive more attention and existing practices based on this mode could be better explored, especially from a knowledge mobilisation perspective.

Give more attention to design-based research

Design-based research, a typical form of the DUI mode, should receive more attention in initiatives such as the CERI project on strengthening the impact of education research. Survey questionnaires collecting data on facilitating research use should not only reflect the Science, Technology and Innovation (STI) way of thinking about interaction between research, practice and policy. In addition to a focus on the function of mediation or brokerage between the two worlds (research, on the one side and policy and practice, on the other), co-creation, co-production or collaborative design also need attention.

Create communities of practice for researchers and practitioners

Communities of practice can be created through research-practice partnerships, school-university partnerships and other institutionalised forms of co-operation. At the doctoral level, the education of practitioners equipped with advanced researcher skills could become a key programme component and could be better exploited for research use and research impact in the education sector. This could be facilitated by applying the knowledge triangle concept to the education sector, where the "innovation" or "business" pole of the triangle are education-sector service providers.

Include consultancy in the scope

Although consultancy is a particularly effective form of knowledge transfer for enhancing research impact, this way of using and disseminating research-based knowledge has rarely been identified as an important form of knowledge mobilisation or knowledge utilisation. Most knowledge mobilisation analyses ignore it. Consultancy is an important part the activity of many researchers and could be a component of researcher training.

Encourage creative, user-friendly forms of scientific communication

Research outcomes published in academic journals often do not reach practitioners who can make use of them in their practice. Storytelling can reach those who have limited interest in reading research reports or are reluctant to look for scientifically based solutions. National or institutional policies and research funding agencies can encourage the communication of research outcomes via storytelling. This would result in fictional literature, films or theatrical performances conveying research-based knowledge in a form that targets our rational thinking, senses, emotions and motivational energies. This would require more intensive communication and co-operation between scientists and artists, and research on the impact of communicating science through stories.

The six forms of enhancing research impact presented in this chapter highlight not only the social dimension of research utilisation but also the high-level complexity of this process. Analysis of the practice of using research has described this process using the language and the approach of complexity science, underlining its non-linear nature and the difficulties of predicting its outcomes:

> *"There is increasing evidence that the use of research is emergent, non-linear, iterative and contingent (…) When considered through a complexity lens, research use is a process that is characterised by multiple interactions among many entities co-creating dynamic, non-linear patterns of unpredictable behaviour governed by feedback loops that cause cascading changes throughout the system. (…) users are 'active problem-solvers and generators of their own knowledge base instead of merely passive receptacles of information and expertise' (…) Taking into account the contingent, emergent and unpredictable nature of research use would imply acknowledging and accommodating unpredictable outcomes that might emerge over time." (Lemay and Sá, 2012, p. 479[3])*

Insights from innovation and knowledge-management thinking can offer significant contribution to our analysis of research impact. There are several ways to strengthen the impact of education research, some of them more unusual. Therefore, we should not be too bound to the researcher's perspective as it focuses by whom and how the knowledge they produce will be used. Rather, we should place ourselves in the position of practitioners. For the latter what counts are the problems and challenges they face in their daily practice. Their concern is not how effectively research-based knowledge can be used in practice but how they can solve their real-life problems and find the knowledge that can support this.

As the authors of a relevant earlier innovation research paper noted: "In many organizations, there is a profound influence on operations and policies derived not from research and development but from the accumulated wisdom of the practitioners" (Johnson and Brown, 1986[39]). These authors, drawing on earlier research, identified four different forms of "transmission of knowledge": (1) Research, development, and diffusion (2) Problem solving (3) Linkage (4) Social interaction models. This classification was later applied in analyses of knowledge transfer and utilisation in education (Becheikh et al., 2010[40]; Nelson and O'Beirne, 2014[41]).

Attention has often focused mainly on the research, development, and diffusion, and the linkage models; that is, on the dissemination of research outcomes in the case of the former, and on mediation in the case of the latter. Those concerned by innovation, focusing either on micro-level innovation management or macro-level innovation policies, show more interest in the use of knowledge for problem solving and the creation of social spaces to enhance innovative problem solving. In other words, they look at the use of

knowledge from the perspective of those who have to solve problems and cooperate with each other to find new solutions.

This paper asserts that thinking about researcher-practitioner relationships in a DUI mode promotes "problem solving" and "social interaction", and improves the chances of research utilisation. Taking the perspective and language of innovation and knowledge management helps us understand the practitioners involved in collaborative problem solving. What interests practitioners is research in a contextualised form. They need researcher partners who listen to them, who are willing to cooperate with them in enduring partnerships, and who can understand their everyday language and give specific, contextualised advice to them.

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Notes

[1] See paragraph 37 of the act on "'Scientifically Based Research" (Public Law 107–110. 107th Congress. An Act „To close the achievement gap with accountability, flexibility, and choice, so that no child is left behind" (2002[43]).

[2] See the box ''Assessment: Hungary'' in Gordon et al. (2009[42]).

[3] See the project's website here: www.oecd.org/education/ceri/assessingprogressionincreativeandcriticalthinkingskillsineducation.htm.

[4] See the website ''Qu'est-ce que le « doctorant-conseil?" of the University Poitiers (https://college.ed.univ-poitiers.fr/quest-ce-que-le-doctorant-conseil). English translation by the author.

[5] The books have been published in Hungarian but a rough translation of many chapters are available in English.

[6] In 2020, for example, the researcher-teacher status (acquired five years earlier) of 76 applicants was renewed and 26 new additional applications were approved. The same year 2146 teachers acquired the master-teacher status, with 547 renewals and 1599 new applications (source: Information shared with author by the Educational Authority of Hungary).

9 Using research well in educational practice

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International efforts to improve the use of educational research raise important questions about what it means to use research *well* in educational practice. To date, there has been wide-ranging debate about what counts as quality evidence, but very little dialogue about what counts as *quality use*. This chapter focuses on this idea of quality use (or using research *well*) and explores how it can be conceptualised, what it involves in practice, and how it can be supported. It draws on findings emerging from a five-year study of research use in Australian schools, which has involved a systematic review of international research as well as surveys and interviews with over 900 educators. The findings presented provide a frame with which to review current approaches to using and supporting research use. The work overall highlights the value of practitioner perspectives and the need for more work on using research well in education.

Introduction

Internationally there are widespread efforts to improve the use of research evidence across many sectors (Boaz et al., 2019[1]). Education has been very much part of such trends, with the "global push to bolster the connections between research and practice" (Malin et al., 2020, p. 1[2]). The *Emerald Handbook of Evidence-Informed Practice in Education* (Brown and Malin, 2022[3]), for example, outlines developments within more than 20 different countries. Earlier edited collections (e.g. Finnigan and Daly (2014[4]); Gorard (2020[5]); Levin et al. (2013[6])) painted a similar picture of evidence-related developments across varied countries.

These kinds of developments raise important questions about what it means to use research *well* in education. As Parkhurst (2017, p. 170[7]) argues in the field of policy, "To improve the use of evidence in policy requires an explicit engagement with the question of what constitutes *better use* from a political perspective" [original emphasis]. This is about a subtle but important shift from a focus on the quality of the evidence towards a focus on the *quality of the use*.

This distinction is important because improved evidence use in education requires clarity about not only what counts as quality evidence but what counts as quality use. To date, there has been wide-ranging debate about the former but very little dialogue about the latter. There is a well-developed literature around understanding and appraising the quality of different kinds of evidence (e.g. Cook and Gorard (2007[8]); Freeman et al. (2007[9]); Nutley, Powell and Davies (2013[10]); Puttick (2018[11])) but little in the way of an equivalent for understanding and appraising the quality of different kinds of use.

Overlooking quality of use relative to quality of evidence is problematic. Most fundamentally, it fails to challenge the tendency for efforts to focus more on the communication and synthesis of research findings and less on supporting the uptake and application of such evidence (see for example, Gough, Maidment and Sharples (2018[12])). In a similar way, discussions about quality in relation to evidence use can become too easily framed as a research/supply issue more than a use/demand issue. This can lead to system-level developments focusing heavily on creating access to valid and reliable evidence but saying little about how to support intelligent use of that evidence.

Against this backdrop, this chapter introduces and explores the idea of "quality use of research" or using research *well*. It presents insights emerging from an ongoing five-year study, the Monash Q Project, to understand and improve research use within Australian schools. The discussion covers three aspects of quality use of research: (i) how it can be conceptualised; (ii) what it involves in practice; and (iii) how it can be supported. The ideas presented are underpinned by a cross-sector systematic review and narrative synthesis of relevant international research as well as surveys and interviews with over 900 Australian educators.

We are aware that practice can be informed by many different types of evidence such as research-based evidence, practice-based evidence and data-based evidence (Nelson and Campbell, 2019[13]). We are also aware that practitioners' research engagement can involve engagement *in* (doing) research and engagement *with* (using) research (Bell et al., 2010[14]; Prendergast and Rickinson, 2019[15]). The ideas presented in this chapter, though, are focused on a particular type of evidence, namely *research* evidence, and a particular kind of research engagement, namely *using* research. By "research evidence", we mean evidence generated through systematic studies undertaken by universities or research organisations and reported in books, reports, articles, research summaries, training courses or events (Nelson et al., 2017[16]). By "using research", we mean the process of actively engaging with and drawing on research evidence to inform, change and improve decision making and practice (Coldwell et al., 2017[17]).

The remainder of the chapter is presented in five main sections. We begin by explaining the research processes of the Monash Q Project that underpin the ideas and insights discussed. We then discuss the framing of quality use in terms of the Quality Use of Research Evidence (QURE) Framework. Next, we look into quality use in practice in terms of educators' perspectives on using research well. We then

consider the question of how quality use can be supported within schools, drawing again on the experiences of educators. Finally, we conclude by summarising the key arguments of the chapter and discussing their implications for strengthening the quality use of research evidence in education.

Monash Q Project

The Monash Q Project is a five-year study to understand and improve the use of research in Australian schools. A partnership between Monash University and the Paul Ramsay Foundation, it involves close collaboration among teachers, school leaders, policy makers, researchers, research brokers and other key stakeholders across Australia. To date, the main research activities have included a systematic review and narrative synthesis in order to develop a conceptual framework of quality use, and empirical investigation in order to explore educators" perspectives on quality use in practice (see Box 9.1).

Box 9.1. Monash Q Project: Study methodology

Systematic review and framework development

The early phase of the project in 2019 involved a systematic review and narrative synthesis of relevant literature in health, social care, policy and education in order to define what "quality use of research" might mean in education. The aim was to explore if and how quality of research use had been defined and described within each of the sectors. The selected publications provided the basis for four narrative syntheses that addressed how quality of evidence use had been defined, described and conceptualised within each sector. Thematic analysis was then undertaken to identify similarities and differences between the four narratives as the basis for the development of the Quality Use of Research Evidence (QURE) Framework, which is discussed in the next section. Throughout the development of the framework, the research team shared evolving ideas about quality research use with project partners and stakeholders through meetings, workshops and conferences. This feedback from stakeholders informed the development and refinement of the framework (see Rickinson et al. (2017[18]) for full details).

Empirical investigation with educators

Building on the conceptual analysis and framework development, the project's school-based research phase commenced in 2020 with a number of surveys and interviews conducted between March 2020 and October 2021. These research activities aimed to explore educators' perceptions and use of research in their practice; The enablers and barriers affecting research use as well as what educators believe is involved in using research well. This chapter reports quantitative and qualitative findings from 27 in-depth interviews as well as two surveys involving a total of 906 educators from 4 Australian states (Queensland [QLD], New South Wales [NSW], Victoria [VIC] and South Australia [SA]). Survey 1 explored perceptions and use of research in practice and was completed by 492 educators; Survey 2 explored research-use enablers and barriers and was completed by 414 educators; and the in-depth interviews explored views on using research well and involved 27 educators (see Annex A for sample and analysis details, or Rickinson et al. (2021[19]) and Walsh et al. (2022[20]) for additional information).

Source: Rickinson, M. et al. (2017[18]), "What can evidence-use in practice learn from evidence-use in policy?", *Educational Research*, Vol. 59/2, pp. 173-189; Rickinson, M. et al. (2021[19]), *Using Research Well in Australian Schools*; Walsh, L. et al. (2022[20]), *What, Why, When and How: Australian Educators' Use of Research in Schools*.

The following three sections introduce our definition of quality use and explain the components of the QURE Framework; explore educators' perspectives on quality use in practice; and highlight how quality use can be supported in schools.

Quality use of research: The QURE Framework

The cross-sector systematic review and narrative synthesis (Box 9.1) found a definite lack of explicit definitions or descriptions of quality of evidence use across all sectors. With a few important exceptions (e.g. Earl and Timperley (2009[21]); Parkhurst (2017[7]); Rutter and Gold (2015[22]); Sackett et al. (1996[23])), well-developed articulations or discussions about what "using research well" means or involves were not found. In all sectors, though, there were lines of thinking that touched on quality use indirectly, often in connection with evidence-use improvement or capacity building (Rickinson et al., 2021[19]). Drawing on these ideas, a framing of high-quality use of research was developed as:

> *… thoughtful engagement with and implementation of appropriate research evidence, supported by a blend of individual and organisational enabling components within a complex system (Rickinson et al., 2020, p. 5[24]).*

As shown in Figure 9.1, this definition sees quality use as comprising:

- two core components (appropriate research evidence and thoughtful engagement and implementation)
- three individual enabling components (skillsets, mindsets and relationships)
- three organisational enabling components (culture, leadership and infrastructure)
- system-level influences.

The following sections now elaborate on each of these different parts of the QURE Framework, drawing on key ideas from the literature and, where relevant, some brief practical examples.

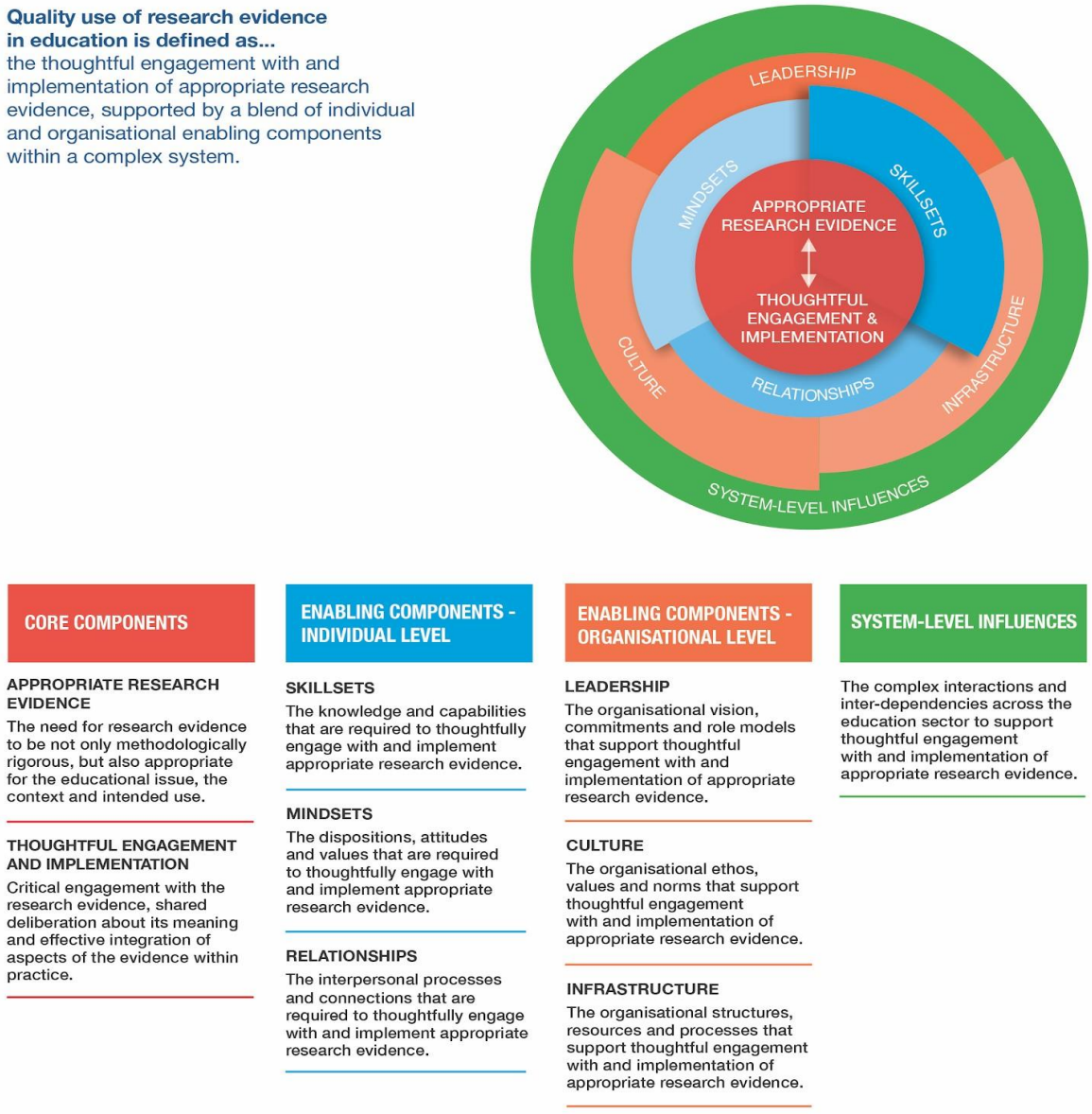
Core components

At the centre of the QURE Framework are two aspirations: for the research evidence to be *appropriate*, and for the engagement and implementation to be *thoughtful*. It is important to stress that these two core components are highly interconnected in the sense that coming to appropriate evidence will depend on thoughtful engagement, and engaging and implementing thoughtfully will depend on the evidence being appropriate.

"Appropriate research evidence" is about emphasising the context-specific nature of quality evidence. From a use perspective, quality research evidence needs to be not only methodologically rigorous but also appropriate for the educational issue, the context and the intended use. As Nutley and colleagues (2013, p. 6[10]) argue: "Evidence quality depends on what we want to know, why we want to know it and how we envisage that evidence being used."

"Thoughtful engagement and implementation", meanwhile, reflects educators' critical engagement with the research evidence, shared deliberation about its meaning, and effective integration of aspects of the evidence within practice. According to Coburn, Honig and Stein (2009, p. 71[25]), research evidence "does not speak for itself" and so educators must actively "interpret and make meaning of it in order to use it". Research evidence does not replace professional expertise, rather, using evidence well involves integrating "professional expertise with the best external evidence from research" (Sharples, 2013, p. 7[26]).

Figure 9.1. Quality Use of Research Evidence (QURE) Framework



Source: Rickinson, M. et al. (2020[24]), *Quality Use of Research Evidence Framework*, pp. 6(24).

Individual enabling components

It will be clear from what has been said about the core components that high-quality evidence use is a sophisticated undertaking. At an individual level, it requires educators with particular *skillsets*, *mindsets* and *relationships* in order to thoughtfully engage with and implement research that is appropriate to their intended use and setting (see Box 9.2).

"Skillsets" refer to the significant knowledge and capabilities involved in being able to translate, apply and sustainably implement evidence-informed decisions and approaches in specific contexts. Specifically, this involves being able to access research, assess its quality, and understand research approaches and methods (Brown and Greany, 2018[27]; Earl, 2015[28]; Nelson and O'Beirne, 2014[29]; Stoll et al., 2018[30]). More broadly, this involves educators' abilities to draw on their professional judgement (Coldwell et al.,

2017[17]) and combine their understanding of context and existing practice with the research (Spencer, Detrich and Slocum, 2012[31]).

Alongside skillsets, *"mindsets"* are the dispositions, attitudes, and values that are required to use research well. For example, educators with a disposition towards evidence use have a questioning mind (Earl, 2015[28]), a conscious motivation to engage with research (Stoll et al., 2018[30]), and an awareness of their own biases and assumptions (Earl, 2015[28]; Evans, Waring and Christodoulou, 2017[32]; Spencer, Detrich and Slocum, 2012[31]). Using evidence is not simply a technical activity, it is influenced by personal and professional values and beliefs (Nelson and Campbell, 2017[33]).

In addition to skillsets and mindsets, "*relationships"* refer to the interpersonal processes and connections that are required for quality research use. Using research well is not an isolated, individual activity. Rather, viewing and supporting evidence use as a social process requires collective learning and responsibility (Earl, 2015[28]) along with genuine and structured collaboration both within and across schools (Greany and Maxwell, 2017[34]; Park, 2018[35]).

Box 9.2. Alex's story – Individual enablers in action

Alex is a specialist teacher at a small government primary school where many of the students come from highly disadvantaged backgrounds. He is passionate about being a "curious, adventurous and proactive" user of research, particularly in relation to understanding how to best support his students who have a disability, are living in poverty, and/or are experiencing trauma.

Alex accesses research from a wide variety of sources, including academic databases, university researchers as well as research translation services within his state-based Department of Education. He also examines whether the research is "fit for purpose" in a number of ways, including in relation to surveys of colleagues' professional development needs, his school's improvement agenda, and standards of evidence published by his Department of Education. As he explains:

> *You need to ask: 'Am I getting an outcome?', 'How well does this fit in my context?', and 'How likely is it that my colleagues and I will be able to implement the research or evidence properly?'*

After finding research that goes "hand in hand" with his intended purpose for using it, Alex works closely with his principal, Phoebe, to support their colleagues to engage with this research in professional learning teams. Alex also supports teachers to trial research-informed changes in the classroom and collect data to determine the effectiveness of these interventions.

Alex's story demonstrates the individual enablers of: ***skillsets*** in how he accesses, appraises, and implements research that is fit for his specific purpose and context; ***mindsets*** given his belief in the value of using research and his questioning mind to ensure that it is appropriate; and ***relationships*** because of how he collaborates with his principal and colleagues via professional learning teams.

Organisational enabling components

At an organisational-level, quality use of research also requires organisational contexts with supportive *leadership*, *culture* and *infrastructure*. Together, these organisational enablers provide educators with the conditions and resources to thoughtfully engage with research in their context (see Box 9.3).

"Leadership" is about the organisational vision, commitments and role models that support and encourage quality research use. At the school level, leadership has been identified as a key leverage point for developing and modelling a research-engaged school culture (e.g. Dyssegaard, Egelund and Sommersel (2017[36]); Godfrey (2019[37]); Nelson and Campbell (2019[13])). In highly research-engaged schools in the

United Kingdom, for example, senior leaders were found to "play a key role, acting as intermediaries and facilitators of access to, engagement with and use of research evidence, for staff in their schools" (Coldwell et al., 2017, p. 7[17]).

Closely entwined with leadership is organisational "*culture"*, which is about the organisational ethos, values and norms. There is a need for evidence use to be a cultural norm that is embedded within an organisation's "outlook, systems and activity" (Handscomb and MacBeath, 2003, p. 10[38]). This involves, for instance, promoting research use within whole-school policy and planning documents (Brown and Greany, 2018[27]; Stoll et al., 2018[30]; Tripney et al., 2018[39])Critically important is an ethos that encourages staff to regularly reflect on their practice as well as take risks and try different approaches based on evidence (Brown, Schildkamp and Hubers, 2017[40]).

Quality use also depends on "*infrastructure"*; that is, the organisational structures, resources and processes to support research use. There is a need for measures such as: the allocation of time, space, facilities and budget; the creation of school-based research coordinators or champions; the establishment of links with external research partners and networks; and the development of formal and informal processes to support staff learning and deliberation about research and practice (Cain, 2019[41]).

Box 9.3. Genevieve's story – Organisational enablers in action

Genevieve is a classroom teacher at a small government school for students with physical and intellectual disabilities. One of the core improvement priorities at her school is better using research-informed strategies to support students' learning.

Genevieve explains how her principal, Kerrie, is very "hands on" and each week, individually meets with every teacher for an hour to unpack research, think about how it could be used in their classroom, and address any potential difficulties that they may face. Kerrie has also established professional learning communities that allow teachers and teacher aides to regularly meet and plan a common approach for making research-informed changes across the school:

> *[We have] that time to sit down as a group to be able to talk about things, to explain things, and to go through the bits of research. … That gives people the chance to ask if they're not sure … [and] not just have it squished in a staff meeting*

At the same time, Genevieve engages with other schools in her region to understand and trial different research-informed strategies and report back on their findings. Her regional office also provides access to research and regularly sends an advisor to help Genevieve and her colleagues adapt the research and consider what improvements could be made.

Genevieve's story demonstrates the organisational enablers of: ***leadership*** because of how her principal is "hands on" in supporting teachers to engage with research; ***culture*** given how research is embedded into whole-school priorities and regular staff meetings; and ***infrastructure*** through establishing structured time and external partnerships to support the improved use of research.

System-level influences

"System-level influences" take account of the complex interactions and interdependencies across the education sector that are needed to support thoughtful engagement with and implementation of appropriate research evidence. There is growing support for understanding and improving evidence use through system-wide approaches, which focus on building connections between evidence generation, synthesis, distribution and use to form effective "evidence ecosystems" (Boaz and Nutley, 2019, p. 251[42]; Sharples, 2013[26]). There is also increasing awareness of the need to consider the "wider political and societal

systems" (Gough, Maidment and Sharples, 2018, p. 11[12]) and the (often limiting) impact that other system influences such as accountability policies and improvement priorities can have on evidence use in schools (Godfrey, 2019[37]). At the same time, system leaders can enable broad support for evidence use by prioritising research use at the board, district or central office level (Education Endowment Foundation, 2019[43]; Farley-Ripple et al., 2018[44]) and by providing funding to support the creation of evidence-informed cultures and infrastructures (Nelson and Campbell, 2019[13]).

Practising quality use

The role of educators' voices in helping to move models of research use beyond the theoretical have been acknowledged within relevant literature (e.g. Boaz and Nutley (2019[42]); Oliver, Lorenc and Innvær (2014[45])). In our work, educators' responses have helped to ground the QURE Framework in practical perspectives and to shed light on what is involved in practising quality research use. Overall, educators' interview and survey responses indicated that how well research is used is an issue that matters to teachers and school leaders (Rickinson et al., 2021[19]). When talking about research use in practice, educators were strong in their views that quality research use needed to be intentional and purposeful. It needs to be aimed at bringing about positive change in students' learning and outcomes, school performance and/or educators' own knowledge, practice and professionalism.

These views, however, were expressed by educators in different ways. Firstly, educators used emotive language and expressions to describe quality research use in their schools. The language used suggested the importance of using research and the positive contribution it can make to their work. For example, one primary school leader expressed their passion for research use as follows:

> *I love research, I just think it has such a positive impact. And I think that if you can prove that it works…then that's what you should be using. (Interview response, Senior Leader, Government Primary School)*

Secondly, educators had clear views not only about using research well but also using research poorly. These descriptions provided rich insights into the dimensions of quality research use that mattered to them as well as the complex nature of quality use in practice. Table 9.1 shows examples of educators' different descriptions, highlighting how each dimension of research use was discussed both in relation to quality use and poor use.

Table 9.1. Examples of quotes about quality research use and poor research use from educators' interviews and responses to Survey 1

Dimensions of research use	Quality research use quotes	Poor research use quotes
The research	Quality research use involves "a strong research basis. For example, either a history or there are multiple researchers in the field who are affirming [an] appropriate teaching practice based on research. [Or] clear impact has been shown over time". ***Interview response, Senior Leader, Independent P-12 School***	Poor research use involves "research that "fits" a particular trend or fad that doesn't have any evidence of improving student learning. Something found on Twitter that has not been looked at critically". ***Survey response, Senior Leader, Government Primary School***
The user's mindset	Quality research use means "to keep an open-mind and not be biased, but still having a focus and a particular lens when searching for, reading and discussing research. It means to not jump so quickly into agreeing or disagreeing with the evidence". ***Survey response, Senior Leader, Government Primary School***	Poor research use means "teachers only seeking research that fits their beliefs, resulting in a static state of mind where there is no room to learn". ***Survey response, Education Support Staff, Government Secondary School***

Dimensions of research use	Quality research use quotes	Poor research use quotes
The school leadership	Quality research use is when "leaders collaborate with teachers to gather research to help design systems and structures in line with the school's vision". ***Survey response, Teacher, Government Primary School***	Poor research use is when "someone in power gets a bee in their bonnet about a new research idea and foists it on the entire school community with no ownership or engagement". ***Survey response, Teacher, Government Secondary School***
The outcomes	Quality research use leads to "reduced pressure on both teachers and students". ***Survey response, Teacher, Independent P-12 School***	Poor research use leads to "unhappy staff, low student progress, and complacency". ***Survey response, Teacher, Government Special School***

Thirdly, from the ways in which educators described quality research use, six key characteristics became clear across our interview and survey data. For educators, quality research use needs to be: *purposeful, embedded, connected to teacher professionalism, collective, time and effort dependent, and curiosity-driven* (see Table 9.2). These characteristics were selected as key because of the powerful ways in which they featured in educators' responses as well as how often they were referenced within the interviews and surveys (Rickinson et al., 2021[19]).

Table 9.2. Key characteristics of quality research use from educators' responses in interviews and Survey 1

Quality research use characteristics	Educator quote examples
Purposeful • There is purpose in both research use intent and individuals" behaviours. • There is direction about intended practice change, with clear and transparent rationale for both the research itself and its use. Research use decisions and actions are shaped by the context of the practice, students or the school environment.	"It starts at the top…and that's our decision for the whole school. And it's transparent and we make sure that all staff have an understanding of what's expected [when using research]". ***Interview response, Senior Leader, Government Primary School***
Embedded • It is an intrinsic part of the school's culture or environment. • It is embedded in practice, school processes and schedules, such as planning and review cycles, informal and formal discussions, and decision making.	"Using research well means it's intrinsic in your approach…we talk research all the time". ***Interview response, Senior Leader, Government Primary School***
Connected to teacher professionalism • Research use is seen as a professional expectation. • It is associated with improvements in teaching practice and student outcomes, educators' own teaching skills, confidence and knowledge, and school performance and credibility.	"For me, to feel like I'm doing my job well, I have to do that professional reading [of research] that informs my practice, so I know that practice deeply and I know that what I'm doing is the right thing to do". ***Interview response, Senior Leader, Government Primary School***
Collective • There is collective engagement in the use of research. • This involves staff consultation and buy-in to research use-related decisions and processes, group discussions, debate and reflection about research use and outcomes, and a research-use school culture that is collaborative and trustworthy.	"It's not about me [the school leader]. It's about the collective and empowering staff to get on board with the research". ***Interview response, Senior Leader, Catholic Secondary School***
Time and effort dependent • Time and effort are dedicated and taken within school hours to use research. • Taking the time to engage with research deeply and carefully, experimenting with research, and evaluating different practice approaches and outcomes is valued within the school culture.	"Because we live in this fast-paced way that we work and schooling … I think that the concept of slowing down to then help you speed up is something that we might need to do". ***Interview response, Senior Leader, Government Primary School***
Curiosity-driven • Being curious and inquisitive involves individuals having a growth mindset and being open-minded to new knowledge through research use.	"Number one disposition is being curious. I keep using the word "inquiry"...having the willingness to go forward with inquiry-oriented action into exploring what that research is." ***Interview response, Senior Leader, Government***

Quality research use characteristics	Educator quote examples
• There is a school culture of questioning practice and looking to improve teaching and outcomes through research use.	***Primary School***

Finally, there were clear differences between the ways in which teachers and school leaders responded to questions about using research well or poorly. The main difference between teachers' and school leaders' responses was the criticism that each levelled at others for poor research use. Teachers appeared more explicitly critical of school leaders when research was not used well, with responses indicating a need for or expectation of school leaders to guide and involve others when using research. One teacher, for example, described poor research use as:

> *When research is used to make decisions by those at the top without giving teachers an opportunity to consider the evidence and to discuss its implications. (Survey response, Teacher, Independent P-12 School)*

School leaders' responses, meanwhile, tended to be less explicitly critical of others, although there were some occasions where teachers were blamed for research use being used poorly. For example:

> *Poor research use occurs when teachers disregard the research, and do not simply 'give it a go'. (Survey response, Senior Leader, Catholic Primary School)*

These different perspectives on using research well or poorly highlight the critical role of school-level support in improving the use of research in practice.

Supporting quality use

Overwhelmingly, educators' survey and interview responses indicated that using research well was enabled within a school by the intentions and actions of school leaders. Educators indicated that school leaders could be instrumental in making quality research use a "normal" part of how a school performs in three main ways:

1. Creating a positive and trusting research-engaged school culture that includes them, as leaders, role-modelling research-engaged mindsets and behaviours.
2. Helping teachers and staff to develop their research use-related skills and knowledge.
3. Providing school resources, processes and schedules that support research use (Gleeson et al., 2020[46]; Rickinson et al., 2021[19]).

Firstly, in Survey 1 and interviews, educators emphasised the importance of leadership for quality research use (referenced in 89% of interviews and 72% of surveys) and highlighted the connection between effective leadership and a research-engaged school culture (96% of interviews, 40% of surveys). Building on this, educators in Survey 2 identified specific aspects of a school culture that were seen as critical for supporting increased and improved use of research in practice. These included "trusted staff-leadership relationship" (seen as important by 82%) and a "culture of knowledge sharing" (81%).

Notably, each of these aspects were important to both leaders and teachers. For example, whether "leaders demonstrated, and role modelled research use and implementation" was valued by 84% of leaders and 73% of teachers. As one survey respondent explained:

> *Leaders should not only quote what the 'research says', they have to walk the talk and model its implementation. (Survey response, Teacher, Catholic Primary School)*

Secondly, educators looked to leaders for support with their research use-related skill and confidence development. In their responses to Survey 1 and the follow-up interviews, educators associated several key skills with quality research use including: "research skills", involving capabilities to find, read, interpret and critique research (referenced in 81% of interviews and 85% of surveys); "relational skills", involving

capabilities to mentor others and network for improved research use (52% of interviews, 21% of surveys); "thinking skills", involving "forward thinking", problem-solving and reflective capabilities (44% of interviews, 56% of surveys); and "data literacy skills", involving capabilities to collect and analyse data (22% of interviews, 11% of surveys).

In Survey 1, a number of educators indicated that they lacked confidence in their capabilities to "judge the quality of research" (44% lacked confidence) and "analyse and interpret research" (32%), while 64% indicated struggling to "find relevant research". Consistent with previous studies (e.g. Dagenais et al. (2012[47]); van Schaik et al. (2018[48])), educators who were not confident to "judge the quality of research" were significantly less likely to regularly use research in practice compared with educators who were confident to "judge the quality of research" (see Annex A for details of statistical methods).

Similar responses were also seen in Survey 2 where just over a third (36%) felt that research use was not worthwhile because the research was "being described in a way that could not easily be used or applied to practice". As a result, educators' most critical development needs were about how to "identify issues where research could help" (43% ranked in top 5 needs, 1st ranked overall), "assess the usability of research" (42%, 2nd ranked), and "assess research for contextual relevance and fit" (41%, 3rd ranked).

Given these findings, it is unsurprising that Professional Learning (PL) was reported as a priority for school and system leaders to address. In the second survey, just over two-thirds of educators (68%) indicated that it was "important" or "very important" for schools to provide "internal collaborative learning opportunities and/or structured professional learning communities". Furthermore, educators who indicated the adequate provision of internal PL opportunities within their school were significantly more likely to report regularly using university research and/or university guidance in their practice compared with educators who indicated a lack of adequate provision of such opportunities within their school. This statistically significant relationship was also seen in relation to external (beyond school) PL opportunities (see Annex A for details of statistical methods).

Finally, educators stressed the need for school leaders to provide school resources, processes and schedules to support quality research use. Specifically, their responses highlighted the provision of sufficient time to engage with research while at school as a priority issue for school leaders to address. Educators reported that finding sufficient time to use research was a prominent challenge. In Survey 1, the majority of educators (76%) did not feel that they had "adequate time to engage with research" and the same percentage reported struggling to "keep up with new research" (76%). Unsurprisingly, educators who felt that they lacked "adequate time to engage with research" were significantly less likely to report regularly using research in their practice compared with those educators who felt that they did have sufficient time to engage with research (see Annex A for details of statistical methods).

The challenges in finding sufficient time for research use were also striking in educators' responses in Survey 2, with nearly two-thirds of respondents (61%) indicating that using research was not worthwhile because of the "significant time needed to access, read and put research into practice". For educators who used research during the school term, 81% indicated doing so at school during work hours. However, they also used their own time, with many engaging with research at home after school (59%) and/or at home on weekends (69%). While educators indicated that it was important for schools to provide structured time to engage with research (e.g. 72% of Survey 2 indicated it was "important" or "very important" to "build time into staff schedules"), they also highlighted the need for system actors such as state and federal Departments of Education to address workload pressures and insufficient teaching resources in schools to help free time to engage with research. For example:

> *It raises questions around [the] issues with our system. … Time is the biggest issue because we have some very well-intentioned staff who want to try [using research] but feel so burdened by the documentation and administrative requirements [of the profession]. (Interview response, Middle leader, Catholic Secondary School)*

Conclusion and implications

Our purpose in this chapter was to introduce and explore the idea of "quality use of research evidence" or using research *well*. This idea comes against a backdrop of growing efforts to improve the use of educational research internationally, which can be seen to raise important questions about what "using research well" in education means and involves. To date, however, such questions have been little discussed. As explained at the outset, there is a well-developed literature around understanding and appraising the quality of different kinds of evidence but little in the way of an equivalent for understanding and appraising the quality of different kinds of use.

In response, this chapter has shared conceptual understandings and empirical insights in relation to framing, practising and supporting quality use. In summary, it has argued that:

- Quality use of research evidence in education can be defined as "thoughtful engagement with and implementation of appropriate research evidence supported by a blend of individual and organisational enabling components and system-level influences".
- Educators have strong views on what using research well involves in practice and emphasise the importance of it being purposeful, embedded, connected to teacher professionalism, collective, time and effort dependent, and curiosity-driven.
- Educators make clear that using research well does not happen in a vacuum but requires school-level support, in particular, research-engaged leadership and culture, research-related professional learning opportunities and most importantly, time provision for engagement with research.

Based on these main arguments, we see four potential implications for individuals and organisations interested in strengthening the role of research within school and system improvement. This includes teachers, school leaders, system leaders, teacher educators, policy makers, funders, researchers and research brokers, and the organisations, networks and systems within which they work.

Focus on evidence utilisation (pull) as well as evidence production (push)

Firstly, the ideas in this chapter can provide a frame with which to review current efforts to support evidence use. The idea of quality use, for example, highlights the need for system-level developments that not only create access to valid and reliable evidence but also support productive use of that evidence. There is a reported tendency, even among evidence brokerage organisations, to focus on "a research production (push) approach to the use of research rather than a problem-solving, demand-led (pull) approach" (Gough, Maidment and Sharples, 2018, p. 7[12]). The concept of quality use, then, can be a stimulus for reviewing the balance between efforts to improve the production and availability of high-quality research evidence (push) and efforts to improve the capacity of policy makers and practitioners to use it productively (pull). Similarly, the enabling components of the QURE Framework can encourage educational leaders of all kinds to think carefully about how well they are modelling and fostering the development of:

- *Education professionals* with not only the knowledge and capabilities to understand research but also the dispositions and values to be open to its meaning and the capacity to work with others to figure out how to use it in context.
- *Education organisations* with not only the structures and processes to enable staff to engage with evidence but the ethos and values to make this a cultural norm, and the leadership and commitment to demonstrate and promote its significance.
- *Education systems* that support quality evidence use not only within specific individuals, institutions or contexts but also through coordinated interventions across multiple levels and with varied key stakeholders.

In connection with all of the above, educators' perspectives on using research well highlight the importance of reviewing the extent to which school-level supports prioritise *protected time* through formal and informal processes, and the ongoing development of skills and confidence through *professional learning*.

Move the conversation from whether we use evidence to how well we use evidence

Secondly, the ideas presented in this chapter can be a stimulus for reflection on current approaches to using evidence. At a general level, these ideas can encourage us to think carefully about: how willing we are to move from talking about *whether* we use evidence to talking about *how well* we use evidence; and how interested we are in improving not just the *quality of our evidence* but also the *quality of its use*. More specifically, the core components of the QURE Framework and the six characteristics of quality use in practice can be seen as an invitation to reflect honestly on current approaches to:

- *Practising evidence use* – How curious are we about the "appropriateness" of our evidence, and the "thoughtfulness" of our engagement and implementation of that evidence?
- *Developing evidence use* – How serious are we about our evidence use being "purposeful", "curiosity-driven" and "connected to professionalism"?
- *Leading evidence use* – How focused are we on enabling evidence use that is "embedded", "collective" and "time and effort dependent"?

Support evidence use as a practice and listen to the views of practitioners

Thirdly, the ideas within this chapter underline the value of practitioner perspectives for understanding and improving evidence use. Several authors have pointed out a lack of work focused on the practice and practitioners of evidence use. Farley-Ripple et al. (2018, p. 236[44]), for example, describe how "little attention has been paid to the practice of evidence use" within education, with the result that "what practitioners actually do and use when engaging with research" is not well understood. Along similar lines, Lomas and Brown (2009, p. 914[49]) note that most models of research use in policy "address the role of the researcher trying to get his or her research used more than that of the civil servant trying to do the using". With these kinds of concerns in mind, the work reported in this chapter can be seen as an attempt to explore not just what using research well means conceptually but also what it involves practically in terms of teachers' and school leaders' experiences and perspectives. The findings reported here are, of course, at an early stage and there is much more to be done but the more general point is that evidence use as a field needs far more work that is focused on the practices and perspectives of the *users* of evidence.

Build international understanding of high-quality evidence use

Finally, the insights shared within this chapter can be a stimulus for increased work on the quality of evidence use. Some five years ago, we argued that there was "real potential in coming years for more sustained exploration of the quality and qualities of evidence use within [...] educational practice and policy" (Rickinson et al., 2017, p. 187[18]). The work reported in this chapter is a first attempt to initiate this kind of exploration within one geographical context but we hope it can help to stimulate future similar studies of what using research well looks like in practice in other countries and/or systems. Writing several years ago, Qi and Levin (2013, p. 19[50]) reported that "knowledge mobilisation in the field of education is still a relatively new area". While much has changed since the time of that statement, we would argue that the "relatively new area" description is still true for our understanding of quality use of research in practice and how best to support it.

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Annex 9.A. Sample and analysis details

Annex Table 9.A.1 below provides details of the sample for each of the empirical research activities that are reported on in the chapter. It outlines educators' geographical location and role within their school.

Annex Table 9.A.1. Sample details

		Survey 1 (*N*=492)	Survey 2 (*N*=414)	Interviews (*N*=29)*
State	New South Wales (NSW)	149	158	5
	Victoria (VIC)	195	150	13
	Queensland (QLD)	116	83	9
	South Australia (SA)	32	23	2
Role	Teacher	281	307	2
	Middle leader	60	32	7
	Senior leader	99	24	20
	Other role	52	51	0

Note:
* 27 interviews were conducted with a total of 29 interviewees.

In terms of analysis processes, quantitative survey data were analysed in SPSS Statistics (Version 27.0) and the percentages reported in the chapter represent the number of respondents who either: "agreed" and "strongly agreed" with Likert-style rating items; ranked items in the top five positions for ranking-style questions; or selected an item for dichotomous questions. Likert-style and ranking-style questions were also recoded (e.g. "agree" and "strongly agree" responses were grouped together) to allow for similar statistical analyses to the dichotomous questions. Throughout the chapter, the phrase "significantly less" or "significantly more" denotes a statistically significant relationship ($p < .05$) between two recoded survey items based on Fisher's exact tests (see Walsh et al. (2022[20]) for more details).

Qualitative interview data were analysed in NVivo (Version 12) using Braun and Clarke's (2006[51]) codebook thematic analysis approach, which provided flexibility to allow for both deductive coding as well as inductive coding and the identification of new themes. Percentages reported in the chapter reflect the proportion of interview and/or survey responses which were coded to a specific theme (see Rickinson et al. (2021[19]) for more details).

10 Perspectives on education research

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This chapter presents different perspectives on what education research is, what types of research are relevant for policy and practice, and how research should be produced. The discussion is framed by some key questions that have emerged from decades of debate about the relevance of education research for teaching practice and policy. This is followed by short opinion pieces in which experts representing different countries, types of organisations and roles answer these questions from their own perspectives. The viewpoints include academia, policy, practice, funders, unions and teacher training. The chapter concludes with a set of convergences, divergences and open questions.

Introduction

In a discussion on the impact and use of education research in policy and practice one cannot avoid getting into the core questions about research itself. The nature and sources of research evidence as well as its quality and relevance for policy and practice have long been debated (e.g. Nutley, Walter and Davies (2007[1]), OECD (2007[2]), Nutley et al. (2010[3])). There has been a great deal of discussion about what purpose education research should serve, and which methodologies are the highest quality and most useful for addressing various questions. The debate also includes the question of how, by whom and under what circumstances research should be produced, and how it should be financed.

In 2007, Thomas Cook and Stephen Gorard debated the place of experimental design in evidence-based policy making and practice in the "Evidence in Education" OECD volume (OECD, 2007[2]). Despite the fact that one of them (Thomas Cook) is a strong proponent of randomised control trials (RCT) while the other (Stephen Gorard) is an advocate of mixing different methods, there was more agreement than disagreement between them. Notably, they both pointed to the importance of addressing causal questions that lie at the core of the evidence base for education policy, much of which is concerned with improving educational outcomes and efficiency. They also agreed that there was a lack of experimental design in education research. Where they disagreed was the urgency of producing more research on effective practices and the weight that experiments should have in causal studies. Fifteen years later, this chapter aims to pick that conversation up and take it forward in four main ways.

First, by *reflecting on what has changed* since then and the implications of those changes for education research today. The "what works" movement in education has led to significant investments into intervention testing in many countries, including through RCTs, over the past decades. Does that mean that education research today serves policy and practice more effectively? If so, in what ways? What is still missing, if anything? Research has been growing in other areas too. For example, the interdisciplinary fields of neuroscience and cognitive science have been yielding knowledge that could be relevant for policy and practice. Can that knowledge be used in educational decision making and is it? Could the same debate today be sparked by the question: "Experimental research or cognitive sciences: Which one yields a stronger evidence base?" What other substantive changes in research matter for education policy and practice?

Second, by *enlarging the debate from a primarily methodological one to a broader discussion* on the role of actors in research production and its implications for the quality of research. The evidence-based practice and policy agenda has led to increased collaboration between practitioners and researchers. Part of the appeal of co-production is that it brings research knowledge directly into practice while also enriching research with an understanding of what the practice-based challenges are. With this, the popularity of applied research and practice-based methodologies such as action research, collaborative enquiry and design-based research has grown. Are there additional actors engaged in research production and is now the time for them, or for others, to become more involved? What do such models imply for the scientific rigour of research? How can we (re-)define and ensure the quality of education research given that it now exceeds the boundaries of academia?

Third, by *considering the overall coordination of research production* and what can be done to address the perceived lack of it. Education research has been accused of not producing evidence in a cumulative way and thus being unable to systematically improve practice and policy. Can and should education research work towards building a comprehensive knowledge base for teaching and schooling? If so, how can that be done? Attempts have been made to direct research production through funding but some of these have also been strongly criticised. Should public funding be (more) prescriptive with respect to the production of education research? And if so, how? Is there a tension between evidence-informed policy/practice and policy/practice-driven evidence? Funders of education research have diversified in the past decades. In addition to public funding, which in many countries is very limited compared to other service sectors, increasingly more education research is funded by private organisations and foundations. While this

implies more resources, the particular interests, goals and criteria of funders influence the aim, scope and sometimes also the methods of the research. What does that mean for research relevance and quality? Are there any ethical considerations, and if so, how should they be addressed?

Fourth, by *adding more voices to the table*. In the 2007 volume, the debate took place between two prominent academics. In general, a lot of the discussion about the purpose, quality and the production of education research takes place within the confines of the research community. These issues are discussed during academic conferences and published in academic literature (e.g. Moss et al. (2009[4]), Nelson and Campbell (2017[5]), Furlong and Oancea (2005[6]), Rasmussen (2021[7]) to cite only a few examples relevant to the above questions). This chapter aims to make other voices heard: Actors who have roles in education policy or practice, or are at the crossroads of these communities. They may or may not have engaged in academic education research but they are all concerned with various aspects of research production. The invited experts not only represent different roles and types of institutions but also different countries with different education systems.

The next section presents short opinion pieces by invited experts. They were all prompted to react to the above introduction either by selecting and addressing one or more of the questions proposed above that they consider the most pressing or by bringing in a new question they think is more important. These opinion pieces aim to enrich the discussion and contrast distinct perspectives, with a view to learn from each other and broaden the scope of reflections.

The seven opinion pieces draw an interesting arc that spans from the production of research in a more traditional, academic sense, to the engagement of various actors, funding issues and ethical considerations. Dirk Van Damme focuses on core issues of research production, such as the disciplinary identity of educational research, funding (or the lack thereof), methodological and research quality issues. Mark Schneider presents a way forward to increase the scientific rigour of education research, where this takes into account the fact that research should serve practice and policy. John Bangs and Martin Henry provide a perspective that bridges research and advocacy, pointing to the important role of unions in ensuring the relevance of research production, facilitating teachers' research use and engagement in research. The teacher engagement piece is brought forward, with a focus on research co-production, by Emese K. Nagy's voice as a school leader, researcher and teacher educator. Tine S. Prøitz extends this discussion with deeper considerations for the effectiveness of research-practice partnerships. Vivian Tseng frames such partnerships in the democratisation of research production and proposes new and suitable approaches to funding research. Finally, Makito Yurita expands on the idea of democratisation, by pointing to imbalances and power issues not just between various groups of people, but also between research methodologies and countries.

The long and winding road for educational research

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Educational research is in a dire state

This bold statement may seem counterintuitive because the output of research is steadily growing and the call for evidence-informed policy and practice has never sounded as loud as today. The list of interesting initiatives and organisations devoting themselves to the dissemination and translation of educational research (see the interesting overview for Europe in Pellegrini and Vivanet (2020[8])) is growing longer and the integration of research evidence in policy and practice is steadily improving.

Educational research has grown and matured. This has resulted in thousands of valuable and interesting research papers in specialised outlets. It has also led to growing optimism that educational research could resolve some of the most difficult issues in educational policy and practice. The expansion of experimental

design and, especially, of randomised controlled trials (RCTs), often proclaimed to be the gold standard of educational research design, has brought many people to believe that it is possible to develop a catalogue of 'what works' interventions that can be readily implemented.

With the expansion of educational research funding, activity and output, the methodological quality of educational research has improved. Though one can still find a lot of contemplative and opinionated papers in educational journals, the 'empirical turn' in educational research has clearly turned research output in the direction of quantitative, methodologically sound research. Research methodologies have become more sophisticated and research designs more complex.

However, focusing on these positive trends leads to a distorted picture. The reality is that education systems are still very far from becoming knowledge-intensive systems in which research evidence penetrates decision-making processes both at macro-, meso- and micro-level. Like other complex public policy systems, education is looking for reliable sources of knowledge and is increasingly turning to scientifically founded research knowledge. Research evidence promises to provide the knowledge and information-enabling complex systems to change in order to adapt to or to anticipate changing circumstances (Fazekas and Burns, 2012[9]; Burns and Köster, 2016[10]). However, despite the growing number of educational researchers and increasing quantity of published educational research, the influx of research evidence into educational policy and practice is still far below what is necessary to turn education into an evidence-informed system. The consequence is that education – both at the macro- and at the micro-level – suffers from an epistemic or lack-of-knowledge uncertainty problem. Policy makers as well as practitioners try to minimise the risks associated with epistemic uncertainty by tapping into various knowledge sources that compete with research evidence, such as experiential knowledge or teachers' professional knowledge. These knowledge sources, although valuable and not to be underestimated, cannot match the accuracy of scientifically founded research evidence. The consequence is the multiplication of ineffective and sometimes counterproductive interventions and practices.

To explain why education has so far failed to turn into an evidence-based system, one can look at three possible factors: The production of research evidence; the transmission and translation of research evidence; and the reception and integration of research evidence into policy and practice. Each factor is relevant. But in my view, the core issue is situated on the production side. The research system is failing to produce sufficient quantity and quality of evidence to feed a complex system such as education.

Funding and supply issues

The easy explanation is that this is the result of a lack of funding and that if more resources were available, the situation would automatically improve. There is some truth in this. Compared to the health sector, which is a public policy sector similar in size and mission, education is very far behind in terms of moving to an evidence-informed system. Estimates suggest that the share of education research in public research expenditure is about one-fifth of that of biomedical research.

But in order to assess the maturity of a research sector, the quality of published research is much more relevant than its financial input. The share of published research synthesis papers is an excellent indicator of this. In its recent White Paper, education.org calculated that, globally, the health/education expenditure ratio is 1.75 but the health/education knowledge synthesis ratio is no less than 26 (Education.org, 2021[11]). Whether the publication of research synthesis papers is a reliable metric is open to debate, but the magnitude of the gap is significant.

However, there is little empirical support for the claim that we are dealing with a purely quantitative supply problem. If that were the case, the positive trends in production and dissemination of educational research would have had a visible impact on the overall effectiveness and efficiency of the educational system itself (Tucker, 2019[12]).

Deeper causes

Over the past decades, education systems have not benefitted from the increase in educational research spending and output. Education has not improved in terms of macro-efficiency indicators such as per student cost nor overall learning outcomes or equity This is the case for both developed and developing economies (Angrist et al., 2021[13]). How is it possible that, while knowledge of effective teaching and learning has grown, progress in getting children into schools (i.e. in building schools and training teachers) has not resulted in better learning opportunities?

What are the deeper causes of the problem? Why has more and better educational research not resulted in visible impact?

The theoretical basis is weak and flawed

A lot of educational research is heavily influenced by fashionable frameworks with weak scientific support such as social constructivism. The empirical turn in educational research enabled it to distance itself from old philosophical and pedagogical foundations without, however, establishing a theoretical basis of its own. Theories have been imported from neighbouring disciplines and only very rarely have they emerged from educational research itself. The space of theory in research has been filled by particular pedagogical belief and value systems such as early 20th-century child-centred *Reformpädogogik*, John Dewey's pragmatism, or Paulo Freire's critical pedagogy.

The most interesting research on education is found in neighbouring research domains such as sociology of education, economics of education, cognitive psychology and neuroscience. Educational research benefits from these fields, but as an interdisciplinary and applied field of research, it should also be able to produce groundbreaking research itself.

Methodological debates and biases

Philosophical and normative debates on methodology have absorbed enormous research power and energy, and occupy a large part of publication output (Wrigley, 2018[14]). For example, the discussion on randomised controlled trials (RTCs) lingers on, turning into an unproductive and unsolvable ideological battle (Connolly, Keenan and Urbanska, 2018[15]).

The replication crisis in social sciences has hit educational research very hard. Already in 2014, an analysis of the top 100 education journals revealed that only 0.13% of the published papers were replications, far less than in any other field of social research (Makel and Plucker, 2014[16]; Perry, Morris and Lea, 2022[17]).

Policy makers and practitioners are calling on educational researchers to do more relevant research that is applicable to educational policy and practice (Wyse, 2020[18]) and this risks further weakening the scientific basis of educational research. Situated research with often weak methodologies does not lend itself to generalisation and the construction of a consolidated knowledge base (Tipton and Olsen, 2018[19]).

Educational research suffers from different kinds of biases. "Insider bias" (i.e. those designing and implementing an educational intervention being the ones evaluating its impact) is strong in educational research (Barshay, 2019[20]). External, independent evaluation studies are rare in the educational field.

Finally, educational researchers are particularly prone to ideological or political bias. Many are strongly motivated by political activism, which influences their research design and findings.

Education systems and societies at large do not receive the high-quality educational research they need and deserve.

How to fix them

There are no quick fixes to the current situation. Making education systems more evidence-based will require a lot of effort on multiple levels. And it will require time. More fundamental issues need to be addressed.

Provide more strategic funding for research growth

Educational research has not reached the quantitative threshold to meet the demands of a huge and complex system like education for reliable evidence. Growth in the production of educational research is very much needed. Governments and research funders need to develop a strategic plan for the gradual increase of funding resources. Qualitative issues will be more easily solved with some extra quantitative space. Despite the call for more relevant, policy- and practice-oriented research, sufficient resources need to go to more fundamental, time-intensive research (for example, in longitudinal designs) and theoretical research building on generalisable empirical findings.

Educational research does not enjoy high priority in research funding mechanisms. Even though it is perceived to be applied, educational research does not enjoy the same status as more fundamental research domains. But for more funding and improved status to have impact, educational research must address its qualitative deficiencies.

Establish education research as an academic discipline

The funding issue is closely related to the relationship between educational research and its neighbouring disciplines. Interdisciplinary connections and mutual fertilisation are extremely important but education needs and deserves its own foundational body of research evidence, informed by but not reduced to the perspectives of neighbouring disciplines.

To establish itself firmly as an academic discipline, education needs to devote more attention and energy to establishing its own theoretical foundation. Important pedagogical traditions can certainly inform the construction of educational theory but are not to be considered as theories in their own right. Theories emerge through sufficiently generalisable and replicable empirical research, not through ideological frameworks.

Improve self-regulation and evaluation

The educational research field has to improve self-regulation in its assessment and evaluation procedures, peer review practices and publication procedures. There needs to be more rigorous approaches to research, and less ideology and activism. The publication pressure on researchers also leads to over-publication, with too many close to worthless papers. With so many competing publications, high-quality publications struggle for visibility and impact. There also needs to be much more rigor in educational research associations, research funding bodies and educational journals.

Accept limitations

In order to gain more respect (and funding), educational researchers often over-sell the capacity of empirical research to provide useable answers to policy and practice. Much effort that goes into promoting evidence-based policy and practice implicitly suggests that there is an evidence-based answer to every problem in education. This is untrue; in fact, research evidence provides useful knowledge for addressing only a very limited number of issues in policy and practice. The often-used phrase “research evidence shows” should be employed only when there is robust, replicated and generalisable evidence from high-quality research.

The road to upgrading educational research so that education systems become evidence-based knowledge systems is a long and winding one. In the meantime, let's be respectful of how policy makers and practitioners solve their knowledge needs. The challenge lies with the research community, not with teachers and policy makers.

More scientific rigour for education research

Mark Schneider, Director of the Institute of Education Sciences, United States

Box 10.1. Institute of Education Sciences, United States

The Institute of Education Sciences (IES) is the science office within the United States (US) Department of Education. The Institute's portfolio supports research on early childhood, elementary, secondary, tertiary, and adult education.

With an annual investment in education research of around USD150 million, IES is one of the world's largest education research funders. Since its founding in 2002, IES has been focused on supporting rigorous education research that is transparent, actionable, and focused on consequential outcomes with the potential to improve student achievement.

Source: IES (n.d.[21]), *Homepage*, https://ies.ed.gov/.

This chapter has a wide purview but I have chosen to focus on the last point enumerated in the chapter introduction: How should research be produced? Education research is a large field pursued in many different ways around the globe. My contribution to this chapter has a particular focus: Increasing the scientific rigor of education research.

I have the pleasure of reflecting on what I believe to be some of the challenges that the field of education research faces as it works to increase the quality of work aimed at improving learner outcomes. This brief essay reflects a set of fundamental principles I believe need to be followed to move education sciences forward.

From RCTs to standards for excellence

For the first 20 years of the Institute of Education Sciences (IES) in the United States (see Box 10.1), we focused on strengthening the field's capacity to do rigorous research characterised by internal validity and relying heavily on randomised control trials (RCTs). But simply knowing that something works is not enough. To be truly transformational, research must address a wider range of issues. We have embarked on an institute-wide effort that emphasises factors that can make research transformational. We call this effort Standards for Excellence in Education Research (SEER).[1] I introduced SEER in two blog posts.[2] IES has refined SEER frequently and will continue to do so as we receive feedback from researchers, practitioners, and policy makers.

IES previously enumerated eight SEER principles encouraging researchers to:

- Pre-register studies.
- Make findings, methods, and data open.
- Identify interventions' components.
- Document treatment implementation and contrast.

- Analyse intervention costs.
- Use high-quality outcome measures.
- Facilitate generalisation of study findings.
- Support scaling up of promising interventions.

IES recently announced a ninth principle focused on equity in education research, calling on researchers to "Address inequities in societal resources, opportunities, and outcomes".

SEER codifies practices that IES expects – and increasingly requires – to be implemented as part of IES-funded causal impact studies. But note that many SEER principles and associated recommendations are applicable to other types of research the Institute supports as well.

There is growing scientific literature supporting each of these principles – but much of SEER is relatively new to education science research. The first two are clearly "normal science" and I will not comment on them further. In the rest of this brief essay, I briefly highlight the importance of a few principles that have presented challenges to American education researchers. I begin with the challenge of identifying the *core components* of an intervention.

Identify the components of an intervention

Imagine a medical trial where the intervention consisted of a bag of pills – some green, some red, some yellow. Patients take these pills and at the end of the experiment, we find that these pills improved outcomes. It is unlikely that any medical review board would ever approve such a treatment and the results would likely (and deservedly) be denied publication. Yet, far too many education interventions are exactly like the bag of pills – a collection of parts, many of which have never been clearly identified, let alone evaluated. IES has been pushing hard to get education researchers to identify the components of an intervention and then work to isolate the effects (and the costs) of each component. This requires a lot of work, especially in developing a common taxonomy by which to classify components and a nomenclature to identify and describe the components themselves. We have been supporting social science research firms who have, in turn, partnered with intervention developers and study authors to help create both.

Analyse costs

For several years, we have been requiring cost analysis for most of the research we support and the requirements for cost analysis have been getting more demanding. Education officials need to know how much something costs. Sometimes a less effective programme should be chosen because it is much cheaper than a more effective programme that exceeds a school's budget. Introducing cost analysis was a challenge to American education researchers, very few of whom have training in economics. In the first year of implementing this SEER principle, many grant applications were rejected as being "non-responsive" to this requirement. We, in turn, provided technical assistance[3] – from easy-to-use tools to help desks[4] staffed with cost analysis experts – to the field. Given how many proposals were rejected as non-responsive, it was obvious that we were serious about cost analysis and now almost all applications meet this requirement (and the proposed work is getting better and better).

Use high-quality outcome measures

Consider the SEER principle that calls for the use high-quality outcome measures. This principle traces back to a simple fact: When researchers or developers create their own outcome measures, the measures are all too often "over-aligned" with the intervention, producing estimates of effects that can be several times larger than observed using measures created by others. As the late Robert Slavin convincingly argued (2014[22]) these biased measures all too often lead to false conclusions and bad recommendations. While we still allow developers and researchers to use their own measures, we are now requiring them to

use high-quality "common measures" so that results can be more easily validated and compared across interventions. We have supported work like EdInstruments[5] to help catalogue measures used in contemporary education research. More work is needed, though, to identify a more parsimonious set of high-quality outcome measures.

Facilitate generalisation of findings

There are many prongs to the generalisation SEER principle. The one that we have emphasised most focuses on replication. Many sciences have a replication crisis – that is outcomes of experiments fail to replicate. The good news: Education science research does not have a replication crisis. The bad news: That is because we hardly ever replicate existing work. There are at least two consequences to that. First, idiosyncratic (sometimes fraudulent) work enters the mainstream (see Stuart Ritchie's book *Science Fictions*[6] for just how common this is) and, often, consequential decisions are made on the basis of those claims. Second, without replicating work, we cannot identify which populations of learners might benefit the most (or not at all) from specific interventions. Thus, not only do we need more replications but we need to make sure those replications systematically vary population groups to advance IES' mission of identifying "what works for whom under what conditions".

Unfortunately, traditional field-based impact evaluations, especially randomised control trials, the gold standard of research, can be very expensive and take a long time to implement and analyse. We have been supporting[7] digital learning platforms that can accommodate multiple researchers conducting faster turnaround studies than is the norm in traditional experiments. Here, we borrowed from the work of Jim Manzi[8] and his mantra to "fail fast." We are supporting an XPrize competition to instantiate that idea by having teams of researchers use digital learning platforms to deliver experiments and then replications based on the findings of the original experiment. To compete, teams had to have platforms with at least 100 000 users (some have far more).

Support scaling

Another SEER principle pertains to the scaling up of promising interventions. All too often, interventions that have promise in transforming learner outcomes never come to market and never scale beyond the small number of schools/students that were involved in the original field tests. Part of the problem is one of misalignment of incentives. To the extent to which we fund academic researchers, their interests are to publish and get tenure and promotion. Most do not have the interest nor the skills to scale their products. IES has been struggling with this issue for some time. Most recently we have worked with SRI International to identify and inculcate explicit market orientation into work we fund (Wu et al., 2021[23]). We still have not found a scaleable way of encouraging scaling – but we are working on it.[9]

Address inequities

The final SEER principle calling on researchers to "address inequities in societal resources, opportunities, and outcomes" is the newest addition. This principle reflects the growing concern for social justice and for addressing historical inequities in education. This principle is a sharper version of our long-standing commitment to research designed to close education gaps – a commitment built into our 2002 authorising legislation (US Congress, 2002[24]).

In sum

SEER is not the only set of principles to structure the study of education interventions – and for many problems facing education around the world, it is not even the best way. However, we can often conduct far more rigorous research than we have done in the past. IES has placed a large bet that SEER can

increase the rigor of education research, help education research improve its standing as a scientific enterprise, and, most importantly, improve the outcomes of more and more learners across the life span.

From research to advocacy

John Bangs, Special Consultant, Education International

Martin Henry, Research Coordinator, Education International

Box 10.2. Education International

Education International (EI) is the largest global union federation with just under 400 member unions and organisations in membership who represent over 32 million teachers and support staff. Founded in 1993, it has become the principal advocate for the teaching profession across the world. In the last 15 years, EI has increasingly focused on linking research evidence to the framing of teacher policy. It works closely with UNESCO, the OECD and a range of other global organisations.

Triennially EI publishes comprehensive research on the Global Status of Teachers. The 2021 edition painted a graphic picture of the views and aspirations of the global teaching profession as it emerged from adapting education to respond to the impact of the pandemic.

The full range of Education International's research and publications can be accessed at www.ei-ie.org/en/resources/publications-and-research.

Source: EI (n.d.[25]), *Homepage*, https://www.ei-ie.org/en and EI (2021[26]), *The Global Report on the Status of Teachers*.

Introduction

In inviting Education International (EI) (see Box 10.2) to give its perspective on the use of research evidence in education, the OECD asked some interesting questions. One of the most relevant to EI is: "Does education research serve policy and practice more effectively?" (It is a question, we assume, which uses the 2007 baseline when the OECD's *Evidence in Education: Linking Policy and Practice* (2007[2]) was published). The purpose of this paper is to demonstrate that the answer to the OECD's question is, unequivocally, "Yes".

Education International and research

To answer this question, we refer to the wide range of EI research and how it informs EI's advocacy. We then focus on how EI's and the OECD's research have contributed to the development of effective teacher policy by way of providing an in-depth exemplar of how EI has constructed research and advocacy partnerships with another global organisation. This does not mean, however, that because a specific EI/OECD lens is used to illustrate EI's relationship with research and teacher policy that this presents an exclusive summary of all EI's research output on teaching as a profession.

Union membership density – the proportion of teachers who are members of unions – within the teaching profession is the highest and most stable among all economic sectors (Carter, Stevenson and Passy, 2010[27]). It is not surprising, therefore, that unions are in constant touch with their membership, investigating and analysing their views and the professional environments within which they work. In the past, teacher unions were targets of research and contributors to research but, increasingly, teacher unions

have become key players in commissioning educational research. Twenty years ago, EI created its own Research Network of member organisations who share their own research with other unions and an independent Research Institute which commissions research directly.

Why does EI commission research? The answer is quite simply to inform the development of its education policies and to enable its member organisations to be able to confidently advocate for them knowing that they are supported by research evidence. One example among many illustrates this. Triennially EI publishes comprehensive research on the Global Status of Teachers.[10] The 2021 edition painted a graphic picture of the views and aspirations of the global teaching profession as it emerged from adapting education to respond to the impact of the pandemic (EI, 2021[26]).

Research and teacher policy – Education International and the OECD

EI supports teachers' ownership of research

Of course, research and evidence collection has always been important to teacher unions. Prior to 2010, the OECD's social partner, the Trade Union Advisory Committee (TUAC) through which EI is represented, was not represented on the OECD's key research boards such as those for the Centre for Educational Research and Innovation (CERI), the Programme for International Student Assessment (PISA) and the Teaching and Learning International Survey (TALIS). Now TUAC is invited by these boards to send participating observers to their planning meetings.

One of the reasons for this shift was that, through EI's advocacy, the OECD understood that teachers' active consent to take part in OECD teacher-focused studies helped it to both implement those studies more smoothly and to achieve a much wider understanding among teachers of the studies' outcomes. For its part, EI's engagement in the development of TALIS and PISA through TUAC has enabled it to contribute to the teacher policy aspects of those studies and to argue that their data and policy findings are as much the property of teachers and their organisations as they are of educational jurisdictions.

EI helps research reflect the reality of teaching

EI's engagement in the developmental processes of TALIS and PISA has also, for example, led to the questionnaire scales on the causes and nature of teachers' stress within TALIS 2018 (OECD, 2020[28]). This came about as result of proposals made by EI. Additionally, the scales on teacher leadership within the TALIS 2013 questions and the conclusions within TALIS 2013 (OECD, 2014[29]) about the need for systemic guidance on securing a shift towards distributed leadership in schools (OECD, 2014, p. 200[29]) were influenced by EI's own commissioned study on teacher leadership (Bangs and Frost, 2012[30]). This EI study involved a qualitative survey of classroom teachers and their organisations in a range of countries in order to provide EI with recommendations for a policy framework for enhancing teacher leadership.

The inverse is also true: data from OECD studies has also provided the basis for EI-commissioned research into the impact or absence of jurisdiction-wide teacher policies. For example, Burns and Darling-Hammond's analysis of TALIS 2013 data led to insights and policy proposals independent of the original report itself, particularly in relation to teacher shortages, collaboration and leadership (Burns and Darling-Hammond, 2014[31]).

Teachers themselves are also increasingly engaged in carrying out research themselves, not least because Masters degrees and Doctorates require research reviews if not primary research. An important question for teachers is how they can gain access to research partnerships and work alongside researchers. Securing these opportunities is becoming an increasingly important goal for teacher unions in countries such as Norway where teacher training includes an academic dimension involving teachers learning about research disciplines and carrying out action research.

EI supports research that informs the creation of effective teacher policy

EI partnership with the OECD on teacher policy-related research has continued since 2010. For example, through TUAC, EI has twice contributed chapters to the OECD's synthesis of educational policy development, Education Policy Outlook (EPO). Those contributions were informed by surveys of teacher unions in OECD member countries carried out by EI to provide the evidential basis for its TUAC chapters. In essence, the surveys tracked teacher unions' changing priorities within teacher policy. For example, "Education union partnerships in policy reforms" (OECD, 2015[32]) found that the most productive teacher union discussions with governments were on teachers' professional development, working conditions, equity issues and curriculum in that order. By 2019, "Success in hard times" reported that the highest percentages of teacher union respondents believed that the most productive areas of discussion with governments were now on teachers' pay and conditions, and curriculum reform (OECD, 2019[33]).

Since 2010 EI's and the OECD's developing relationship on research and evidence-informed policies has enabled the creation of the International Summits on the Teaching Profession (ISTPs), which is a unique partnership between OECD Education Ministers, the OECD itself and EI (see Box 10.3). Bangs (2020[34]) provides an in-depth analysis of the ISTPs' relationship to the development of teacher policy. It came to two conclusions. The first was that the bedrock of outstanding education systems was a confident teaching profession at the edge of its game, engaged as equals in the development of reform. Secondly, it concluded that the organised voice of teachers was essential to the success of those reforms.

Box 10.3. The International Summits on the Teaching Profession

Established in 2011 by United States Secretary for Education, Arne Duncan, the National Education Association and the American Federation of Teachers, the ISTPs have taken place annually up until the present day. They are unique in providing the only international forum in which elected Ministers and teacher union leaders can meet on a confidential basis to share educational practice and set practical education targets for the coming year. Hosted by individual OECD countries, each ISTP has focused broadly on aspects of teacher policy. They are supported by background reports from the OECD and EI, which synthesise evidence and research outcomes relevant to each Summit's discussion themes.

The most recent Summit was again hosted by the United States. Its theme, Learning from the Past, Looking to the Future: Excellence and Equality for All, explored actions needed for post-pandemic educational reconstruction with a focus on teacher professionalism and well-being, whole child education and equity, and intentional collaboration (NCEE, 2021[35]). The OECD and EI reports provided the research evidence for the background reading for the Summit (Schleicher, 2021[36]; EI, 2021[37]).

Source: NCEE (2021[35]), *Learning from the Past, Looking to the Future: Excellence and Equity for All*, https://ncee.org/quick-read/learning-from-the-past-looking-to-the-future-excellence-and-equity-for-all/; Schleicher, A. (2021[36]), *Learning from the Past, Looking to the Future: Excellence and Equity for All*, https://doi.org/10.1787/f43c1728-en; EI (2021[37]), *Learning from the Past, Looking to the Future: Excellence and Equity for All: A Briefing by Education International*, https://www.ei-ie.org/en/item/25427:learning-from-the-past=looking-to-the-future-excellence-and-equity-for-all.

The relationship between EI and the OECD on research developed since 2010 has led to a joint initiative to set out the principles both organisations believe should inform post-pandemic educational recovery. Published in 2021, they emphasise that the recovery of education systems from the effects of the health crisis will be vital to the future social and economic health of societies. They also stress the importance of: Schools as centres of their communities; digital technology which supports teaching; focusing on education

for the whole child; and the need to foster teacher well-being and efficacy. The principles draw on the research and policy collaboration between EI and the OECD since 2010 (OECD/EI, 2021[38]).

In conclusion

It is quite clear from EI's experience that partnership and engagement has served policy and practice more effectively because of the alliances it has built up with global organisations that understand the policy and practice link. OECD is one example but a similar story could be told about EI's relationships with organisations such as UNESCO and the United Nations.

EI's primary interest in creating effective teacher policy is not solely because it enhances the daily professional lives of our members but because education systems function better and students learn more when teacher perspectives are taken into account. We also know that education systems that seek to enhance the well-being and efficacy of their teachers are correlated overall with high levels of achievement among all their students.

Teacher unions' involvement in research is not confined to pay and conditions. Teacher unions around the world commission and carry out significant research on professional issues. Yet the value, quality and extent of teacher union-initiated research is often underestimated by educational jurisdictions, which is a mistake because, increasingly, unions understand that evidence-informed policies are far more persuasive than policies based on assertion.

Indeed, the primary purpose of research commissioned by unions is to support their advocacy of union policies. Increasingly, researchers are attracted to working for teacher unions because they know that the policy impact of their research is much more likely to be amplified by union advocacy than when it is confined to publication in academic journals. Yet, interestingly, given the density of union membership in teaching, there are very few academics whose main research discipline is the study of the teaching profession and its organisations.

Engagement in research, whether as a participant completing questionnaire scales or as a director of research, does not come without a time cost. Survey fatigue is real among teachers involved in studies. However, teachers will willingly engage with surveys if they understand their purpose and can have access to their results. That is why the research teachers engage in most willingly is research that is relevant to their professional lives. They are as interested in seeing evidence have an impact as the union leaders who represent them.

For the day-to-day practice of teaching, teacher unions can reinforce the relevance of research for teachers. For researchers and research itself, teacher union involvement in research can amplify research findings and encourage an increase in the range and foci of educational research activities. For the development of robust and effective education policies, teacher unions can play a major role in strengthening the impact of research on policy.

Thoughts on public education research

Emese K. Nagy, School leader, Hejőkeresztúr; Head of Institute of Teacher Education, University of Miskolc, Hungary

As the director-general of a Teacher Training Institute and a core member of a doctoral school, I continuously participate in university research. As the head of a primary school, I experience how external and internal examinations and research affect the school. I treat the two as complementary, keeping in mind how useful they are together for the school. There is already a lot of joint research between universities and the school but our goal is to involve both parties in joint research with the same communication status to increase efficiency.

Other public education institutions think similarly. Most have recognised that education-related research (action research) and internal, institutional research are essential for their successful operation. While there is excellent research going on in universities and doctoral schools, the widespread publication and practical implementation of some of this research is slow and sometimes lags behind.

The purpose of my writing is to draw attention to the importance of action research[11] for the school and the importance of its joint implementation by researchers and school teachers.

The purpose of educational research

Research can take place at multiple levels, affecting society as a whole. It can affect an institution, a teacher, a student, or a parent. The overarching goal of organisational research (theory / cognitive and experimental / action research) generated at all levels of education is to improve the quality of education, bearing in mind that it effectively influences and supports (educational) policy and school practice. Research on pedagogical practice (action research) can only be interpreted positively if the aim and results of the given teaching and learning activity are mutually reinforcing, the teachers are aware of the importance of their own activities, and all this is related to their own activities and self-efficacy. As a school leader, useful research means that its results can be transferred to everyday education. However, I argue that in research, process and content are at least as important as outcome. A meaningful outcome is only possible if the research is conducted by professionals who are experienced in the activity.

School research can focus on teaching and learning in the narrow sense as well as education more broadly. We research how to improve learning, literacy, intellectual development, and within that, personality development, keeping in mind how knowledge gained in practice can be used to improve education. All this is aided by the relationship between research and practice as well as that between basic research and applied research. As a school leader, useful research is related not only to phenomena and facts but also to their practical application or use. Therefore, applied research supported by education policy plays an increasingly important role. It is expected that research results will be disseminated and utilised as widely as possible, and that research will make a positive contribution to the overall development of education policy.

Who should participate in research and how?

It is common for most school-action research to be carried out by “external” professionals and that the whole research process follows the methods and pace they define. In such research, school teachers are only passive participants in a process. The role of the educator in this case is not so different from when education policy or the education government initiates reform efforts. In this configuration, teachers do not find research useful because they feel they do not “own” the research. Thus, they do not benefit from its results and the research does not help their daily work so there is no reason to change their daily work or increase their knowledge. In the absence of direct impact, research is not important to them or to the school. Once the research project ends, it is often not followed by pedagogical development. This is regrettable as researchers primarily involved teachers because they believed that they would use the knowledge gained during the process.

Accumulated theoretical knowledge is usually far removed from the school context. A better understanding of educational processes is not as important and useful for a school as putting the knowledge gained through the teaching and learning process into practice. In the life of teachers, action research only becomes useful if they can hope to change their own school conditions and competencies, i.e. it brings practical benefits. After identifying the questions to be answered, area to be studied, and research aspects, and selecting the partners, the school treats both parties – external researchers and teachers – as equal partners with both parties influencing the research. In this configuration, the teacher has the status of a competent expert.

When school educators initiate action research, they often focus on areas that were not previously available to developers. Theoretical researchers usually look at issues related to disciplines, trying to find the system in them while school educators look for answers to questions that are expected to have a direct and usually immediate impact on their work. In the course of the research, it is therefore worth relying on the opinions, knowledge and research of professionals and educators with practical experience as all this can be transformed into useful knowledge.

Box 10.4 gives two examples. One illustrates research- "burdened" teachers whose involvement in research did not benefit the school. The other example demonstrates how the close collaboration between a research group and the school was able to provide information that subsequently increased student performance. It is fundamental for researchers to involve teachers in research if the aim is to expand teachers' professional knowledge. Action research will only be useful in the lives of educators if they can hope to change their own school conditions and develop their competences, thereby bringing practical benefits.

Box 10.4. Good and bad research in schools: Two examples from the author's school

Example 1

The aim of a research project conducted in 2008 was to assess the work and workload of teachers, and to explore the use of teachers' working time frameworks, especially mental and temporal workloads and their distribution. The study was exploratory in nature. As the researchers had little knowledge of teachers' use of time, one expected result of this exploratory research was the development of an analytical framework for teacher workload. The study aimed to measure the average number of pedagogical hours spent in the school building, the way in which compulsory working time frame was filled in and out of school, and the proportion of time spent teaching students per day. Methods included questionnaires, detailed interviews and document analysis. However, after the research was conducted, no feedback was received from the researchers. The school could not use the results and conclusions and as school director I could not benefit from them to increase school performance.

Example 2

One of the country's leading universities launched a research project at the school aiming to transform the school's organisation after diagnosis and adapting the results to school. The research would be important in informing the school's endeavour to scale up a major innovation. The school had adapted the Complex Instruction Programme developed by Stanford University, transformed it into a new innovation, and began to disseminate it to other schools. The diagnosis had three main foci:

- Assess the operation and condition of the organisation.
- Examine the motivation and behaviour of the faculty and teachers.
- Map the operation of school management.

The diagnosis enabled the school to apply and stably integrate the programme.

As the programme is used in nearly 200 schools in Hungary, it was important that the measurement tools be valid. University researchers prepared a questionnaire based on continuous feedback received from school management and teachers to help ensure that the measurement could be conducted in other schools as well. School teachers therefore played an important role in the process, drawing researchers' attention to the fact that questionnaires can be too general and misleading without proper knowledge of the method. The results of the research provided useful information for the proper foundation of the management of the institution.

How can policies support research and practice links?

In Hungary, the pedagogical career model and related evaluation system were launched in 2013 to support the effectiveness of educators' pedagogical work and identify areas for improvement. In addition to professional recognition, financial motivation was created: The assessment qualification serving as the basis of the teacher advancement system. The career development system includes the following grades for qualification:

- Trainee.
- Teacher I.
- Teacher II.
- Master teacher.
- Researcher teacher.

While obtaining the Teacher I. and II. categories is based on previous performance and assessed competences, the "Master" and "Researcher Teacher" categories involve specific future assignments. This is not simply a higher degree of a linear progression system but is quite different in quality. Teachers in these roles are expected to contribute actively and intensively to the development, research and innovation processes in the public education system. A researcher teacher is also expected to share their research results outside their own school and offer solutions to improve public education (see also Box 4.3).

As an example, research has made my school a knowledge-creating organisation. Due to the help and involvement in various projects of researcher and master teachers, the school is today characterised by continuous research, measurement and evaluation, and the sharing and incorporation of results into education both within the institution (with the help of master teachers) and outside the institution (thanks to researcher teachers).

I must note, however, that we are talking about a "lucky coincidence" in the case of this school as it has a researcher teacher who works closely with the university (as an instructor) and three master teacher colleagues who are also involved in research. In addition, their research topics are all related to the school's pedagogical programme, the Complex Instruction Programme. As a researcher teacher, my own research on the preparation of university students for a teaching career extends beyond school education. Such lucky constellations, however, are not yet widespread.

Summary

In sum, action research is important for schools but can only be truly beneficial if implemented jointly by researchers and teachers. I strongly believe in the effectiveness of research for public educational institutions involving school educators. Therefore, education policy makers should support and facilitate this type of collaborative research and ensure that they are not just sporadic "lucky constellations".

Time to rethink research-practice relationships for practitioners

Tine S. Prøitz, professor in education science, University of South-Eastern Norway

Recent developments in education policy have emphasised the importance of practitioner involvement in education research. Although the question of practitioner involvement in research is not new, today's newer ways of working collaboratively and understanding knowledge development and relationships between researchers and practitioners have interesting potential but also face several obstacles.

One obstacle is how the focus of research on research-practice collaboration and partnerships often are limited to the research itself and fail to focus on the collaborative efforts involved. In a time when collaborative efforts are called for by policy and academia alike, there is paradoxically limited systematic and empirical knowledge about how research-practice partnerships can be optimally performed. Developing not only communities for the practice-based education research of scientific quality involving multiple actor groups but also researching how such communities can work productively for all parties involved is highly important for the development of new knowledge in education. And, it seems to be very timely.

Still, emergent research on the topic underscores the point that research-practice relationships characterised by the involvement of multiple actor groups need to be explored to find newer ways of involving and mobilising both practitioners and researchers. There are multiple forms of research-practice collaboration but finding the best way of working together requires a rethinking of both researcher and practitioner roles.

Researchers have varied understanding of the relationship between research and practice in education, how research use can be understood and what factors contribute to reducing or upholding the so-called research-practice "gap". Further, practice-based research has been highlighted as an umbrella term for newer approaches to linking and tightening this relationship (Furlong and Oancea, 2005[6]). Governments and universities have introduced initiatives aiming to strengthen the research-practice relationship in education. Across the Nordic countries, we can see variations of these initiatives, including:

- Partnership agreements between universities and schools, as well as with local authorities
- Funding schemes that require collaboration between researchers and practitioners
- Growth in professional doctoral programmes in which applicants must have teacher education and preferably work in teacher education or in schools while doing their doctoral work (e.g. Prøitz and Aasen (2016[39]); Prøitz and Wittek (2019[40])).

There is a recent and ongoing example of an ambitious national research-practice initiative in Sweden (Box 10.5). Studies conducted on the initiative's first five years of operation have shown that the issue of multiple actor roles in education research is a particularly interesting topic to revisit (Prøitz et al., forthcoming[41]). Research approaches involving teachers and other practitioners in research activities as, for example, co-researchers, is not new in Sweden; rather, there is a long tradition of action and design research. However, this new initiative both includes and parallels these approaches, thereby raising the question of multiple actor involvement in all types of education research, not only those that have teacher involvement as a built-in part of the methodology.

Box 10.5. The Swedish ULF project

ULF was a national pilot project commissioned by the Swedish government from 2017 to 2021. The project developed and tested sustainable collaboration models between academia and the school or school system in research, school activities, and teacher education. The project involved 25 universities with teacher education and more than 150 municipalities and a substantial number of schools and teachers.

The goal for the pilot project has been to develop an infrastructure that deploys long-term sustainable collaboration models between academia and schools to strengthen the disciplinary foundations and approaches used in schools. The collaboration models are intended to result in research that is relevant to schools by enabling professional groups within schools to initiate research, not just researchers within academia. After the pilot project ends, the ultimate goal is to make successful collaborative models

permanent and start using them nationally. The vision is for the collaboration models to serve as the basis for professional practice in schools and for teacher education.

Following the initial pilot phase the ULF project has been continued to 2024 by the Swedish government as a transition period. The intention is for it to become a permanent arrangement after this transition period.

Note: The Swedish acronym ULF stands for Utveckling (Development), Lärande (Learning) and Forskning (Research).
Source: Ulfavtal (n.d.[42]), *ULF FAQ*, https://www.ulfavtal.se/about-ulf/ (accessed on 2 March 2022).

The research-practice gap – A metaphor stating the obvious?

Despite variations, a common characteristic of initiatives is the involvement of multiple actor groups in what we traditionally have considered to be the academic turf of researchers. Another characteristic is a strong belief in how these actors who have been brought together will almost effortlessly develop not only a stronger relationship between research and practice but new and improved knowledge that is applicable and relevant to education practice (Prøitz, 2020[43]). Seen from a traditional perspective, initiatives to strengthen the research-practice relationship and close the gap blur the demarcation lines between theory and practice; scientific knowledge and experience-based knowledge; researcher and practitioner; and the university and school. In the field of education, the relationship between these categories is often characterised by tension, and as being opposites, contradictory, and even conflicting.

On the other hand, researchers have pointed out how the gap metaphor is an exaggerated misunderstanding and that it can be used productively to make people aware of the challenges in the field and in their development towards more integrated perspectives. Further, the literature presenting "newer perspectives" on these matters is 15–20 years old, with studies discussing more integrated ways education research can involve multiple actor groups. Developments in today's situation in both academia and the education sector indicate a growth in the mutual interest and discovery of the benefits of collaboration that can overcome the less functional sides of the traditional divisionary lines between theory and practice, and between discipline and profession. Most of these perspectives are rooted in the perceived need to bridge and overcome the research-practice gap. However, the key question is whether such initiatives are approaching the issue in the most constructive way by trying to reduce and overcome differences that are considered to be the very qualities of the professions concerned. Another way could be to explicitly recognise and even appreciate the differences between researchers and practitioners including the values, perspectives, strengths and weaknesses that follow from their practices. Acknowledging the differences in collaborative initiatives cannot only push collaborations further but also their outcomes.

One way to think of the involvement of multiple actors in practice-based research can be to consider collaboration as an effort involving different discourses with different languages and frames of reference anchored in the actor's workplaces and profession. Over time and with resources and efforts, the discourses can potentially become a common one with shared language and interests between researchers and practitioners, creating a "third space discourse" (Moje et al., 2004[44]). This does not necessarily mean discourses that are harmonious, without disagreement or debate or where practitioners or researchers have to become more alike; rather, these are areas where dialogue is based on a shared goal.

Getting there requires more than simply placing the different actors in the same physical room: It requires time, money, dialogue, the exchange of views and mutual respect, interest, and understanding for each other´s work environments and contexts. It will probably challenge traditional views on the status of knowledge types as well as require openness to innovation, the redesign of roles, and different ways to develop research-practice relationships. Even with these challenges, the potential for developing not only

new knowledge but innovation in education research that is informed by shared understandings in a common search for solutions makes the effort critical.

Rethinking the research-practice relationship

A central question in research-practice initiatives is as follows: What role should/can different actor groups have in practice-based research? Research that has described well-functioning partnerships points towards the ideal of involving actors as equal partners in all parts of the research process. This can be from research problem identification, definition and data collection to analysis and the presentation of results. Others have pointed out how challenging this can be, for example, for economic reasons. It is difficult to get the resources required to work together and find the right time and place for meetings between teachers and researchers. Culturally, the lack of a shared language and knowledge frameworks, and asymmetrical power structures and status also inhibit productive collaborations.

What is to be gained by teachers or administrators as co-researchers and is it best for all to get involved? The Swedish example displays successful projects involving teachers and school administrators in various ways, such as in the research process and other roles in the research process; it also points out practical difficulties such as providing practitioners with the necessary time to become involved and finding gathering areas that can function for all. Other issues relate to research competence and research literacy among practitioners; researcher knowledge about the everyday life of schools; and funding and available resources. The varied approaches can hopefully lead to relationships that can be beneficial to the development of new knowledge relevant for practitioners as well as provide important new and expanded insights into education that can further research and knowledge development in the field. Furthermore, the Swedish initiative provides a concrete - though not exhaustive - list of proposals for further work on practice-research relationships that have been developed by acknowledging the differences of the actor groups involved and what they bring into education research processes.

Clarity in actor roles for both practitioners and researchers

Explore and clarify the roles of both teachers and researchers in the relationships by engaging in early-stage discussions on what involving multiple actor groups entails in research-practice initiatives. A timely question is whether a more productive way of involving practitioners would be to have them take part in discussions and decision-making processes to secure a practice-based perspective rather than being co-researchers.

Equality between practitioners and researchers involved

For the discussion on actor roles to be productive, every actor should be involved in research based on their existing knowledge, competences, and experience, with the researcher as researcher and teacher as teacher. This approach requires several issues to be considered: It requires the acknowledgment of practitioner knowledge as being equally important in research development processes to scientific knowledge. This is not necessarily easy because actor status, actor power, and perceptions of hierarchy between researchers and practitioners influence what knowledge will dominate the discussions. It requires mutual competence building, respect, and curiosity between the parties involved, which takes time and engagement.

Accessible arenas where practitioners and researchers easily can meet

The Swedish initiative has shown that practice-based research requires well thought-out processes and arenas adapted to practitioners and researchers working together. One example of such efforts is to gather practitioners and researchers in seminars with smaller groups to discuss, collectively identify knowledge needs and develop researchable topics of relevance and interest to all parties involved. Later in the

process, the same seminars can be used to discuss central concepts, challenges, opportunities as well as results.

Ensuring scientific quality in the research-practice relationship

Careful considerations of what scientific quality means and what requirements must be covered to secure quality in research-practice collaboration is needed. Issues that will emerge include questions regarding research ethics, ownership of data and results and epistemological and methodological issues. This requires the involvement of researcher competence and researchers experienced in practice-based research that can foresee and handle challenges that arise when multiple actors are involved. As an example, Swedish history has shown that over time, practice-based initiatives can become more developmental than research-oriented and that it can be a challenge to uphold the principles of scientific rigour when multiple actor groups with varied interests collaborate. The question of involvement requires epistemological considerations of what constitutes and ensures quality in education research when multiple actors are involved.

Actor involvement in the various phases of the research process

Practitioners' involvement can be carried out in terms of practice orientation and practice involvement in the various phases of the research process. It can also occur in pre- and post-research processes; for example, as part of needs identification and considerations of relevance as an integrated part of securing scientific quality. Collaboration between practitioners and researchers in these processes is highly important for the development of a scientific knowledge basis for both policy and practice.

Multiple actor involvement for larger practice- research projects

Finally, the question of multiple actor groups in education research is not confined to smaller, local, context-bound, and practice-based research projects; it is also highly relevant for larger research projects aiming for empirical or analytical generalisations.

First things first

Vivian Tseng, Senior Vice-President, William T. Grant Foundation

Box 10.6. William T. Grant Foundation

The William T. Grant Foundation invests in high-quality research focused on reducing inequality in youth outcomes and improving the use of research evidence in decisions that affect young people in the United States.

Source: William T. Grant Foundation (n.d.[45]), *Homepage*, http://wtgrantfoundation.org/.

First things first: What is the purpose of education research?

Any discussion about what research is needed – and the ancillary questions of how it should be conducted and funded – must begin with the fundamental question of what purpose research serves. If the central goal of education research is to improve practice and policy, then research agendas should focus on key practice and policy concerns. Unfortunately, that is more often the exception than the rule. For far too long,

researchers and research funders have had outsized influence on research agendas, and thus it is unsurprising that research is more likely to fill gaps in the academic literature than inform practice or policy dilemmas. Even as the research community has increasingly sought to produce more relevant research, we still rely heavily on our discussions *about* practitioners and policy makers rather than *with* them. Even our attempts to study a practical topic like implementation ends up focusing on questions about intervention dosage and fidelity (researchers' priorities) rather than questions about adaptation for specific populations, contextual concerns, or implementation conditions (practitioners' priorities).

Informing practice and policy is not an end unto itself and, for many of us, the ultimate goal of education research is to serve students and communities. Unfortunately, students and communities – especially those marginalised by racism, poverty, xenophobia, and homophobia – are even further sidelined in research agenda-setting than are education practitioners and policy makers.

In the United States, both universities and school districts have long histories of racial injustice (Diamond, 2021[46]). Universities sit on land acquired through theft, conquest, and the genocide of Indigenous peoples. They were built using the proceeds from slavery and exploitive taxation of Chinese labourers. In modern times, universities still produce "extractive research" wherein academics collect data from marginalised students and communities but neglect to leave behind anything of significant value for the people who shared their personal experiences, family lives, instructional time, or saliva. On the other side of the table, education practice and policy-making bodies have also been sites of exclusion. Black, Asian, and Chicano children were segregated from White children throughout most of US history. Indigenous children were sent to residential schools to separate them from family members and erase their cultures and languages. White flight from urban communities drove segregation in the 1970s and 80s, and gentrification fuels it today.

If we see students and their communities as beneficiaries of education, then their interests should be at the centre of education research. Their *self-determination* is critical given our colonial and racialised history, and education research should serve *their* interests in the ways *they* want to be served. This is not to say that researchers and funders have not sought to centre marginalised students in research but too often it has been done through researchers' perceptions of what would benefit marginalised students (Bruno and Iruka, 2022[47]). Moreover, because the research enterprise has been racialised, research on racially and socio-economically marginalised students has too often been deficit-oriented and damage-centred (Kirkland, 2019[48]; Tuck, 2009[49]).

If the purpose of education research is to make policy and practice more equitable, then it is critical that marginalised students and their families and communities be present at the research agenda-setting table along with practitioners, policy makers, and researchers. Designing, conducting, interpreting and using research alongside them has never been more important, especially given our current social and political moment when, for example in the United States, we witness the widening inequality caused by the pandemic, the racial reckoning spurred by the murder of George Floyd, the White supremacist insurrection at the US Capitol, rising anti-Asian violence, the callous treatment of Haitian and Central American refugees at our southern border, and the backlash in communities where families of colour are moving in.

Democratising Evidence through Partnered Research

To re-centre research agendas on the intended beneficiaries of education research, practice, and policy, we can look to the democratising evidence movement (Democratizing Evidence in Education, n.d.[50]; Tseng, forthcoming[51]). The idea is simple: To apply democratic principles to the production and use of research evidence. Democratising the production of education research would mean that agendas are no longer set primarily by researchers and research funders but by a variety of stakeholders who decide "what questions are asked and answered…result[ing] in an evidence base that is more relevant to the concerns of stakeholders, including the communities served by educational institutions" (Jackson, 2021, p. 209[52]). Researchers, practitioners, communities, youth, and policy makers would deliberate, negotiate, and

compromise over research priorities. The agenda-setting process would likely be messier and more time- and resource-intensive than our current system but the research would yield more relevant, trusted, and impactful work (Tseng, Fleischman and Quintero, 2018[53]).

Research-practice partnerships (RPPs) are a promising strategy for democratising evidence. In a recent landscape scan in the United States, Farrell and her colleagues (Farrell et al., 2021[54]) define RPPs as "long-term collaboration[s] aimed at educational improvement or equitable transformation through engagement with research. [They] are intentionally organized to connect diverse forms of expertise and shift power relations in the research endeavour to ensure that all partners have a say in the joint work."

RPPs contrast in several ways from traditional research arrangements (Tseng and Coburn, 2019[55]). First, researchers co-develop research agendas with practitioners, youth, and/or community members. Second, partnerships embrace relationship building as opposed to strict researcher independence and detachment from "the researched" (Vakil et al., 2016[56]). RPPs rely on close, iterative interactions to determine research needs and to collectively interpret findings and their implications for policy or practice. Trust between partners is a marker of the strength of the partnership. Third, partnerships embrace long-term commitments. Researchers do not come and go with different projects and grants. No study can ever address the complex problems faced by educators or communities, and RPPs emphasise sustained commitments to build knowledge over time, delve into complex challenges, and iteratively apply research to educational improvement.

Implications for funders

The success of research-practice partnerships and other forms of community-engaged or participatory action research will rely in part on funders' willingness and capacity to depart from some traditional funding practices (Bednarek and Tseng, 2022[57]; Tseng, Bednarek and Faccer, forthcoming[58]). Below I offer four recommendations for funders who seek to join the movement to democratise evidence.

1. Provide sustained and flexible funding

Building any kind of productive relationship requires time and the challenges are amplified by historical uses of research to justify and exacerbate inequality. Many marginalised communities are wary of research and researchers, and it takes time and intentionality to build more equitable, trusting relationships. Relationship building is not a one-and-done activity (Wentworth et al., 2021[59]). Sometimes trust is broken, and repair work is needed. Other times, leadership changes and new relationships must be created.

Funders can invest patiently in relationship building, especially with communities that have been systematically marginalised. On the front end, funders can launch new partnerships by supporting planning periods when partners can begin building trust and developing a shared sense of purpose and commitments. In times of leadership transitions or community change, funders can provide supplemental funding so partners can revisit their goals and agreements. Throughout the partnership, funders can support "brokers" or "boundary spanners," staff who shoulder the responsibility of strengthening the partnership and partners' skills to carry out collaborative work (Wentworth et al., 2021[59]).

Funders can consider which expenses are allowed, encouraged, or even required in grant budgets. When the funding system incentivises researchers to constantly seek support for new projects, their time and energy is diverted away from the long-term agendas developed with partners and towards funders' priorities, which may not align with those developed in partnership with communities. Further, organisational infrastructure and staffing are crucial for partnership activities such as communicating findings to diverse stakeholders; applying findings to practice or programme change; supporting communities and youth to mobilise research to advocate for change; scoping new projects; and maintaining robust data systems (López Turley and Stevens, 2015[60]; Tseng, Easton and Supplee,

2017[61]). These are all operating and capacity-building costs that are not adequately covered in most research grants.

Funders can also attend to how funds are allocated across partners (Fine, 2022[62]). Because researchers are often the Principal Investigators on research projects, funding tends to support the researchers and research organisations. While it is common for budgets to include "incentives" for study participants, the payments are premised on the need to induce "the researched" to participate in studies. When funders back authentic collaborations, however, community and practice organisations will need support for their time, effort, staffing, and expertise.

2. Redefine deliverables

Research funders often consider publications as key deliverables, and thus it is no surprise that the field is awash with journal articles and lengthy reports. The unfortunate reality, however, is that those publications are rarely read by practitioners and policy makers and even more rarely by communities and youth.

Relationships, not papers, drive the use of research (Nutley, Walter and Davies, 2007[1]). Practitioners and policy makers seldom turn to journals, reports, or books to help them solve problems; instead, they look to trusted colleagues. Communities turn to their neighbours. In strong RPPs, they turn to their research partners. Publications are still important for codifying research findings but they are not the mechanism through which research achieves impact. If funders want research to be used, we might do well to focus less on the number of publications and more on the quality of relationships, partnership infrastructure, and capacity support for interpreting and using findings.

While interpersonal relationships are foundational, institutional relationships are better positioned to withstand leadership turnover. Urban school superintendents in the United States last less than three years in their positions, and thus RPPs that foster institutional collaboration persist even as individuals come and go (Tseng, Easton and Supplee, 2017[61]).

Funders might also consider changes in organisational capacity, incentives, and norms as grant outcomes. Academic incentives tend to reward faculty for their influence on other academics, not policy makers, practitioners, or communities (Bogenschneider and Corbett, 2021[63]; Hart and Silka, 2020[64]; Gamoran, 2018[65]). Graduate students and faculty are offered little guidance, mentoring, or skill-building opportunities to conduct partnered research (Tseng et al., in press). Funders can use their grant making to incentivise changes so that academia rewards faculty and departments that produce socially impactful research and equips academics with the requisite skills.

Box 10.7. Examples of democratised research funding

Deliverables

- The Carnegie Corporation of New York's Rigor and Relevance Initiative (2014[66]) provides special funding consideration to universities that "count" policy-relevant activities in promotion and tenure reviews and that stop tenure clocks for "periods of immersion in policy work".
- The William T. Grant, Doris Duke, and Spencer Foundations' Institutional Challenge Grants encourage universities to reward faculty partnerships with policy makers and practitioners (Tseng, Bednarek and Faccer, forthcoming[58]).

Grant criteria and processes

- The Lenfest Oceans Programme at the Pew Charitable Trusts has developed a set of grant-making criteria, which might serve as a model for education funders (Landrum et al., 2022[67]).
- Henrick and colleagues' (2017[68]) Five Dimensions of RPP Effectiveness can also inform funding criteria for partnership proposals. The dimensions are 1) building trust and cultivating partnership relationships, 2) conducting rigorous research to inform action, 3) supporting the practice organisation in achieving its goals, 4) producing knowledge that can inform educational improvement efforts more broadly, and 5) building the capacity of participating researchers, practitioners, practice organisations, and research organisations to engage in partnership work.

Source: Carnegie Corporation of New York (2014[66]), "Rigor and Relevance Initiative: Bridging the academic-policy gap", Request for Proposal; Tseng, V., A. Bednarek and K. Faccer (forthcoming[58]), "How can funders promote the use of research? Three converging views on relational research", *Humanities & Social Sciences Communications*; Landrum, J. et al. (2022[67]), "Grant-making criteria for developing useful and usable marine science: A philanthropic perspective", https://doi.org/10.3389/fmars; Henrick, E. et al. (2017[68]), "Assessing research-practice partnerships: Five dimensions of effectiveness", https://wtgrantfoundation.org/new-report-assessing-research-practice-partnerships-five-dimensions-effectiveness.

3. Reconsider grant criteria and processes

Changing *what* gets funded requires changes in *how* grants are funded. Academia has criteria for determining what constitutes strong research but funders will need additional grant-making criteria to evaluate the strength of partnerships and partnership research, and the extent to which it serves marginalised communities.

Grant review processes can be more inclusive and funders might consider both *who* they bring into the review process and *how* different stakeholders are engaged in reviews. The academic peer review process has relied on researchers as reviewers but if studies are to serve the interests of practitioners, policy makers, youth, or communities, then perhaps there should also be proposal evaluators. Review processes may also need to be reconfigured: While all stakeholders can weigh in on all aspects of proposals, different parties might weigh in more heavily on certain issues. For example, communities might have final say in whether the research fits with their goals and interests whereas researchers might be relied on more heavily to evaluate the research methods and analyses, and practitioners might closely attend to the potential actionability of findings.

4. Study thyself

For funders who want the research they support to be more useful and used, we can put our ideas and practices under empirical scrutiny. We can support studies examining whether, how, and under what conditions collaborative projects are successful, and ways to improve their effectiveness. This includes developing methods and measures to rigorously assess whether collaborative research is used in policy and practice and whether educational outcomes improve. We can also study the partnership practices, and operating conditions that make some collaborative projects more successful than others – findings that could help partners improve their work. We can also study which funding practices are more likely to support successful projects and thereby improve our work as funders. By supporting rigorous empirical studies, we can build stronger knowledge of how we can produce and use research to achieve educational equity.

Conclusion

In offering my take on education research, I have suggested that we focus on first things first: What is the purpose of education research? If the goal is to inform more equitable policy and practice for marginalised students and communities, then we will need to redesign our research enterprise to fit that goal. Today we have a research enterprise designed to address researchers' questions. We will need to innovate new ways to conduct and fund research so that it meets the goals of democratising evidence. Research-Practice Partnerships are one important strategy for redesigning research so that the agendas are co-defined by education stakeholders. Education RPPs are already expanding across the United States but their success will strongly depend on funders' willingness and capacity to alter our practices to support that work.

Professionalism in the production and use of education research in the era of useability and utility

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Introduction

This opinion piece calls for a critical look at how two decades of discussion on education research affected what discerning and choosing "quality" research in education in today's rhetorical space means.

Two issues are to be addressed: First, we need to critically investigate the role of different actors in defining or affecting what constitutes "quality" in the education research chosen to make "informed decisions" in policy and practice. Second, we need to examine the rhetoric around "quality" that poses threats on narrowing the scope of education and limits what knowledge is used. Hence, we need to examine who are the participants in education research and how are questions asked to inform policy and practice in education today.

New criterion of "quality" in education research and threats to professionalism

Democratising the decision-making process in education is an ideal that makes our education system accountable and inclusive of all people in a society. However, applying the rhetoric of democratisation to how we decide on what education research should look like sets a trap. This is because there are complex power dynamics and imbalances across stakeholders and participants in education decision making. Such a trap may threaten the rigour and ethics in education research and its application to policy and practice.

Education research has measures set in place to ensure its quality. Traditionally, it is the professionals in the research community that take on the responsibility to ensure rigour in education research through peer review. However, there have been persisting challenges in education regarding the gap between research and practice.

Nonetheless, the past two decades of discussion on the quality and use of education research have ushered in new criteria on discerning the quality of research that has a bearing on policy and practice. These criteria are established by needs and forces outside the research community: Namely, the criteria that research findings be practically applicable to resolve pragmatic needs or grasp current issues in education. "Is this finding applicable to resolve or answer (a certain) pressing issue?" has become a criterion of discerning and measuring the "quality" of chosen research.

Whose useability should define quality?

With “useability” as the essential criterion for discerning “quality” in education research, it is critical to work out in detail ways to balance different political powers. These are exercised by diverse actors who affect education research and its use in policy and practice. In discussions on making education research more relevant and responding to pragmatic needs in education, it is ideal to ensure the involvement of user-communities such as policy makers, practitioners, students, parents and even future employers. There are enough arguments in favour of a democratic forum in which the research community could come into dialogue with its user-communities, and progress towards education research that contributes better to the production of knowledge relevant to policy and practice. This is an interesting argument and even, theoretically, ideal but there are constraints to be addressed before its application in practice.

That said, education research has already or always been open to diverse users, some of whom are outside the research community. Furthermore, the user-communities of education research are overly diverse and fluid, and thus each of them represents different roles, responsibilities, interest, financial capacities and power to influence decision making in policy and practice in education. The research community does not have exclusive power of determination over education research, and thus, it has proved difficult to find sufficient common ground among user-communities.

The differentials in power held by different actors means that some actors have more determining power over others on how research gets funded, what scopes are set and what methods are used when designing research in education. For instance, in the United States, the Department of Education aims to control the types of education research by prioritising funding for randomised control trials. In so doing, it aims to make education research contribute to building a causal knowledge base to inform policy and practice. Many countries have also shifted investment in education research to that which promises the production of causal knowledge in education. Setting such a priority in the allocation of research spending is a rational policy action in the pursuit of “value-for-money” in public spending.

Funding allocation driven by utility and efficiency in research spending prioritises responding to the needs of the political and quantitative mainstream. Allowing the lens of “applicability” to discern who the majority is, what a majority wants and needs, and the ways to make a functional majority drive research risks overlooking the realities and needs of minorities, the disenfranchised, and voices that do not align with the criteria of “applicability” in a given context. Therefore, it is important to acknowledge that efficiency-based quality in education research comes at a cost. It sets limits on those who have a voice in education research as well as those whose voice is represented in policy and practice through education research.

Latent threats in the dominance of experimental design

Along with favouring useability of research knowledge, there is a trend in investing in education research using experimental design. This trend poses a threat to fairness and equity in the use of and access to quality research in education. Experimental design in education research is costly, one that is higher when the scope is set for system-level policy and practice. There are also the costs of the verification of produced knowledge. Hence, making overly heavy investments in particular types of research with a certain agenda or methodology may narrow not only the scope of research but the number and diversity of researchers who are able to participate in knowledge production.

Lastly, in an era of declining education spending, the current trend in focusing research investment on experimental design comes at the cost of undermining, if not ignoring, other important questions that cannot be answered with causal explanations. Experimental design is an adequate means to understand and measure the causal relations between inputs and their outcomes. It offers causal knowledge to better inform decision making in policy and practice in education but the causal knowledge produced by such research is done so through the removal of existing diversities and complexities in education practice in the form of variables. In this respect, research-based causal knowledge can tell us what intervention

techniques or what area of intervention would likely impact student learning or teacher teaching more greatly, for example. However, it answers very little about how such interventions functioned where they were implemented. More importantly, it does not answer why the same interventions worked differently or did not work for those for whom there was no impact.

If too much investment goes into education research that promises immediate useability in pragmatic issues of policy and practice, this could accelerate operationalisation in teacher policy and teacher professional development practice. Teachers would face de-professionalisation and become mere utility tools, enacting operations of "what works". This would be validated by quality education research at the cost of making statistically insignificant variables of the outliers (e.g. students on both tails of the normal distribution in terms of learning or social advantages). Undermining outliers works to reproduce social and political inequality as they cannot afford educational alternatives and would lose educational opportunities.

Issues smouldering beneath useability-based quality in education research

To sum up, while recognising the value in the democratic involvement of different actors, interests, and views in defining purposes and "desirable quality" in education research that is applicable to policy and practice, it is essential to critically examine how this diversity affects the funding of and choices made in education research. While pragmatically applicable research may enable the policy design to respond to a perceived majority of needs, the uneven and greater distribution of investment towards research and consequent policy that caters only to such needs leaves out "outliers" via statistic normalisation (e.g. in terms of research fields/questions or researchers' interests). Such omissions and exclusions of "outliers" in education contributes to a social reproduction detrimental to minorities, disenfranchised / disadvantaged groups and ideas that do not fit the statistical mean.

This leaves out not only individuals, communities, or minority groups of a given society but even entire countries and systems that cannot afford or do not have the means or specialists to adapt such research to their own conditions and contexts. They end up taking on research productions that overlook their own context in an attempt to align to a "normality" defined without them. Similarly, the operationalisation of teachers carried out from sources and processes external to them would make them into mere tools to seed and enact "useable", functional knowledge defined outside their communities of practice and their teaching/learning sensitive contexts.

Professionalism and ethics in education research

We need to remember at all times that a productive, successful education is just as much about the needs and rights of outliers to develop and access the opportunities of a modern society as it is about the "median majority". This needs to be reflected in the funding of education research as well as in the definitions of "quality" and decisions about "applicable" research designs and products.

Therefore, no discussion on the quality and use of education research can be complete without defining the roles of the professional community in education and ways to build trust around it. As argued in this opinion piece, education research is open to diverse actors; and the professional community has even smaller roles in today's rhetorical space in which "useability" has become an additional criterion in discerning the quality of education research. Today, education is increasingly a field in which differences in values and priorities are constantly negotiated among diverse actors and across complex agendas. The quality and use of education research cannot be established without defining some fundamentals of professional rigour and ethics that should cut across participants and discussions. Professionalism, therefore, is not so much about the knowledge and skills in conducting research in education but the ability to be entrusted with monitoring ethics in education research and its application in policy and practice.

Conclusions: The future of education research

Although the seven opinion pieces in this chapter are markedly different in terms of focus, narrative and proposed solutions, they have a striking common element. *They all want education research to be more relevant.* Some authors concentrate on relevance for policy makers and educational practitioners while others go beyond to include students and communities. There are four emerging themes that cut across several of the perspectives.

Theme 1: Research quality and scientific rigour

It appears that the discussion on research quality has moved forward on several fronts in the past decade. First, among those concerned with scientific rigour, the debate is no longer focused primarily on methodological approaches. Mark Schneider demonstrates how the new research standards of the United States Institute of Education now extend beyond traditional scientific rigour with a view to helping establish a stronger knowledge base for educational practice and policy. Notably, they include considerations for generalisation and scaling. In the same vein, Dirk Van Damme notes that the "empirical turn" in education research has brought more rigorous research; however, understanding how far these findings generalise is still a challenge. Both emphasise the lack of replications and various biases as major obstacles and both advocate providing strategic funding and working to overcome the main biases. What differs is that Dirk Van Damme believes that educational research needs its own identity (as a separate academic discipline with its own non-ideological theories and more self-regulation). Mark Schneider, on the other hand, focuses on more practical ways to increase research standards (e.g. well-defined components, unbiased outcome measures, considerations for generalisation and scaling).

Second, those whose primary focus is to involve users (and, even, ultimate beneficiaries) in research call for a novel conceptualisation of scientific quality. Rather than viewing practitioners' engagement in research as a threat to scientific rigour (as viewed by Dirk Van Damme), they favour the meaningful and deep engagement of several actors as a new criterion of research quality. At the same time, as Tine Prøitz stresses, ensuring scientific quality when multiple actor groups collaborate in the research process remains an important consideration. Vivian Tseng brings this discussion to a meta-level: Rigour is needed not only from those conducting research but those who fund it. Education research itself should be researched and evaluated to determine what works, how and under what conditions.

Theme 2: The nature and quality of collaboration between researchers and practitioners

The authors of the last five pieces all agree that actors' engagement in research is what ensures its relevance. They point to various developments while also drawing attention to major challenges that remain.

Over the past 20 years, practitioner-researcher collaboration has evolved from a wish and a discourse to reality in many countries. However, as demonstrated by Emese K. Nagy, the nature of collaboration matters strongly for the relevance and applicability of research. Developing mutual respect and overcoming traditional power relations is key. Rather than forcing different types of knowledge (research knowledge and practice-based, experiential knowledge) to converge, mutual respect is about valuing all forms of knowledge and experience equally, according to Tine S. Prøitz.

Scaling research-practice partnerships, as illustrated by examples in Sweden and the United States, is more recent. As a result, evidence on how and under what conditions such partnerships can contribute to building a robust and cumulative knowledge base for education is still in its infancy. Two sets of factors are to be understood: One is a set of characteristics internal to research-practice partnerships, including actors' respective roles, and suitable spaces and timeframes for collaboration; the other is a set of external factors such as funding schemes for research and systemic incentives for all actors.

Theme 3: Ethical considerations of democratised education research

Education research should help repair inequities in our society by making education better for *everyone*. Several of the pieces are concerned with how this can be realised in practice. Addressing inequities was added as a separate principle to the standards of research excellence in the United States. Vivian Tseng believes that for education research to fulfil this mission, evidence itself should be democratised. The voices of all actors, and in particular of marginalised groups, should be heard and incorporated not just in the process of each individual research initiative but in agenda setting. Makito Yurita also discusses democratisation in terms of methodologies. Prioritising certain methodologies, particularly expensive experimental designs, can lead to certain types of research and groups of researchers being sidelined. This is problematic because helping marginalised groups requires addressing different types of questions through different methodologies.

Theme 4: Better policies for education research

Better research for better policies, yes, but also better policies for better research. Several of the pieces remind us that improving research production has policy conditions. First and foremost: funding. The volume and nature of the research produced is contingent not only on available funds but the criteria for funding. Unsurprisingly, more would be better. The criteria however is a complex matter. What kind of research should be funded? Experimental designs? Foundational and theoretical research? Participatory research? What is the right formula to get desired outcomes?

Vivian Tseng demonstrates just how much equity depends on the way funding is provided. Makito Yurita adds that funding criteria such as prioritising high-cost designs can marginalise education research for entire education systems.

However, it is not just about money. Incentives for different actors also determine what and how research is produced. John Bangs and Martin Henry emphasise incentives for teachers. Emese K. Nagy illustrates this through a career model that explicitly incentivises teachers to engage in research. Several authors also highlight the problem of academic incentives that, by requiring certain types of output, discourage producing research for policy and practice. They do not favour participatory approaches either.

Bottom line

This chapter moves the dialogue on education research forward by offering a discussion space beyond the walls of academia that spans the different contexts of policy, practice, research and advocacy, and different countries. A great deal of thinking has gone into the production of education research in the past decades. As a result, there is more education research today. It has become more relevant for policy and practice, and more rigorous and more participatory. These developments have provoked a more refined understanding of what still needs to be done. The perspectives presented above express diverse but not truly contradictory views. We hope that readers and the authors themselves will recognise and benefit from the complementarity of these perspectives to advance the agenda of education research. Importantly, this dialogue should not just be broadened and continued but become more evidence-based itself.

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Notes

[1] For more information, see https://ies.ed.gov/seer.

[2] See https://ies.ed.gov/director/remarks/researchcomp2018.asp and https://ies.ed.gov/director/remarks/seer2018.asp.

[3] See https://capproject.org/.

[4] See https://ies.ed.gov/seer/cost_analysis.asp.

[5] See https://edinstruments.com/.

[6] For more information, see https://us.macmillan.com/books/9781250222695/sciencefictions.

[7] See https://seernet.org/.

[8] See https://www.basicbooks.com/titles/jim-manzi/uncontrolled/9780465023240/.

[9] See https://ies.ed.gov/funding/pdf/2022_84305N.pdf.

[10] See https://issuu.com/educationinternational/docs/2021_ei_research_statusofteachers_eng_final/.

[11] Action research – originally termed by Kurt Lewin – is a systematic enquiry centred on a problem related to teaching practice, in which the practitioner performs the roles of both researcher and teacher. In its popular adaptation, collaborative enquiry, researchers and teachers work together to solve a problem through systematic investigation (Kuhne and Quigley, 1997[69]; Ainscow et al., 2016[70]).

11 Improving research-policy-practice engagement: Lessons learnt and ways forward

Nóra Révai, OECD

This chapter summarises the main lessons learnt from the volume. It begins by connecting the themes discussed in the publication with wider societal challenges. It then summarises six key lessons. Two relate to conceptual developments: The need for shared understanding, vocabulary and conceptual clarity; and a call to view policy and practice as two parts of the same whole rather than separate contexts. Three pertain to enabling systematic and high-quality production and use of research: The need to improve research quality and use it well; the need for deeper and more meaningful collaboration between researchers, policy makers and practitioners; and enhanced governance through renewed leadership, stronger incentives and appropriate funding. Finally, a last message calls for a greater focus on understanding "what works in what works''. The chapter ends with a proposal to advance this agenda in two concrete ways.

Introduction

Viewing the pale blue dot (Sagan, 1994[1]) – our planet – in the vastness of space raises a razor-sharp awareness of what matters most for humanity: To protect life. Education also needs to respond appropriately to what is already happening: The scarcity of resources and energy, large-scale migration due to climate change and the changing landscape of our planet. Responding appropriately requires a relentless effort to build cumulative knowledge of how we can best empower children not just to cope in life and with the coming challenges but also to become active and responsible agents of change. Continuously generating relevant research and ensuring its quality use in education policy and practice is fundamental to keeping education systems agile, relevant and efficient.

Evidence-informed decision making is not a new idea nor a new movement but its importance and complexity are becoming increasingly more visible not just to experts, policy makers and practitioners but to the general public. This increased awareness, particularly in the health and environment sectors, presents a window of opportunity for other sectors such as education to rethink research use in policy making and practice. Inversely, understanding how we can reinforce the dynamics of research production and use in education might also inform other sectors.

This volume set out to map recent developments in knowledge mobilisation in education policy and practice. Leading experts brought new perspectives on evidence-informed policy/practice through recent research. The OECD *Strengthening the Impact of Education Research* policy survey provided initial insights into how countries are tackling the challenge of reinforcing research use. The introduction chapter pointed to two *conceptual considerations*:

- Recognising complexity in the way we talk about “knowledge mobilisation”.
- Connecting policy and practice.

It also outlined *key questions* related to enabling a more systematic and high-quality production and use of research in policy and practice.

- How can we think about the quality and relevance of research and its use?
- What structures, processes and relationships support this? (see Table 1.1).

While there are no straightforward answers or recipes to respond to these questions, a number of messages have emerged from the chapters of this volume that can take us forward on the path.

What have we learnt about the conceptual considerations?

Naming the game: From brokerage to engagement

The first conceptual consideration was that the terms we use to talk about knowledge mobilisation do not appropriately recognise complexity. The chapters in this volume demonstrate just how scattered our vocabulary is when it comes to capturing the dynamics of research production, mediation and use. In fact, the OECD team has been struggling from the beginning of this project to decide what term to use. Just the introduction above uses four different expressions: Knowledge mobilisation; evidence-informed practice/policy; strengthening the impact of education research; and reinforcing research use.

Terms that suggest clearly linear thinking – knowledge transfer, transmission, dissemination, knowledge-to-action – are no longer “trendy” in literature, precisely to avoid narrowing the problem to a push/transfer one. Mediation and brokerage evoke a two-way process and are used more frequently, particularly when the focus is on the “in-between” of research and decision making. In this volume, David Gough, Jonathan Sharples and Chris Maidment, speak about “knowledge brokerage initiatives” (Chapter 7). Tracey Burns and Tom Schuller (Chapter 3) explicitly point to the contested nature of terminology and use brokerage

agencies to signal continuity with previous work that looked at institutional brokerage efforts. As Gábor Halász (Chapter 8) underlines, the term "knowledge mobilisation" is increasingly popular because it turns away from linear thinking and brings into focus the idea of co-creation. This means that researchers and practitioners / policy makers are not simply connected but work together to come up with new solutions.

Mark Rickinson and colleagues (Chapter 9) focus on a particular aspect: The quality of research use, which they define as the "thoughtful engagement with and implementation of appropriate research evidence". Annette Boaz, Kathryn Oliver and Anna Numa Hopkins (Chapter 6) use "research-policy engagement initiatives", which draws attention to the importance of mutual engagement to reinforce research production and use. Engagement is described as ultimately the key element in several of the opinion pieces in Chapter 10 as well (e.g. Tine Prøitz, Vivian Tseng, Emese K. Nagy), and appears central in the most recent "evidence ecosystem" models by David Gough, Jonathan Sharples and Chris Maidment (Chapter 2 and 7).

If we believe that discourse shapes how we think about "the impact of education research" and ultimately what we do to reinforce its use, then we must make deliberate efforts to improve the clarity of that discourse. Research today seems robust on the importance of the collective engagement of different actors – primarily but not limited to researchers, practitioners and policy makers – in both the production and use of research. In fact, engagement of latter two increasingly overlap from a co-creation perspective. Thus, **research-policy-practice engagement** seems a promising new phrasing. (Although to note the beauty and hazard of the conceptual nature of the English language: One can put everything and nothing in a condensed expression. Such expressions are also often untranslatable into other languages.)

Policy and practice: Putting the pieces together

The second conceptual consideration set out in the introduction chapter aims to recognise and elaborate on connections between policy and practice. While there are distinctive differences between policy and practice (e.g. in terms of structures, the number of actors and the nature of work), there are also fundamental similarities, particularly in terms of practitioner and policy maker professionalism, including research competences. Not recognising the link between research use in policy and practice ultimately hampers the capacity of both policy and practice to improve student learning. As pointed out by Tracey Burns and Tom Schuller in Chapter 3, it has been difficult to shift the focus from evidence-informed policy to evidence-informed practice in education. When this happened, the discussions shifted too much and almost "left policy off the hook".

This phenomenon is apparent in several instances across this volume. When it comes to deeper forms of engagement in education, in particular research co-production (or more broadly, knowledge co-creation), most chapters talk about research-practice partnerships (see e.g. Emese K. Nagy, Tine Prøitz and Vivian Tseng). But there is a general lack of discourse on policy-research partnerships (although some examples are given by Gábor Halász in Chapter 8). Recent research such as that conducted by Mark Rickinson and colleagues has advanced the understanding of research use in practice but this has not yet been translated/applied to policy. Similarly, as pointed out by Annette Boaz, Kathryn Oliver and Anna Numa Hopkins, we now have a decent amount of evidence on teachers' professional learning but policy makers' capacity building has not been widely evaluated. To avoid shifting emphases and parallel but disconnected developments, the first step would be to connect research use in policy and practice at the abstract level.

The second step is unfolding what research-policy-practice engagement means in practice. Jordan Hill (in Chapter 4) argues that policy organisations should have strong relationships not just with research producers but also with organisations that work across the contexts of research and practice. Linking policy with practice-oriented research intermediaries can create a unique channel in which research "travels" across these interconnected contexts. Some interesting examples were given in various chapters such as the Policy Innovation Research Unit that works with the United Kingdom's Ministry of Health to pilot policies and co-produce early-stage research with healthcare stakeholders at both the policy and practice levels

(in Chapter 6). The OECD survey shows that some ministries of education solicit university-school partnerships to facilitate research use in policy, which suggests that there are examples for the threefold nature of research-policy-practice engagement. Understanding how such partnerships work exactly and what their potential is in increasing research dynamics and improving learning should be on our research agenda in the future.

What have we learnt about the key questions?

Research yes, but quality research! And, also values…

Reinforcing the use of research in decision making is only desirable if we have good research and if that research is used well. Quality is a recurring theme in this volume. Chapter 7 stresses that brokerage initiatives must attend to the quality of research by establishing clear standards for evidence. What this involves is exemplified by the standards of the United States Institute of Education described by Mark Schneider in Chapter 10. Dirk Van Damme (Chapter 10) suggests that this is not just about methodology but about establishing a disciplinary identity for education research; overcoming ideological dispositions and biases; and acknowledging limitations.

Tracey Burns and Tom Schuller (Chapter 3) stress the need to collectively create a cumulative knowledge base in education that is "quasi-universally acknowledged as well-founded". A consolidated body of knowledge requires research to be replicated in different contexts and the growing evidence to be regularly synthesised. The authors suggest that brokerage organisations should be working more closely together to advance the science of evidence synthesis.

Even if we do have high-quality education research, using it *well* adds another dimension to quality as explored by Mark Rickinson and colleagues in Chapter 9. The authors unpack the term "thoughtful engagement" with research and identify its key ingredients. These include individual enablers (skills, mindset and relationships), organisational ones (leadership, culture and infrastructure) as well as systemic elements.

As stressed by José Manuel Torres in Chapter 2, values and the ultimate objectives of producing and using research should not disappear into the distant horizon. Learning needs to be at the centre of all efforts. Research is not and should not be deprived of values. Vivian Tseng reminds us to not forget marginalised groups, and to work with them instead of treating them as research objects. Makito Yurita also draws our attention to the dangers of marginalising research groups and methodologies, and even entire systems if we narrow the focus and methods of education research too harshly.

Unpacking engagement: Dialogue is not enough

The meaning of high-quality research-policy-practice engagement is not straightforward and must be unpacked.

As research evidence rarely gives clear instructions for practice, teachers and policy makers need to be active in interpreting and implementing it. Engaging with research does not necessarily involve interaction with researchers. For Rickinson et al. (Chapter 9), "thoughtful engagement and implementation" means that teachers critically engage with research evidence, collectively deliberate about its meaning, and effectively integrate aspects of the evidence within practice. Such direct research use remains important.

However, to strengthen the link between research, policy and practice, scholars have been encouraging more dialogue between researchers, practitioners and policy makers. The OECD policy survey shows that almost all countries have projects that encourage interactions between various actors and ministries often have extensive relationships with a number of actors. Still, many countries perceive the lack of relationships as a main barrier to research use. It seems that *speaking* to each other is *not enough*. Research has shown

that interaction needs to be accompanied by capacity building (see Chapter 5). As Gábor Halász describes in one of his personal experiences: Researchers have to learn to listen. The language and stories of teachers and policy makers is not a scientific discourse but carries the deep knowledge of students, schools, teaching and learning. Without understanding their experience and unpacking their knowledge, it is more difficult to ask relevant research questions, formulate meaningful hypotheses, and design appropriate research. A good conversation between the different actors requires genuine curiosity, respect and active listening.

There seems to be consensus across the board that teachers' and policy makers' involvement in research is important to make research more relevant and reinforce its use. However, *the nature of involvement is significant*. Emese K. Nagy (Chapter 10) demonstrates how research can be useless for a school when teachers and students are mere objects of study. Vivian Tseng (Chapter 10) goes beyond that, pointing to the deep disrespect of communities, particularly marginalised ones, when research does not originate from their needs and does not feed its results back to those groups. John Bangs and Martin Henry (Chapter 10) emphasise the role unions can play in bringing research and practice closer to each other, both through advocacy and direct involvement in research production.

Teachers and policy makers need to recognise the hypotheses studied as relevant to problems. Developing appropriate hypotheses is easier when researchers and practitioners / policy makers work closely: Teachers / policy makers can help refine the hypotheses to be relevant, while researchers can make sure they are suitable for research. Similarly, collective engagement in the subsequent phases of research production – research design, interpretation and dissemination of findings – can also strenghten the relevance and usefulness of research. Yet, the OECD policy survey finds that teachers and school leaders are primarily involved in restricted ways in research production: Most often in data collection, i.e. as objects of study. The situation is not much better for policy makers who may be more involved in asking questions and communicating results but rarely have a say in research design and interpreting the findings.

There are promising initiatives that explore deeper forms of engagement and genuine co-creation (as the Swedish research-practice partnerships described in Chapter 10). But there is still a need to understand how such partnerships can produce relevant and high-quality research. Tine Prøitz (Chapter 10) points to key elements such as having a space for co-creation, understanding how the specialised knowledge of all participants can be best capitalised on, and producing suitable deliverables for all parties. Research in this field is only in its infancy and has, until now, been largely confined to a handful of countries where research-practice partnerships have existed for a while (Coburn and Penuel, 2016[2]). We have limited understanding of how engagement between researchers, practitioners and policy makers works exactly; what the necessary ingredients and the current barriers are to it.

Governing the system: Leadership, incentives and funding

Research-policy-practice engagement is not a simple triangle with three groups of actors. Research dynamics (production and use) is a complex sub-system of a complex education system. Systems thinking – as laid out by Best and Holmes (2010[3]) and discussed across various chapters in this volume – requires a good understanding of the landscape of mechanisms and the network of actors. David Gough, Jonathan Sharples and Chris Maidment point out in Chapter 7 that mapping this landscape and developing a theory of change based on its understanding is largely missing in the work of brokerage institutions. The OECD policy survey attempts an initial mapping across countries. The survey data presented in Chapters 4 and 5 show the diversity of this landscape. Some key findings are:

- Overall, a large number of organisations are active in producing research and facilitating its use in policy and practice, with universities and teacher education institutions dominating the landscape in many systems. However, the number and type of organisations active across research production and mobilisation varies considerably across systems.

- Brokerage agencies (i.e. institutions with an explicit mission to facilitate research use) exist in less than half of the systems. Some systems did not report any connection between ministries and brokerage agencies despite the latter being active in research production and facilitating its use in policy and practice.
- The number of mechanisms that facilitate research use in policy and practice vary greatly across systems.
- Around 40% of systems do not synthesise and disseminate educational research findings through user-friendly tools, and less than a quarter of them have a system-wide strategy for facilitating research use in policy/practice.

While there is no one approach that can suit such diverse landscapes, there are elements that all countries and initiatives aiming to reinforce research dynamics need to consider. There are also many opportunities for shared learning, which can result from comparing and contrasting these different contexts.

First, *strategic leadership* – within and across organisations and at the system level – is necessary to drive the dynamics of research production and use. Annette Boaz and colleagues (Chapter 6) found that only less than half of research-policy-practice engagement initiatives have an explicit focus on strategic leadership and this is mostly limited to advocacy. The analysis of David Gough, Jonathan Sharples and Chris Maidment (Chapter 7) echoes this finding for the United Kingdom What Works Centres. Going beyond leadership of brokerage initiatives, leadership at the central level remains important in governing complex education systems, notably in providing a strategic vision, clear guidelines and feedback (Burns and Köster, 2016[4]).

Second, *incentives* for a good research-policy-practice engagement need to be in place for practitioners, policy makers and researchers. The OECD survey shows that teachers, school leaders and policy makers are encouraged to use research but do not have formal incentives such as allocated time, salary supplement and formal recognition to do so. Some promising initiatives include research co-production built into teachers' career development (e.g. a "researcher teacher" status in Hungary that requires completing doctoral studies and regularly conducting research); public sector PhD schemes; and various researcher roles in government (e.g. embedded researchers, research fellows). It will be important to evaluate and compare these initiatives to understand their impact and the conditions under which they work. In addition, traditional academic incentives, such as publishing in high-impact journals, seem to be a major obstacle to researchers engaging with practitioners and policy makers more deeply. This point appears across the chapters.

Finally, *funding mechanisms* need to respond to the nature of research-policy-practice engagement. Dirk Van Damme (Chapter 10) reminds us that, despite growing investment, funding for education research remains much lower than in other comparable sectors. Importantly, Vivian Tseng calls for rethinking funding schemes and aligning criteria, timeframes and deliverables to adjust to the needs of high-quality research-policy-practice engagement. In particular, funding needs to take into account all of the above points. It should provide appropriate incentives, recognise the time it takes to create trustful relationships, reward skills and capacity building as one of the outcomes of such partnerships, and emphasise outputs that serve the needs of users and ultimate beneficiaries.

What works in what works? More meta-research is needed

The ultimate objective of the OECD project *Strengthening the Impact of Education Research* is to understand how we can effectively reinforce the use of research in education practice and policy. This meta-level in education research has been termed as "What works in what works" (Gough, Maidment and Sharples, 2018[5]) or the Science of Using Science (Langer, Tripney and Gough, 2016[6]).

The good news is: This has become a vibrant field of study across countries and sectors, and it has brought important insights already as demonstrated by numerous chapters in this volume (some of which have been summarised above). As stressed by José Manuel Torres in Chapter 2, conceptual development is important because it helps frame discussions in new ways and drive our thinking on research-policy-practice engagement forward. However, mental gymnastics are not enough. The study by David Gough, Jonathan Sharples and Chris Maidment (Chapter 7) was one of the first efforts to build evidence on brokerage initiatives. The chapter underscores the need for these initiatives to become evidence-informed themselves. The systematic investigation and evaluation of existing efforts aimed at reinforcing research impact are critical to improving such efforts. However, Annette Boaz, Kathryn Oliver and Anna Numa Hopkins (Chapter 6), and Tracey Burns and Tom Schuller (Chapter 3) point to the striking lack of such evaluations.

Further research is needed to understand how we can make research-policy-practice engagement more effective. As the authors of Chapter 7 emphasise: Neglecting research on research use jeopardises the credibility and effectiveness of efforts aiming to increase research impact. The different chapters point to a number of questions that remain to be explored, including, but not limited to the following:

- How can we conceptualise and measure the impact of education research?
- How successful are initiatives that support knowledge production by non-researcher actors (e.g. governments) in generating high-quality research and reinforcing its use?
- Under what conditions are partnerships (research-practice, research-policy and research-policy-practice) most effective in generating high-quality research and reinforcing its use?
- How should the various types of brokerage efforts be prioritised, sustained and funded?
- How can we coordinate efforts at the system level more effectively? What sort of leadership, incentives and funding are needed?
- How should education research as a discipline improve to produce higher quality and more relevant findings?

It must be recognised that “what works in what works” research is unlikely to produce a simple checklist approach or prescriptive recipes for solving the problem. Such checklists or recipes would either be too general (and thus not operational) or overwhelmingly detailed with myriads of conditions and dependencies (and thus not operational). This is because the research production-use system is in constant evolution and it is hard to predict what patterns will be emerging. A complex system cannot be geared towards a particular idealised state in a straightforward way by fixing some parameters at a certain point of time. In addition, Annette Boaz, Kathryn Oliver and Anna Numa Hopkins (Chapter 6) remind us that context-specific solutions will always be fundamental: A top-down, “one size fits all” approach will not work.

However, complexity does not mean we are unable to act. Further investigation of the above questions and continuous reflection on the state of the system is critical for building a cumulative knowledge base on what works in what works – as underscored by Tracey Burns and Tom Schuller (Chapter 3). It is possible to steer the system by finding “triggers” that make an impact, understanding what structures and processes are effective under what conditions, and scaling them.

What’s next?

This volume’s primary focus was to provide an overview of recent research and an initial mapping of structures, processes and relationships aimed at reinforcing research use. The introduction chapter outlined a number of questions around the key dimensions for strengthening the impact of education research: Quality and relevance of research; culture and mindset; and skills and capacity necessary for high-quality, systematic research production and use. This report helped specify what we already know and what elements of those questions remain to be explored (see the list of questions above for example).

The next step in developing a more robust knowledge base on research mobilisation – or research-policy-practice engagement – in education is to systematically explore these dimensions.

The *Strengthening the Impact of Education Research* CERI project will continue to advance this agenda in two main ways.

First, through research and analysis. The policy survey conducted in 2021 offers insights into aspects not yet explored in this volume. In particular, building individual skills, and organisational and systemic capacity for better research production and use is critical for countries. This will be the main focus of the next volume. The policy survey represents the perspectives of one group of actors only – policy makers at the level of education ministries. As such, it paints a partial and one-sided picture of the landscape. The next phase of the project will focus on collecting data from other actors. In particular, it will target intermediary organisations, including not only brokerage agencies but other types of intermediaries that can reveal various facets of what works in research-policy-practice engagement, and how it works.

Second, through building a network of key actors in the field and providing extensive opportunities for peer learning. These actors include academics and experts, a range of intermediary organisations, and, of course, regional and national authorities across OECD and partner countries. Several of the chapters in this volume point to the untapped but immense potential of peer learning in these areas from a number of different angles:

- Learning from other contexts: Discussion and debate about education research should not stay within closed cliques – confined within the walls of academia, public authorities, schools or funding institutions. We have already seen how much policy and practice could borrow from one another's developments in the field of research use.
- Learning from other countries and systems: Our survey demonstrates the diverse landscape of research production and use across systems. This diversity provides fertile ground for sharing good and bad practices, and exploring what works and how.
- Learning from other sectors: This volume provides an initial glimpse into the vastness of research and experience accumulated in other sectors from which education could benefit.

By developing a platform for mutual learning, the OECD can play the role of an independent broker of brokers in education, as advocated by Tracey Burns and Tom Schuller in Chapter 3 in this volume. By collecting and analysing data from OECD and partner countries, it can contribute to developing a robust knowledge base in the field.

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Educational Research and Innovation

Who Cares about Using Education Research in Policy and Practice?

STRENGTHENING RESEARCH ENGAGEMENT

Across the OECD, enormous effort and investment has been made to reinforce the quality, production and use of education research in policy and practice. Despite this, using research in education remains a challenge for many countries and systems. The OECD launched the Strengthening the Impact of Education Research project to respond to this challenge.

This publication reports on the first phase of the project. It maps the various structures, processes, actors and relationships that reinforce the quality, production and use of education research in policy and practice. The publication brings together leading experts who provide insights into recent research and international experience gathered from both policy and practice, including from other sectors such as health, agriculture and environment.

The publication provides a first set of analyses of data collected from over 30 systems through an OECD survey. It describes the mechanisms used to facilitate research use in education policy and practice, and the levels of engagement of various actors in these processes. By mapping the drivers of, and barriers to, using research systematically and at scale, the publication sets out an agenda for future inquiry. It can be a resource for policy makers, educational leaders, teachers and the research community.

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