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Exploring the Complex Interaction Between Governance and Knowledge in Education

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Edu Working Paper N° 67

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TABLE OF CONTENTS

SUMMARY 4
RÉSUMÉ 5
Introduction 6
1. Setting the stage: Governance and knowledge in complex environments 7
Complexity 7
Governance 7
Knowledge 8
2. The multi-faceted relationship between governance and knowledge 9
Knowledge in governance 10
Knowledge's direct role in governance 11
Knowledge's indirect role in governance 15
Governance of knowledge 17
Governance of knowledge production 18
Governance of knowledge mediation, dissemination, translation 20
Governance of knowledge utilisation 22
3. Putting the pieces together: Towards an analytical model 23
The analytical model 24
Models of governance 24
Modes of learning and types of knowledge 25
How does the model work? 27
Interactions among learning modes 29
Conclusion 29
REFERENCES 32

SUMMARY

Governments in all OECD countries are facing the challenge of governing increasingly complex education systems. There is a growing need for governance structures that can handle this complexity and which can provide actors with the knowledge they need to make decisions. This working paper asks the question: *How do governance and knowledge mutually constitute and impact on each other in complex education systems*? It provides an answer through a state of the art literature review and original theoretical argumentation. It breaks new ground by combining different schools of academic and policy thinking which traditionally look at various aspects of the relationship between governance and knowledge separately. Research in public management, political science and public policy, sociology, institutional economics, and organisational management (particularly the knowledge transfer literature) is augmented with work from education and other social sciences, including healthcare, law, and social justice. This working paper argues that just as knowledge is crucial for governance, governance is indispensible for knowledge creation and dissemination. It proposes an analytical framework that combines models of governance with modes of learning and types of knowledge, and provides preliminary empirical examples to support this framework. In the context of diverse social, economic and political environments of OECD countries, the interaction between these two focal points – models of governance and types of knowledge – has become increasingly relevant to researchers, policy makers, and education stakeholders more generally.

RÉSUMÉ

Dans tous les pays de l'OCDE, les pouvoirs publics sont confrontés à la difficulté de gérer des systèmes éducatifs toujours plus complexes. Cette situation nécessite, de façon croissante, la mise en place de structures de gouvernance capables de faire face à cette complexité et de fournir aux acteurs concernés les connaissances dont ils ont besoin pour prendre leurs décisions. Le présent document de travail pose la question suivante : *en quoi gouvernance et savoir sont-ils mutuellement constitutifs et comment interagissent-ils dans les systèmes éducatifs complexes* ? Il apporte une réponse en examinant les publications qui existent actuellement sur le sujet, et aussi par le biais d'une argumentation théorique originale. Il ouvre également de nouvelles perspectives en combinant différentes écoles de pensée universitaire et de réflexion politique qui abordent en général séparément les divers aspects de la relation entre gouvernance et savoir. Aux recherches menées dans les domaines de la gestion publique, des sciences politiques et de l'action publique, de la sociologie, de l'économie institutionnelle et de la gestion administrative (en particulier les études relatives aux transferts de connaissances), s'ajoutent les travaux ayant trait à l'éducation et à d'autres sciences sociales, y compris la santé, le droit et la justice sociale. Ce document de travail fait valoir que, tout comme le savoir est essentiel à la gouvernance, celle-ci est indispensable à la création et à la diffusion du savoir. Il propose un cadre d'analyse associant des modèles de gouvernance à des modes d'apprentissage et à des types de savoir, et fournit une première série d'exemples empiriques à l'appui de ce cadre. Compte tenu de la diversité des contextes sociaux, économiques et politiques dans les pays de l'OCDE, l'interaction entre ces deux volets essentiels – modèles de gouvernance et types de savoir – revêt une pertinence croissante pour les chercheurs, les décideurs et les parties prenantes du monde éducatif dans leur ensemble.

Introduction

Governments in OECD countries are facing the challenge of governing increasingly complex education systems. As a result, there is a growing need for governance structures that can handle this complexity and which can provide actors with the knowledge they need to make decisions. These two focal points – governance and knowledge – are examined here as they are embedded in the context of diverse social, economic and political environments. The key question posed is*: How do governance and knowledge mutually constitute and impact on each other in complex education systems*?

There is no current, readily available literature that discusses this question with the requisite breadth and depth. Rather, there are only different schools of academic and policy thinking which look at various aspects of the relationship between governance and knowledge. Hence, this review is necessarily explorative, experimental and open-ended. It is clear that additional theoretical and empirical research in many fields is needed in order to fully explore this pressing question. The main focus here is to report on theoretical and analytical perspectives as developed and documented in the literature. This paper was developed as a working paper for the CERI Governing Complex Education Systems (GCES) project, and will be part of a series of working papers that emerge as the project progresses.

As there is no dedicated body of literature that explores this particular research question, this review draws on a wide range of academic disciplines:

- public management
- political science
- public policy
- sociology (especially sociology of knowledge)
- institutional economics
- organisational management (particularly knowledge transfer literature).

These academic disciplines provide research on a variety of policy fields such as education, healthcare, and others. Academic findings are supplemented by previous work in the field by the OECD and other international organisations. The papers deemed relevant for this review were identified through the bibliographic network of key publications and authors in each of the disciplines, which were themselves identified based on the salience of arguments in the wider literature and high citation indices. Where gaps remained after employing such search strategy, keyword searches were conducted using Google scholar and electronic databases (*e.g*. ERIC, Jstor).

The review is structured as follows: First, we set the scene by defining and locating governance and knowledge in complex environments. This is a crucial step since both governance and knowledge are concepts used and misused in a variety of ways in both academia and policy circles. Second, the multi-faceted relationship between governance and knowledge is broken down according to distinct elements and discussed in detail. Finally, tentative conclusions are formulated by way of collating a selected set of governance models and learning modes which lead to hypotheses worth further research and discussion.

1. Setting the stage: Governance and knowledge in complex environments

Complexity

Researchers and policy makers have been aware of the growing complexity of education systems throughout the developed world for some time now (*e.g.* Halász, 2003; Hodgson, 2000; OECD/CERI, 2007) and have attributed it to a number of simultaneous factors:

- the growing diversity of stakeholders' preferences and expectations, which places more demand on education systems;
- more decentralised and flexible governance structures;
- the increased importance of additional layers of governance at the international and transnational levels; and
- rapidly changing and spreading information and communication technologies (ICTs).

It must be noted that the degree and nature of complexity varies greatly across countries and over time within the same country. In addition, through such measures as the reform of governance structures or changes in administrative obligations, the potential exists for governments to influence the degree – decreasing or increasing – of complexity of education systems.

For the ensuing discussion, it is essential to note the wide-ranging ramifications of increased complexity in the education systems of OECD countries (Bammer and Smithson, 2008; Grek and Ozga, 2010; Grin and Loeber, 2007; Heclo, 1974). As public policy has become more uncertain and indeterminate in many respects, the difficulty of effectively steering and governing societies in general, and education systems in particular, has grown. As a result, there is an increasing need for enhanced knowledge, understanding and effective learning.

Governance

Governance is a concept defined and used in a variety of ways, most of which address either too broad or too narrow a range of phenomena for the present analysis (Chhotray and Stoker, 2009; Stoker, 1998). For the purposes of this review, the following definition of governance has been adopted: *Governance refers to the process of governing societies in a situation where no single actor can claim absolute dominance.*

This understanding of governance is similar to that of Pierre and Peters (2005, p. 2-6) although their definition is more detailed in that it refers specifically to four key activities of the state: (1) articulating a common set of priorities for society; (2) providing coherence; (3) steering; and (4) accountability. The state has been the dominant actor in these key activities for some time, but it has by no means held absolute dominance. This recognition of interdependence between state and society and the lack of absolute state dominance has come about not only in political science, but also in political sociology (Evans, 1995; Evans, Rueschemeyer and Skocpol, 1985; Jessop, 2002). In some cases, societal actors have a stronger influence (Lyall and Tait, 2005) such as under participatory budgeting or industry self-regulation governance arrangements. By implication, governance is understood as a dynamic process involving implementation and monitoring as well as decision-making. It is possible to identify ideal-types of governance structures based on the relative dominance of state and non-state actors (Pierre and Peters, 2005, Chapter 1); later on, these types will be discussed and linked to learning processes (see Chapter 3 of this paper).

This definition of governance does not imply any particular mode and process of policy making. Hence, it is underlined that policy making is assumed to be neither logical-rational nor linear. It is widely recognized by scholars that political and personal beliefs combined with the large amount of policy relevant information available – itself impossible to adequately process given the bounded cognitive capacity of actors – derail policy making from a rational and structured ideal. These issues will be picked up later and linked to modes of knowledge acquisition and organizational behaviour. This link is crucial in that one of the central issues underlying this discussion is the lack of reliable policy relevant knowledge available to policy makers in a timely and easily accessible manner.

It should be noted that the governance structures found in advanced democracies vary greatly in many respects, one of which is the degree to which they are capable of drawing on the information generated by the various actors, analysing this information and using the resulting knowledge for supporting decision-making and implementation (Howlett, 2009; Pierre and Peters, 2005). These functions together are often labelled as learning capacity which concept will also feature as crucial below.

The variety of governance structures is also due to the different traditions, or mix of traditions, followed by different countries, which can have considerable impact on the stock and flows of knowledge available for decision-making and implementation (Christensen and Laegreid, 2007). In the literature of public management, some of the most influential schools of thought that discuss these traditions are (to mention the most prominent): classical "Weberian" bureaucracy (Olsen, 2005); new public management (Christensen and Lægreid, 2010); network(ed) government (Goldsmith and Eggers, 2004); joined-up government (Bogdanor, 2005); and digital-era government (Dunleavy, Margetts, Bastow *et al*., 2006).

Knowledge

As with the concept of governance, knowledge is also an analytical concept ridden with confusion and conceptual controversies. Simply put, the essential problem is that every thought can in some way be conceptualised as knowledge and the distinction between knowledge and action is not always clear cut (Hochschild, 2006). A key step in defining this concept is thus to constrain what we consider as "knowledge". Throughout this review, the general definition of knowledge used follows that of Hess and Ostrom, who state that "*knowledge is assimilated information and the understanding of how to use it*" (Hess and Ostrom, 2007, p. 8) where information is organized data understood in its context and data constitutes the raw bits of information (Davenport and Prusak, 1998). More specifically for our purposes, the concept of knowledge is narrowed down to *policy relevant knowledge*, that is, knowledge that concerns policy issues and is shared by at least some policy makers, either within or outside the state (Grin and Loeber, 2007).

The present understanding of policy relevant knowledge is that its use does not diminish the quantity available for further users. That is, in economic terminology, it is a pure public good in its abstract form[1]: exclusion is difficult and it is non-rivalrous (V. Ostrom and E. Ostrom, 1977). For example, as someone reads and understands Einstein's general theory of relativity, the theory will still be available for further readers in the same way. However, this doesn't imply that there are not actors who benefit from restricting access to policy relevant knowledge. Often cited examples are drug company profits earned through intellectual property protection or governments denying publishing data on public spending. However, knowledge understood as a commons is more vulnerable to restriction and exclusion in the digital era than it was before as centralized digital repositories such as LexisNexus or government portals could quickly and effectively remove content from publicly accessible databases.

Employing this definition of policy relevant knowledge allows for different views on knowledge and different knowledge types.[2] As opposed to the standard commodified view of knowledge – whereby knowledge is understood as a product produced and transferred similarly to physical objects – a wide range

of researchers see knowledge as embedded in particular social environments such as academic disciplines, practitioner communities, or expert groups (Oborn, Barrett and Racko, 2010). The existence of "communities of practice" (Brown and Duguid, 1991; Wenger, 1998; Yanow, 2000), creates a need for translating and situating knowledge generated in one context in order to make it meaningful and readily available in another.[3] This translation (as well as dissemination) function is often discharged by brokerage agencies in education and other social policy domains, such as health (OECD/CERI, 2007).

Some authors organise different types of knowledge into a hierarchy where quantitative scientific knowledge in general, and randomised control trials in particular, are considered the most trustworthy and robust forms of knowledge (Fitz-Gibbon, 2000; Oborn, Barrett and Racko, 2010; Sackett, Rosenberg and Gray, 1996). This is then followed in the hierarchy by knowledge obtained through quasi-experimental research, and then by that gleaned from qualitative study (*e.g.* case studies, focus groups, etc). In this review, quantitative scientific knowledge is not the only type of knowledge considered as valid. Furthermore no explicit hierarchy of knowledge is used, for our aims are primarily analytical rather than normative.[4] We reiterate the statement in OECD/CERI (2007): "*…our basic proposition [is] that there is no single best method for or type of evidence-based policy research*" (p. 24). The type of method required depends both on the type of question to be answered and what the data will be used for.

In addition to explicit knowledge, tacit knowledge (including professional knowledge) can play a crucial role in governance and knowledge transfer (Graham and Tetroe, 2009; Jacobson, 2007; I. Nonaka, 1994; Polanyi, 1968). Similarly, declarative and procedural knowledge may be crucial as well (Sternberg, Mio and Mio 2009). The public policy literature often makes a distinction between beliefs and policy ideas, where beliefs form the defining core of groups of policy makers such as epistemic communities, advocacy coalitions and other similar collectivities (Radaelli, 2009; Sabatier, 1988). An influential categorisation of types of knowledge which neatly maps into the distinct stages of the policy cycle is developed by Nutley, Walter and Davies (2003) and is brought into the education research literature by Raffe and Spurs (2007): Know-about problems (*e.g.* the current policy efforts directed at social inclusion reflect a considerable knowledge base on health, wealth and social inequalities), know-what works (*i.e.* what policies, strategies or specific interventions will bring about desired outcomes), know-how to put into practice (*i.e.* knowing what should be done is not the same as being able to do it effectively), know-who to involve (such knowledge covers estimates of client needs as well as information on key stakeholders necessary for potential solutions), and know-why (*i.e.* knowledge about why action is required, *e.g.* relationship to values).

Finally, it must be noted that the absence of knowledge or some types of knowledge – *i.e.* "non-knowledge" – can play as important a role in governance as knowledge itself (Clarke, 2006). For example, the absence of reliable scientific evidence may compel policy makers to rely on anecdotal evidence and analogies, or, similarly, the non-existence of basic statistical data on education outcomes allows for individual policy makers' opinions to take on the role of knowledge, while serving particularistic interests (Bajomi *et al.*, 2010).

2. The multi-faceted relationship between governance and knowledge

As understood in the above sense, governance and knowledge partially overlap and mutually constitute each other; nevertheless, they are analytically distinct concepts. They mutually constitute each other in that, on the one hand, governance is not conceivable without a minimum degree of knowledge – that is to say, collective action is impossible without agreement on at least some of the basic ideas by some of the actors. On the other hand, creating and sustaining policy relevant knowledge is impossible without some sort of governance structure in place (*i.e.* in complete chaos), for shared understanding is unlikely to be sustainable without recurring acts of governance.

Governance and knowledge are analytically separable insofar as they refer to different elements of reality and, hence, can be considered simultaneously in theories and empirical investigations if carefully conceptualised and measured. However, their circular relationship makes the study of their interaction problematic, even given the definitional constraints imposed above (J. L. Campbell, 2002; John, 1998).

In order to analytically unpack the interaction between governance and knowledge, and to make the discussion tractable, the two directions within the circular relationship are discussed separately. This approach yields two questions to be explored:

- What is the role of knowledge in the governance of complex education systems?
- What is the role of governance in knowledge creation, dissemination and utilisation in education policy?

Based on a broad review of the literature, these two questions can be explored separately, on different levels, and according to different aspects of policy making. On the one hand, knowledge can play a role in and contribute to governance either directly, *i.e.* as a resource, instrument or input of governance (*e.g.* Hood, 2006; 2007; Howlett, 2011; Sörlin and Vessuri, 2007). It can also work indirectly through shaping actors' preferences and means of goal achievement, and by determining group formation (*e.g.* Freeman, 2006; Grin and Loeber, 2007). On the other hand, governance of knowledge can steer knowledge production as well as dissemination, translation and utilisation (*e.g.* Fuller, 2000; Stehr, 2004; Sörlin and Vessuri, 2007). Each of these aspects leads to distinct literatures, which are discussed in detail below (for an overview see Table 2.1). The added value of breaking down the circular relationship between these two constructs is that it allows for a more coherent and richer picture of the interplay between governance and knowledge and novel insights can be derived from putting the individual pieces together (see "Putting the pieces together: Some food for thought" at the end of this paper).

Table 2.1. Governance and knowledge: An overview

Direction of interaction	Aspect of the link	Sub-aspect of the link	Relevant literature
Knowledge in governance	direct: as input, instrument and resource	problem definition	public policy and political science on agenda setting
		policy solution	"what works" literature
		implementation	public management on regulatory instruments
		feedback	literature on evaluation and monitoring
	indirect: through actors	individual level: preference formation and goal attainment	policy learning and organisational learning
		group level: group formation	public policy and political science
Governance of knowledge	knowledge production	facilitating production	science and technology policy, knowledge governance
		direct production	sociology of knowledge, public management and 'what works' literature
	knowledge mediation	within the state and across the state-society boundary	knowledge management, knowledge translation and policy learning
	Knowledge utilisation	by key policy makers	knowledge management, knowledge translation and policy learning

Knowledge in governance

Knowledge is directly relevant to governance as a crucial input to the process, a resource for political decision-making, and an instrument of policy implementation; it also plays an indirect role in influencing

actors' behaviour on an individual and group level. Knowledge is indispensable for effective governance as, for example, Pierre and Peters (2005) put it: "the ability of institutions to govern hinges on the availability of reliable information and the ability to process information" (p. 7).

Knowledge's direct role in governance

As laid out in Table 2.1, knowledge feeds directly into governance as a critical resource in:

- problem definition
- identification of policy solutions
- deriving feedback
- policy implementation[5]

Each of these elements is discussed in turn below.

The role of knowledge in **defining and identifying policy problems** has been subject to extensive academic inquiry, most notably by students of public policy and political science who analyse the politics of attention and agenda setting (Jones and Baumgartner, 2005; Kingdon, 2010), often as part of the policy cycle (Jann and Wegrich, 2007). Policy problems do not arise naturally; they must be recognised and identified as such by influential policy makers and, subsequently, put on the political agenda. This is considered to be an inherently political process (Birkland, 2007). In analysing this process, it is of particular importance to recognise the bounded cognitive capacity of policy makers and, hence, of the institutions they embody. Bounded cognitive capacity refers to the reality that an individual's cognitive capacity is limited, and as a result the amount of information which each individual can process is restricted and typically falls short of the information-rich environment of complex policy systems (Simon, 1991). Humans frequently simplify the understanding of the complex reality surrounding them by relying on cognitive shortcuts and heuristics (Kahneman, Slovic, and Tversky, 1982) as well as by employing beliefs and ideologies (Grin and Loeber, 2007). On a meso-level, this means that organisations also frequently lack the capacity to learn and adapt to their complex environments adequately (Lindblom, 1959; Simon, 1997).

The issue of bounded cognitive capacity becomes particularly pertinent when combined with the limited knowledge base on which policy makers can draw when making decisions. By implication, knowledge of the objective characteristics of policy problems does not sufficiently explain the intensity of recognition and efforts at solving problems. Rather, the defining influence is a plausible definition of the problem (D. A. Stone, 2001) and the availability of a policy image (Baumgartner and Jones, 1993). Recent accounts of problem definition and agenda setting increasingly recognise that knowledge expressed in expert and professional discourses plays a crucial role in this process (Jann and Wegrich, 2007; OECD, 2009).

Problem definition and identification in education policy have gone through a significant shift in OECD countries in the last two decades (see for example Box II.1). Most notably, problems and challenges of national education systems are increasingly recognised in light of global developments as conveyed by international organisations such as the OECD or the EU and defined in terms of quantitative data (Martens, Nagel, Windzio and Weymann, 2010; Ozga, Dahler-Larsen, Segerholm and Simola, 2011). Hence, the importance of the role played by international policy networks and scientific communities has increased; by implication, knowledge governance instruments have become increasingly influential in education policy making (Grek and Ozga, 2010; OECD/CERI, 2007).

As there is no single accepted model or family of models of problem definition, the role of knowledge in governance cannot be unambiguously defined. A particularly troubling issue is that different models assume or imply various causal mechanisms and put the emphasis on disparate groups of actors, which bring about conceptual problems when attempting to compare and synthesise these models. For example the literature growing around the work of John W. Kingdon recognises the media and top politicians as key actors and analyses the limited attention of politicians available to any policy problem (Kingdon, 2010). Other scholars like Diane Stone or Judy Sebba, on the other hand, emphasise the role played by experts and think thanks in influencing policy makers mostly located in public administrations rather than political parties (Sebba, 2011; D. Stone, 2004). At any rate, the inclusiveness and openness of policy making is a crucial aspect of the role knowledge plays in governance- an issue that will be further investigated in the concluding section.

Box 2.1. OECD's PISA and national problem identification and definition

A widely discussed example of how (new) knowledge plays a powerful role in problem definition is the case of OECD's Programme for International Student Assessment (PISA) and its impact on national policy making (Grek, 2010; Jakobi and Martens, 2010; Rinne and Ozga, 2011; Rubenson, 2009).

PISA is a standardised measurement of 15-year-olds' skills and competencies in reading, mathematics and science (OECD, 2010a). It has been carried out every three years since 2000, providing rich evidence on countries' performance. PISA allows for comparing the performance of countries' (65 countries and territories in 2009) education systems based on students' test scores.

It is argued that in a number of countries, PISA results have exerted a transformative effect on national understanding of educational performance and inspired a series of education reform measures: new problems were identified, previously neglected aspects of educational performance rose in priority, and, thus, new solutions were sought (Grek, 2010; Jakobi and Martens, 2010; Rinne and Ozga, 2011; Rubenson, 2009).

Germany is one of the most extensively studied countries where PISA transformed the understanding of problems underlying national education policy making (Niemann, 2010). Throughout the 1990s German education policy change can be characterised as a series of incremental adjustments. The first PISA results (published in 2001) placed Germany well behind other developed OECD countries. These results "shocked" policy makers and the public, who reacted vigorously and demanded sweeping changes to secondary education. The underlying understanding of what constitutes good education performance and how well Germany scores internationally in these respects were both changed in the process. Interestingly, the "PISA shock" also allowed for more radical change to the system than the previous incremental steps already identified

Problem definition and the **identification of policy solutions** are not strictly separable because whether a problem is recognised as such often depends on the capacity of governance structures to tackle it (Jann and Wegrich, 2007). This interdependence is explicitly articulated in the "garbage can" model of policy making (Cohen, March and Olsen, 1972; Kingdon, 2010). By implication, the same knowledge that enters the process of problem definition is present in the policy solution and vice versa making the traditional distinction between problems and solutions obsolete.

The identification and the development of policy solutions is of central concern in the literature on "what works?" and evidence-based policy making (*e.g.* Davies, Nutley and Smith, 2000; Nutley, Walter and Davies, 2007). This literature looks at how scientific research can influence policy and how effective practices can be reliably identified, codified and translated into policies and practice given predetermined policy goals and problem definitions.[6] It also acknowledges the complex two-way relationship between research and policy as well as practice (Best and Holmes, 2010; Nutley, Morton, Jung and Boaz, 2010; Nutley, Walter and Davies, 2007). This research strand employs a much more narrow definition of knowledge in that it only considers scientific knowledge, and even within scientific knowledge it applies a hierarchy of knowledge types in which the randomised control trial sits at the top (Fitz-Gibbon, 2000).

In this framework, knowledge is the driving force behind policy change and the key to continuous improvement of public services (Davies, Nutley and Smith, 2000). Accordingly, identifying the interventions that work, *i.e.* effectively delivering the expected results without too many offsetting or unintended consequences, constitutes and should constitute the *modus operandi* of policy making and governance. This approach clearly represents a rationalist ideal, which moves between normative and positive accounts of governance. It is frequently echoed in government policy papers such as the "Modernising Government" White Paper of the United Kingdom[7] or in international expert groups such as the Cochrane Collaboration in health[8] or the Campbell Collaboration in education and social justice[9]. There is also a number of targeted policies for supporting the use and generation of evidence in education, for example in Ontario, Canada (C. Campbell and Levin, 2009). The importance of evidence in education and some of the governance structures facilitating its use is also elaborated upon by the OECD (OECD/CERI, 2007).

Although the use of research evidence in policy making has increased in the last decade in many countries, the empirical assessment of the degree to which research evidence informs policy making and practice is disappointing in many policy fields (Cooper, Levin and C. Campbell, 2009). There is a large gap between scientific evidence and the reality of policy making and service delivery (Best and Holmes, 2010; Boaz, Grayson, Levitt, and Solesbury, 2008; Bogenschneider and Corbett, 2010; Davies, Nutley and Smith, 2000; Oborn *et al.*, 2010). This gap, nevertheless, can differ substantially from country to country. Work in seven countries by the OECD (OECD, 2009) revealed clear differences in country (and/or region) approach to using research in policy making for vocational education, with only two of the seven countries having any kind of systematic plan or strategy to use research to guide policy design and implementation. In this work not only was research not used at various policy stages, but too often the research component was the first to be cut due to budget and time constraints. This included cuts during the policy design stage (where the use of research reports and other evidence would be key) and in the implementation phase (including running a pilot and/or monitoring and assessment exercises to help improve policy planning and uptake).

Recent work suggests that the reasons behind this lack of research use has more to do with organisational dynamics than the presence or absence of formal reports, highlighting the need to pay more attention to interpersonal processes and structures in order to identify routes of effective reform (Levin, Sa, Cooper *et al*., 2009). The key factors affecting the use of research in general are identified to be (Nutley, Walter and Davies, 2007, Chapter 3):

- the nature of the research to be applied such as quality of findings and methods and timeliness;
- the personal characteristics of both researchers and potential research users, such as research users' education background and attitudes towards policy change;
- the links between research and its users, such as physical access, the existence of knowledge brokers and personal contacts between researchers and research users;
- the context for the use of research, such as interests and organisational culture.

Nevertheless, the evidence-based policy movement has also received wide-ranging criticism in education policy and other fields alike. The epistemological criticism stresses that evidence-based policy's excessive focus on scientific evidence in general, and randomised control trials in particular, neglects valuable and important types of knowledge which could contribute to better policies (Ashcroft, 2004; Head, 2008). The democratic criticism underlines that the increased reliance on evidence in policy making diminishes the role of negotiation, consensus building and the exchange of diverse opinions, which constitute the very essence of democracy (Sörlin and Vessuri, 2007). Finally, the methodological criticism concentrates on the problematic of empirically tracing research impact on policy, especially in the case of indirect research impacts (Nutley, Walter and Davies, 2007, Chapter 9). A combination of these arguments

points at a particularly troubling issue: the de-politicisation of knowledge-based decision-making where important decisions are delegated to expert committees or left for scientific formulae, effectively removing them from the realm of political negotiation even though the knowledge base is insufficient for making clear and straightforward decisions (*e.g.* Vifell and Sjörgen, 2011).

Providing **feedback** on the implemented policies (either rolled-out or piloted) is considered to be a separate element of governance which, nevertheless, is often discussed by the same literature on evidence-based policy making. Identifying what works frequently means evaluating the policies implemented in the country in question or elsewhere. Hence, there is no need to spell out the link between governance and knowledge specifically linked to feedback and monitoring.

Regarding knowledge as an instrument of **policy implementation**, there is a rich literature within public management,[10] crystallising around such areas of inquiry as: information[11] as an implementation tool (Howlett, 2011); information-based procedural instruments (Howlett, 2000); information as a policy instrument (Vedung and van der Doelen, 1998); soft regulation (Brandsen, Boogers and Tops, 2006); and other similar concepts. Knowledge as an instrument of implementation has been classified as a procedural instrument, that is, an instrument which is "intended to manage state-societal interactions in order to assure general support for government aims and initiatives" (Howlett, 2000 p. 412). Thus, it is considered to achieve its aims indirectly without relying on the state's direct authority.

Knowledge as policy instrument implies either a positive or negative use of knowledge (Howlett, 2005). A positive use increases the amount of knowledge available for the actors and contributes to enhanced participation and transparency. Examples include the education of public servants, targeted information provision, and formal evaluation. A negative use of knowledge, which is much less studied, encompasses instruments that limit the knowledge available for actors or mislead them; for example, propaganda or information suppression.

Knowledge can be an effective instrument of governance when private and public interests coincide (Box 2.2), but it should not be used in cases where universal compliance is necessary (*e.g.* paying taxes or refraining from criminal action) (Vedung and van der Doelen, 1998). Knowledge provision can complement other regulatory instruments in order to enhance their effectiveness as in the case of public campaigns recently launched in a number of European countries to highlight the downside of tax evasion and appeal to citizens' sense of duty (Gerstenberger, 2008).

Box 2.2. Education league tables and performance indicators

One frequently discussed example of information provision is education league tables and performance indicators. These are generally used to support education quasi-markets with the goal of increasing transparency in the system and empowering the consumers (*i.e.* the parents and students) by alleviating information asymmetries (Hood, 2007; Salmi and Saroyan, 2007; Waslander, Pater and Weide, 2010). The essential problem in this case is that when making decisions regarding which school to choose, parents typically rely on perceptions of reputation, informal networks and myths instead of thoroughly examining official performance data (Waslander, Pater and Weide, 2010). This tendency is often strengthened in that official data, even if readily available, is not always presented in a manner that allows for simple interpretation and use. Thus, even if parents intend to use the provided performance data, they might misinterpret it or consider it too complex to use. An additional layer of the argument is that league tables are often criticised because they provide crude and imperfect measures of education quality at the same time that they are interpreted as precise and reliable measures by many users (Salmi and Saroyan, 2007).

Similarly, information disclosure regulations are often instituted to support consumer and individual choice and to enhance their optimality (*e.g.* food labelling disclosing basic nutrition information), even though it is not clear that the information provided in these ways is used (or used correctly) by the target audience (Baldwin and Cave, 1999). Research of this issue suggests that using knowledge as a regulatory instrument may be undesirable because 1) its production, standardisation and quality assurance is too costly, and 2) consumers may choose not to value the knowledge gained and rely on other characteristics of products (*e.g.* they may neglect potential health dangers and

make a choice based on price).

Knowledge's indirect role in governance

As outlined above, knowledge indirectly feeds into governance through:

- individual policy makers and
- formation of groups and networks of policy makers.

On the **individual level**, knowledge, especially the acquisition of new knowledge, has an impact on policy makers' beliefs, preferences and instrumental knowledge (means of goal attainment). In turn, the revised beliefs, preferences and instrumental knowledge change how policy makers act and shape governance (*e.g.* Hochschild, 2006). There is a long tradition in public policy and political science of studying policy makers' preferences and instrumental knowledge and the change in these preferences over time, most notably by scholars of policy learning and, in part, by students of policy transfer and diffusion (Freeman, 2006; Grin and Loeber, 2007). These efforts have also been supported by academic work done within the organisational learning tradition (Argyris, 1999; Argyris and A, 1996; Lipshitz, Popper and Oz, 1996; I. Nonaka, 1994; Willem and Buelens, 2007; Yanow, 2000). Change of beliefs and belief formation are also important objects of scholarly interest here; they are discussed below together with group formation since the two issues are closely intertwined.

A large number of models of policy learning exist: rational learning (Weyland, 2002, 2006); social learning (Hall, 1993); political learning (Heclo, 1974); instrumental learning (Boswell, 2008); collaborative learning (Raffe and Spours, 2007); lesson drawing (Rose, 1991, 1993, 2005); government learning (Etheredge, 1981; Etheredge and Short, 1983); and systematically pinching ideas (Schneider and Ingram, 1988). The attempts to unite some of these models have mainly failed in generating long-lasting consensus even on basic issues (*e.g.* Bennett and Howlett, 1992). In the field of education policy research, three models of policy learning have been outlined by Raffe and Spurs (2007) that can be applied to a range of education policies:

1. rationalist
2. collaborative
3. politicised

In the rationalist model, policy learning takes place within a rational process of structured and centralised decision making, *e.g.* following the classical policy cycle. This brings policy learning close to the previously discussed "what works" movement. Knowledge is explicit, declarative and universalistic. Here, learning and political contestation are separate, that is, first political goals and options are chosen; second, the learning process determines the best available outcome and aids effective implementation. In the collaborative model, policy learning takes place in a less hierarchical and well-structured process of policy making where the boundaries between private and public are blurred. Here, learning is inherently intertwined with political decision making and knowledge itself is contested, diverse, and often tacit and embedded in networks. In the politicised model, policy learning also takes place in a centralised, hierarchical setting which is, in addition, highly personalised. Learning is dominated by political calculation and is ridden with conflict and confusion. Knowledge is diverse and contested on ideological and political grounds. These models are revisited in chapter three of this paper where they are linked to governance models.

Raffe and Spurs (2007) suggest that policy making in the English secondary education and training system is dominated by the politicised model. This is manifested in prioritising political (ideology bound) knowledge over academic and practitioner knowledge, constraining bottom-up innovation and aiming at greater control over education research. This has taken place in spite of the strong rhetorical emphasis on professional policy making and evidence. The dominance of political learning has subordinated the two other forms of learning and has resulted in drawing superficial lessons, causing unintended negative outcomes (Lumby and Foskett, 2007). The overall empirical record of policy learning is not much more positive than that suggested by the English case or by what has been concluded regarding evidence-based policy making in other fields (Freeman, 2006; Radaelli, 2009).

A critical assessment of the usefulness of the policy learning literature for understanding the role knowledge plays in governance starts with highlighting the lack of consensus around the most basic elements of learning (who learns, from what, for what reason?) and the most generic learning mechanisms. This frequent lack of agreement concerning the underlying causal mechanisms or micro-mechanisms (Hedström and Swedberg, 1998) precludes attempts to unify or harmonise them. For example, some researchers like Claudio Radaelli (*e.g.* Radaelli, 2000) make extensive use of institutional isomorphism (*i.e.* coercive, mimetic, and normative isomorphism) as a main causal mechanism (DiMaggio and Powell, 1983) even though their individual level foundations are unclear. Whereas others such as Richard Rose (*e.g.* Rose, 1993) strictly remain within the realm of rational processes. Furthermore, different researchers emphasise individual or group processes as the main driving factors of policy learning.

Hence, determining what role knowledge plays in governance is not possible in a clear and straightforward way. Furthermore, many models of policy learning lack an explicit reference to power and interests which can make an essential impact on learning and preference formation (Fazekas, 2010; Hochschild, 2006). Finally, the empirical study of policy learning is problematic in many respects, and the applied methods are often incapable to decide between competing models and hypotheses (James and Lodge, 2003; Radaelli, 2009).

The above individual level accounts often discuss group and organisation-level policy learning as an integral part of their analytical model; thus, sometimes the individual level and the **group level** scholarship cannot be clearly separated. Subsequently, we focus on those theories which emphasise group-level interaction and the role of policy beliefs in group formation. Nevertheless, it must be noted that beliefs are generally taken for granted, and there is little academic knowledge regarding how beliefs are formed, changed or preserved (J. L. Campbell, 2002).[12]

Policy beliefs, paradigms or worldviews as specific forms of knowledge are powerful mediums of governance. They not only define policy subsystems, groups of policy makers such as advocacy coalitions, issue networks, or epistemic communities, they also limit the range of alternatives and types of knowledge that policy makers are willing to consider (Campbell, 2002; Sabatier, 1988; Sabatier and Weibe, 2007). Beliefs, paradigms and worldviews are used interchangeably and generally refer to cognitive paradigms, notions of validity, taken-for-granted descriptions, cause-effect relationships and normative ideas about the policy field (Haas, 1992; Hall, 1993; Heclo, 1974; Sabatier and Weibe, 2007). Most importantly, policy beliefs are "sticky" and subject to tradition, context and experience, implying persistent differences among countries and historical periods (J. L. Campbell, 2002). In addition, new beliefs and intellectual traditions gain ground by reframing previous ideas and relating themselves to their predecessors which creates a distinct process of partially overlapping intellectual traditions (Frickel and Gross, 2005).

Beliefs of policy makers typically limit the choice set from which policy problems and options are generated. They also make some types of knowledge invalid and provide a cognitive frame within which new knowledge is interpreted, *i.e.* beliefs guide policy learning. Considering beliefs in policy making reveals that policy makers may act according to the logic of appropriateness rather than consequentiality

(March and Olsen, 1989) and beliefs may even override policy makers' own self-interest (Fazekas, 2010; Quirk, 1990).

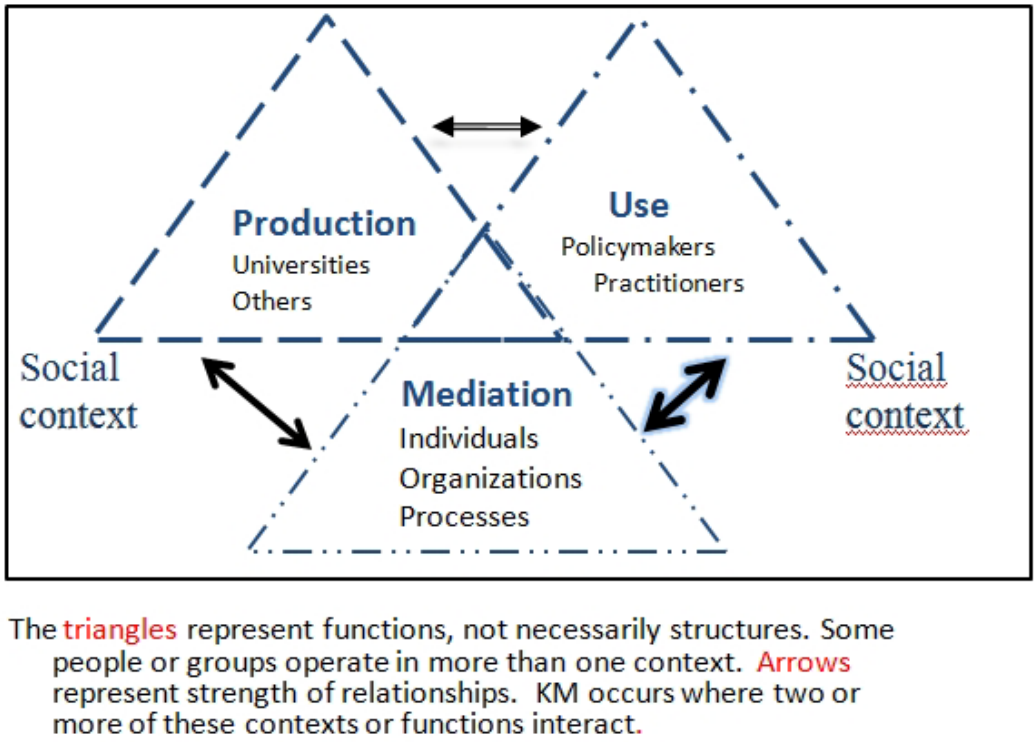
Beliefs often form the basis for group and network formation and can thus modify how governance is conducted. This has been articulated most notably in scholarship on advocacy coalitions (Sabatier, 1988; Sabatier and Weibe, 2007), issue networks (Heclo, 1974) and epistemic communities (Dunlop, 2009; Haas, 1992). These examples of policy communities and their numerous versions are characterised by different degrees of cohesion and closeness, which is in direct correspondence with how, to what degree, and which beliefs are shared. On this scale, issue networks lie closer to the loosely defined and less closed extreme while epistemic communities are closer to the more closely defined and exclusive end (Pierre and Peters, 2005). While the theoretical frameworks relying on one or the other version of policy communities are useful analytical tools for researchers, these communities often play a crucial role in the international diffusion of ideas (*e.g.* Haas 1992) and policy change (Sabatier and Weibe, 2007).

Governance of knowledge

Knowledge is a crucial resource in the governance of education systems as well as in the economy and society as a whole (*i.e.* the knowledge economy and knowledge society) (Sörlin and Vessuri, 2007). Thus it is not surprising that specific governance arrangements are developed and implemented in OECD countries in order to have an impact on knowledge production, dissemination and utilisation.

Models of knowledge mobilisation, knowledge translation, and knowledge to action all have different foci, but they increasingly see effective knowledge utilisation depending on three groups of actors: knowledge producers, knowledge mediators, and knowledge users (Best and Holmes, 2010; Levin, 2011; Oborn *et al*., 2010). These three actor groups are overlapping and individuals can be in more than one group at any given time, nevertheless, the categories are present in most governance systems and each category plays a discretely different role. A knowledge mobilisation model developed by Ben Levin, for example, sets this out clearly (Levin, 2011):

Figure 2.1. Model of research knowledge mobilisation



Source: Levin, 2011, p. 17.

Governance of knowledge can influence these groups of actors and their actions. Following the model above, governance's impact on knowledge is divided into three parts, which reflect distinct strands of the literature:

- governance of knowledge production
- governance of knowledge mediation (dissemination, translation, etc.)
- governance of knowledge utilisation and use

Before proceeding to detailed discussions of each, it must be noted that the distinction between knowledge producers, mediators and users relies on a particular commodified understanding of knowledge. If one takes a situated and embedded understanding of knowledge, then the distinction becomes problematic, even obsolete. Similarly, the collaborative view on knowledge translation combines these functions into one unit containing a dense network or interrelationships (Best and Holmes, 2010). As already mentioned, the same individuals can also be in more than one category or role increasing the number of potential ways in which the three categories can be intertwined. While maintaining this three-way categorisation, the following discussion can also be interpreted holistically within the various cross-overs among and between the three categories.

Governance of knowledge production

Governing knowledge production entails two simultaneous activities in which governments typically engage:

- facilitating knowledge production either by non-state actors or through collaboration between state and non-state actors, and
- direct production of knowledge by the state.

In the context of this review (and focus on policy relevant knowledge), the facilitation of knowledge creation and its direct production focuses on institutionalised forms of knowledge production (*e.g.* universities, research institutes, think tanks) (Kogan, 2007). Discussions about the **facilitation of knowledge production** frequently sit within a broader field of science and technology policies (*e.g.* OECD, 2010) and are also touched upon by research on tertiary education and their role in producing research (Santiago, Tremblay, Basri and Arnal, 2008). Nevertheless, the most relevant literature is the knowledge governance literature, which approaches the issues either from a management or a political science perspective (Davies, Laycock, Nutley *et al*., 2000a; Foss and Michailova, 2009; Sörlin and Vessuri, 2007).

The key question underlying this scholarship is how public actors can steer research (*e.g.* defining go and no-go areas of research) and how the quality as well as the "quantity" of research can be enhanced. These questions are far from obvious, as the state and main research producing institutions are generally separated and, thus, issues of control and governance arise (Fuller, 2000; Stehr, 2004). As the production and use of knowledge in governing the economy and society becomes more and more important, these issues will continue to pose challenges for OECD member countries (see *e.g.* the previous example of government efforts within the English education and training system to use the research agenda to serve its own goals and wield power and legitimacy through research (Raffe and Spours, 2007).

There is a range of policy instruments in the hands of policy makers to steer research production. Traditionally this has involved grants and grant making (*e.g.* sponsorship) and modification of the institutional setting of main research centres such as universities (Kogan, 2007). As knowledge and research evidence in education has become more of a commodity, the market of research producers and users has expanded accordingly. Government levers to steer education research production now typically target major independent research producers such as think tanks, independent research consortiums, and even some brokerage agencies (OECD/CERI, 2007). In addition to targeting independent research providers, governments can also sponsor research arms of ministries and other government affiliated centres that have more independence than ministries but less than independent research centres (in fact, government affiliated research centres lie at the boundary between direct state knowledge production and facilitation of knowledge production).

Providing funding and support is one of the most common steering mechanisms. External funding generally involves stronger or weaker restrictions on research questions and objectives, methods of enquiry and publication and dissemination. Sponsorship is typically embedded in varying institutional settings ranging from (1) the autonomous model where researchers can determine all major aspects of scientific enquiry, (2) the partnership model where academics and funders define the elements and boundaries of the research jointly, and (3) the managed model where the important characteristics of the research project are defined by the funder, either public or private (Kogan, 2007). The further one gets from the autonomous model, the more questions are posed regarding the impartiality and objectivity of the research and interpretation of results.

A clear area of tension lies in the different timescales of knowledge production (*i.e.* research) and governance and policy-making: while researchers take years to thoroughly investigate a particular question, governments are looking for immediate answers to practical policy questions. As a result, governments that are sophisticated users of research are increasingly funding and fielding calls for tender that provide rapid responses to their most pressing questions. The rise in the number of governmental research organisations and governmental organisations which engage in research is also part of this

process. This codetermination and management of research projects can be and is often used as a policy lever – but it does raise the worry that the desired answer is provided with the question and the funding is used as a lever to "cherry pick" those research results which support the desired position. Thus as setting funding and priorities to better tie research to policy has become more popular for many OECD governments, thorny questions have arisen regarding the independence, impartiality and objectivity of scientific research especially under the managed model (Henkel, 2000; Henkel, Hanney, Vaux *et al*., 2000). From both a practical and academic perspective it is an open question where the ultimate control of knowledge production should lie and to what mix of self-regulation and external control scientific communities should be subjected (Fuller, 2000; Stehr, 2004).

Science (including social science) has become more politicised in the last half century. This is partially due to an increased demand for accountability and the use of research evidence in policy making (OECD/CERI, 2007), and also partially due to a growing public awareness that research cannot always be taken at face value unless it is from a trusted source (see, for example, the cautionary tale of big tobacco in the US). From a government perspective, this has resulted in more emphasis being placed on how to improve the policy relevance and responsiveness of research, thus also blurring the institutional divisions between state and research (Fried, 2008). The results of this intense reform and research effort going into improving the connection between evidence and policy as well as practice were discussed above.

The literature on the **direct production of knowledge** by the central public administration or other governmental organisations such as statistical offices or oversight committees is sporadic and lies within various disciplines. Since a coherent body of literature on which we could base our treatises does not yet exist, three salient issues are discussed briefly in order to provide a flavour of the area and facilitate further thinking. These are:

1. *Quantification and official provision of statistical data* as discussed in the sociology of knowledge: It is firmly identified that data collection, analysis and dissemination are an effective means by which governments transform public dialogue, increase control over policy areas and eventually wield more power and extend their authority (Porter, 1995). The reliance on "hard evidence" lends legitimacy to public action and potentially increases trust, an example of which can be seen in treatment of educationally impaired children in the United Kingdom (Kogan, 2007). Nevertheless, lack of data or limited public access to data can also lend more power to the authorities in that they can rely on their own expertise instead of objective data (Bajomi *et al.*, 2010; Clarke, 2006).

2. *Performance measurement and target setting* within the public domain as discussed in the (new) public management literature: Performance measurement and management is often implemented from the centre of the government in order to increase control, bring about transparency and enhance the rationality of the policy process, either in actuality or rhetorically (Halligan, 2007; Hood, 2006b, 2007). However, these systems are often contested, gamed and reversed.

3. *Experimentation in policy implementation* such as pilots as discussed by the "what works" literature[13]: Experimentation and piloting are not used often enough although many countries have shown a considerable increase in both in the last decade (Davies, Nutley and Tilley, 2000b; Nutley, Walter and Davies, 2007, OECD, 2009). However, their use can give rise to practical and ethical issues in education.

Governance of knowledge mediation, dissemination, translation

As knowledge is a key resource of governance and since knowledge production is several steps removed from knowledge utilisation, a range of governance structures have been developed to aid in

knowledge dissemination, translation and, ultimately, utilisation.[14] These structures have been subject to intense enquiry, most notably by students of knowledge management and organisational learning in private and public organisations (Common, 2004; Dierkes, Antal, Child *et al*., 2003), knowledge translation (Best and Holmes, 2010), policy learning (Willem and Buelens, 2007) and governance research done within the OECD (OECD, 2001; Saussois, 2003; Scott, 2003).

In this perspective, knowledge is a resource that resides with the actors of governance, especially within the state, but which is at least partially hidden and thus must be realised through active knowledge management (Saussois, 2003). This is imperative to increase the policy making capacity of governments (Pierre and Peters, 2005) and to avoid policy failure (Howlett, 2009).

There is a wide range of learning tools, *i.e.* policy measures, for promoting dissemination and translation of knowledge in governing: (1) routines that enable personnel movement, (2) training, (3) observation, (4) publications, (5) interactions with customers and suppliers, and (6) inter-organisational alliances (Oborn, Barrett and Racko, 2010). These map roughly on to the three broad categories outlined as important to mediation in the Levin (2011) model: individuals, organisations, and processes. In a similar vein, Walter, Nutley and Davies (2003) have categorised interventions that facilitate research use in policy and practice according to intervention form and content and the intervention's underpinning mechanism.

Strategies for knowledge mediation on the level of the individual include personnel movement, training, and interactions with other stakeholders as outlined above. Individual commitment and the willingness to champion the process is also important (OECD, 2009). Although key to the success of any knowledge mediation strategy, an overly heavy reliance on the individual contains an inherent weakness: once a particular individual has moved on, much of the knowledge and individual abilities for mediation go with him or her. Interventions focused at the individual level are thus vulnerable to organisational change and personnel mobility. However this limitation should not be taken as a reason for not pursuing these valuable and important strategies.

The organisational and process levels, then, are the levels at which the greatest sustained impact and leverage can be obtained. Key organisational characteristics associated with effective knowledge sharing are high levels of trust among staff, absence of power games, and appropriate incentives (Willem and Buelens, 2007). Innovation aimed at improving knowledge dissemination can also tackle inter-organisational knowledge sharing: for example, organisations expressly created as knowledge mediators include brokerage agencies (OECD/CERI (2007)), which aim explicitly to improve knowledge transfer and mediation in areas such as education, social justice, or health care. It should be noted that these agencies may also take part in knowledge production (*e.g.* delivering systematic reviews, for example the EPPI-Centre and CUREE in the United Kingdom, and the now defunct Canada Council on Learning). Websites, newsletters, and other forms of interaction are key parts of the process and can be very effective mediation tools if they connect with the right stakeholders.

In spite of the growing popularity of knowledge mediation and an enormous increase in the processes and organisations dedicated to this, there is little empirical record of the effectiveness and impact of knowledge mediation efforts. A number of case studies, including work from the OECD, indicate that there is room for great improvement on all levels of dissemination and translation, and especially in research on these topics (Levin, 2011; OECD, 2009). One of the key difficulties is that the effects under study are highly likely to be indirect and context-dependent by nature, which makes them more difficult to analyse and measure. Other important limitations to this field of study include the reliance on self-report in absence of rigorous referencing and the limited generalisability of case studies. Individual reports on behaviour may be more or less accurate, if one is answering very specific questions. However, educational policy making is a highly complex process, one that is influenced by societal conventions and expectations, some of which may make self-reporting unreliable. Although difficult to study, this is an exciting new area of

research that is as necessary as it is promising. Levin (2011) provides an interesting overview of the work in this area as well as some suggestions for overcoming some of the challenges mentioned above. Potential lessons emerge from impact studies of science funding employing methodologies and of tracking forward or backward (ESRC, 2009, 2011).

Governance of knowledge utilisation

While the limited research on knowledge utilisation is often incomplete, there is a wide range of tools and policy measures for promoting the use of research in governance. Indeed "evidence-based policy", once a peripheral idea on the policy making agenda, has become a significant argument. In times of economic distress there is even more pressure placed on ensuring the effectiveness of educational expenditure, as a major component of public expenditure generally. In this climate, it has become almost impossible to propose radical educational change in many OECD countries without basing it on some kind of research evidence even though this evidence is incomplete and contested.

The clearest and most wide-sweeping attempt to mandate the use of knowledge is provided by the No Child Left Behind Act of 2001 in the United States. Centred on improving school performance through increasing accountability, the Act requires schools to rely on research for developing programmes and teaching methods, and specifically restricts funding for educational reform to programmes that have proven effectiveness based on "scientifically based studies and evaluations of education reform strategies and innovations" ("No Child Left Behind Act of 2001," 2001). In this context, "scientifically based studies" by and large translate into studies using experimental methodology, and preferably randomised control trials. The efficacy of this approach is under discussion and criticism has been levied regarding unintended negative outcomes (*e.g.* teaching to the tests and a general lowering of standards to ensure that schools and teachers are considered to be succeeding), but this is clearly a dramatic example of the governance of knowledge utilisation.

For most OECD countries, it has become clear that *promoting* the use of evidence in policy making is not the same thing as *ensuring* its use. A number of realities intrude, including the limited time and capacity of policy makers, the need to build on consensus and incorporate public opinion, and the interaction among different forms of knowledge when determining the best course of action (OECD, 2009). Limitations to the possible topics and scope of change due to the prevailing status quo are accompanied by limitations in the process of using knowledge itself. The distinction above between individuals, organisations and processes is an interesting way to analyse this issue. For example, one intriguing area of study is complex governance structures' capacity to analyse and learn, *i.e.* not only within central government but also across other institutional actors, such as schools, health care practitioner agencies and corporations (Borrás, 2011; Davies, Laycock, *et al*., 2000; Fazekas, 2010; Howlett, 2009). These works typically look at knowledge production and mediation. Making learning happen in organisations is also a long-standing topic in management studies (i.e. organisational learning and knowledge management). In this domain one of the key foci is putting processes in place which assure that knowledge is generated, shared, and implemented (Dierkes *et al*., 2003, part VII).

On an individual level, policy makers' analytical capacity is likely to be one of the main drivers of low levels of research utilisation even in countries characterised by high overall quality of policy making (Davies, Laycock *et al.*, 2000; Howlett, 2009). In a high-pressure and time-pressed environment, it is a rare policy-maker who has the capacity to access and interpret the relevant research at the precise moment it is needed; hence, organisational processes become crucial. The analytical capacity of organisations to use complex and multiple sources of information is likely influenced by institutional culture and the importance given to using research (including the role of media) (OECD/CERI, 2007). For example, if there is an individual and organisational requirement or organisational norm that research knowledge is used during decision-making and implementation, and if access and capacity are sufficient in the

organisation, there is a much higher likelihood that it will be used. However these capacities and requirements are very rarely built into governance systems, and are often the first elements of the process to be skipped when under time or budgetary pressure (OECD, 2009).

Indeed a cynical take on the process is, unfortunately, not unknown: policy is formed, and then, with the expectation that it be based on research evidence, staff are tasked with finding the evidence that will support the already-developed policy. Although clearly subverting both the letter and spirit of the process, this behaviour makes clear that there are actually two discrete issues under discussion in this section: 1) the use of policy knowledge in policy-making; and 2) the *appropriate* use of policy knowledge.

There is a relatively weak knowledge base on research use and uptake (by schools, individuals, and researchers but not policy makers) indicates that there is a relatively weak knowledge base on this topic. Additionally, and as mentioned in the previous section, there are methodological limitations involved in studying the use of knowledge in that much of the process relies on self-report, and many of the effects are indirect and thus hard to measure. Certainly if the knowledge that is used has been gathered after the fact and with an eye to a desired outcome, there will be a strong bias against reporting this accurately. Levin (2011) suggests that the empirical work in this relatively new field of study can be improved by a few rather simple measures, including focusing on organisational processes, structures and contexts rather than individual attitudes or actions and gathering data on specific behaviours and practices rather than on generalised attitudes, including if possible, multiple sources of information (triangulation).

3. Putting the pieces together: Towards an analytical model

This review has shown that knowledge is crucial for governance and that governance is indispensible for knowledge creation and dissemination. As complexity in education systems continues to increase, governance systems' capacity to learn becomes more and more crucial. Most institutions involved in education policy have become knowledge-intensive organisations whose success depends most critically on their ability to learn.

There is work to be done on the interactions between governance and knowledge production, mediation and use, however. Conceptually, governance and knowledge partially overlap and mutually constitute each other; nevertheless they are analytically distinct concepts. At times, they appear to blend into each other; for example when knowledge is used to regulate education quasi-markets. Other times, they are clearly separate; for example when research is produced outside the government and informs it only indirectly. Simultaneously, knowledge can be powerful and influential on its own; that is, there are times when new knowledge itself enforces change on policy makers and how they think about reality (Hall, 1993; Heclo, 1974). However, much more frequently, knowledge and ideas follow from interests and power relations (Radaelli, 2004).

Interactions between knowledge and power/interests/beliefs appear to be at the heart of governance. The definition of interests follows from what policy makers know and believe (J. L. Campbell, 2002; Hochschild, 2006). On the other hand, power and interests often determine the form, content and codification of knowledge through, for example, their influence on research funding and formal institutions of knowledge creation (Gordon, 1977). Government power can be strengthened by knowledge, especially its codified and trusted forms (*e.g.* natural sciences), but this effect varies by salience of the policy field, nature of the subject field, forms of knowledge and the perceived rationality and authority of knowledge (Kogan, 2007). In many domains including education, there is little reliable research done that considers the interaction between knowledge and interests.

While there are very few common, core findings of the reviewed literature, it is possible to identify distinctive ways of interaction between characteristics of the policy process and types of knowledge.

Distinctive policy processes tend to go along with specific types of knowledge: for example, the politics of agenda setting brings public knowledge (as represented by the media) to the fore compared to other types of knowledge (see *e.g.* Kingdon, 2010, for an example from the United States). In the next section, we focus on these interactions in order to construct an analytical model of the interplay between governance and knowledge by way of concluding the literature review.

The analytical model

As mentioned above, different models of policy making tend to go hand in hand with different types of knowledge and thus modes of learning. Initial arguments on this point are offered, for example, by Raffe and Spurs (2007) or Nutley and Webb (2000). Generally speaking, most of these models specify one or a few types of knowledge (*e.g.* scientific-rational knowledge) and concentrate on how and at what point this knowledge becomes influential in policy making and policy change. In most *rational* models of policy making, most notably in traditional models of the policy cycle, scientific knowledge – that is, codified, explicit and transferable knowledge – plays a central role (see earlier references to the "what works" movement). Here, knowledge is most important in defining alternative courses of action and appraising their likely consequences. In models which assume *boundedly rational* actors (*e.g.* Lindblom, 1959; Simon, 1957; 1997), the picture is rather different as heuristics, shortcuts and paradigms gain importance in guiding policy making. In yet another often referenced model, the *garbage can* model, problems and solutions are not assumed to follow in an orderly manner, but rather exist simultaneously and connect only when windows of opportunity arise (*e.g.* Cohen, March and Olsen, 1972; Pierre and Peters, 2005).

These are not only theoretical models of policy making and the use of knowledge, they are also models that are, at least partially, mirrored in real world policy-making situations. However, in order to understand how governance and knowledge interact, it is necessary to go one step further and consider empirically rooted models of governance, linking them to modes of learning and the knowledge types they centre around. Due to analytical complexities, divergent perspectives and the gaps in the relevant literature, this synthesising step is taken only by a few authors (Campbell and Pedersen, 2008).

The following section aims to go beyond partial and incomplete typologies by systematising some of the main findings in the literature. As a starting point we outline a small number of broad types of:

- models of governance; and
- modes of learning and types of knowledge.

We then explore the specific ways these broad types interact. As this is exploratory work the framework proposed below remains simplistic, serving primarily as a heuristic tool for generating new insights and research questions. Further empirical research would be necessary to improve and develop it, particularly in terms of specifying how micro, mezzo, and macro-levels could be linked.

Models of governance

The starting point is the widely accepted **models of governance** as outlined by Pierre and Peters (2005). The use of these models allows for the generation of hypotheses regarding the state's access to knowledge and its analytical capacity. The five models outlined by these authors "constitute a continuum ranging from the most dominated by the state and those in which the state plays the least role and indeed one in which there is argued to be governance without government" (Pierre and Peters, 2005, p. 11). The models, in brief, are:

1. *Étatist* – where the government is the principal actor in governance and can take action unilaterally as well as decide whether some actors are permitted to exert influence. The state usually relies on a strong and professional bureaucracy for formulating and implementing policies (Campbell and Pedersen, 2008).

2. *Liberal-democratic* – where the state still plays a preeminent role and can choose which of the intensely competing actors it will grant influence to in governance. This system often has a weaker permanent bureaucracy and prefers to rely on parliamentary institutions instead.

3. *State-centric* – where the state is still the most dominant actor, but it also establishes institutionalised relationships with several of the most powerful societal actors, such as business associations and trade unions. A close to ideal-typical example of this model is the neo-corporatist system (Schmitter and Streeck, 1999), which displays a high degree of consensual decision-making. Often, strong state bureaucracy supports governance and the institutionally incorporated actors also possess considerable permanent organisations.

4. *Dutch governance school* – where the state relies heavily on social networks to govern. Among the many actors who take part in and influence governance, the state is merely one of the actors and not even necessarily the most powerful. Typically, there is no strong permanent state bureaucracy present, and actors decide based on widespread consensus.

5. *Governance without government* – where societal actors are more powerful and carry more legitimacy than the state itself. In this model, the state merely provides an arena where other actors come together to decide and implement policies (Rhodes, Weller and Bakvis, 1997). Bureaucracy tends to be weak and to lack powerful analytical capabilities; in addition, consensus is often required for collective action since no single actor can authoritatively enforce its will on others.

Modes of learning and types of knowledge

The other dimension of interest is the **modes of learning** and the **types of knowledge** therein. While there is no single source which would constitute a widely accepted view, a small number of distinct models emerge from the literature on policy learning (for an overview see Dunlop and Radaelli, 2011; Freeman, 2006; Grin and Loeber, 2007). These models are distinct in the sense that they are conceptually separate and empirically identifiable; however, they can operate simultaneously and by no means constitute an exhaustive list of learning mechanisms and processes. The learning modes that are often employed in the literature and the underlying knowledge types are:

1. *Rational learning* concerns the dissemination and internationalisation of explicit, declarative, formalised and transferable knowledge, most notably scientific knowledge (Bennett and Howlett, 1992; Rogers, 1995; Rose, 1991). The learning process is not constrained to any particular group; however, those that benefit from it are mainly those who understand the formalised language of this type of knowledge.

2. *Collaborative learning* denotes learning that targets socially embedded knowledge, which is often tacit and procedural, and, thus, not readily transferable across contexts and accessible to outsiders (Raffe and Spours, 2007). This type of learning is often tied to policy and practitioner communities.

3. *Politicised or symbolic learning* concerns knowledge regarding actors' preferences, the policy making process itself, and ideas and symbols that mobilise political resources (Heclo, 1974; May,

1992). This learning mode is typically observed in actors who take part in a heavily politicised policy making process.

4. *Social learning* is about core beliefs and paradigms, which are typically resistant to change (Haas, 1992; Hall, 1993; Sabatier and Weibe, 2007). Core beliefs and paradigms are shared within policy communities and networks whose members acquire these knowledge types through socialisation.

The five governance models and the four learning modes can be combined in order to show how governance structures are generally systematically linked to modes of learning (see Table 3.1).

Table 3.1. Governance models and learning modes

	Learning models			
Governance **model**	Rational learning	Collaborative learning	Politicised/symbolic learning	Social learning
Étatist	High	Low	Low	Medium/Low
Liberal-democratic	High/Medium	Low	High	High
State-centric	Medium	Medium	Medium	Low
Dutch	Medium/Low	High	Medium/High	Medium/Low
Governance without government	Low	High	High	Medium/High

Note: Cells denote how conducive a particular governance model is to a certain mode of learning, and, conversely, the type of knowledge at available in certain governance models.

Table 3.1 maps out the various links and the conduciveness and availability of knowledge of each combination. The links are established through a few basic explanatory factors, which relate both to governance and knowledge by encompassing their essential characteristics based on the above discussions; most notably who takes part in policymaking, using what knowledge, and how decisions are made and implemented. These factors and mechanisms are the following:

1. Inclusiveness or openness of the governance structures determines the policy making centre's access to actors and their knowledge (Campbell and Pedersen, 2008) as well as the degree of political contestation which in turn has an impact on the readiness of actors to learn and revise prior views (Porter, 1995). The inclusiveness and openness of the knowledge base determines how informed decision-making is, but it may also decrease or increase the likelihood of conflict among knowledge forms and stakeholders.

2. The degree of consensus required for policy formulation and implementation has an impact on how knowledge is shared among public and private actors and how broad shared understandings need to be for policy change (Lijphart, 1991, 1999). Consensual decision-making structures or their absence are ingrained not only in institutions, but also in attitudes and behaviours of policy makers.

3. Characteristics of the permanent bureaucracy, most notably its analytical capacity, determine, at least in part, the amount and quality of knowledge available for policy makers and the speed with which new knowledge can be created or mobilised for solving new policy problems (Howlett, 2009). This also includes the capacity of administrations to mobilise the range of learning tools

necessary for informed decision-making, which can range from staff training to capacity to conduct experiments to support complex decisions. The quality of bureaucracy is often measured by how closely it reflects essential Weberian ideals – *i.e.* "weberianness" – which also plays a role in knowledge transfer within the public administration and the preparedness of public employees to analyse data (Dahlström, Lapuente and Teorell, 2010; Evans and Rauch, 1999). Conversely, the knowledge commanded by a bureaucracy also determines how powerful it is and how well it can preserve its position.

4. The availability of knowledge, most crucially statistical and analytical knowledge, is determined by its production and the infrastructure for dissemination that goes beyond the knowledge produced by the state itself (Best and Holmes, 2010; Furner and Supple, 2002; Rueschemeyer and Skocpol, 1996; D. Stone, 2004).

How does the model work?

In the following section the logic of the model is spelled out by discussing each of the four columns (*i.e.* learning modes) and how they interact with the models of governance. Examples from country experiences are provided to illustrate key points, but of course this section remains primarily theoretical and would benefit greatly from additional empirical research.

Rational learning is most prevalent at the *étatist* end of the spectrum in the state centric governance models, decreasing when moving towards society centric models. A strong state is likely to command formidable resources in terms of statistical data, analytical capacities and the capacity to fund scientific research catering to its needs (see Pierre and Peters, 2005, Chapter 2). In Korea, for example, the state is strong and centralised, and has been putting an increased explicit emphasis on the use of rational learning to support policy making in education. To this end, Korea funds extensive collection of statistical data, education research bodies and centres, and has explicit research capacity in its ministries. Increasing accountability and high pressure to continue to excel at national and international benchmarking programmes have combined to keep the focus and drive in this direction, sometimes at the expense of other forms of knowledge.

A very particularly education-based example comes from Switzerland, which has a strong central government in many areas but not in education, which is the remit of the region (*canton*). The exception to this is the vocational education and training system (VET), which is run by the national level. For over a decade, the federal authorities have systematically and deliberately set out to increase the production, mediation, and use of rational learning modes and scientific evidence in particular (OECD, 2009). Mechanisms used include national dialogue and policy-making, support for research centres and knowledge dissemination, and funding for individual researchers, post docs, and graduate students to use empirical methodology to answer policy-relevant questions. This systemic and long-term strategy for building an explicit and empirical knowledge base in VET is rather different from the strategies and learning modes employed in other educational sectors, and is an interesting illustration of the interplay between governance model and knowledge type.

And lastly, the clearest and most wide sweeping attempt to mandate the use of rational learning modes is provided by the No Child Left Behind Act in the United States. As already discussed, the Act specifically restricts funding for educational reform to programmes that have proven effectiveness based on "scientifically based studies and evaluations of education reform strategies and innovations" ("No Child Left Behind Act of 2001," 2001). By mandating the use of rational learning modes, the producers of such knowledge gained power and prominence and overshadowed other forms of learning. However there is some question about how deep this shift in paradigm reaches. This will be discussed more thoroughly below.

Collaborative learning is strongest in the governance without government model, and it decreases as the state becomes more dominant. The main reason behind this tendency is that in more open forms of governance where power is shared, the embedded knowledge of societal actors is an important element in decision-making. As in most cases a broader set of actors result in a more varied set of knowledge types, there is unlikely to arise a single most dominant type of knowledge, rather *bricolage* and collective sense-making is dominant (Freeman, 2007; Heclo, 1974). Here, shared power is matched by shared and diverse knowledge base. A good example of this comes from the Nordic countries, which use consensus as a primary mechanism to derive policy in education. In Denmark, for example, collaborative learning, including the expertise of practitioners, unions, parent organisations, and the students themselves, is central to the policy making process. In two areas studied by the OECD (VET and the use of digital learning resources), the use of empirical research played a rather small role in policy development and implementation – rather, the focus was on collaborative learning and its accompanying knowledge types OECD 2009, 2010).

Politicised/symbolic learning is strongest in goverance models without a strong and permanent public bureaucracy, that is, in Dutch and "Governance without government" models. A strong public bureacracy tends to limit the politicised nature of policy making and facilitates technocratic discourse as career bureaucrats' are less responsive to political turnover and the rapid change of political agendas (Heclo, 1977; Maranto, 2005; Meyer-Sahling, 2008). Hence, *étatist* and state-centred models display low to medium levels of politicised/symbolic learning. On the other end of the spectrum, a marketplace for ideas and competition for the attention of the government typically facilitates politically inspired knowledge production and funding (*cf.* Campbell and Pedersen, 2008). For example, the United States is a widely recognised example where the state largely contracts out knowledge production and where partisan research institutes play a crucial role in the knowledge production landscape. This is met by the dominance of political appointees in public administration as opposed to career bureaucrats. All these taken together has led to a strong presence of politicised learning, and makes the introduction of the No Child Left Behind Act, with its focus on rational learning, an even more interesting turn of events.

Another interesting example is explored by Raffe and Spurs (2007), who suggest that policy making in the English secondary education and training system between 2003-07 was dominated by politicised/symbolic learning. As explained previously in this working paper, this was manifested in prioritising political (ideology bound) knowledge over academic and practitioner knowledge, constraining bottom-up innovation and aiming at greater control over education research. Most interestingly for our analysis, this took place in the context of a strong rhetorical emphasis on the use of research evidence and an official alignment with rational learning. This suggests that there is the potential for interaction among learning modes, and that inherent tensions between them might be used to build legitimacy. This will be explored more thoroughly below.

Social learning: The capacity of governance structures to allow for paradigm shifts varies greatly with the consensual nature of policy making. The prominence of a strong, permanent bureaucracy typically represents continuity in governance, and thus *étatist*, state-centric, and the Dutch governance school models are likely to display a higher degree of "stickiness" of policy core beliefs and paradigms. Deeply engrained beliefs and paradigms characteristically fend off knowledge that is incongruent with prevailing views, sometimes even in the face of explicit counter evidence. One intriguing example of the strength of social learning in most OECD countries is the continuing strong resistance to increasing class size, for example, despite scientific studies demonstrating that it is not as important to student achievement as was previously thought. Strongly held beliefs (especially those learned through social learning modes) are very resistant to change. Interestingly, in the case of class size, the resistance can be as prevalent in policy makers as it is in practitioners, and is generally observed across all models of governance.

Interactions among learning modes

As can be seen from the previous discussion, there is a potential contradiction or tension among different learning modes within the same governance model. This implies that the presence of some learning processes inhibit the advancement of others. For example, it is hard to conceive that the same country would be high on rational as well as politicised learning. The two learning processes are likely to block or constrain each other as the nature of accepted knowledge forms, modes of reasoning, and actor relations are opposing by nature.

For instance, in the example discussed above of the English decision making in secondary education between 2003-07, policy makers made extensive use of rational learning rhetoric while the dominant learning mode appeared to be politicised/symbolic learning (Raffe and Spurs, 2007). In this case study it appeared that a politicised or symbolic learning process was taking the form of rational learning to wield more legitimacy. The selective use of scientific evidence to support political agendas is of course in contradiction to basic notions of rational learning, but anecdotal evidence suggests that this would not be the first time this strategy was adopted (see, for example, the previous discussion on "cherry picking" those research results which support a desired position). In these cases, whether it is an explicit manipulation of the learning mode or rather an incomplete understanding of how rational learning and scientific evidence could be used remains unclear.

Similarly, rational and collaborative learning modes follow opposing patterns whereby the dominance of one makes the presence of the other one less likely. An example of this is the implementation of the No Child Left Behind Act of the United States. As already explained, the use of explicit declarative knowledge and in particular of quantitative scientific knowledge, was the cornerstone of the policy and process. This was *intended* to weaken the use of collaborative learning. As funding for programmes developed with collaborative learning was radically cut, there was a need to shift the rationale and basis for various proposed reforms from practitioner knowledge towards a more scientific and formalised learning mode. As a result, the arguments that are levied in the policymaking process and the symbols invoked by practitioners have thus changed to become more aligned with scientific and methodological discourse. However the true measure of whether the fundamental learning modes have actually been changed still remains to be seen.

These are just two examples of many. As OECD countries push to use more rational learning modes in education policy-making and practice, the ways in which the other learning modes and types of knowledge are accommodated (or displaced) will vary depending on context and of course governance type. The tensions and interplay between the links in the model are a fascinating area for future study.

Conclusion

The key question posed in this review was: *How do governance and knowledge mutually constitute and impact on each other in complex education systems*? As explained in the introduction, there is very little literature that bridges the work on governance and that on knowledge. Traditionally, different schools of academic and policy thinking have looked at various aspects of the relationship between governance and knowledge separately. Hence, this review was necessarily explorative, experimental and open-ended. We reviewed the literature in each of the domains across many sectors, including work from public management, political science and public policy, sociology, institutional economics, and organisational management (particularly the knowledge transfer literature). This was augmented with work from education and other social sciences, including healthcare, law, and social justice. The working paper ends with a discussion on how best to bridge the various literatures and possible next steps. As part of this, we proposed a model that brings together models of governance with modes of learning and types of knowledge.

Although it is clear that additional theoretical and empirical research is needed in order to fully answer the opening question, there is an urgent need to do so. Governments in all OECD countries are facing the challenge of governing increasingly complex education systems. There is a growing need for governance structures that can handle this complexity and which can provide actors with the knowledge they need to make decisions. In the context of diverse social, economic and political environments of OECD countries, the interaction between these two focal points – modes of governance and types of knowledge – has become increasingly relevant to researchers, policy makers and education stakeholders more generally.

NOTES

[1] Naturally, a book containing knowledge would be a private good.

[2] It is worth mentioning that our definition of knowledge does not attempt to incorporate a notion of truth or validity because the nature of knowledge drawn upon in policy making is often imprecise and incomplete (Clarke, 2006). On the other hand, it is frequently the case that robust and trustworthy scientific results are neglected over long periods of time.

[3] The issue of translation already arises when communities themselves assign meaning in different ways; the incommensurability of different understandings and worldviews between communities of practice is not necessarily the first instance of the need for translation.

[4] Any hierarchy of knowledge forms is implicitly normative as choosing among knowledge types implies a choice among the communities which produce and carry them; a claim based on the widely shared notion that knowledge overlaps in a number of ways with the various communities that created it (Head, 2008).

[5] Even though knowledge can be understood as institutional, as in "the rules of the game", this is not considered as part of the discussion in this essay because it constitutes a rather different take on the above issues and leads to a distinctly different body of academic literature from those explored here.

[6] Some of the latest contributions to the "what works" perspective move towards an examination of policy learning where not only the effectiveness of interventions is looked at but also the more complex and indirect ways through which research impacts on policy making and practice (*e.g.* forming worldviews).

[7] *www.archive.official-documents.co.uk/document/cm43/4310/4310.htm*.

[8] *www.cochrane.org/about-us*.

[9] www.campbellcollaboration.org/.

[10] In addition, it should be noted that the European literature also contains several references to the issue of soft regulation in the EU.

[11] This literature mainly uses the term information in a synonymous meaning to knowledge as defined in this review. For reasons of consistence with the referred literature the original term is used here.

[12] Probably one of the most notable exceptions to this statement is the concept of policy-oriented learning within the advocacy coalition framework (Sabatier, 1988; Sabatier and Weibe, 2007).

[13] It should be noted that, while pilots are typically carried out by governments, the analysis is frequently done by external research outlays, which brings this example closer to the facilitation of knowledge production rather than direct production.

[14] Once again, knowledge dissemination, translation and utilisation can be understood as creating new knowledge; thus it is possible to blur the distinction drawn between the sections dealing with knowledge's *direct* role in governance (p. 6) and knowledge's *indirect* role in governance (p. 9).

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