

Unclassified**English - Or. English****16 December 2022****DIRECTORATE FOR EDUCATION AND SKILLS****More than just a go-between: The role of intermediaries in knowledge mobilisation****OECD Education Working Paper No. 285**

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Abstract

Despite the widespread effort to increase and improve the use of evidence in policy making and practice, practical efforts to enhance research-policy-practice engagement in the education sector often fall short of their ambition. Little is known about how such knowledge mobilisation initiatives can be characterised and how their impact can be understood and measured. This paper reviews theoretical and empirical literature on knowledge mobilisation focusing on the above research gaps. It conceptualises knowledge mobilisation actors and initiatives, discusses the shortcomings of the current literature, and proposes a set of frameworks that captures their objectives, functions and impact. It is hoped that these frameworks will support future empirical research efforts.

Résumé

Malgré l'effort répandu visant à accroître et à améliorer l'utilisation de la recherche dans l'élaboration des politiques publiques et dans la pratique scolaire, les efforts concrets pour renforcer l'engagement entre la recherche, les politiques publiques et la pratique dans l'éducation restent souvent en dessous de leurs ambitions. On ignore la manière dont ces initiatives de mobilisation des connaissances – *knowledge mobilisation* – peuvent être caractérisées et la manière dont leur impact peut être compris et mesuré. Cet article passe en revue la littérature théorique et empirique sur la mobilisation des connaissances en se concentrant sur les lacunes de la recherche mentionnées ci-dessus. Il conceptualise les acteurs et les initiatives de mobilisation des connaissances, discute les lacunes de la littérature actuelle et propose un ensemble de différentes structures – *frameworks* – qui saisissent leurs objectifs, leurs fonctions et leur impact. Notre ambition est que cet effort puisse soutenir la recherche empirique future.

Table of contents

Acknowledgements	3
Abstract	4
Résumé	4
1. Introduction	7
2. Concepts and definition: Framing the conversation	8
2.1. Defining the phenomenon.....	8
2.2. Describing the actors.....	10
3. Objectives and functions.....	12
3.1. General and specific objectives	12
3.2. Functions.....	13
4. Intermediaries' characteristics.....	18
4.1. Who acts as intermediaries?.....	18
4.2. Specialisation of intermediaries	20
4.3. Typology of intermediaries.....	23
4.4. Organisational characteristics	24
5. Conceptualising and evaluating the impact of knowledge mobilisation.....	26
5.1. Research use: instrumental, conceptual or symbolic?	26
5.2. Evaluating research impact in academia.....	29
5.3. Typology for evaluating knowledge mobilisation initiatives	34
5.4. Theory of change and the design of knowledge mobilisation initiatives.....	40
5.5. Knowledge mobilisation initiatives: focusing on what works and why	41
6. Conclusions	42
A wider perspective is missing	42
The definition of intermediaries needs expanding	43
Typologies for diverse intermediaries is a first step towards assessing their effectiveness.....	43
Evaluations should be mapped and extended to gauge intermediaries' impact.....	44
Next steps.....	44
References	45
Annex A. Additional tables.....	52

FIGURES

Figure 1. Knowledge mobilisation studies mentioning "intermediaries"	9
Figure 2. Partnership area of a fictive intermediary-beneficiary connection	17
Figure 3. Organisations hosting academic-policy engagement	19
Figure 4. Organisations responsible for activities linking evidence to policy making	20
Figure 5. Activeness of organisations in producing education research and facilitating its use	21

TABLES

Table 1. Research knowledge intermediary functions	14
Table 2. Typology of research intermediary organisations	24
Table 3. Types of research use	27
Table 4. REF's impact case studies relevant to knowledge mobilisation in the education sector	32
Table 5. Typology for evaluating knowledge mobilisation activities	34
Table A.1. Terms referring to “knowledge intermediaries” used in the literature	52
Table A.2. Objectives of intermediaries	55
Table A.3. Dimensions of intermediary functions	57

1. Introduction

Governments worldwide expect research to provide educators and policy makers with evidence that will improve the quality of teaching and education (Cain, 2015^[1]; Cain, Wieser and Livingston, 2016^[2]). Calling for greater knowledge mobilisation in the education sector – defined as the “intentional efforts to increase the use of research evidence [...] in policy and practice at multiple levels of the education sector” (Cooper, 2014, p. 29^[3]) – has been on the agenda of many governments and organisations, including the OECD. Effective knowledge mobilisation promises to enrich the public debate and decision making with sound empirical judgement which would ultimately help to maximise the societal impact of policy makers’ decisions. Calls for greater knowledge mobilisation have led to notable examples of increased provisions on innovative and evidence-based interventions. These are demonstrated by current national policies such as the United States’ 2015 Every Student Succeeds Act (U.S. Department of Education, 2015^[4]) and the Swedish Education Act (Parliament, 2010^[5]) and former international efforts such as the Evidence Informed Policy and Practice in Education and Europe (EIPPEE) Network uniting 36 partners and 23 countries (EIPPEE, 2016^[6]).

Yet practical efforts to enhance research-policy-practice engagement in the education sector often fall short of their ambition, as there is still a disconnect between research production and its use in policy and practice (education.org, 2021^[7]). The research-policy-practice gaps are complex and point to a clear challenge: as Boaz, Locock and Ward (2015^[8]) put it, “[it] is in everyone’s interests and no-one’s job description, and everyone blames everyone else for its absence” (Boaz, Locock and Ward, 2015, p. 147^[8]). In the past two decades, a growing number of organisations and initiatives have tried to address this problem. These “research knowledge intermediaries” are positioned between research producers and research users and carry out the necessary activities that enable the mutual influence between these two groups and the needed changes in their practices to achieve evidence-based decision-making (Honig, 2004^[9]; Cvitanovic et al., 2017^[10]).

While knowledge mobilisation has become a research field on its own and the subject of large scrutiny, the study of knowledge intermediaries is a relatively new phenomenon (NORRAG, 2022^[11]). The academic knowledge about these intermediaries, although growing, remains limited in several areas.

Firstly, there have been only a few attempts to systematically map the types of intermediary actors and their work in the education sector. Twenty years ago, their work was even considered as “an unrecognised, largely unplanned activity” (CHSRF, 2003, p. i^[12]). Since then, some notable efforts include the work of Cooper in Canada (2014^[3]), Langer and colleagues in the United Kingdom (2016^[13]), the EIPPEE project focusing on brokerage at a European level (Gough et al., 2011^[14]) and Oliver and colleagues on a global scale (2022^[15]). While these studies have provided valuable insights, we still lack a common understanding of how we can characterise knowledge intermediaries, such as what their aims, functions and characteristics are.

Secondly, conceptualising the impact of knowledge mobilisation remains a challenge as it is unclear what knowledge use entails. Generally, more demanding definitions of knowledge impact relate to the improvement of social outcomes (e.g. student learning outcomes) and are more difficult to measure (Lavis et al., 2003^[16]). For this reason, many organisations tend to focus on how many people were reached by a given initiative, or intermediate impacts, such as research users’ attitudes or skills, which can at best be taken as proxies for impacts on policy, practice, and society that occur in the long-term. These gaps may lead to spending public resources on ineffective initiatives, on the one side, and undermining the credibility of knowledge intermediaries, on the other side (Oliver et al.,

2022^[15]). To address this, it is fundamental to build evidence on the effectiveness and impact of intermediary organisations and initiatives.

This working paper thus aims to answer two main questions:

- ***How can intermediaries and their activities be characterised?***
- ***How can the impact of intermediary organisations and initiatives be conceptualised and evaluated?***

To answer these questions, it sets out to build a theoretical framework of knowledge intermediaries by reviewing a wide range of knowledge mobilisation literature. Given the abundance of work in this area and the lack of agreement on definitions, on a typology of knowledge intermediaries and on the conceptualisation of their impact on policy and practice, this framework should prove useful for various strands of empirical work on knowledge intermediaries. The OECD/CERI *Strengthening the Impact of Education Research* project intends to use this framework as a backbone for the design and delivery of a survey on research knowledge intermediaries in the education sector of OECD member countries.

This document is structured as follows. It starts out with an analysis of terms that have been used to refer to knowledge mobilisation and provides operational definitions of the key terms that are used throughout the working paper. Subsequently, a typology of the objectives and functions associated with intermediary actors is developed, followed by a categorisation of intermediaries based on some of their characteristics. The following section features a review of different notions on the use of research, a typology for evaluating knowledge mobilisation initiatives, and the associated methodological and practical challenges. In the final sections, the issues remaining unaddressed in the literature are discussed, which will serve as a basis for a future survey on research knowledge intermediaries. This paper concludes with some recommendations for future research.

2. Concepts and definition: Framing the conversation

A vast spectrum of different, though overlapping, terms and concepts has been used to describe research mobilisation in the literature (Graham et al., 2006^[17]; Levin, 2008^[18]; Davies, Powell and Nutley, 2015^[19]).

2.1. Defining the phenomenon

The conceptualisation of the interaction between research production and its use has evolved in the last decades from a linear thinking, which suggests a one-way process from research production to its adoption, to a system thinking, which recognises that actors are embedded in complex systems that influence each other (Best and Holmes, 2010^[20]). Although concepts pointing to a linear thinking and particularly to research-push processes – such as knowledge transfer, transmission or dissemination, and knowledge-to-action – are in retreat, current terms still struggle to appropriately recognise the complex nature of the field (OECD, 2022^[21]). “Knowledge mobilisation” has been a preferred term as it better captures the requirement of specific effort, time and collaborative work for its development. It also implies that the connection between the processes of research, practice and policy has an interactive, social and gradual essence, rather than having a one-way immediate course (Levin, 2013^[22]). More recently, the term “research-policy-practice engagement” has been coined, referring to the greater interaction at the interpersonal or inter-organisational level. This emphasises the role of different stakeholders, organisations and

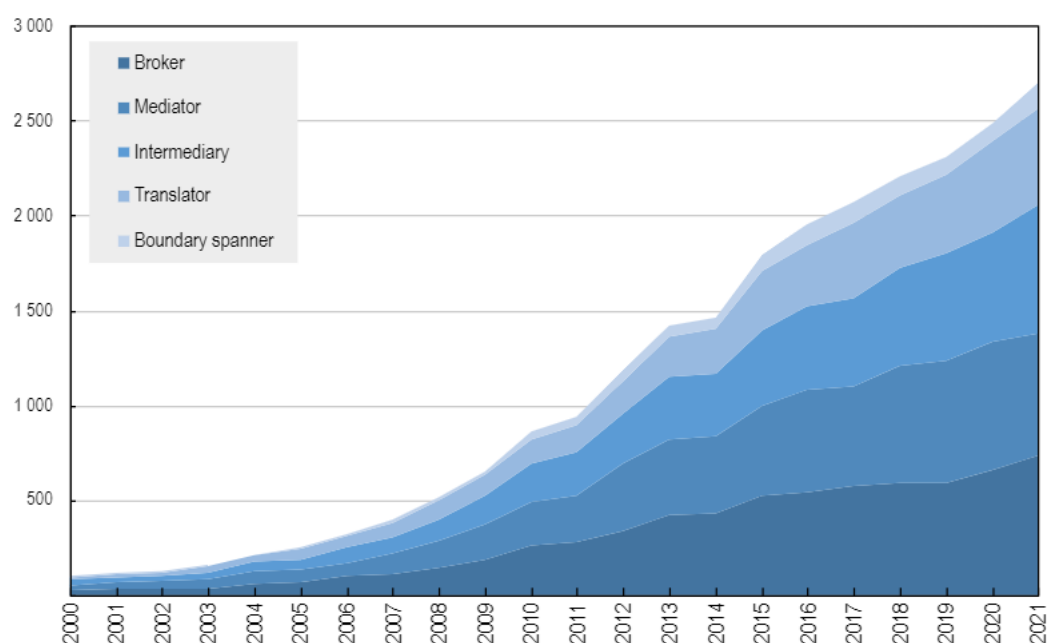
networks in increasing research use in policy making and practice (Oliver et al., 2022^[15]; OECD, 2022^[21]).

Another concept that has been the subject of discussion is “knowledge” itself. This working paper, when talking about “knowledge”, will generally refer to “research knowledge” – also known as scientific or factual knowledge –, except when specifically mentioned otherwise. Different types of knowledge – such as technical knowledge or practical wisdom (Malin, Brown and St Trubceac, 2018^[23]), the experience and expertise of teachers and policy makers – are intertwined and interact with each other. Research knowledge is often not used directly by decision makers and practitioners, but rather may shape their attitudes and ways of thinking in indirect and subtle ways if it is linked to their own knowledge (Nutley, Powell and Davies, 2013^[24]; Cain, 2015^[11]). Actors should thus be conscious of the existence and relevance of the different types of knowledge and their influence (further discussed in Section Conceptualising and evaluating the impact of knowledge mobilisation Conceptualising and).

Similarly, the organisations or individuals that take on the activities of knowledge mobilisation are also identified in the literature by a multiplicity of terms and definitions. A wide cross-sector search of studies related to knowledge mobilisation in Google Scholar shows a clear increase in the use of terms such as “broker”, “mediator”, “intermediary”, “translator” and “boundary spanner” since 2000 (see Figure 1).

Figure 1. Knowledge mobilisation studies mentioning "intermediaries"

Number of studies on knowledge mobilisation mentioning "intermediaries", by term and year.



Note: Data was collected through a Google Scholar search, using the following code: “research” AND “knowledge” AND “broker|brokers” AND (“research|knowledge mobilisation|mobilization” OR “knowledge translation|mediation” OR “knowledge-to-action” OR “evidence-based|evidence-informed policy|practice”). For the other terms, the used codes were equivalent.

In a more focused review of 44 specialised papers and reports (see Annex Table A.1), the most used terms were “knowledge brokers”, “intermediary organisations” and “mediators” – or their derivations. These terms are sometimes used interchangeably, as one third of the

44 reviewed articles use at least two of these and their definitions do not noticeably differ. This diversity of terms however is not seen as a problem by the intermediaries themselves, even if they paradoxically agree on the importance of securing an agreement on key concepts before engaging in knowledge mobilisation activities (Davies, Powell and Nutley, 2015_[19]).

“Broker” is the most commonly used term in the reviewed literature – although less so amongst the non-Anglo-Saxon countries – and is equally used across different sectors. It has also been the most widely adopted term in education policies that put the evidence-informed practice agenda at their forefront (Révai, 2020_[25]), even if it is not commonly used by the organisations themselves (Davies, Powell and Nutley, 2015_[19]). The term “intermediary” has a stronger presence in Scottish articles and in the literature related to education, with a steady growth over time. “Mediator” is mainly used in education-related studies. Over time, the concepts have become more diversified, from a dominance of the term “knowledge brokers” at the end of the 20th century to the recognition and use of other terms in later years.

A review of 277 Anglo-Saxon articles on knowledge mobilisation in the health, education and environment sectors reported some differences on the use of these terms (Neal, Neal and Brutzman, 2022_[26]). “Brokers”, the most used term, was commonly used in the health sector referring to people engaged in multiple knowledge mobilisation functions. “Intermediaries” was preferably used in education pointing to dissemination organisations, whereas “boundary spanners” mainly referred to linkage entities in the environment sector.

Despite the research-push processes becoming less “trendy”, most definitions of these actors tend to be consistent with the idea that research is “pushed” from academia to practitioners and policy makers (MacKillop, Quarmby and Downe, 2020_[27]). In the absence of concepts that reflect the complexity of the system and the work of these actors in particular, this working paper uses more neutral concepts such as “knowledge intermediary”, “intermediary organisation” or just “intermediary”.

2.2. Describing the actors

An intermediary is commonly defined by the position it occupies, labelled as the “go-between” (CHSRF, 2003_[12]; Ward, House and Hamer, 2009_[28]), as they operate between at least two identified communities of actors. These actors have been identified as policy makers and implementers (Honig, 2004_[9]); researchers and teachers and school leaders (Vanderlinde and van Braak, 2010_[29]); or more recently and broadly, research producers and research users (Cooper, 2014_[3]).

Between two communities

The definitions of these two communities have become less specific over time. As actors have diversified, and their interaction to each other has increased (Newman, Cherney and Head, 2016_[30]), the boundaries between these two communities are becoming blurred.

On the one hand, referring to these communities as research producers and users is a simplification. The educational sector is actually composed of several different types of actors, beyond just researchers, policy makers and teachers, such as inspectors, local authorities, training providers, businesses and the media (Burns and Köster, 2016_[31]). Each one of these actors has their own resources, needs, interests and goals. Hence, acting as an intermediary between two or more members of these communities requires consideration of the different characteristics of these actors. The variety of actors can lead, first, to complexifying the work of intermediaries, and second, to turning them into “specialists” for one kind of actor or of relationship.

On the other hand, several actors are no longer associated with a single function such as using research or producing research. For instance, teacher educators and training institutions, can be research producers and users at the same time, particularly they are embedded in an academic context. Although less common, in co-production processes research users are actively involved in its production. Research producers and users can be thus considered as functions or roles rather than as actors. Previous authors have already considered intermediaries as organisations serving an intermediary function, but that they may be research producers or consumers as well (DeBray et al., 2014^[32]). These functions have also been identified as “contexts” within which people and organisations operate (Levin, 2011^[33]). Actors can accomplish one or more of these functions interchangeably, although some actors are more strongly associated with one of the functions (e.g. researchers to research production). Knowledge mobilisation is thus a third function between at least two actors accomplishing the functions of research production and of research use.

A broad spectrum of actors has been identified for intermediaries: Individuals, groups, organisations and structures. They typically combine several activities and relational structures. Thus, “intermediary” points to a role and its corresponding practices rather than to an actor focusing exclusively on knowledge mobilisation activities. And as such, an intermediary – or an actor “acting” as an intermediary – is likely to undertake other activities or “perform” other roles, related or unrelated to knowledge mobilisation.

Relationship with the beneficiaries

Knowledge mobilisation is a phenomenon that inherently implies interdependent and asymmetric relationships between intermediaries and the organisations they work with and for – the beneficiaries (Wehn and Montalvo, 2018^[34]). Intermediaries may depend on one or both parties to perform their essential functions. This dependency may be either financial or might relate to the particular work to be done, as intermediaries serve the needs of research producers and users. At the same time, these potential beneficiaries need intermediaries’ work to better perform their own. This same interdependency can be partially rooted in the asymmetries between beneficiaries and intermediaries. While intermediaries might have access to information, contacts and “know-how” that beneficiaries lack, beneficiaries may have the necessary resources – e.g. monetary – for intermediary work.

At the same time, an intermediary should operate independently of those parties by providing “distinct value beyond what the parties alone would be able to develop” (Honig, 2004, p. 67^[9]). In this sense, intermediaries can be considered to favour neither knowledge providers nor its recipients (Ward, House and Hamer, 2009^[28]). But whereas some intermediaries themselves have emphasised the importance of being seen as non-partisan (Burns and Schuller, 2007^[35]), others are openly influenced by funding streams and advocacy agendas (Reckhow, Tompkins-Stange and Galey-Horn, 2021^[36]). Maintaining their fragile and ambiguous position can be a challenge for intermediary organisations and individuals (Kislov, Wilson and Boaden, 2016^[37]). Intermediaries have also been characterised as having their own agendas, goals and means, preferring to work in coalitions with peers with similar characteristics (DeBray et al., 2014^[32]). Intermediaries are not necessarily neutral: They are conscious of the power of public opinion and can look to exploit it to lobby for particular and pre-determined causes (Burns and Schuller, 2007^[35]; Levin, 2013^[22]).

A singular definition of intermediary organisations will not cover the broad spectrum of their nature and work, as they vary according to the sector they work in and the needs of the organisations they work with and for, amongst other factors. This very lack of definition

of what an intermediary is has been one of the causes that makes their identification and study difficult (Honig, 2004_[9]).

Defining research intermediaries for the purposes of an empirical study requires understanding the objectives and functions associated with this intermediary role. This will be the focus of the following section.

3. Objectives and functions

Intermediaries are commonly characterised, sometimes even defined, by their objectives, functions and activities (Neal, Neal and Brutzman, 2022_[26]). This section identifies and classifies the objectives and functions endorsed by the literature. This paper will then consider knowledge intermediaries as organisations or individuals that fulfil any of the identified intermediary functions.

3.1. General and specific objectives

The literature identifies two levels of objectives of knowledge intermediaries. First, an overarching and general aim of facilitating knowledge mobilisation often referring to enhancing an evidence-based decision-making or a research-use culture in policy and practice. This overarching objective is sometimes formulated explicitly, for example, to facilitate the creation, sharing, and use of knowledge (Sverrisson, 2001_[38]). In other instances, the intermediaries' objective is not explicit or the phrasing is vague or metaphorical: Cooper refers to this as a “catalyst for knowledge mobilisation” (2014, p. 30_[3]), Sin talks of bridging the divide between evidence, policy and practice (2008_[39]).

The second level of the intermediaries' objectives are the more specific purposes that these organisations aim to achieve in a short or a medium term. These objectives can be regrouped under their overarching and general abovementioned aim. In this regard, the reviewed literature reports more specific objectives, particularly linked to promoting the flow of information between research producers and users and to encouraging the interactions and engagement of these two communities.

These distinctive objectives can be aligned to three dimensions first identified by the 1996 Canadian *Connecting with the World* report (Strong et al., 1996_[40]) and later widely revisited and deepened by the knowledge mobilisation literature (Oldham and McLean, 1997_[41]; Ward, House and Hamer, 2009_[28]; Bornbaum et al., 2015_[42]; Kislov, Wilson and Boaden, 2016_[37]):

- Creating and disseminating knowledge

Here, intermediaries fulfil the role of *knowledge manager*. Creating and translating knowledge, adapting it into different formats and disseminating it, either passively or actively, are actions that address “the overwhelming quantity of research evidence and its lack of relevance to decision makers” (Ward, House and Hamer, 2009, p. 4_[28]).

- Facilitating relationships

By creating and promoting knowledge-related relationships and networks, intermediaries enable the multiplication, dissemination and expansion of knowledge. It is based on the perception that the involvement of decision makers in the research processes can enhance the use of research results by the former, and that relational strategies can improve knowledge exchange (Ward, House and Hamer, 2009_[28]). Here, intermediaries fulfil the role of *linkage agent*.

- Building skills and capacities

Intermediaries can focus on building the necessary understanding, skills, capacities and conditions to create, adapt, communicate and use knowledge for a sustainable and scalable development. Here, intermediaries take on the role of *capacity builder*. This is closely linked to a constructivist view of teaching itself, in which teaching is not simply about transferring knowledge, but rather about creating possibilities for the construction and production of knowledge (Freire, 1998^[43]).

The main objectives associated with knowledge intermediaries as identified in almost 20 studies over the last 25 years are summarised in Annex Table A.2. General objectives are the most common, followed by objectives related to information management, linkage agency and capacity building, in that order. There are no significant differences amongst the objectives linked to intermediaries and the different terms used to refer to them.

Despite different conceptualisations of the objectives and roles of knowledge intermediaries, they are not mutually exclusive, as intermediaries likely operate in an amalgam of these (Bornbaum et al., 2015^[42]). A similar phenomenon occurs with the functions, which are related to the day-to-day activities performed by intermediary organisations to achieve those objectives. The next section will describe and classify these functions.

3.2. Functions

Typology of intermediaries' functions

In the last decade, several attempts have been made to identify and classify the functions of intermediaries. These categorisations, although different, tend to overlap with each other. Based on an extensive review of literature, Annex Table A.3 regroups the classifications of intermediaries' functions proposed by some of the leading experts on knowledge mobilisation into a broader typology. This framework is comprehensive, in that it captures all the elements identified in the reviewed typologies and proposes – to the extent possible – clearly defined dimensions. Table 1 summarises these dimensions and gives some example outputs associated with each. Each function is linked to one of the three main objectives identified above, or categorised as “transversal”. However, functions are not strictly limited to that specific objective, as in some cases they may serve other purposes.

The framework does not assume that actors playing an intermediary role fulfil all these functions simultaneously or even the entirety of one function. This paper considers as an intermediary any organisation carrying out any, or several, of the functions described in Table 1.

Table 1. Research knowledge intermediary functions

Function dimension	Description	Examples of outputs
Knowledge manager		
<i>Research production</i>	Conducting primary research (i.e. conceptual work, collecting and analysing data) and secondary research (reviewing and analysing primary research). The process of research production also involves identifying, compiling and translating existing research, assessing its quality and relevance. It can involve systematically mapping research gaps and driving the research agenda. Research produced by intermediaries often serves the purpose of increasing the availability and accessibility of research in a particular field or with a particular perspective.	Primary research: research reports, papers and working papers. Secondary research: literature reviews, meta-analyses, research reports, synthesis and summaries. Calls for tender, commissioning of research, research agendas – based on identified gaps.
<i>Research dissemination and advocacy</i>	Establishing and coordinating communication channels through which research-based products or other relevant material are purposefully circulated. These channels may be adapted to ease the beneficiary's comprehension, considering their context and particular setting. It also involves advocating for evidence use in decision making and promoting knowledge mobilisation and the necessary infrastructural, organisational and cultural changes that may facilitate research use for stakeholders and stimulate the evidence-informed education agenda.	Communication channels: websites, newsletters, blogs, presentations, forums, and print and online media. Adapted research outputs: practice guidelines, decision aids, policy briefs and fact sheets.
Linkage agent		
<i>Relationships and network building</i>	Systematically mapping and analysing relevant actors and their relationships. Facilitating connections amongst the different actors (e.g. researchers, practitioners, policy makers, stakeholders with relevant expertise, organisations working on related problems and with similar goals) and supporting their collaboration in order to help stakeholders to understand each other's work and context. These connections are meant to lead to practical action, to more relatable research in terms of the users' perspective or to processes of research co-production.	Events, presentations, collaboration, networking and partnership agreements.
Capacity builder		
<i>Individual skills and capacity building</i>	Facilitating the professional learning and skills development of researchers, practitioners and policy makers. This could be training for practitioners or policy makers in research awareness, understanding and use or critical appraisal skills or training for researchers, such as offering exposure to and knowledge about how policy or practice works. These training programmes imply a level of knowledge of the context of the different stakeholders. This function could also concern training and capacity-building for stakeholders to develop strategic leadership skills.	Workshops, training courses, seminars, webinars, courses, public lecture series, informal mentorship and public meetings with national or international experts.
<i>Organisational and system development and capacity building</i>	Mapping research-use capacity gaps across organisations. Developing and offering intra- or inter-organisational capacity building. Building strategic knowledge mobilisation or research use plans or programmes in organisations. These can be manifested in the organisations' formal structure and/or their processes, such as the creation of internal incentives to promote the use of research within the organisation.	Organisational diagnosis, organisational development programmes, leadership development, coaching, mentoring.
Transversal		
<i>Research use and intervention support</i>	Providing direct assistance to integrate research evidence in practice and policy. This can be done through a coordination role or a more active one, even a leading role. This function is heavily dependent on the other functions, as it implies the implementation of research-use initiatives, and should ideally be based on research itself.	Meeting plans, guidelines for interventions and programme plans. Implementation coaching and mentoring. Funding proposals for intervention support.

Function dimension	Description	Examples of outputs
<i>Evaluation, scale-up and sustainability</i>	Evaluating ongoing processes and accomplished changes on key indicators to ensure the expected impact and to learn from knowledge mobilisation initiatives. Evaluation can concern: - the extent and quality of research use by practitioners, policy makers and its impact (e.g. on teaching practice, policy processes). - the evaluation of the results of knowledge mobilisation initiatives themselves along the above dimensions. The evaluation results can lead to: - Building knowledge on knowledge mobilisation itself, its potential effects and the most effective mechanisms to achieve it. - Scaling up effective research-use initiatives (e.g. to other school systems). - Maintaining on the long-term knowledge mobilisation initiatives and of research use itself. The scaling-up and sustainability processes are multifactorial and can relate to any of the above dimensions.	Monitoring plans, outcomes and impact evaluation plans, evaluation reports and recommendations, intra- or inter-organisational scale-up plans, feasibility studies, guidelines and programmes.

Source: Adapted from Cooper, A. (2014^[3]), “Knowledge mobilisation in education across Canada: A cross-case analysis of 44 research brokering organisations”, *Evidence and Policy*, Vol. 10/1, pp. 29-59, <https://doi.org/10.1332/174426413X662806>; Bornbaum, C. et al. (2015^[42]), “Exploring the function and effectiveness of knowledge brokers as facilitators of knowledge translation in health-related settings: a systematic review and thematic analysis”, *Implementation Science*, Vol. 10/1, <https://doi.org/10.1186/s13012-015-0351-9>; Davies, H., A. Powell and S. Nutley (2015^[19]), “Mobilising knowledge to improve UK health care: learning from other countries and other sectors – a multimethod mapping study”, *Health Services and Delivery Research*, Vol. 3/27, pp. 1-190, <https://doi.org/10.3310/hsdr03270>; Powell, A., H. Davies and S. Nutley (2017^[44]), “Missing in action? The role of the knowledge mobilisation literature in developing knowledge mobilisation practices”, *Evidence and Policy*, Vol. 13/2, pp. 201-223, <https://doi.org/10.1332/174426416X14534671325644>; Gough, D., C. Maidment and J. Sharples (2018^[45]), *UK What Works Centres: Aims, methods and contexts*, <https://eppi.ioe.ac.uk/cms/Default.aspx?tabid=3731> (accessed on 15 December 2022); Oliver, K. et al. (2022^[15]), “What works to promote research-policy engagement?”.

The suggested categories are not intended to be mutually exclusive. They are actually closely intertwined: Some intermediary activities may be part of more than one category or may be related. For instance, coaching and mentoring can relate to individual and organisational development, as well as intervention support. Similarly, the translation of research findings to local or specific contexts implies a degree of collaborative work with stakeholders and understanding of their contexts and needs. Furthermore, intermediary initiatives that perform only one of the functions do not tend to be very effective. Such is the case for activities bringing researchers, practitioners and policy makers together: Although promising and necessary, they 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^[13]).

The functions can be performed for the benefit of a third-party organisation or for the intermediaries themselves. An example of the former is when an intermediary promotes a programme to increase research-use skills of a potential beneficiary’s employees or develops an evaluation plan for a particular knowledge mobilisation initiative. But intermediaries can also develop a plan to increase their own skills and capacities or evaluate their own actions facilitating the use of research.

The last two categories – Research use and intervention support and evaluation, scale-up and sustainability – are linked to the other functions. These are achieved through leadership capacity building, the promotion of research-use practices, knowledge mobilisation advocacy and the embedding of research-use mechanisms in organisational processes. Scaling-up processes have been linked to individual and organisational capacity building

and the role of leadership in pushing for an evidence-based improvement culture (Gu et al., 2021^[46]). These activities should themselves be research-based. For this, they can be considered as “transversal functions”.

Intermediary-beneficiary partnership area

The functions that intermediaries perform will depend on their objectives, skills, capacities, experience and resources. At the same time, they will also depend on the goals, needs and focus of the organisations with whom the intermediaries work or to which they give support (henceforth beneficiaries). This intersection between the intermediaries’ competences and the potential beneficiaries’ needs also determines the role the intermediary plays in their relationships. These connections may be formal or informal, direct or indirect. Intermediaries do not always directly collaborate with the organisations that benefit from their work, as they might just disseminate content in an untargeted manner, for instance. For their part, organisations can benefit from this content without a formal collaboration with the intermediaries.

This “partnership area”, specific to each intermediary-beneficiary collaboration, is an interactive space between an intermediary and an intended beneficiary. It often (but not necessarily) includes a “research-push” dimension, with intermediaries – and possibly researchers – intending to integrate evidence of their choice in practices and/or policies. This choice can be influenced by the agenda of the intermediaries or by the interests and goals of intended beneficiaries – which may, in turn, be influenced by third-party external agents. Thus, the partnership area also often involves “research pull” processes, empowering beneficiaries to formulate knowledge needs and obtain appropriate responses from the research community. Box 1 represents a fictive case of a specific partnership area.

Box 1. Intermediary-beneficiary partnership: A fictive case

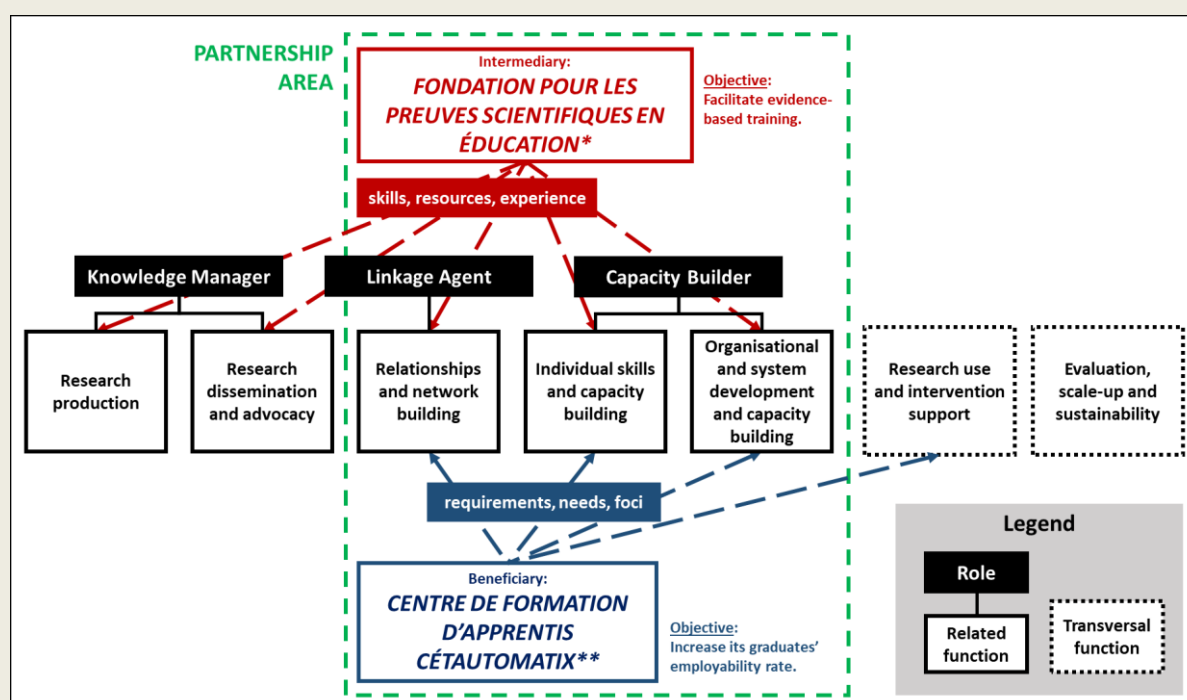
The beneficiary

The *Centre de formation d’apprentis Cétautomatix* is a French vocational centre, specialised in training of the craft of metallurgy. It is a non-profit private school, managed by the national trade union of metalsmiths. For some years, *Cétautomatix* graduates have endured low employment rates. The centre Director, Mr. F. Aestus, is highly concerned by this and is determined to change the situation. According to his analysis, the low employability of its graduates is rooted in a lack of alignment of the centre’s training offer with the current labour market demands. Director Aestus envisions the implementation of reforms within *Cétautomatix* that would enable frequent and meaningful interactions of its students with the world of work and to an update of the current curriculum and the skills of the trainer staff. To ensure the effectiveness of these reforms, he expects that they will be based on specialised research evidence.

The intermediary

The *Fondation pour les Preuves Scientifiques en Éducation* (FPSE) is a Canadian non-profit organisation. Focused on French-speaking educational systems, the FPSE aims to “facilitate evidence-based secondary, vocational and tertiary training”, according to its website. Although its experience is primarily linked to capacity building at an individual and at an organisational level, it has also led seminars and networking events involving research producers and users. Recently, FPSE has started to produce its own research and to disseminate this through its communication channels.

Figure 2. Partnership area of a fictive intermediary-beneficiary connection



The partnership area

F. Aestus learns about the work of the FPSE through a webinar they led on vocational training and education. He decides they are the perfect match to support *Cétautomatix* in its upcoming reforms and contacts them via email. Director Aestus contemplates not only that FPSE 1) connects *Cétautomatix* with metalsmith labour market representatives, but also that FPSE 2) co-develop the necessary capacity-building strategies at an individual and organisational level and that they 3) provide support in implementing these strategies.

Mrs. Vulcan, FPE Programme Manager on Vocational Education, recognises the potential collaboration with *Cétautomatix* as a great opportunity to expand their network building capacities. Nevertheless, she thinks their organisation might lack the necessary experience to lead the implementation of the intervention. Thus, Vulcan and F. Aestus agree to limit their partnership so that FPSE acts as a linkage agent –facilitating networking events – and as a capacity builder –, designing organisational and individual development plans. Since the intermediary role played by FPSE will only partially

address the needs of *Cétautomatix*, they will also need other connections for the strategy implementation.

Figure 2 depicts this particular *Cétautomatix*-FPSE partnership.

Note: *Foundation for Evidence in Education. ***Cétautomatix* Apprentice Training Centre.

Note: This case is a work of fiction. Names, characters, places and incidents either are products of the authors' imagination or are used fictitiously. Any resemblance to actual events or locales or persons, living or dead, is entirely coincidental.

Intermediary functions and beyond

By detailing the various functions that knowledge intermediaries typically carry out, we determine some of the ways that intermediaries contribute to the goal of enhancing a research-use culture in policy and practice. Linking short-term functions with longer term objectives in this way may be a first step towards designing a theory of change for knowledge mobilisation initiatives in the education sector. This can ultimately lead to a structured and effective framework to monitor and evaluate knowledge mobilisation initiatives. This will be discussed in more depth in Section 5.

As demonstrated above, the functions carried out by intermediaries are partly dependent on these actors' goals, skills, capacities, experience and resources. Thus, the characteristics of a particular intermediary organisation are indicative of the functions it can perform. The following section discusses the organisational features of research knowledge intermediaries.

4. Intermediaries' characteristics

If literature focused on knowledge intermediaries is scarce – although growing –, research on their characteristics is even scarcer. In the last decade, four main studies (Gough et al., 2011^[14]; Cooper, 2014^[3]; Oliver et al., 2022^[15]; OECD, 2022^[21]) have emerged that not only shed light on the actors performing this role, but also reveal research gaps. In particular, there is a lack of understanding of the connection between intermediaries' functions, their characteristics and impact.

4.1. Who acts as intermediaries?

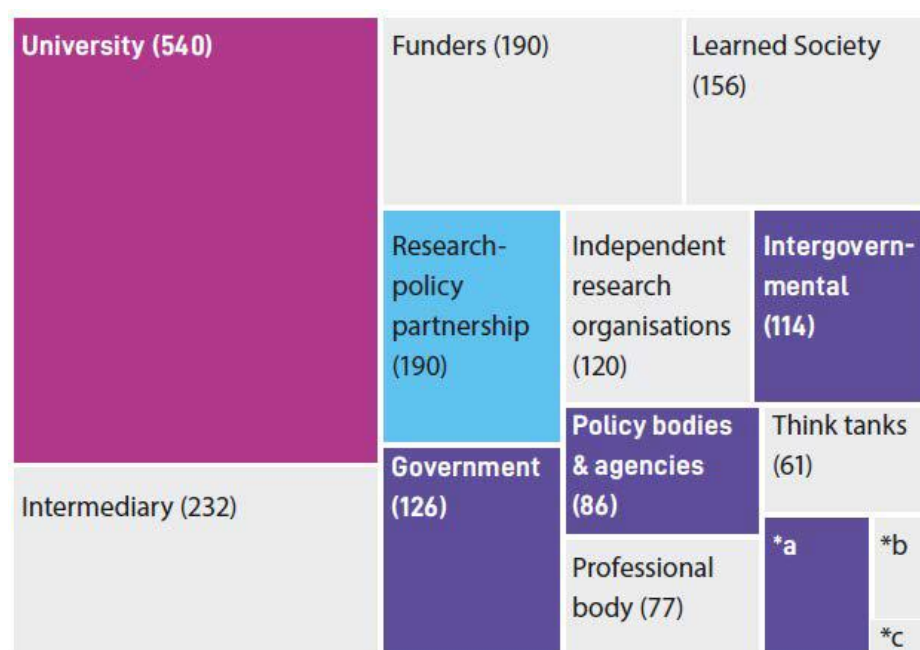
A few decades ago, the Canadian Health Services Research Foundation noted that knowledge brokering can occur without individuals performing formal brokering roles and called for a greater focus on the activities and processes, not just on individuals (CHSRF, 2003, p. i^[12]). However, the amount of research on these forms of activities and processes is still very unbalanced. A recent review of literature covering multiple sectors highlighted that the majority of research papers still focus on intermediaries as individuals (MacKillop, Quarmby and Downe, 2020^[27]). The same review warned that a focus on individuals may lead to overestimating the relevance of personal characteristics – e.g. charisma, emotions and credibility – and neglecting other significant factors, such as the culture, contexts and environments in which intermediaries' work takes place, and their organisational features, structures and processes.

Since then, intermediaries described in the literature have included formal roles and initiatives (such as individuals, organisations, partnerships and even entire countries) and informal ones (such as groups, teams, networks and interactive settings). A recent cross-

case study reported that the role of intermediaries has been largely informal and not well leveraged (Shewchuk and Farley-Ripple, 2022^[47]). The following paragraphs highlight four studies that illustrate the diversity of this field and provide a more comprehensive picture of intermediaries.

The first one is an analysis of 44 Canadian organisations dedicated to knowledge mobilisation in the education sector, the “research brokering organisations” or RBOs (Cooper, 2014^[3]). This analysis included organisations that connect research producers and users, and whose mission statements, goals and/or strategic plans are explicitly related to knowledge mobilisation. It identified, amongst others, charitable foundations, research centres, government agencies, professional organisations and individual researchers, the media, lobbyists, interest groups, think tanks, labour groups, policy entrepreneurs, private companies and consultants. The study showed that universities’ and RBOs’ efforts to increase the use of research evidence were consistent and more robust than those of ministries of education and school districts.

Figure 3. Organisations hosting academic-policy engagement



Note: The number between parentheses refers to the number of activities led by the respective organisation.

a: Parliamentary initiatives (51); b: Business (21); c: Non-profit initiative (7)

Source: Boaz, Oliver and Hopkins (2022^[21]), “Linking research, policy and practice: Learning from other sectors”, in OECD (2022), *Who Cares about Using Education Research in Policy and Practice?: Strengthening Research Engagement*, Educational Research and Innovation, OECD Publishing, Paris, <https://dx.doi.org/10.1787/d7ff793d-en>.

The second study is a wider cross-sector and cross-country effort, mapping 513 organisations that promote research-policy engagement in over 40 countries, although the majority of the organisations are in the United Kingdom (Oliver et al., 2022^[15]). Organisations were included in the sample if “there was evidence from their websites and associated documentation that they were now, or had ever been, actively engaged in promotion of academic-policy engagement activities” (Oliver et al., 2022, p. 4^[15]). As in

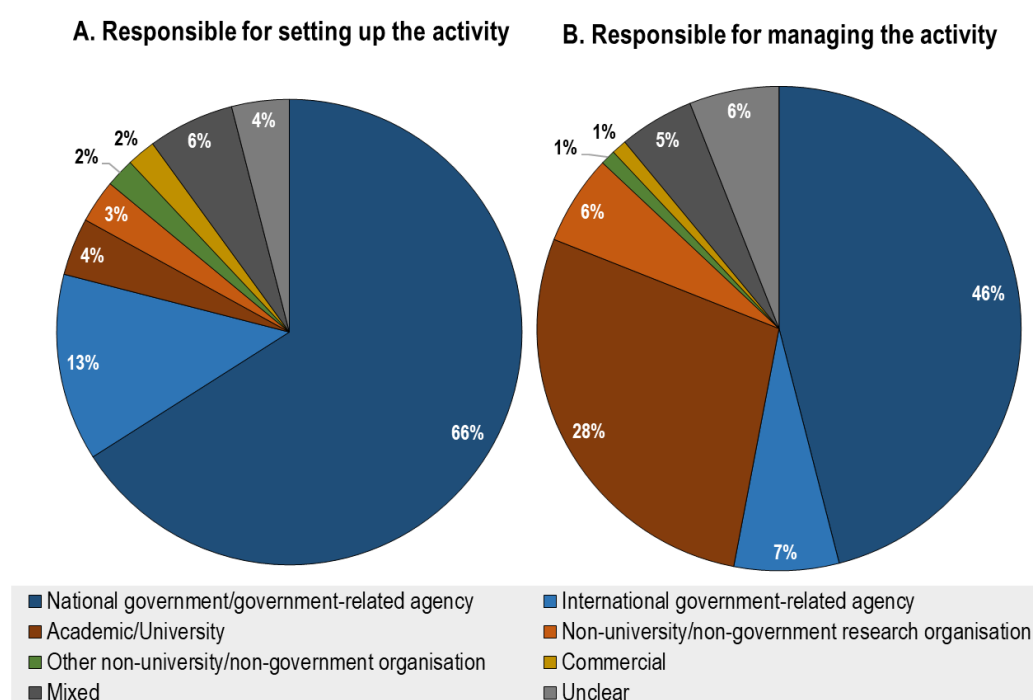
Cooper's analysis, this mapping is thus focused on these so-called “explicit” intermediaries.

As shown in Figure 3, of the 1 923 research-policy engagement initiatives identified, 28% were led by a university. Intermediaries, funders, research-policy partnerships and learned societies were also common developers of these initiatives. In total, the study identified over a dozen types of organisations. The diversity of such intermediaries could suggest that for every particular need, there is a particular intermediary (Shewchuk and Farley-Ripple, 2022^[47]).

4.2. Specialisation of intermediaries

The third study, conducted in the context of the Evidence Informed Policy making in Education in Europe (EIPEE) project, adopted a different methodology (Gough et al., 2011^[14]). It first identified 269 activities in 30 European countries – again, the majority in the United Kingdom – that linked research evidence to policy making in education. It then classified the organisations responsible for these activities. This allowed the authors to consider “implicit” intermediaries, that is, organisations that do not specifically and formally declare their work as knowledge intermediaries but still play this role.

Figure 4. Organisations responsible for activities linking evidence to policy making



Source: Adapted from Gough, D. et al. (2011^[14]), *Evidence informed policymaking in education in Europe : EIPEE final project report*, EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

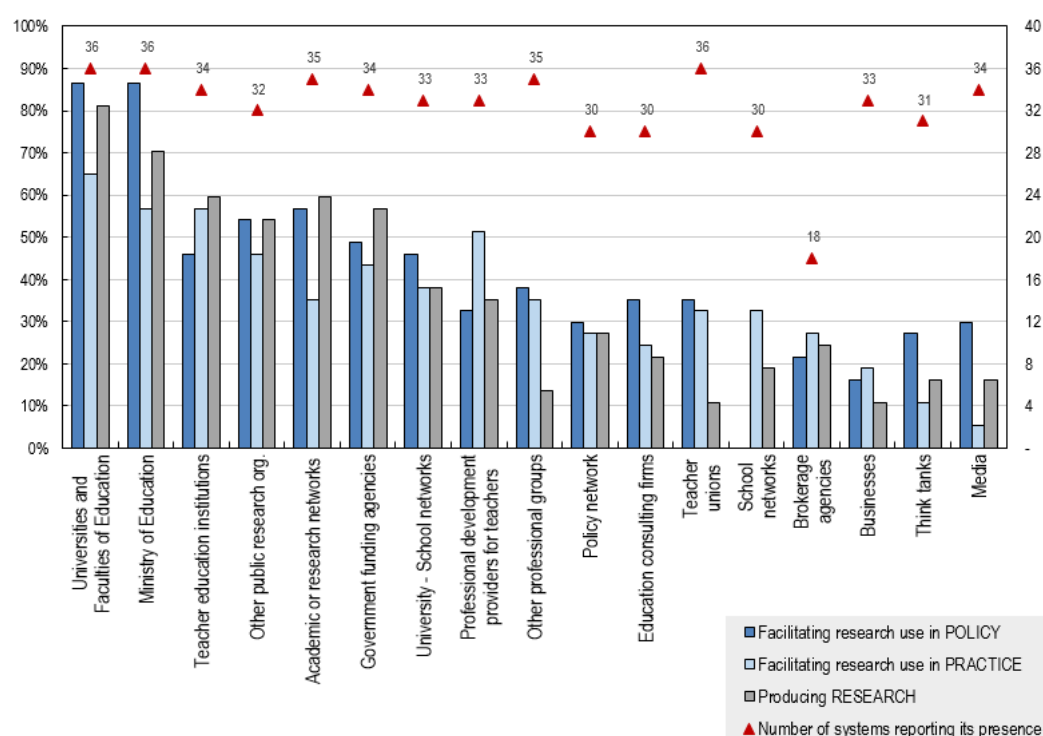
The authors differentiated between the organisations who were responsible for setting up the activity and those who were responsible for managing it. Regarding the former, there is a clear dominance of governments and national or international government-related

agencies. Regarding the latter, even if national governments and government-related agencies generally continue to take part in managing these activities, their responsibility is reduced, with academia and universities taking a larger role (see Figure 4). Although governments – and other organisations – may lead both the set-up and the management of initiatives, in many government-university partnerships the parties have different roles: One setting up the activities, and the other managing it.

Finally, the fourth study, a recent OECD survey (OECD, 2022^[21]), mapped whether and to what extent a given type of organisation (from a list of 17 types) is active in producing research and facilitating its use in policy and practice across 37 education systems representing 29 countries¹. Universities, teacher education institutions and networks directly involved in academia (e.g. research networks and university-school partnerships) appeared to be the most prevalent and active ones, as well as homogeneously active across systems (see Figure 5).

Figure 5. Activeness of organisations in producing education research and facilitating its use

Percentage of systems reporting that the given type of organisation is “Active” or “Very active”.



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.

Source: OECD *Strengthening the Impact of Education Research* policy survey data.

¹ 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), Türkiye, United Kingdom (England), United States (Illinois). Non-member countries: Russian Federation, South Africa.

Fewer than half of respondent systems reported the presence of brokerage agencies – here, referring to formal agencies with an explicit primary mission to support research mobilisation. And even systems that have brokerage agencies, indicated a strong diversity in how active they were.

Organisations have distinctive profiles. Some, such as public research organisations, have a mixed profile, with similar levels of activeness in both research production and mobilisation across policy and practice. Others have a more specific profile, focusing their work on either producing research or facilitating its use. This is the case of universities and academic networks, which are, unsurprisingly, more active in research production. What is however surprising is that overall, they are perceived as more active in facilitating research use in policy, than in practice. For their part, teacher education institutions are seen as mostly active in producing research and facilitating its use in practice, whereas professional development providers for practitioners are seen as mainly active in facilitating the use of research in practice. Nevertheless, there is still a considerable proportion of systems that do not see these organisations as active research facilitators: 40% for initial teacher education organisations and over 60% for professional development providers.

However, systems vary with respect to the role of certain organisations. For example, in some systems ministries of education are perceived as only active in facilitating research use in policy and practice, but not in producing research, while in other systems they are the most active research producers. Box 2 is an example of different knowledge mobilisation profiles in one system.

Box 2. Different knowledge mobilisation foci amongst Norwegian actors

Focus on producing research and facilitating its use in both policy and practice

The Knowledge Centre for Education was established by the Ministry of Education and Research in 2013. Since 2019, it has been a research centre within the Faculty of Education and Arts at the University of Stavanger, although it continues to be directly funded by the Ministry.

The Centre produces research syntheses for the whole education sector – practitioners, researchers and policymakers alike – and disseminates these syntheses in formats that enable engagement and understanding. The Centre aims to increase knowledge about systematic syntheses of research – their relevance, their use, and how to do systematic research reviews and syntheses.

Focus on producing research and facilitating its use in policy

The Directorate for Education and Training commissions research on education and has the responsibility to ensure that relevant research is made easily accessible to the Ministry and policy makers. It summarises reports and articles, provides an assessment of the quality of specific studies, and an assessment of the policy implications of research findings.

Focus on facilitating research use in practice

Utdanningsforbundet, the largest teacher union, hosts a digital research portal where the aim is for teachers to easily access research that is relevant to their profession. The portal hosts more than 3 000 freely accessible and searchable articles on education research.

While the union's main target group is practitioners, the research presented is also intended to inform policy – especially school owners at the municipality level.

Source: University of Stavanger (2022^[48]), *Knowledge Centre for Education*, <https://www.uis.no/en/research/knowledge-centre-for-education> (accessed on 27 September 2022); Utdanningsdirektoratet (n.d.^[49]), *Directorate for Education and Training*, <https://www.udir.no/in-english/> (accessed on 27 September 2022); Utdanningsforbundet (2022^[50]), *Utdanningsforskning.no*, <https://utdanningsforskning.no/> (accessed on 27 September 2022).

In sum, some pertinent insights can be drawn from the above four studies. First, studies should not exclusively focus on individuals acting as intermediaries, as they may neglect the influence of organisational features. At the same time, organisations, and how they function, cannot be properly understood without also looking at the people who work within them. Thus, organisations and individuals cannot be disassociated (Belkhodja et al., 2007^[51]). Second, studies should consider both explicit and implicit intermediaries, i.e. organisations that do and do not formally declare their work as intermediary. A recent study looked at specific examples of education resources that had been considered useful by practitioners and examined the origins of these studies (Shewchuk and Farley-Ripple, 2022^[47]). This type of research can broaden the range of relevant actors to consider and diversify the results obtained. Whereas studies focusing on explicit intermediaries showed a dominance of universities (Oliver et al., 2022^[15]), studies focusing on implicit intermediaries included mainly governments and government agencies acting as intermediaries (Gough et al., 2011^[14]). Third, organisations in intermediary roles may have different profiles in terms of research production and mobilisation. The intermediary profiles of some organisations – and thus their functions – can be surprising or unexpected. For example, some ministries of education are not perceived as active facilitators of research use in practice. Finally, it is necessary to broaden the scope from an almost exclusive focus on Anglo-Saxon initiatives. As the OECD survey showed, results may vary significantly from one system to another.

4.3. Typology of intermediaries

In her analysis, Cooper (2014^[3]) proposed four types of intermediary organisations mainly based on two factors: the organisation's belonging to the formal education system, and its sources of funding. Whereas the funder's interests may shape the use of research (Reckhow, Tompkins-Stange and Galey-Horn, 2021^[36]), the nature and frequency of research use may also vary across organisational contexts, domains and disciplines, as organisations have diverse functions within the education system (Cooper, 2014^[3]). For instance, when seeking evidence, national governments or ministries tend to rely primarily on international organisations (e.g. UNESCO, OECD, World Bank). Civil society organisations tend to have a wider range of information sources, including regional organisations (e.g. the United Nations Economic Commission for Latin America and the Caribbean and the African Campaign Network for Education for All) and local platforms (NORRAG, 2022^[11]).

Cooper proposed four types of intermediaries: Governmental; Not-for-profit; For profit; and Membership (see Table 2). The first three are the most common ones, with governmental and not-for-profit intermediaries appearing as the more active ones, in terms of knowledge mobilisation efforts.

While many fit into this typology, some do not belong to any of these categories. This paper therefore proposes a fifth category, expanding on Cooper's "Governmental" category and

distinguishing between governmental educational, and non-educational. With this additional distinction, we consider the typology below to be exhaustive, although the categories are not mutually exclusive (organisations may belong to more than one depending on their particular characteristics) (see Table 2).

Table 2. Typology of research intermediary organisations

Type of intermediary	Location in the formal educational system	Source(s) of funding	Organisations
<i>Governmental educational</i>	Inside	Government	Ministry research branches District-level research services Standard and evaluation agencies Funding agencies
<i>Governmental non-educational</i>	Outside	Government	Parliamentary initiatives Policy bodies and agencies Intergovernmental
<i>Not for profit</i>	Outside	Donations Grants Private Government	Universities (and their faculties) University research centres Advocacy groups Issue-based organisations Think tanks Research partnerships Independent research organisations
<i>For profit</i>	Outside	Private Clients	Textbook publishers Instructional program vendors Research consulting companies Media Business
<i>Membership</i>	Inside or outside	Own members Other	Professional bodies (e.g. teacher unions) Networks Learned societies Civil society (e.g. parent groups)

Source: Adapted from Cooper, A. (2014^[3]), “Knowledge mobilisation in education across Canada: A cross-case analysis of 44 research brokering organisations”, *Evidence and Policy*, Vol. 10/1, pp. 29-59, <https://doi.org/10.1332/174426413X662806>.

Beyond the four studies described above, there has been limited analysis of the work of each type of intermediary and its effectiveness. More research is needed to understand the specific setting in which knowledge intermediaries work: with whom they usually collaborate, what objectives they have, what functions they perform and, crucially, which factors enhance or limit the effectiveness and/or impact of their work.

4.4. Organisational characteristics

A limited number of previous studies have considered intermediaries’ organisational characteristics. The existing studies have examined how knowledge intermediaries differ on some key dimensions, such as the types of organisations with which they collaborate, their composition, their location, the scope of their work (e.g. local, state, national, international) and their funding sources (Honig, 2004^[9]; Cooper, 2014^[3]; Shewchuk and Farley-Ripple, 2022^[47]). The studies have also covered a number of other characteristics of knowledge intermediaries.

- Target audience

Intermediaries' target audiences can include researchers, practitioners (teachers, school administrators, higher education professionals), policy makers, parents and other community members, students themselves and the general public (Cooper, 2014^[3]; Malin, Brown and St Trubceac, 2018^[23]; Shewchuk and Farley-Ripple, 2022^[47]). This broad spectrum is confirmed in another study that conducted interviews with 51 intermediaries working in the sectors of health care, social care and education in Anglo-Saxon systems (Davies, Powell and Nutley, 2015^[19]).

- Size

In terms of their size, Cooper (2014^[3]) differentiated the following categories of intermediaries: “small” (with ten or less full-time employees), “medium” (between 11 and 20 employees) and “large” (more than 20 employees). Although most of the Canadian intermediaries analysed in Cooper's study were found to be small, there were no significant differences between the intermediaries' size and their knowledge mobilisation efforts. Shewchuk and Farley-Ripple (2022^[47]), in turn, defined the small, medium and large categories with a larger number of employees – less than 50, from 50 to 249, and over 250 employees, respectively –, with the first two being the most common.

- Expenditure

Small Canadian intermediary organisations had annual operating expenditures varying between CAD 150 000 and CAD 2 million (Canadian dollars), whereas large intermediaries reported annual expenditures between CAD 2 million and CAD 20 million. These expenses included salaries, project and programme expenses, grant allocation, fundraising costs, operations and administration costs, marketing and communications, events, monitoring and evaluation costs, networking costs, training initiatives, conducting research and research dissemination (Cooper, 2014^[3]).

- Revenue

Some organisations reported revenues in the form of donations, government funding, consulting, providing services for fees, selling publications and other sales, membership and speaking fees, and registration fees from workshops and events (Cooper, 2014^[3]). Shewchuk and Farley-Ripple (2022^[47]) found that intermediaries' annual revenue spans from under USD 1 million to over USD 1 billion. These revenues however do not give an indication of the level of effort, results, effectiveness or impact of the organisations acting as knowledge intermediaries.

- Skills, capacities and qualities

There is slightly more research on the skills, capacities and qualities necessary to be effective in a knowledge intermediary position. There is some agreement that interpersonal skills, communication skills, motivation, expertise and knowledge about the context of both research producers and research users are necessary to perform the role of intermediary successfully and effectively (Dobbins et al., 2009^[52]). Studies have identified certain intermediary attributes – e.g. credibility (Lavis et al., 2003^[16]), clarity (Bowen and Martens, 2005^[53]), neutrality (Van Kammen et al., 2006^[54]), flexibility (Dobbins et al., 2009^[52]), energy and commitment (Maxwell, Sharples and Coldwell, 2022^[55]) – that have a positive impact on research use. Nevertheless, these characteristics are commonly described in single instances or single settings – particularly in the health sector –, making it difficult both to compare them, and to generalise to the entirety of actors acting as intermediaries (Phipps et al., 2017^[56]).

The skills and capacities associated to intermediary organisations in fact often are related to individual skills rather than organisational capacity. This is not surprising given that

organisations are made up of individuals, whose collective skills at least partially – if not fully – determine organisational capacities (Belkhodja et al., 2007^[51]). However, overall organisational capacity is more than just the sum of individual capacities. It also includes organisational culture, such as norms, values and behaviours.

Overall, there is a lack of literature on the intermediaries' characteristics and on the relationship between these characteristics and the functions that intermediaries accomplish, the roles they perform, and ultimately their impact. Underlying this lack of evidence is a weak conceptualisation of effectiveness and impact itself. How to conceptualise and measure the impact of research on policy making and on school and teaching practice in general, and that of intermediaries in particular, is still a topic of some debate. The following section presents a review of different forms of research use and a typology for evaluating the impact of knowledge mobilisation activities.

5. Conceptualising and evaluating the impact of knowledge mobilisation

In recent years, enhancing the impact of education research on educational practice and policy has become more important in many education systems. Sebba (2013^[57]) speaks of three imperatives to maximise research impact: Economic, moral and academic. The first one refers to the “responsibility to ensure that the limited resources available are spent in ways that maximise intended outcomes and minimise waste” (Sebba, 2013, p. 395^[57]). The second imperative speaks of the necessity to base the design of initiatives into people's lives on best available evidence, while the third one points to a recent trend in academia to include research impact on policy and practice as a requirement for research funding.

Taken together, these imperatives speak of accountability to funders and other stakeholders for investment in education research. While some experts argue that certain types of education research should focus exclusively on advancing the academic discipline, the goal of this section is to explore different conceptions and measurements of research impact. Measurements vary greatly depending on a given conception of research use and its quality, for both policy and practice, as well as the type of research in question. This section discusses the multifaceted nature of research use, the different ways to measure research impact, as well as some of the challenges that stand in the way of knowing what truly works in knowledge mobilisation.

5.1. Research use: instrumental, conceptual or symbolic?

One of the key messages of the knowledge mobilisation literature is that even scientifically rigorous research is not guaranteed to have the desired impact on policy and practice. It may be misinterpreted, applied to a wrong context, for wrong reasons, or simply ignored. In this regard, symbolic, conceptual and instrumental research use (summarised in Table 3) introduced by Lavis and colleagues (2003^[16]), and quality dimension of research use proposed by Rickinson and colleagues (2020^[58]) can bring some clarity to a discussion about the impact of knowledge mobilisation initiatives.

Table 3. Types of research use

	Instrumental	Conceptual	Symbolic
<i>Main features</i>	- Used to “solve a particular problem” - Originates from a medical field and clinical problem solving	- Indirect impact by affecting practitioners’ and policy makers’ mental models - Focus on concepts and theories	Used to legitimate practices or decisions that have already been made
<i>Shortcomings</i>	- Poorly reflects the policy and practice processes - Overlooks the value dimension	Susceptible to misinterpretation and oversimplification	Conflicts with the notion of evidence-informed policy and practice
<i>Example</i>	Referring to specific findings that support human capital theory to call for higher investment in education	Referring to education as human capital	Referring to specific findings that support human capital theory to justify a past decision to increase education spending

Instrumental use of research

Research can be used instrumentally to “solve a particular problem at hand” (Lavis et al., 2003, p. 228_[16]). For instance, teachers may want to learn about the effectiveness of using digital tools in language teaching with a clear aim of improving their pupils’ academic achievement. This use of research is linked to knowledge mobilisation because of its direct and evident connection to policy and practice goals. The instrumental model of research use (also called a “linear” or “engineering” model) originates from the field of medicine where it is used for clinical problem solving (Biesta, 2007_[59]). It can be employed either proactively, by commissioning or conducting research, or reactively, by using existing research to resolve a given problem.

However, it is worth considering the two most prominent reservations about instrumental use of research. Firstly, it is said to poorly reflect the processes of decision making and professional practice. For instance, based on the findings of his field study, Cain (2015_[1]) developed a theory of research-informed teaching in which research is only one of the three “voices” that inform teacher practice. In fact, teachers primarily rely on their own as well as their colleagues’ experiential knowledge and judgement to plan and reflect on their own work. Windows of opportunity in which research challenges teachers’ existing beliefs and practices are rare. Even in these circumstances, research is not applied directly but in relation to already existing knowledge to make it relevant to a particular context.

According to the second critique, the instrumental model overlooks the fact that education deals with values, which cannot be resolved through research itself. Most education situations require a judgement on the relative importance of competing values, such as academic excellence, equity and emotional well-being. Therefore, simply consulting academic literature on a given question often does not point to a particular course of action. For this reason, education research has been shown to be most impactful when there is a clear consensus on values (Nisbet and Broadfoot, 1980_[60]).

Conceptual use of research

Focusing only on instrumental research use risks overlooking the many intangible and indirect ways in which research can affect policy making and practice. In knowledge mobilisation literature, conceptual research or an enlightenment effect are used to refer to this indirect influence of research (Lavis et al., 2003_[16]). Instead of focusing on findings that are transmitted from a research producer to a research user, it focuses on concepts and theories (Cain, 2015_[1]) which affect decision makers' "mental models rather than directing conscious choices" (Haynes et al., 2020, p. 5_[61]). In this way, research can alter decision makers' views by questioning the established way of seeing and doing things, and by bringing their attention to emerging trends (Nisbet and Broadfoot, 1980_[60]). For instance, human capital theory offers an economic view of education – an investment that can yield productivity gains at an individual and national level (Becker, 2009_[62]). Thus, merely invoking the term "human capital" can act as a call for more investment in education.

In terms of magnitude of influence, conceptual research use can produce strong enlightenment when research suggests a comprehensive view of professional practice which replaces previous ones (Cain, 2015_[1]). Yet, this view is seen as less plausible than the moderate enlightenment view, according to which teachers select from research what is relevant for their practice and integrate it in their views about teaching and learning (Hammersley, 2002_[63]). More concretely, the influence of conceptual research use can manifest through informing policy deliberations, facilitating stakeholder communication, identifying gaps in evidence (Cvitanovic et al., 2017_[10]), as well as turning non-problems into problems and vice versa (Weiss, 1986_[64]). In fact, there is some preliminary evidence that at least in the health sector these intangible effects are more common than direct influence of research (Heather and Popay, 2000_[65]).

The enlightenment view promises that a better understanding can be reached through exposure to different ideas but without direct engagement with research that informs them. On the one hand, this is an appealing promise since, unlike in the instrumental view, people's values, perspectives and goals are seen as malleable by research. On the other hand, when research is used in such an indirect way, there is no process for distinguishing between sound and flawed claims, and thus research becomes prone to misinterpretation and oversimplification (Weiss, 1986_[64]).

Conceptual research use can be captured by looking at the intermediate outcomes, such as policy makers' and practitioners' understanding of certain concepts, theories and attitudes, which can be measured by methods such as discourse analysis or interviews. However, the question of how to measure the impact of conceptual research is underexplored and thus provides a potential avenue for further research.

Symbolic use of research

Symbolic – also referred to as strategic or tactical – use of research, is not used to inform decision-making processes, but rather to legitimise a practice- or policy-related decision or action already made (Lavis et al., 2003_[16]). For this reason, it is tightly linked to confirmation bias – humans' tendency to seek for information that confirms their beliefs (Nickerson, 1998_[66]). Using research in this ad-hoc way conflicts with the notion of evidence-informed policy and practice and should therefore be discouraged by knowledge intermediaries.

The strategic use of research can also point to commissioning research to straightforwardly justify a decision. This has been considered as an inversion of evidence-based policy making into "policy-based evidence making" (McMillin, 2012_[67]). This practice implies an opportunistic use of research, deliberately neglecting relevant research findings and

fabricating, suppressing and instrumentalising facts for political purposes. The strategic use implies a double selectivity process: Either evidence is neglected or distorted when it comes into conflict with political values, or it is misinterpreted or simply ignored by a limited political perception (Strassheim and Kettunen, 2014^[68]). However, commissioning research is not equivalent to using research symbolically. If research is commissioned transparently to be conducted by independent researchers, then whether it is used well depends in large part on research users. The next subsection takes a closer look at what it means to use research well.

Using research well

Although the three types of research use are important to understand, they do not explicitly tackle the quality dimension of research use. This dimension is described by a Quality Use of Research Evidence framework (QURE) (Rickinson et al., 2020^[58]). According to this framework, quality use of research in educational practice requires appropriate research evidence in the first place. This means research that is both methodologically rigorous and appropriate for a specific problem. Quality use also necessitates thoughtful engagement and implementation of research, which means that educators critically assess how it may be used in combination with professional knowledge to inform practice. In addition, the authors specify that enabling components at the individual (skills, mindsets, and relationships), organisational (leadership, culture, infrastructure) and system-level have an impact on the appropriate evidence and its thoughtful engagement and implementation.

Based on this framework, the symbolic use of research cannot be considered a high-quality form of use. As for instrumental and conceptual uses of research, these could either be of high or low quality. For instance, a knowledge intermediary may carry out a systematic review to identify the most effective instruction strategy for pupils from disadvantaged families. Yet, if teachers misinterpret the evidence or do not have the skills to integrate it with their professional knowledge, the strategy may not have the intended effect. Similarly, conceptual use of research runs the risk of applying a specific concept to a wrong problem as the research user is unfamiliar with the original work from which the concept originates.

A comprehensive evaluation of knowledge mobilisation impact should aim to capture the multifaceted nature of research use. This includes the three types of research use already outlined in Table 3 and the quality of use outlined in this subsection. Before moving towards a typology for evaluating the impact of knowledge mobilisation initiatives, the paper explores how research impact is tracked in academia, including a recent shift towards considering impact on policy and practice.

5.2. Evaluating research impact in academia

Despite the rise of formal knowledge brokerage agencies, universities remain one of the key knowledge intermediaries in the education sector. In addition to producing research, they are engaged in publishing, communication and advocacy. Given that universities have traditionally sought to advance knowledge and methods within the boundaries of academic disciplines, their impact on society has often gone unnoticed. However, the imperative to maximise research impact has reached universities as well. This subsection takes a closer look at the standard approaches to measuring research impact in academia, as well as an increasingly important dimension: impact on education policy and practice.

Research impact on research

In the academic world, the conventional approach to measuring the impact of research has been confined to academic or scientific impact, which relates to the advancement of

knowledge and methodology within and between disciplines (Buchanan, 2013_[69]). As such, it is not necessarily meant to be directly applied in policy and practice, and instead contributes primarily to the body of scientific knowledge by “identifying problems, generating hypotheses and developing new methodologies” (Lavis et al., 2003, p. 169_[16]).

Peer review is a common method for judging the quality of academic research. It involves an editor of a journal and two referees reviewing a scientific paper based on which a decision is made to reject, accept or return the paper to the author for amendment (Smith, 2006_[70]). The use of bibliometric indicators is another common method of measuring research quality. While varying in form, these indicators are based on citation count in peer-reviewed journals, taking it as a mark of a researcher’s, journal’s or research output’s influence within or across several scientific disciplines (Belter, 2015_[71]). The most widely used bibliometric indicators are a journal impact factor used for measuring the impact of a given journal (Garfield, 1999_[72]) and the H-index employed for quantifying the impact of an individual researcher (Hirsch, 2005_[73]).

The limitations of bibliometric indicators have been widely documented in the literature. While taken as a proxy for the productivity and the reputation of a journal or researcher’s work citation indexes fall short of capturing the quality, significance, and impact of their publications (Sin, 2008_[39]). In particular, they do not take into account the wide variety of reasons scientific work is cited and the fact that many of these reasons say very little about the impact on a given academic discipline (Belter, 2015_[71]). Instead, bibliometric indicators are used as a basis for awarding research funds, determining academic ranks and pay, assessing staff performance, as well as evaluating the return on investment to research funders (Lomas, 2007_[74]; Sin, 2008_[39]). This inward orientation of the academia is also evident in the established practice of researcher-to-researcher communication (e.g. “more research is needed”) with a researcher-to-practitioner or researcher-to-policy-maker communication (e.g. featuring recommendations on implementation of the findings) being less common (Lomas, 2007_[74]).

Recently, there has been a trend to broaden the impact measurement of research to include grey literature (read more in Box 3) which can be said to “produce and distribute the seeds of new knowledge” (Marzi, Pardelli and Sassi, 2011, p. 31_[75]). Grey literature performs several important functions which make the consideration of its impact necessary. In the context of knowledge mobilisation it is particularly useful as it can act as a form of dissemination by communicating the findings to decision makers in clear and understandable language, as well as providing information on “context, policy decisions, and public interest that are of particular value to decision makers” (Sibbald et al., 2015, p. 49_[76]). Within academia, it may help to explain the theoretical background of given findings, identify research gaps and thereby point to possible research questions.

Box 3. Grey literature

Grey literature includes “policy briefs, issue briefs, or technical reports on specific content areas (e.g., health, environment, and poverty) meant to inform decision making that may not enter formal publication venues” (Sibbald et al., 2015, p. 50^[76]). It has increased in scale exponentially due to the emergence of open access venues and, in fact, has surpassed peer-reviewed academic literature in terms of volume due to its low cost and self-publishing. Conversely, because of the ever-increasing volume and the absence of a standardised database, it is more difficult to study grey literature. Another sign that grey literature is receiving more recognition is its inclusion in evidence syntheses and meta-analyses with some studies showing that the exclusion of grey literature can significantly influence their results.

Source: Sibbald, S. et al. (2015^[76]), *Into the gray: a modified approach to citation analysis to better understand research impact*, <http://dx.doi.org/10.3163/1536-5050.103.1.010>

There have been several attempts to track the impact of grey literature within and beyond academia. For instance, Sibbald and colleagues (2015^[76]) have developed a modified citation analysis comprised of a broadened search strategy, which includes sources from grey literature, as well as qualitative and quantitative coding of a given text allowing an assessment of how research was used (e.g. assessing if the original research article is cited for its theory, methodology or findings). Moreover, a recent analysis of evidence use in Norwegian school reforms included grey literature and concluded that the OECD was the most referenced international organisation in policy decisions (University of Oslo, 2022^[77]). Lastly, web-based solutions, such as Overton, allow us to track the connections between universities, non-governmental organisations and policy organisations by analysing citations from academic publications, grey literature and policy documents (Overton, n.d.^[78]).

The impact of academic research impact on policy, practice and society

Another common criticism of bibliometric indicators is that they fail to capture the impact research may have beyond academia – on industry, politics and culture. For instance, the EU agreement on reforming research assessment advocates for replacing a simplistic use of citations metrics with qualitative expert review which may be combined with a cautious use of quantitative indicators (European Commission, 2022^[79]). According to the agreement, these changes may help to more accurately reflect the diverse range of contributions research can make, including “scientific, technological, economic, cultural and societal impact” (p. 8^[79]). Three concrete examples of how these forms of research impact may be assessed are presented below.

Example 1. Research Excellence Framework in the United Kingdom

One of the research assessment systems that have moved in the direction of tracking societal impact is the Research Excellence Framework (REF) in the UK. Beginning in 2014, with its latest version having been launched in 2021, the REF is a high-stakes assessment based on expert review which determines the allocation of research funding to higher education institutions, as well as their ranking in the national league tables. Consequently, it can have a substantial impact on their reputation, student enrolment and financial stability.

To prove the impact of research beyond academia, universities in the UK are required to submit impact case studies demonstrating the effects on “the economy, society, culture, public policy or services, health, the environment or quality of life” (The Research Excellence Framework, 2019^[80]). A more detailed look at the impact areas, types, and indicators that are relevant for knowledge mobilisation in the education sector is provided in Table 4.

Table 4. REF’s impact case studies relevant to knowledge mobilisation in the education sector

Impact area	Impact type	Indicators of reach and significance
<i>Public policy, law and services</i>	• Informing policy debate • Altering or confirming the policy direction, its implementation or withdrawal • Improving public services	• Citations in policy documents and public discussions • Contribution to expert panels and policy committees • Measures of improved public services • The number of attendees in knowledge exchange events • Participants’ feedback
<i>Practitioners, delivery of professional services, enhanced performance or ethical practice</i>	• Changes in professional standards, guidelines or training, professional ideas, workforce planning, educational practices and methods • Improvement of professional services	• References to research papers by practitioners, in professional standards • Documented changes in behaviour, knowledge attitudes • Improved performance as a result of training
<i>Understanding, learning and participation</i>	• Improving the public’s understanding of issues and phenomena • Shaping public attitudes, values, the capacity to make decisions and participate in the political process • Encouraging engagement with research	• References to research in various media formats • An increase in participation in events, programmes or use of resources, public opinion surveys, engagement in political and civil society organisations

Source: The Research Excellence Framework (2019^[80]) *Panel criteria and working methods*.

The REF impact assessment acknowledges the importance of diverse evidence in support of the link between underpinning research and the claimed impact. According to the REF, demonstrating reach is not enough for proving significance. For this reason, factors such as public engagement, understanding and attitudes towards certain issues are seen as central channels through which change on policy and practice outcomes can be affected.

At least two critical questions can be raised in relation to the REF’s approach to measuring societal impact of research. First, some case studies limit themselves to reach indicators which merely represent the intermediate outcomes and reveal very little about the influence a given research mobilisation activity has had on policy, practice or educational and social outcomes.

Second, by focusing on standalone and self-reported indicators, impact case studies fail to gauge a relationship between a knowledge mobilisation activity and the desired outcomes. Given that decisions in practice and policy are based on a myriad of factors, contribution analysis is one of the most suitable methods for establishing a robust relationship between

two variables (Mayne, 2001^[81]). In other words, the methodological standards applied to the evaluation of research impact are not up to par with those applied to research itself.

A related concern has to do with the impartiality of the evidence as the evaluation of research impact is conducted by researchers themselves and then submitted for an expert review. Given the high-stake nature of the REF assessment, there is a substantial risk of cherry picking the evidence, as well as intentional or non-intentional manipulation in evaluating knowledge mobilisation activities (Department for Business, Energy & Industrial Strategy, 2016^[82]). Lastly, the REF has been criticised for imposing a substantial burden on universities in terms of time and cost. In fact, the cost of the 2014 exercise is estimated at GBP 246 million, while the annual value of quality related research funding distributed to UK higher education institutions is roughly GBP 2 billion (Department for Business, Energy & Industrial Strategy, 2016^[82]).

Example 2. Impact assessment in the Horizon programme of the European Commission

The impact assessment of the EU Framework Programme for Research and Innovation presents another interesting case of measuring a diverse range of impacts. Unlike the REF, the EU Horizon programme is assessed in relation to predefined objectives in main three areas: Open Science, Global Challenges and Industrial Competitiveness, and Open Innovation (Directorate-General for Research and Innovation of the European Commission, 2018^[83]). They in turn correspond to scientific, societal and economic impact pathways which are assessed in the short-, medium-, and long-term. To minimise the reporting burden on the programme beneficiaries, techniques such as automatic data sourcing from available datasets are used. To evaluate the programme's impact on long-term social and economic outcomes, more sophisticated methods, such as macroeconomic modelling and counterfactual evaluation designs, are used (European Commission, 2018^[84]).

Example 3. Economic and Social Research Council (ESRC) impact plans

Impact may also be considered before research has been conducted. For instance, as part of the funding application process, the UK Economic and Social Research Council (ESRC) requires a submission of an impact plan detailing the nature of the potential impact, activities that will aim to bring it about, along with the time, skills and costs of implementation and evaluation (Economic and Social Research Council, n.d.^[85]). The ESRC encourages applicants to go beyond mere dissemination activities and focus on co-production as a way of ensuring the relevance of research for intended users. As a support for applicants seeking to demonstrate the potential impact of their research, the ESRC offers an impact toolkit featuring information on effective knowledge exchange, event organisation, commercialisation and public engagement. While the benefits of the impact plans should be weighed against their respective costs, it serves as an example of how researchers may be incentivised to think about knowledge exchange and research as equally important parts of their work.

This subsection discussed universities' efforts to expand the scope of impact beyond academia by including grey literature and societal impact. Combined with the different facets of research use, these approaches provide valuable guidance on how to capture the impact of knowledge intermediaries' work. The next subsection presents a typology for evaluating knowledge mobilisation initiatives.

5.3. Typology for evaluating knowledge mobilisation initiatives

Table 5 features a typology for evaluating the impact of knowledge mobilisation initiatives based on the review of different facets of research use, conventional approach to measuring research impact in academia and knowledge mobilisation literature. Its goal is to provide a conceptual framework to support individual researchers and organisations working on evaluating knowledge mobilisation initiatives. The starting point of the typology was the work of Lavis and colleagues' (2003^[16]) in which they distinguished between process, intermediate outcome and outcome impact measures. More impact areas were added in order to cover all set of functions performed by knowledge intermediaries (see Table 1), drawing from a large array of work (Henrick et al., 2017^[86]; Coldwell et al., 2017^[87]; Wiggins et al., 2019^[88]; The Research Excellence Framework, 2019^[80]; Schwendinger, Topp and Kovacs, 2022^[89]; Maxwell, Sharples and Coldwell, 2022^[55]).

The typology is composed of three key dimensions – impact area, impact type and indicators / methods – which progress in terms of specificity. It features seven impact areas which are not presented in any particular logical or chronological order, as that depends on a specific theory of change constructed for a given knowledge mobilisation initiative (see Theory of change and the design of knowledge mobilisation). Lastly, the list of indicators and methods is meant to be indicative rather than exhaustive.

Table 5. Typology for evaluating knowledge mobilisation activities

	Impact area	Impact type	Indicators
REACH	<i>Reach / Access</i>	Access to and reach of knowledge mobilisation initiatives (e.g. trainings, events, communication materials, evidence platforms)	- Website clicks, downloads - Bibliometric indicators (number of citations, publications in peer-reviewed journals, etc.) - Frequency and number of events (e.g. training sessions), the number of attendees - Contributions to expert panels, policy and parliamentary committees
SIGNIFIANCE	<i>Relationships</i>	- Relationships between research producers, intermediaries, and users - Demand for knowledge mobilisation initiatives	- Commissioned research projects - Information requests by research users - Time and resources invested in research-practice and research-policy partnerships - Informal partnerships and collaborations - Network measures (e.g. size, density of various networks) employing social network analysis

Impact area	Impact type	Indicators
<i>Competences (individual level)</i>	• Subject matter expertise • Ability to distinguish scientific knowledge from non-scientific knowledge • Ability to convene and collaborate with experts, policy makers or practitioners • Ability to identify evidence needs • Attitudes to research use and knowledge mobilisation • Intention to use research • Willingness to reconsider one's beliefs, past decisions according to evidence • Knowledge and understanding of different research methodologies, their limitations, and ethical issues • Knowledge and understanding of policy and practice contexts	• The share of civil servants / practitioners with a given degree / qualification • Performance in scientific literacy tests • Responses to surveys and feedback forms (attitude, intention to use, understanding, perception, etc.) on research use, policy and practice settings
<i>Culture, infrastructure and leadership (organisational level)</i>	Organisational enablers of research use (Rickinson et al., 2020^[58]): • Culture – “values and norms related to research use and knowledge mobilisation” • Leadership – “vision, commitments and role models aimed at research use and knowledge mobilisation” • Infrastructure – “structures, processes, and resources allocated to research use and knowledge mobilisation”	• Official knowledge intermediary positions • References to research use in strategic documents • Time, money, and space allocated to discussing and learning about research use • Incentives, guidelines, standards, qualification requirements aimed at supporting research use • Responses to attitudinal surveys • Professional identity connected to research use • Research as the preferred source of information • Intensity of the use of research sources
<i>Research use</i>	• Was research used to inform a given policy or practice? • How was research used? ○ Conceptually ○ Instrumentally ○ Symbolically • Was research used well? (QURE model) ○ Selecting appropriate evidence ○ Thoughtful engagement and implementation	• References to research sources, findings or concepts in legislation, deliberations, strategic documents, meetings or public speeches • Adoption of a research-based practice or policy • Interviews and observations focusing on whether research was used well, conceptually, instrumentally or symbolically

Impact area	Impact type	Indicators
<i>Education and society</i>	Impact on educational, and broader societal outcomes	System-level educational indicators focusing on: - Equity (e.g. drop-out rate, share of graduates entering further education) - Efficiency (e.g. pupil/teacher ratio) - Effectiveness (e.g. average test scores, average income after graduation, satisfaction with education institutions)
<i>Evidence system (regional or national level)</i>	Impact on evidence system's capacity to support the production, mobilisation and use of research knowledge	- Amount of funding allocated to research production, mobilisation and use activities at a regional or national level - Number and density of school / policy networks, connectivity of other stakeholders - Adoption of research informed practices and policies at a regional / national level (e.g. funding, strategic decision-making) - Research and data infrastructure - Data sharing agreements - Procedures and policies for data governance

The first impact area is the reach of knowledge mobilisation initiatives which signifies “the extent to which the potential constituencies, number of groups of beneficiaries have been reached” (The Research Excellence Framework, 2019, p. 52_[80]). Many knowledge intermediaries focus on access or reach measures, such as the number of research products, distributed messages or website clicks due to their low cost and availability of data (Lavis et al., 2003_[16]). However, they fail to capture the effectiveness of knowledge mobilisation initiatives and can only act as a prelude to significance indicators which demonstrate “the degree to which the impact has enabled, enriched, influenced, informed or changed the performance, policies, practices, products, services, understanding, awareness or well-being of the beneficiaries” (The Research Excellence Framework, 2019, p. 52_[80]). The subsequent impact areas and indicators presented in Table 5 denote the significance of impact.

Relationships may encapsulate situations when the contact between research producers and users outlives a given knowledge mobilisation initiative – what Meagher & Lyall (2013_[90]) call enduring connectivity. To capture these relationships, authors recommend focusing on indicators of demand, such as information requests by research users and commissioned research projects. An even longer-lasting impact may be shown by the presence of research-practice and research-policy partnerships, and informal partnerships and collaborations. Social network analysis is one of the common methods used to study relationships between individuals and organisations in research use (Gitomer and Crouse, 2019_[91]).

Another common focus of knowledge mobilisation studies is research users’ competences, such as knowledge of research, policy or practice contexts, skills and attitudes related to research use. These are captured by indicators such as feedback on the relevance of a given initiative and a share of practitioners or policy makers with a given qualification. As an example, part of the Education Endowment Foundation’s (EEF) Research Leads Improving Students’ Education (RISE) project evaluation (Box 4) which encouraged the adoption of

an evidence-informed school improvement model, included stakeholder interviews on their perceptions of its usefulness (Wiggins et al., 2019^[88]).

Box 4. Impact evaluation of the RISE project: from intermediate to social outcomes

The EEF's RISE project was a two-year programme aimed at supporting the uptake of a research-informed school improvement model. At the centre of the model is a senior teacher who acts as a research lead by helping teachers to adopt a research-based pedagogy and thereby improve student outcomes in Mathematics and English.

The programme was comprised of several modules:

- Training sessions and follow-up meetings for research leads
- Workshops for head teachers, as well as for subject leads in Mathematics and English
- Continuous support for the research leads through newsletters, peer network and school visits by the RISE team.

In parallel to the implementation of the programme, a two-stage evaluation process was conducted. The ultimate social outcomes were the General Certificate of Secondary Education (GCSE) results for two consecutive pupil cohorts as captured by randomised control trials. For this purpose, a random selection of 40 schools into control and experimental groups, and their further division into clusters based on historical GCSE grade average were performed. The intermediate and practice outcomes were teachers' use and understanding of research as measured by teacher surveys conducted prior to and after the intervention.

In addition, the impact study was accompanied by additional evaluation activities focused on implementation, feasibility and clarification of the impact evaluation results:

- *Observation of trainings and follow-up workshops* were aimed at understanding the training process, the requirements for achieving implementation fidelity, and assessing the satisfaction of trainees
- *Semi-structured interviews with research leads and head teachers* in case study schools provided information on how the RISE was used in the classroom and shed light on stakeholders' perceptions of its usefulness
- *A questionnaire for head teachers and research leads* was disseminated to find about the levels of interest in, and experience of, research-based teaching in schools

Case studies in selected schools were based on interviews with teachers and enabled a more in-depth look at the levels of engagement in the programme, evidence use in schools prior to the intervention, and average school attainment levels

The evaluation revealed that the programme did not have a significant impact on pupils' GCSE scores, while the participating schools regarded the intervention helpful.

Source: Wiggins, et al., (2019^[88]), *The RISE project: Evidence-informed school improvement*, https://educationendowmentfoundation.org.uk/public/files/Projects/Evaluation_Reports/RISE_Report_final.pdf (accessed on 12 September 2022).

Knowledge mobilisation may be equally targeted at organisations. Rickinson and colleagues (2020^[58]) speak of three main organisational components which enable research use:

- culture, defined as “the organisational ethos, values and norms”,
- infrastructure, relating to “organisational structures, resources and processes”,
- leadership, denoting “organisational vision, commitments and role models” (p. 6^[58]).

Organisational impact indicators may accordingly be aimed at any one of these components and include official knowledge intermediary roles, references to research use in strategic documents and resources (such as time, money and physical space) allocated to discussing and learning about research use. One example of a study focusing on organisational research culture was commissioned by the United Kingdom’s Department for Education (DfE) to assess the impact of seven projects aimed at fostering evidence-informed teaching in English schools (Coldwell et al., 2017^[87]). Specifically, it employed a content analysis by drawing from school websites and strategic documents to determine schools’ engagement, attitudes and awareness of evidence-informed teaching, as well as their change after the projects had ended (Coldwell et al., 2017^[87]). One limitation of content analysis is that it may fail to capture the extent to which research culture is internalised by a community. Instead, interviews and observations may be more suitable methods for tracking the impact on research culture.

A key impact area of knowledge mobilisation initiatives is the actual use of research in policy or practice. It can be measured by looking at references to research sources, findings or concepts in legislation, deliberations and strategic documents or responses to surveys on research use. Case studies are particularly advantageous, as they allow us to discern the way in which research was used (e.g. conceptually, instrumentally or symbolically) (Lavis et al., 2003^[16]). However, they are costly as additional data needs to be collected through interviews or field observations. One example of this type of evaluation is the EEF’s survey on research engagement which investigated the extent to which teachers’ decisions are influenced by online evidence platforms relative to other sources of knowledge (Nelson et al., 2017^[92]).

The subsequent impact area includes educational and social outcomes captured by equity, efficiency, and efficacy indicators. The evaluation of the RISE programme by the EEF serves as an example of evaluating this impact area (Wiggins et al., 2019^[88]). The programme’s effect on social outcomes, namely students’ grades in GCSE school exams in Mathematics and English language, was measured through a randomised control trial including 40 schools. The results of the evaluation study did not prove that the programme had any impact on student learning outcomes as the observed difference was not statistically significant. A more detailed description of the programme’s structure and the evaluation methodology is provided in Box 4.

Evidence system is the last impact area. It refers to the system’s capacity to support the production, mobilisation and use of research knowledge at a regional or national level. Similar to the organisational level, it encompasses culture, data and research infrastructure, as well as leadership and data governance within a given system. It can be captured by indicators such as the amount of funding allocated to research production, mobilisation and use activities at a regional or national level, data sharing agreements, and the use of research evidence in national strategic decision making. Maxwell and colleagues’ (2019^[93]) evaluation of the EEF’s pilot programme aimed at scaling up the evidence use concerning

teaching assistants serves as an example. Stakeholder interviews revealed that the programme facilitated the establishment of a research use infrastructure and strengthened school networks in the Lincolnshire County.

To illustrate how different impact areas and indicators may be used to evaluate the impact of knowledge mobilisation initiatives, Box 5 contains a vignette that depicts the evaluation plan of a fictive intermediary initiative focused on individual capacity building.

Box 5. Monitoring and evaluation of individual capacity-building activities: A fictive case

The Ministry of Education of Syldavia, a small country in Northern Europe, noticed that its staff in a recently created Policy Implementation and Analysis (PIA) unit lacks the necessary skills to consider and use the latest findings of national and international education research. To address this issue, the PIA unit Director, Mrs. Hartensson, contacted the Consultancy for Educational Collaboration and Research (CECR), a European organisation considered as both a *do* and a *think tank*, to create and implement a plan to improve Syldavian policy makers' research skills, in both use and critical appraisal.

Together with a biweekly capacity-building programme lasting two months, Mr. Lima, Head of the CECR, proposed a 2-year monitoring and evaluation plan, which consists of the following measures:

- *Reach*: Number of training sessions; Number of staff members participating in sessions.
- *Competences*: Participants' attitude towards the relevance of the training; Level of understanding of research findings; Level of acquisition of research skills.
- *Research use*: Number of policy documents / decisions referencing research findings; Descriptions of how, under what circumstances and for what purposes staff members engaged with research.
- *Educational and social outcomes*: Level of alignment of education policies promoted by PIA unit with research findings.

Note: This case is a work of fiction. Names, characters, places and incidents are either products of the authors' imagination or are used fictitiously. Any resemblance to actual events or locales or persons, living or dead, is entirely coincidental.

Challenges related to the evaluation of knowledge mobilisation initiatives

It must be noted, however, that there are a few challenges when it comes to evaluating the work of knowledge intermediaries. Firstly, causality between a knowledge mobilisation initiative and the adoption of a particular policy or even the attainment of a desirable social outcome, is particularly difficult to prove. This is because teachers and decision makers are affected by a great variety of factors and considerations whose influence on the outcome is difficult to isolate. Methodologies such as contribution analysis may be employed to address this issue by developing a reasonable account of the initiative's influence on a specific level outcome (Mayne, 2001^[81]). Disentangling the impact of numerous knowledge mobilisation activities further complicates their evaluation (Burns and Schuller, 2007^[35]).

Secondly, choosing the right time scale for capturing the effect of a given knowledge mobilisation initiative (Kislov, Wilson and Boaden, 2016^[37]). While the impact on outcomes, such as knowledge, attitudes and practices may be immediate, the change in educational and social outcomes may only be noticeable several years later. In addition, the

potential influence of knowledge mobilisation initiatives on decisions to forego a particular course of action is nearly impossible to measure.

Overall, a review of knowledge mobilisation literature has revealed a lack of evaluations focusing on educational and social outcomes, as well as evidence system outcomes. This is not surprising given the cost and methodological hurdles of complex evaluation designs which are required to capture the impact on these areas. Moreover, there is an absence of evaluations which would unpack research use into different dimensions. Thus, future evaluations could benefit from incorporating the four dimensions of use discussed in the previous subsection.

5.4. Theory of change and the design of knowledge mobilisation initiatives

In addition to methodological difficulties, evaluation of knowledge mobilisation initiatives is often complicated by their poor design (Oliver et al., 2022^[15]). Firstly, they tend to have unclear, broadly defined goals, such as research impact or evidence uptake, which are impossible to assess. Secondly, many knowledge mobilisation initiatives are often based on a flawed understanding of policy and practice contexts which leads them to tackle issues that do not exist. For instance, communicating research evidence is based on the notion that the lack of access is the core problem, while, in fact, the lack of time and skills may be the core hurdles, and thus demand a different approach to knowledge mobilisation.

One way to make knowledge mobilisation initiatives and their evaluation more structured is by employing a theory of change, which can be defined as “an evidence-based rationale that builds on causal analysis and explains how a set of initiatives is expected to lead to a specific change” (Gough, Sharples and Maidment, 2022, p. 152^[94]). In other words, it reveals implicit assumptions or hypotheses about the underlying mechanisms of a given initiative based on either professional experience or research findings (Weiss, 1997^[95]). For instance, behavioural factors, such as motivation and beliefs, mediate the use of research and need to be considered when designing a knowledge mobilisation initiative (Gough, Sharples and Maidment, 2022^[94]). While a theory of change can be developed by both external researchers and designers of the initiative itself (e.g. knowledge intermediaries), the participation of the latter is necessary for outlining the logic of the initiative. According to Gough, Sharples and Maidment (2022^[94]), a well-defined theory of change requires knowledge intermediaries to consider the following factors:

- Demand and production aspects of the evidence system
- Engagement and the decision-making power of the users and beneficiaries of knowledge mobilisation activities
- Capacity, opportunity and motivation of potential evidence users
- Potential unintended effects and respective strategies to counter them
- Capacity of knowledge intermediaries to affect the desired change.

A theory of change can act as a structured framework for evaluation by specifying goals, which can then be turned into concrete indicators against which to assess the initiative’s success. This feature presents multiple benefits. Firstly, it can be used to monitor the initiative’s success and thereby ensure accountability to funders (Weiss, 1997^[95]). Secondly, a theory of change transcends the traditional black box evaluation by shedding light on contextual variables that may be hindering or enabling its effectiveness (Chen and Chen, 1990^[96]). Thus, by exposing the weak links in the chain of influences, it provides actionable information for practitioners and evaluators alike on how the initiative can be improved. Conversely, understanding the exact mechanisms which have made the initiative

effective may point to alternative ways to improve the same outcomes (Weiss, 1997^[95]). For instance, if a teacher training module is shown to be effective in engendering research-based instruction by affecting attitudes to research use, it may be useful to consider other types of initiatives targeting teachers' attitudes that may be just as effective but cost less (e.g. information campaigns).

Evaluation of the EEF's RISE project provides an example of how a theory of change can be used to guide the planning, implementation and evaluation of knowledge mobilisation initiatives. In that evaluation, a model detailing the assumed connections between the training modules and intermediate outcomes was built in consultation with programme developers. These outcomes included the schools' uptake of the intervention, teachers' knowledge and support for research use, teachers' actual use of research and, ultimately, students' GCSE scores. In addition, theoretical insights on evidence use mechanisms by Langer and colleagues (2016^[13]) and factors affecting behavioural change by Michie, van Stralen and West (2011^[97]), were employed to substantiate the link between the intervention and the different level outcomes. The evaluation suggested that the lack of significant change in pupil outcomes could have been a result of imperfect implementation. The main weaknesses of the programme were identified as being a lack of focus on culture change and knowledge-brokering skills in the training modules, staff turnover as well as short timeframes between the intervention and the measurement of student outcomes.

5.5. Knowledge mobilisation initiatives: focusing on what works and why

As an increasing number of researchers and research organisations are pressured to demonstrate the social, economic or political value of their work, knowledge mobilisation initiatives have proliferated in number, leading to increased noise and busyness (Oliver et al., 2022^[15]). However, this quantitative change has not been matched by rigorous evaluations. A recent survey found that only 3 – 13 percent of knowledge mobilisation activities were evaluated, taking mainly the format of “end of project” reports (Oliver et al., 2022^[15]). The need to invest more in knowledge mobilisation studies has also been expressed as a recommendation to the Institute of Educational Sciences by the National Academies of Sciences, Engineering and Medicine (National Academies of Sciences, 2022^[98]).

The lack of evaluations has led to a situation where significant resources have been spent on these activities without understanding their influence on policy or practice. Moreover, the abundance of knowledge mobilisation initiatives has contributed to more competition between them, potentially imposing opportunity costs on policy makers and practitioners who risk choosing a less effective option. What is more, knowledge mobilisation activities that fail to bring about the desired change are likely to reduce goodwill between stakeholders, thereby undermining opportunities for effective policy, practice and research engagement (Oliver et al., 2022^[15]).

Another potential consequence of the lack of knowledge base about “what works” in knowledge mobilisation is the difficulty of maintaining partnerships between research producers and users and securing funding for other types of resource intensive activities (Davies, Powell and Nutley, 2015^[19]). Providing earmarked funding for evaluating knowledge mobilisation initiatives (e.g. in line with the ESRC practice) may help prevent a situation in which the lack of evidence is taken as evidence for their ineffectiveness.

Meagher and Lyall (2013^[90]) contend that research funders usually require summative evaluation as a way of determining its effectiveness, while researchers tend to treat evaluative milestones as boxes to be ticked. There is a need, however, for formative evaluations that would involve the main stakeholders. This could better contribute to

organisational learning and feed into both the refinement of existing knowledge mobilisation initiatives and the creation of new ones. These qualitative evaluations are often time-consuming but add complimentary value to quantitative summative evaluations by offering insights into why a particular initiative may have succeeded or failed in a specific context. For instance, interviews can shed light on how research was used by, for instance, exploring how research users understood certain concepts and how research informed their practice or decision making.

A no less important concern is ensuring that the evaluation of knowledge mobilisation activities does not impose a disproportionate burden on stakeholders, especially smaller organisations with limited resources (Kislov, Wilson and Boaden, 2016^[37]). For instance, some critics of the REF contend that it has significantly increased the administrative burden and costs on universities (Grove, 2021^[99]). Assessing whether the benefits of tracking research impact outweigh the costs is important. Yet, this thinking seems to lead to an infinite spiral of accountability and evaluation and overlooks the fact that our ability to capture research impact, especially further down its pathway, remains limited.

Lastly, the competition between different knowledge mobilisation activities may also enhance inequalities in the research community as “better-resourced or more ‘acceptable’ academic voices” may be favoured in policy and practice circles (Oliver et al., 2022, p. 13^[15]). This challenge extends to the choice of indicators (e.g. participation of researchers in parliamentary hearings or appointments of researchers as political advisers) as they may reveal more about the impact politics has on research rather than the other way around.

Having discussed the need for and challenges related to the evaluation of knowledge mobilisation initiatives, the next section turns to consider the wider gaps in knowledge mobilisation literature.

6. Conclusions

The world of knowledge intermediaries can seem at times murky and confusing – at least in part due to the nature of their work and the still immaturity of the field itself. This paper addressed two central questions based on a review of knowledge mobilisation literature: how we can characterise knowledge intermediaries, including their objectives, functions and activities, and how we can conceptualise and evaluate the impact of knowledge mobilisation. This section briefly presents the gaps identified in research and suggests how future research can address them.

A wider perspective is missing

Until recently, research on knowledge mobilisation was mainly carried out from the perspective of research producers themselves (Levin, 2013^[22]). However, when using red-coloured glasses, all red flags just look like flags (Carolyn, 2017^[100]): Relevant details can be missed by having a blinkered view. Still today most of the research in this field focuses on research production and use, with the underlying (linear) assumption that these two contexts are distinct and need a bridge to be connected. Systemic approaches that capture the complex mechanisms of research engagement, including co-production and the interaction between different knowledge types are scarce.

In addition, a broad, comparative scope to studying actors fulfilling intermediary roles across countries and systems, disciplines, sectors and organisations is lacking. On a notable example, recent surveys on knowledge intermediaries (Gough et al., 2011^[14]; Cooper,

2014^[3]; Davies, Powell and Nutley, 2015^[19]; Oliver et al., 2022^[15]; Shewchuk and Farley-Ripple, 2022^[47]) have been almost entirely focused on Anglo-Saxon countries and particularly the United Kingdom. This is of particular concern as interests, needs, capacities and behaviours can vary significantly from region to region. For instance, policy “professionals in the Global South tend to use national and regional resources, whereas their counterparts in the Global North access global knowledge platforms, which, without any exceptions, are located in Europe, North America, or Australia” (NORRAG, 2022^[11]). Future research could help to broaden the scope of organisations considered.

The definition of intermediaries needs expanding

An additional area of concern is how studies on intermediaries have mainly focused on individuals. This can overestimate the relevance of personal characteristics and neglect relevant organisational features, structures and processes (MacKillop, Quarmby and Downe, 2020^[27]). However, in recent years, studies focusing on organisations acting as intermediaries have emerged (Oliver et al., 2022^[15]; Shewchuk and Farley-Ripple, 2022^[47]).

Research on knowledge mobilisation should consider organisations acting both explicitly and implicitly as intermediaries. Surveys tend to focus on organisations identifying themselves as intermediaries or on knowledge mobilisation initiatives and not so much on organisations fulfilling the role of knowledge intermediary, regardless of their provenance or self-perception. Organisations who do intermediary work – without necessarily making that explicit – do it as part of a wider role and usually do not solely work as knowledge intermediaries (Cooper, 2014^[3]). Furthermore, intermediary work requires flexibility and receptiveness, as intermediaries must adapt to stakeholders’ current and developing contexts and needs. Thus, these roles, and their associated functions, may be fluid and context-dependent (Bornbaum et al., 2015^[42]; Cooper, 2014^[3]). This non-exclusivity and fluidity may be a challenge to identifying intermediary organisations and defining their functions.

Typologies for diverse intermediaries is a first step towards assessing their effectiveness

The diversity of intermediaries, their organisational characteristics, their functions and the potential beneficiaries suggest that for every particular need, there is a particular intermediary (Shewchuk and Farley-Ripple, 2022^[47]). Intermediaries can also specialise in functions or have a specific profile. The roles certain types of organisations play may vary by system and may differ from the stereotypical expectations commonly associated to them (e.g. a Ministry seeing itself as a research producer). This diversity implies that there is no “magic recipe” on what an intermediary can do to effectively facilitate research use. In addition, it makes it even harder to analyse who is influencing what and how, representing a challenge for future research.

Furthermore, there are no comprehensive descriptions and taxonomies of the intermediaries themselves and their associated functions. There is a general lack of connection between the characteristics associated with intermediaries, their functions and the impact of their work. This would be needed to understand the circumstances under which knowledge mobilisation initiatives are effective (Bornbaum et al., 2015^[42]). It would also help us to understand which type of intermediary work best suits each particular setting and need (Davies, Powell and Nutley, 2015^[16]). By proposing a typology of intermediaries and a typology of their functions, this paper attempts to fill that gap.

Evaluations should be mapped and extended to gauge intermediaries' impact

The lack of evaluation of knowledge mobilisation initiatives and intermediaries' work is an issue on its own and may negatively affect the development, support, perception and value of research intermediaries. Among existing evaluations, there is a tendency to focus on self-reported indicators and available data. In practice this means that evidence for the effectiveness of knowledge mobilisation initiatives is anecdotal and does not extend far enough, as many evaluations focus on reach or intermediary outcomes such as research users' competences (Bornbaum et al., 2015^[42]; Oliver et al., 2022^[15]). Given the methodological difficulties and the cost of tracking impact on policy, practice or educational outcomes, it may not be feasible for all intermediaries to focus on these outcomes. However, effort needs to be made to include such complex impact areas too.

The typology for evaluating knowledge mobilisation initiatives presented in this paper is a necessary piece towards measuring their impact. What is needed now is robust cross-country data on impact evaluations. This could help intermediaries to reflect and refine their work and support policy makers in identifying what works and what does not in evidence systems. This could in turn be used to improve the effectiveness of knowledge mobilisation initiatives make them sustainable and upscale them (Davies, Powell and Nutley, 2015^[19]). It should also be of use to researchers who seek to represent the different ways of assessing the impact of knowledge mobilisation activities. How to identify the most appropriate research methodologies to use with the typology is one of the key conceptual questions that remains unaddressed. This question could become the focus of further inquiry and help to evaluate the impact of the knowledge mobilisation activities presented in this paper.

Next steps

It is worth reiterating that a quantitative increase in knowledge mobilisation initiatives has not yet resulted in a better understanding of their effectiveness. The main reason for this is a general lack of evaluations, and specifically evaluations focusing on research use, education and evidence system outcomes. This situation risks bringing the field into a vicious circle, whereby the lack of evidence of what works in knowledge mobilisation undermines further efforts to use evidence in practice and policy.

In parallel, a question remains as to how evaluation can capture the nature of research use. Given that not all research use is of high quality, it is crucial to know how exactly research was used. This realisation calls for more qualitative and formative evaluations, such as case studies based on field observations and in-depth interviews. In addition, there is a need to better understand how research-practice-policy engagement can be captured in way that accounts for the more complex interactions among actors and different types of knowledge. Measuring the impact of such forms of engagement, including research co-production, or more broadly knowledge co-construction, on policy, practice and research itself is a challenge that remains to be addressed.

This paper will serve as a basis for the design and the delivery of an international knowledge intermediaries' survey being developed by the OECD/CERI *Strengthening the Impact of Education Research* project. Focusing on organisations that engage in knowledge mobilisation, the survey will aim to identify and understand the broad work of these organisations, their roles, functions and processes, with a view to understanding their effectiveness and impact. This will be a first step in providing insights into the research gaps identified in this paper.

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Annex A. Additional tables

Table A.1. Terms referring to “knowledge intermediaries” used in the literature

Author(s)	Sector	Organisation (Country)	Denomination(s)
<i>Strong et al.</i> (1996 ^[40])	Transversal	International Development Research Centre (Canada) International Institute for Sustainable Development (Canada) North-South Institute (Canada)	Knowledge broker
<i>Lomas</i> (1997 ^[101])	Health	McMaster University (Canada) University of Sydney (Australia)	Knowledge brokers
<i>Oldham & McLean</i> (1997 ^[41])	Public Sector	University of Sussex (UK)	Knowledge brokers
<i>OECD</i> (2000 ^[102])	Education	OECD	Intermediaries (Knowledge) Brokers (Knowledge) Mediators Boundary spanner
<i>Sverrisson</i> (2001 ^[38])	Environment	Stockholm University (Sweden)	Knowledge brokers
<i>CHSRF</i> (2003 ^[12])	Health	Canadian Health Services Research Foundation (Canada)	Knowledge brokers
<i>Lavis et al.</i> (2003 ^[16])	Health	McMaster University (Canada) Queen's University (Canada)	Knowledge brokers
<i>Honig</i> (2004 ^[9])	Education	University of Maryland (USA)	Intermediary organisations
<i>Graham et al.</i> (2006 ^[17])	Health	University of Ottawa (Canada) Queen's University (Canada) University of Toronto (Canada)	Change agent
<i>Burns & Schuller</i> (2007 ^[35])	Education	OECD	Brokerage agencies “Bridging” institution Intermediate agencies
<i>Lomas</i> (2007 ^[74])	Health	McMaster University (Canada)	Knowledge brokers
<i>Milton et al.</i> (2007 ^[103])	Health	University of British Columbia (Canada) University of Calgary (Canada)	Knowledge brokers
<i>Nutley, Walter & Davies</i> (2007 ^[104])	Public Sector	University of St. Andrews (Scotland) University of Edinburgh (Scotland) University of Dundee (Scotland)	Knowledge brokers Intermediary broker organisation
<i>Levin</i> (2008 ^[18])	Education	University of Toronto (Canada)	Mediators (Research/Knowledge) Brokers
<i>Sin</i> (2008 ^[39])	Transversal	Independent researcher (UK)	Intermediaries Research brokers
<i>Hoppe</i> (2009 ^[105])	Public Sector	University of Twente (Netherlands)	Knowledge brokers
<i>Ward, House & Hamer</i> (2009 ^[28])	Health	University of Leeds (UK)	Intermediaries Knowledge brokers
<i>Best & Holmes</i> (2010 ^[20])	Health Social Sector	Simon Fraser University (Canada)	Boundary spanners Change agents
<i>Meyer</i> (2010 ^[106])	Transversal	Ecole des Mines de Paris—ParisTech (France)	Knowledge brokers
<i>Vanderlinde & van Braak</i> (2010 ^[29])	Education	Ghent University (Belgium)	Intermediaries
<i>Gough et al.</i> (2011 ^[14])	Education	Massey University (New Zealand) University College London (UK)	Knowledge brokerage agencies
<i>Levin</i> (2011 ^[33])	Education	University of Toronto (Canada)	Third parties Mediators

Author(s)	Sector	Organisation (Country)	Denomination(s)
<i>Fazekas & Burns</i> (2012 _[107])	Education	OECD	Brokerage agencies
<i>Levin</i> (2013 _[22])	Education	University of Toronto (Canada)	Knowledge brokers Third parties Boundary spanners Intermediaries
<i>Cooper</i> (2014 _[3])	Education	University of Toronto (Canada) Queen's University (Canada)	Research brokering organisations Intermediary organisations
<i>Lamari & Ziam</i> (2014 _[108])	Health	University of Québec (Canada) TéluQ-University (Canada)	Intermediaries Knowledge brokers
<i>Bombaum et al.</i> (2015 _[42])	Health	University of Toronto (Canada) Western University (Canada)	Knowledge brokers
<i>Davies, Powell & Nutley</i> (2015 _[19])	Health	University of St. Andrews (Scotland) University of Dundee (Scotland)	(Research) Intermediaries (organisations/agencies) Boundary spanners Knowledge brokers Mediator
<i>Hering</i> (2016 _[109])	Transversal	Swiss Federal Institute of Technology Zürich (Switzerland) Swiss Federal Institute of Technology Lausanne (Switzerland)	Boundary organisations
<i>Langer, Tripney & Gough</i> (2016 _[13])	Education Social sciences Transversal	University College London (UK)	Knowledge brokers
<i>Nutley & Davies</i> (2016 _[110])	Transversal	University of St. Andrews (Scotland)	Boundary spanners/organisations (Research) Intermediaries
<i>Cain, Wieser and Livingston</i> (2016 _[2])	Education	Edge Hill University (UK) University of Graz (Austria) University of Glasgow (UK)	Knowledge brokers
<i>Cvitanovic et al.</i> (2017 _[10])	Environment	University of Tasmania (Australia) University of Manchester (UK)	Knowledge brokers
<i>Kislov, Wilson & Boaden</i> (2016 _[37])	Health	University of Manchester (UK)	Knowledge brokering roles (e.g. knowledge transfer associates, diffusion fellows, or knowledge exchange officers)
<i>Powell, Davies & Nutley</i> (2017 _[44])	Transversal	University of St. Andrews (Scotland)	Knowledge broker Research brokering agencies Research intermediaries
<i>Révai & Guerriero</i> (2017 _[111])	Education	OECD	Knowledge brokers Mediators Brokerage agencies
<i>Gough, Maidment & Sharples</i> (2018 _[45])	Education Health Transversal	University College London (UK)	Intermediary organisations Research intermediaries
<i>Powell, Davies & Nutley</i> (2018 _[112])	Public Sector	University of St. Andrews (Scotland)	Knowledge mobilisers/brokers Brokering organisations Research intermediaries
<i>Wehn & Montalvo</i> (2018 _[34])	Water sector	Institute of Water Education (Netherlands) Netherlands Organisation for Applied Scientific Research (Netherlands)	Mediating parties
<i>Ion et al.</i> (2019 _[113])	Education	Universitat Autònoma de Barcelona (Spain) University of Bucharest (Romania)	Intermediary organisation
<i>Mackillop, Quarmby & Downe</i> (2020 _[27])	Transversal	Cardiff University (Wales)	Knowledge brokers
<i>Révai</i> (2020 _[25])	Education	OECD	(Knowledge) Brokers

Author(s)	Sector	Organisation (Country)	Denomination(s)
<i>Gough</i> (2021 ^[114])	Education	University College London (England)	Knowledge intermediary organisations
<i>Oliver et al.</i> (2022 ^[15])	Public Policy Health	London School of Hygiene and Tropical Medicine (UK) Transforming Evidence (UK) University of Texas (USA) University of Stirling (Scotland)	Intermediary (organisation)

Table A.2. Objectives of intermediaries

Objectives of knowledge intermediaries identified by the literature.

Author(s)	Denomination(s)	Objective(s)	Context(s)	Role	Type of Knowledge
Gough (2021 ^[114])	Knowledge intermediary organisations	Promote the use of research in informing decision making.	Policy and Practice	General	Research
Gough, Maidment and Sharples (2018 ^[45])	(Research) Intermediary (organisations)	Encourage and enable the use of research evidence in policy and practice decision-making.	Policy and Practice	General	Research
		Enable improved engagement between research use and research production.		Linkage agent	
Cvitanovic et al. (2017 ^[10])	Knowledge brokers	Achieve evidence-based decision-making.	Practice	General	Research
		Facilitate the interaction and engagement amongst researchers and end-users.		Linkage agent	
		Develop relationships and networks with, among and between producers and users of knowledge.		Linkage agent	
		Build capacity for evidence-based decision-making.		Capacity builder	
Cain, Wieser and Livingston (2016 ^[2])	Knowledge brokers	Collect evidence from research and find better ways to incorporate research use in policy and practice.	Policy and Practice	General	Research
Kislov, Wilson and Broaden (2016 ^[37])	Knowledge brokering roles (e.g. knowledge transfer associates, diffusion fellows, or knowledge exchange officers)	Bridge a gap in social structure and help knowledge flow across that gap.	Practice	Information manager	Knowledge
Hering (2016 ^[109])	Boundary organisations	Promote information flow in both directions, towards scientific experts and policy makers and managers.	Policy and Practice	Information manager	
Nutley and Davies (2016 ^[110])	Boundary spanners/organisations (Research) Intermediaries	Facilitate access to research knowledge.	Practice	Information manager	Research
		Develop and broker networks and other connections between research producers and potential users.		Linkage agent	

Author(s)	Denomination(s)	Objective(s)	Context(s)	Role	Type of Knowledge
Bornbaum et al. (2015 _[42])	Knowledge brokers	Evidence-based decision-making.	Practice	General	Research
Cooper (2014 _[3])	Research brokering organisations Intermediary organisations	Be a catalyst for research use and/or knowledge mobilisation between research producers and users.	Policy and Practice	General	Research
Meyer (2010 _[106])	Knowledge brokers	Move knowledge around. Create connections between researchers and their various audiences.	Not specified	General Linkage agent	Knowledge
Ward, House and Hamer (2009 _[28])	Intermediaries Knowledge brokers	Make research and practice more accessible to both researchers and practitioners.	Practice	Information manager	Research
Sin (2008 _[39])	Intermediaries Research brokers	Bridge the evidence and policy/practice divide. Address the language and cultural barriers between the worlds of research and decision making.	Policy and Practice	General Information manager	Research
Burns and Schuller (2007 _[35])	Brokerage agencies “Bridging” institution Intermediate agencies	Encourage dialogue between policy makers, researchers, and educators.	Policy and Practice	Linkage agent	
Honig (2004 _[9])	Intermediary organisations	Enable changes in roles and practices for both policymakers and policy implementers.	Policy and Practice?	General	
CHSRF (2003 _[12])	Knowledge brokers	Link different entities or individuals that otherwise would not have any relationship to share and exchange knowledge.	Policy and Practice	Linkage agent	Knowledge
Sverrisson (2001 _[38])	Knowledge brokers	Facilitate the creation, sharing, and use of knowledge. Broker the space between the use and production of research evidence. Facilitate and channel interaction.	Practice	General Linkage agent Linkage agent	Research
OECD (2000 _[102])	Intermediaries (Knowledge) Brokers (Knowledge) Mediators Boundary spanner	Facilitate the search for and access to knowledge and information.	Policy and Practice	Information manager	Knowledge
Lomas (1997 _[101])	Knowledge brokers	Translate the opportunities, constraints and findings from the research setting to the decision-making one, and vice versa.	Policy and Practice	Information manager	Research

Table A.3. Dimensions of intermediary functions

Intermediary functions' categories, classified by the OECD typology proposal.

Dimension	Cooper (2014 ^[3])	Bornbaum et al. (2015 ^[42])	Davies, Powell & Nutley (2007 ^[35])	Powell, Davies & Nutley (2017 ^[44])	Gough, Maidment & Sharples (2018 ^[45])	Oliver et al. (2022 ^[15])
<i>Research production</i>	Awareness Accessibility	Identify and obtain relevant information Create tailored knowledge products	Produce knowledge	Push activities (1)	Produce primary evidence Synthesise existing evidence Translate evidence	Facilitate access to research
<i>Research dissemination and advocacy</i>	Engagement Policy influence	Support communication and information sharing	Broker and intermediation Advocate evidence	Push activities (2) Advocacy and advance knowledge mobilisation	Disseminate evidence	Disseminate and communicate research
<i>Relationships and network building</i>	Linkage and partnerships	Identify, connect and engage with stakeholders Develop, maintain and facilitate networks Facilitate collaboration	Foster networks	Linkage and exchange activities		Build professional partnerships
<i>Individual skills and capacity building</i>	Capacity building	Facilitate development of analytic and interpretative skills		Pull activities		Build decision-maker skills Build researcher skills Strategic leadership (1)
<i>Organisational and system development and capacity building</i>	Organisational development	Facilitate and evaluate change (1)				Strategic leadership (2) Formal evidence requests Reward and incentivise engagement Create and embed infrastructure (1)

Dimension	Cooper (2014 ^[3])	Bornbaum et al. (2015 ^[42])	Davies, Powell & Nutley (2007 ^[35])	Powell, Davies & Nutley (2017 ^[44])	Gough, Maidment & Sharples (2018 ^[45])	Oliver et al. (2022 ^[15])
<i>Research use and intervention support</i>	Implementation support	Project coordination Facilitate and evaluate change (2)	Researching practice (1)	Activities involving practitioners or policy makers Activities users or other stakeholders	Implement evidence	
<i>Evaluation, scale-up and sustainability</i>		Facilitate and evaluate change (3) Support sustainability	Researching practice (2) Advance knowledge mobilisation		Evaluate and improve practice	Create and embed infrastructure (2)

Note: Categories identified by other authors were grouped according to the proposed typology. Some categories, according to their descriptions, fitted in more than one of the proposed categories. In these cases, the repeated categories were identified by “(1)”, “(2)” or “(3)”.