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Sabine Wollscheid, Bjørn Stensaker & Markus M. Bugge

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Evidence-Informed Policy and Practice in the Field of Education: The Dilemmas Related to Organizational Design

Sabine Wollscheid

Nordic Institute for Studies in Innovation, Research and Education (NIFU)

Bjørn Stensaker 

University of Oslo

Markus M. Bugge

Nordic Institute for Studies in Innovation, Research and Education (NIFU)

Evidence-informed policy and practice has been a trend as part of an effort to increase the use of research to improve education at all levels. In many countries, knowledge-brokering initiatives were established to stimulate links between research, policy, and practice. Drawing on a mapping of initiatives in seven countries, this article describes different organizational designs, and discusses potential dilemmas these might imply for the realization of these organizations' roles. Given different interests involved, the article shows that organizational design is crucial for enhancing legitimacy. Findings indicate a trend toward locating the knowledge-brokering function in a combined policy–science logic.

INTRODUCTION

Throughout the last few decades, there has been an exponential growth in scientific output. Since 2000, the total amount of scientific articles has increased by 65% (Thomson Reuters/CWTS Web of Science). Three implications of this development are: first, ever greater difficulties in staying updated; second, the existence of contrasting scientific accounts that may threaten the legitimacy of science (Sarewitz, 2016); and third, an increasing specialization in different scientific disciplines that leads to fragmentation in knowledge production in terms of a rising gap between disciplines and subdisciplines (Howells, 2012).

Address correspondence to Sabine Wollscheid, Nordic Institute for Studies in Innovation, Research and Education (NIFU), P.O. Box 2815 Tøyen, N-0608, Oslo, Norway. E-mail: sabine.wollscheid@nifu.no

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Together these trends have created an increasing need to provide a continuous overview of the vast amounts of knowledge generated. In many countries, these concerns have led to the creation of special agencies or clearinghouses given the task to act as knowledge broker by translating research-based evidence into policy and practice (e.g., Adelle, 2015; Kislov, Wilson, & Boaden, 2017; Moore, Redman, D'Este, Makkar, & Turner, 2017). So far, knowledge brokering has become a significant activity in medicine and health, transport, and social welfare (Burns & Schuller, 2007; Moore et al., 2017). However, in the last few decades, such initiatives, that is, knowledge brokers or knowledge-brokering initiatives, have also been established in education (e.g., Cooper, Levin, & Campbell, 2009), and national initiatives to establish a knowledge-brokering function have been taken place in several European countries including the United Kingdom, the Netherlands, and Scandinavian countries, in addition to Canada and New Zealand.

This development reflects an increased political interest in education. Stimulated by international tests such as Program for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS), more attention has been given to the identification and spread of best practices. However, as politicians have become increasingly aware of the challenges of introducing new ideas into a sector often characterized by strong professional norms and values and highly institutionalized practices, more attention has also been directed to how best practices can be disseminated and upscaled (Ward, House, & Hamer, 2009). Accordingly, current knowledge-brokering initiatives tend to incorporate this broader understanding of the brokering function as identifying not only the best/available evidence-informed knowledge (Nelson & Campbell, 2017) but also how to assist in the dissemination to both the policy and the practice field (e.g., Bornbaum, Kornas, Peirson, & Rosella, 2015; Schlierf & Meyer, 2013).

The knowledge-brokering function can be understood as “evidence mediation” (Tripney, Kenny, & Gough, 2014, p. 61), forming a bridge between the domains of knowledge, policy, and practice (Ward et al., 2009). It is intended to ensure the development of a sound knowledge base by summarizing, visualizing, and making existing knowledge accessible to its potential users in science, policy, and the practice field (see also Meyer, 2010). In some cases, it also comprises a proactive role in terms of ensuring that this knowledge is applied and used in appropriate ways. The knowledge-brokering function may also play an important role in identifying knowledge needs in both policy and the practice field, and in initiating new research. In this sense, the knowledge-brokering function may arrange for feedback loops across the three fields of knowledge production, policy formulation, and practice, thus creating a dynamic and learning knowledge system.

Internationally, there is a growing literature on the nature and role of knowledge brokers in different sectors of society (Adelle, 2015; Bornbaum et al., 2015; Michaels, 2009; Reinecke, 2015). Not least, it is possible to identify a couple of contributions addressing the methodological basis for knowledge brokering and the validity of the outcome related to this activity, and how concepts such as evidence and evidence-informed practice should be defined and understood (e.g., Burns & Schuller, 2007; Nelson & Campbell, 2017). There is also a discussion on what role and what type of activity a knowledge broker should be

engaged in to foster better links between research, policy, and practice (e.g., Kislov et al., 2017; Tripney et al., 2014; Ward et al., 2009).

Less attention has been given to the organizational embeddedness and the organizational links between knowledge brokers and the many stakeholders with which they are supposed to interact, including the specific challenges knowledge brokers can face (Kislov et al., 2017). In one of the few attempts to investigate the knowledge-brokering field from an organizational perspective, Lenihan (2013) found a high degree of diversity in the social policy area as to how the knowledge-brokering function is organized in different countries. He distinguishes between six different types of knowledge-brokering initiatives or organizations: networks; research institutes; corporate groups; foundations; (inter)government bodies; and hybrids and partnerships.

A similar result was found in another study of knowledge brokers within the labor and welfare policy domain, emphasizing how different ways of organizing the knowledge-brokering function in various countries reflect national characteristics and institutional settings (Bugge et al., 2013)..

For the field of education, Tripney et al. (2014) developed a typology of 27 activities and nine underpinning mechanisms to improve the use of research in different parts of the “production-to-use system,” categorized as “pushing,” “pulling,” and “mediating” research evidence. Using survey data and other resources, they show that most activities aim to improve the use of research-informed evidence by making the process of producing research more efficient and thus can be categorized as “push activities.” Further, among the nine undermining mechanisms, knowledge brokers are described as initiatives “promoting interaction and collaboration between researchers and end users.”

These findings are interesting for the knowledge broker field in general, a field that often has the identification and promotion of best, or at least relevant, practice as one of its core ambitions. This diversity is, in many ways, a paradox, as it might suggest that there is no “best way” to organize the knowledge-brokering function. To our knowledge, research upon issues of organizational design associated with knowledge brokers is limited, with few exceptions, mostly in fields other than education.

Exploring the “dark side of knowledge brokering” in the field of health care, Kislov et al. (2017) argue that knowledge brokering is a multidimensional process including the use of various types of knowledge and skills that needs to be sustained over time. Thus, to maximize the impact of research on policy and practice, they argue for a collective process of “brokering” supported at the organizational and policy level. The objective of the present article is to contribute to such an agenda by improving our understanding of the organizational underpinnings of the knowledge-brokering function.

Through a systematic mapping and analysis of the organizational designs associated with knowledge brokering in the field of education, this article addresses this issue through the following research questions: (a) What are the current trends in how knowledge brokering is organized in the educational area? (b) What are the key dilemmas involved with respect to the organization of the knowledge-brokering function in the educational area? (c) What are possible implications of existing organizational designs on the knowledge-brokering function?

The article is organized as follows: In the second section, we outline a theoretical framework illustrating the potential dilemmas of different organizational designs in the knowledge-brokering area. We suggest that different institutional logics may be linked to the different functions of knowledge brokering, and that organizational design is a key way to balance these functions. The third section outlines the data collection and methods applied. In the fourth section, we proceed by mapping and analyzing existing knowledge-brokering designs in the educational area in a sample of Organization for Economic Cooperation and Development (OECD) countries. Based on these findings, the fifth section concludes by discussing the potential implications of different organizational designs.

THE ORGANIZATIONAL CHALLENGES OF KNOWLEDGE BROKERING

The fields of policy, science, and practice have different organizational characteristics, societal purposes and norms, and values systems that are known to be rather powerful and influential (Merton, 1973). As such, they can be seen as fields that are both producing and are themselves embedded in certain institutional logics—where organizational structures, historical patterns of cultural symbols, and material practices come together in ways that distinguish them from each other (Thornton, Ocasio, & Lounsbury, 2012) (see also Table 1).

The different institutional logics involved in knowledge brokering

In the policy area, knowledge can be said to have taken on a more visible role due to the rise of the so-called evidence agenda, which, in principle, could be understood as a kind of rationalization of the policymaking process (Burns & Schuller, 2007).

Although it is quite easy to link the emergence of knowledge brokering, as part of the interaction between science and society, to the evidence agenda, it can still be questioned to what extent policymaking has been heavily influenced by such rationalization attempts. As Hood (2007) has underlined, policymaking can be said to have its own logic strongly influenced by its inherent cultural characteristics of interest negotiation, timing, the matching between knowledge and current political issues, and the symbolic importance of making policies attractive to the larger audience. Faced with the latest developments toward post-truth in politics (e.g., Rider & Peters, 2018), one could also argue that power/knowledge problems become more pressing than ever before, underlying the important role of systematic reviews and knowledge-brokering initiatives.

TABLE 1
Key Knowledge Characteristics According to a Policy, a Science, and a Practice Logic

<i>Institutional logics inherent in knowledge brokering</i>	<i>Policy</i>	<i>Science</i>	<i>Practice</i>
In each area, knowledge is expected to be ...	Timely Negotiable Attractive Legitimizing	Valid Critically tested Ethically sound Specialized	Applicable Solving problems In accordance with professional standards and norms Interdisciplinary

In science, knowledge is often perceived differently than in policy. Merton (1973) has suggested that the field of science—despite huge disciplinary differences—is embedded in a distinct logic with its own norms, values, and cultural characteristics affecting the production of knowledge. The foundation of the evidence movement and the modern “actionable science” can still be said to draw on the assumption that science should be valid, if critically tested, and that the knowledge production process is guided by ethical principles (Palmer, 2012). The growth in scientific production throughout the last decade has caused science to generate contrasting findings (e.g., due to different specialized research objectives and research methodologies), which thus challenges the desired role of science in terms of providing evidence (Sarewitz, 2016).

Furthermore, the so-called Mode 2 paradigm of knowledge production has grown in importance, where knowledge is viewed as application-oriented, socially distributed, transdisciplinary, and subject to multiple uses (Nowotny, Scott, & Gibbons, 2003). A renewed interest in the science–society relationship can also be observed through the raised expectations for documented societal impact from research (e.g., HEFCE, 2014; Martin, 2011). Not least, the knowledge production agenda emerges ever increasingly directly from actual societal needs. Throughout the last decade, research has been acknowledged as an important ingredient to meet pressing grand challenges such as climate change, migration, or demographic aging (Kuhlmann & Rip, 2014). Grand challenges are often seen as highly complex and intersectoral problems that require open-ended and interdisciplinary responses (Kuhlmann & Rip, 2014) through mission-oriented innovation (Kattel & Mazzucato, 2018; Mazzucato, 2018; Mowery, Nelson, & Martin, 2010) or responsible research and innovation (Owen, Macnaghten, & Stilgoe, 2012).

In sum, these developments add increasing complexity to our understanding of the institutional logics of science and constitute part of the explanation for the growth in knowledge-brokering functions in terms of a need for summarizing and synthesizing findings from different scientific fields.

The practice field contains a third kind of logic regarding the production and application of knowledge. As it is well established in the literature on knowledge brokering, knowledge transfer is hardly a matter of linearity but needs to take into account the specific demand and context in which the new knowledge may be relevant (Sarewitz, 2016; Turnhout, Stuver, Klostermann, Harms, & Leeuwis, 2013). While the problem-solving capacity and “actionable” characteristics of knowledge may indeed be important features for the field of practice (Van de Ven & Johnson, 2006), it is increasingly also recognized that established professional norms, standardized and institutionalized practices, procedures, and rules in a given field represent huge barriers to the introduction of new knowledge (Meyer & Kearnes, 2013).

The different logics identified are analytical constructs representing key ontological and epistemological characteristics of the knowledge-brokering process (Van de Ven & Johnson, 2006). At the same time, we also know that policy, science, and practice are fields that can manifest themselves in quite unique ways in different empirical settings, implying that the organizational setup of knowledge-brokering functions can have different functions: They can shield, reproduce, but also combine and mix different institutional logics.

Consequently, for knowledge brokers and knowledge intermediaries that have a formal mandate to work in between the fields of policy, science, and practice, a key challenge is to enable these different fields to engage in the cross-cutting knowledge construction and application activities. Research focusing on this issue has devoted considerable attention to the various strategies and repertoires such knowledge brokers use to overcome the many barriers that may exist to enhance the knowledge exchange between these fields (Schlierf & Meyer, 2013; Turnhout et al., 2013; Van de Ven & Johnson, 2006). While such strategies and the accompanying repertoires may indeed be important, the current article takes a different perspective, and argues for the importance of understanding the organizational settings and linkages between knowledge brokers and the broader knowledge field they are meant to serve and operate within (Guston, 2001). This argument is based upon the recognition that actors in an existing field of knowledge should not be seen as neutral (Jasanoff, 1990), that there might be many vested interests in the outcome of knowledge-brokering processes (Burns & Schuller, 2007), and that involved actors, in various ways and manners, will try to influence the outcome of the knowledge production that takes place (Meyer & Kearnes, 2013).

Dilemmas in knowledge-brokering designs

The three institutional logics identified can be said to constitute inherent characteristics of the knowledge-brokering field. However, the different logics can also be said to feed into the current dynamics seen in this area, not least with respect to the kind of knowledge the knowledge-brokering function is expected to cover, what kind of methodological approaches are perceived as valid in the field, and how independent the knowledge-brokering process should be from the various stakeholders involved.

As there is no official and operational definition of the term “knowledge,” this term is often thought of as being synonymous with scientific knowledge. The OECD (2002) defines research and development (R&D) as creative work done systematically to increase the amount of knowledge, including knowledge of humanity, culture, and society, and the use of this stock of knowledge to devise new applications.

In general, R&D is divided into three subactivities (OECD, 2002): First, basic research is experimental or theoretical work primarily undertaken to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view; second, applied research is also the original investigation undertaken in order to acquire new knowledge. It is, however, primarily directed toward a specific practical aim or objective. Experimental development is systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products, or devices, to installing new processes, systems, and services, or to substantially improving those already produced or installed.

It is, nonetheless, obvious that the concept of knowledge also includes other forms of knowledge and information that do not fall under the definition of research and development. A key dimension in this respect is the distinction between quantitative/measurable knowledge and qualitative/nonmeasurable knowledge. When knowledge is systematized, it has been

common to emphasize quantitative and measurable studies. However, qualitative knowledge can often complement the picture and provide a deeper and more nuanced understanding of the issue under investigation.

In addition to research-based knowledge, experience and practical knowledge may be useful correctives when it comes to assessing the practical feasibility of policies and measures (Cooper et al., 2009). Part of this knowledge is called tacit knowledge, which is often embodied and primarily expressed in concrete actions. There is also a growing awareness that published scientific papers do not necessarily represent reality in a balanced manner. Increased publishing pressure within science can, for example, provide an inclination to publish positive findings. Practice- and experience-based knowledge forms can therefore provide an important supplement to published scientific results (The Economist, 2013). To sum up, we can identify three dimensions that may be affected by the ways in which knowledge brokering is set up and organized.

Affiliation

The term “affiliation” refers to the degree to which the knowledge-brokering agent is operating independently from, or closely connected with, involved stakeholders and possible vested interests. This dimension thus addresses a need for balancing between arm’s length or being autonomous on the one hand, and balancing relevance or embeddedness on the other. Knowledge-brokering initiatives need to be up-to-date, familiar with the field they are meant to serve, and relevant to policymakers and practitioners. At the same time, they are expected not to involve any vested interests and are required to be independent, autonomous, reliable, and legitimate and to be able to challenge existing systems, instruments, and policies. The notion of autonomy and independence not only refers to research being performed independently from politics and recommendations, but also that research institutions should have the freedom and the space to be critical of the kinds of questions raised by research itself. This suggests that one should be cautious in linking knowledge-brokering functions too closely with politics and public administration. At the same time, independence may come at the cost of relevance to pressing societal concerns.

Knowledge breadth

To provide a complete overview of a given discipline and its scientific discoveries and state of the art, we need to possess in-depth knowledge and insights into this field. However, specialized and disciplinary concerns may come at the cost of covering a societal phenomenon that often tends to be interdisciplinary by nature. It is frequently necessary to meet the complex societal needs of knowledge from several disciplines. To mirror the complexity of societal dynamics and interconnectedness, it is important that the knowledge-brokering function is organized in a way that ensures a breadth in terms of inputs from various scientific disciplines. There can be several ways to arrange for such diversity, either by centralizing a knowledge broker to a larger center that can operate independent of specific disciplines and sector interests, or by maintaining a heterogeneous structure in which many actors contribute

to the development of knowledge from their respective fields. Therefore, balancing between specialization and breadth is a central concern, and may be affected by the organization of the knowledge-brokering function.

Methodological breadth

How a knowledge-brokering function is organized may also be important for what methods are applied in the synthesis of knowledge and research. While quantitative studies are best suited to answer whether something does, or does not, work, qualitative studies might be better suited to explaining why something works as it does (or does not). Qualitative studies therefore also play an important part of the overall knowledge base. Currently there is a trend toward including qualitative studies in systematic reviews (Noyes, Popay, Pearson, & Hannes, 2008).

An evaluation of the Section for Welfare Services at the Norwegian Knowledge Center for the Health Services explicitly pointed out that the location at the Knowledge Center offered both advantages and disadvantages (Brofoss, 2013). According to this evaluation, the knowledge broker can benefit significantly from the methodological expertise established in the center's work on health issues. Traditionally, knowledge brokers have mainly applied quantitative methods (e.g., meta-analysis) to synthesize research. While this tradition is often seen as resting on a methodological solid ground, MacLure (2005) has emphasized several problematic aspects of this approach. In the meantime, however, qualitative methods of synthesis have grown in importance (e.g., Saini & Shlonsky, 2012), in particular in the field of education. To gain an overview that encompasses effects, causal relations, inner mechanisms, and more contextual aspects, we need a knowledge-brokering agent to apply both qualitative and quantitative methods, thus ensuring methodological breadth. A strong methodological bias in either direction may cause an inability for a knowledge-brokering function to see the full picture of a given societal phenomenon.

Summarizing the dilemmas of knowledge-brokering designs

The roles in the knowledge-brokering function can be arranged in different ways. Based on an earlier survey of different models of the knowledge-brokering function, Rambøll Management Consulting (2007) has identified alternative ways of organizing the knowledge-brokering function ranging from the establishment of independent clearing houses to more network-based forms of organizing. However, the key point to be made here is that the different ways to organize the knowledge-brokering function are likely to condition the balancing of the different institutional logics identified earlier, and the different dimensions concerning affiliation, knowledge breadth, and methodological breadth.

Organization, or ways of organizing, have, during the latest reform era, been a key tool for governments in accomplishing political objectives in different policy fields (Hood, 2007). A typical feature related to this development is the delegation of authority from governmental agencies to new intermediate and semiautonomous agencies, not least to ensure an arm's-length distance between expertise and decision making (Christensen & Laegreid, 2006).

However, depending on national characteristics, historical traditions, and the institutional landscape in a specific policy field, one can also find examples of how governments have allowed the functional expansion of the tasks within existing organizations, how existing organizations have actively co-opted new policy agendas, and how the opening up of the policymaking process to increased user input has contributed to transforming existing ways of organizing (Hood, 2007).

We argue that these generic insights from the field of public administration have considerable relevance to knowledge brokering in at least two ways: First, different institutional logics are difficult to balance in integrated organizational designs; second, organizational designs matter in respect to how knowledge brokering is operating and for how different dimensions concerning affiliation (autonomy/relevance), knowledge breadth (specialization/interdisciplinarity), and methodological breadth (quantitative/qualitative methods) are prioritized. In short, while specific organizational designs may indeed tone down or blur the different institutional logics described in the preceding, there is also the possibility that certain designs might allow existing logics to co-opt the knowledge-brokering function. These dilemmas are illustrated in Table 2.

Overcoming these dilemmas is dependent on several factors: First, the overcoming of such dilemmas may be contingent upon the degree of systematic overview and continuity around knowledge development. Second, it will depend on the interaction and contact between the various actors across policy, science, and practice. It is vital to be able to develop so-called feedback loops between the parties involved, ensuring that new knowledge development is based on previous experiences with users and on needs from policymakers or the practice field. Third, the system's learning ability depends on the absorptive capacity of the organizations involved (Cohen & Levinthal, 1990). Finally, a system's learning ability depends on the extent to which it has built-in mechanisms that may challenge existing knowledge, policies, and instruments.

DATA COLLECTION AND METHODS

Sample

In this study, we focus on the organizational designs of knowledge brokering in the educational field. This study regards education as being particularly relevant, as this area is arguably in a transition from having a national focus, reflecting national objectives and traditions, toward being increasingly exposed to global trends and ideas about how to boost quality,

TABLE 2
Illustration of Key Dilemmas in Organizing Knowledge Brokering

	<i>Policy</i>	<i>Science</i>	<i>Practice</i>
Affiliation (autonomy vs. relevance)			
Knowledge breadth (specialization vs. interdisciplinarity)			
Methodological breadth (qualitative vs. quantitative studies)			

efficiency, and effectiveness (Burns & Schuller, 2007). At the same time, education has emerged as a vital building block in the so-called knowledge triangle between education, research, and innovation, respectively (Maasen and Stensaker, 2011). Consequently, in education, knowledge brokering appears to be a contested activity, squeezed between domestic and global agendas, and where it may be unclear which organizational designs are relevant.

Our study draws on a systematic retrieval of documents and mapping of a sample of formal knowledge brokers in the field of education addressing decision makers, among them policy-makers at different levels and practitioners. We applied a strategic sampling of knowledge-brokering initiatives within education in different countries: initiatives assumed to constitute variety in terms of organizational factors, that is, affiliation (autonomy/relevance), knowledge breadth (specialization/interdisciplinarity), and methodological breadth (quantitative/qualitative methods). The sample of knowledge-brokering initiatives includes initiatives in European countries, including three Scandinavian countries (Norway, Sweden, and Denmark), the United Kingdom, and the Netherlands and in addition two non-European countries, New Zealand and Canada. Overall, our sample consists of 12 knowledge-brokering initiatives distributed across seven countries.

To find relevant documents for our database and to achieve saturation, we retrieved the webpages of the knowledge-brokering initiatives in the different countries. The documents consisted of descriptions on webpages and strategy documents, with the latter if electronically published and easily available. In terms of language, for the initiatives in Denmark, Sweden, and Norway, we retrieved information in the three Scandinavian languages, while we retrieved documents in English for knowledge-brokering initiatives in the remaining countries.

Analysis

As an analytical tool, we have chosen a mapping approach, which is a descriptive method of data analysis, inspired by document and content analysis techniques (Robson, 2002). This approach consisted of several tasks, iterative rather than consecutive: The first author read the included documents (Web documents; strategy documents) several times, applying different reading techniques, such as screening and narrow reading. During the narrow reading process, information was coded with respect to the three dimensions: affiliation (autonomy/relevance), knowledge breadth (specialization/interdisciplinarity), and methodological breadth (quantitative/qualitative methods). This process was conducted by the first author and validated by the second and third authors.

Limitations

While the mapping of the knowledge-brokering functions in the various countries has been conducted in a detailed and accurate way, we must also acknowledge some weaknesses with this approach. For example, for the dimensions of knowledge breadth and methodological breadth, document analyses of self-descriptions provided on webpages and strategy

documents might reveal a different picture than an analysis of the actual output, that is, published reviews. As many knowledge-brokering initiatives with a focus on the production and dissemination of systematic reviews have a relatively short history, we did not include output documents in our analyses. Accordingly, it is possible that discrepancies exist between self-descriptions and publications. However, combining different methods such as document analyses and expert interviews is likely to have reduced this potential weakness.

FINDINGS

In the following, we provide a mapping of the organization of knowledge brokers in the field of education in the seven countries included in our study (Norway, Sweden, Denmark, the United Kingdom, the Netherlands, New Zealand, and Canada). In our mapping, we distinguish between three different dimensions, namely, affiliation, knowledge breadth, and methodological breadth, which we assume are affected by the ways in which knowledge-brokering initiatives might be set up and organized. As a reminder, affiliation refers to the organization of the knowledge broker and relates in particular to degrees of autonomy and relevance. Knowledge breadth refers to the extent different disciplines are covered. Methodological breadth refers to the potential variety in methods applied by the knowledge broker, for example, the portfolio of quantitative and/or qualitative methods. Further, we provide some information about core funders, sponsors, and target groups to illustrate possible connections between the different knowledge-brokering initiatives.

In general, knowledge-brokering initiatives primarily target policymakers and practitioners (Bugge et al. 2013). With a few exceptions, our knowledge-brokering initiatives also have practitioners and policymakers as their main target groups. Only a few initiatives (NWO, KNAER, EPPI Center) explicitly mention researchers as an additional target group (Table 3).

Diverse affiliations and dominance by science-policy logic

In an earlier section, we provided a list with different categories of knowledge brokers by Rambøll Management Consulting (2007). In our mapping, the following categories are present: clearinghouse (Denmark), knowledge center (Sweden, Norway), and establishment of a separate analysis unit in-house in a ministry, directorate, or other administrative body (Sweden; BES). Other models found include a private, independent company (the United Kingdom), overarching international networks (Campbell Collaboration; Evidence Informed Policy and Practice in Education in Europe [EIPPEE] Network, and NWO), and independent public bodies under the auspices of the ministry (see also Lenihan, 2013). Some of these differ in terms of affiliation; while some of them are affiliated with the university, others are affiliated with a governmental body, and thus closer to politics.

When comparing the Scandinavian countries, for Denmark we identify knowledge-brokering initiatives that are more closely related to the university/research institute sector compared to Norway and Sweden. In Sweden, we identified two initiatives, which are either

governed by the Ministry of Education as an independent unit or embedded in the Swedish National Agency of Education. The Knowledge Center of Education in Norway is funded by the Ministry and affiliated with the Research Council of Norway, as one of five units of the Division of Society and Health. In contrast to Sweden and Norway, the Danish Clearinghouse for Educational Research and the EPPI Center are affiliated with the university.

In the United Kingdom, we identified two knowledge-brokering initiatives in education, which are affiliated at either the university or established as an independent private company. With a longer history in knowledge brokering, core activities of the EPPI Center primarily cover methods development within the use of research. At the same time, both knowledge brokers in the United Kingdom might address policymakers to a large degree. The policy dimension is reflected by relationships between the EPPI Center and governmental bodies via funding, policymakers in Europe, and within institutions at European level, that is, the European Commission (through the piloting of the EIPPEE Network); for CUREE, the policy dimension is reflected by the involvement of the knowledge-broker initiative in different public programs with local or national public and private actors.

In New Zealand, we identified one knowledge-brokering initiative in education, a public body under the Ministry of Education, with the purpose of synthesizing and building on evidence-informed knowledge. In Canada, we identified the KNAER network, an organized collaboration between two university faculties and the Ministry of Education. The main objective of KNAER is to be a knowledge broker between primary research and practice and the establishment of knowledge dissemination across different organizations and stakeholders.

For the Netherlands, we identified NWO, an independent public body, under the auspices of the Ministry of Education, which is comparable to the Research Council of Norway. In addition to the country-specific knowledge-brokering initiatives, we identified two international networks: the Campbell Collaboration and the Evidence Informed Policy and Practice in Education in Europe (EIPPEE).

The Swedish National Agency for Education's advisory council is a unit of the National Agency of Education, an important national authority in education. In its role, the Swedish National Agency of Education can inform research and provide recommendations based on research-based knowledge grounded in educational law. The mandate of the advisory council in terms of research-based knowledge comprises the synthesis and dissemination of research findings to practitioners, school leaders, and teachers as main target groups. The work builds on the idea that practitioners, that is, professionals, are a part of the production of knowledge. The unit transfers and disseminates three different types of research-based knowledge: web-sites, research overviews, and research-informed development activities.

Iterative BES is a public body affiliated with the Ministry of Education in New Zealand to summarize and build up evidence-informed knowledge to inform education policy and practice. This is primarily a knowledge-brokering initiative of well-functioning interventions. Its principal activities cover the collection of knowledge according to "What works in education" and not the conduction of systematic reviews.

The knowledge-brokering initiatives affiliated and organized as relatively autonomous entities include international networks (e.g., Campbell Collaboration), research units located at the university (e.g., the Danish Clearinghouse for Educational Research), and private, independent initiatives (e.g., CUREE). In summary, we find three knowledge-brokering initiatives located at the university: the Danish Clearinghouse for Educational Research, the EPPI Center, and KNAER, with the latter being a hybrid and cooperation between two university units and the ministry. For all three initiatives, we can assume a stronger focus on scientific knowledge than a practice-oriented form of knowledge. KNAER is, however, closer to the policy field, which might indicate less autonomy. The Danish Clearinghouse for Educational Research, however, might have the greatest autonomy, as it is part of an independent research institute/unit.

Among the 12 initiatives, we found only one independent private company (located in England). The main objective of CUREE is to help practitioners, that is, teachers and school leaders, with well-informed decisions based on the most effective methods and approaches. CUREE cooperates with a couple of organizations and individuals to strengthen and inform continuing and further education of teachers. CUREE is working with detailed technical reports (systematic reviews), user-friendly articles, and activities, in addition to evaluations of different formats and short briefings addressing different stakeholders. As an independent private company, CUREE might be more orientated toward different sources of private funding and, in consequence, also more linked to the practice field.

Although well embedded in the national governance structures, the majority of knowledge-brokering initiatives studied can be characterized as being located at some distance to policymakers, maintaining an arm's-length distance. There are, however, a few exceptions, where a knowledge-brokering initiative is directly affiliated to a ministry/policy unit, that is, the Swedish National Agency for Education's advisory council and the BES, New Zealand.

Limited knowledge breadth

Comparing our 12 knowledge brokers for knowledge breadth, only about one-third of the initiatives cover a larger breadth than education and pedagogics: the SFI Campbell Schooling and Education Unit, the EPPI Center, the Campbell Collaboration, and the NWO Netherlands. Interestingly, the initiatives representing a broader (inter)disciplinary focus, such as SFI Campbell or Campbell Collaboration, appear to have a longer history compared to those with a narrower focus on education. This pattern indicates that the shorter history for knowledge-brokering initiatives in education and pedagogics may cause a more direct and atomistic approach compared to more established knowledge-brokering functions, such as those in medicine. Such a characteristic may have implications for the ability to serve complex and interdisciplinary societal needs.

Widespread methodological breadth

Despite the relatively limited degree of knowledge breadth, it seems quite common that knowledge brokers in education are characterized by methodological breadth. Most

knowledge-brokering initiatives are based on both quantitative and qualitative methods, although a few exceptions focus exclusively on quantitative methods and effect studies, namely, the Campbell Collaboration, SFI Campbell, which are knowledge brokers informed by methods of hard sciences. The initiatives with a larger methodological breadth, combining quantitative and qualitative methods, tend to have a shorter history, which reflects the current norm of combining several methods (e.g., Noyes et al., 2008).

Finally, different knowledge-brokering initiatives seem to be highly connected by mutual influence in terms of their purpose and methodological approach and exchange. Examples of initiatives referring to each other as cooperators include the Campbell Collaboration, the EPPI Center, the Knowledge Center of Education in Norway, and the Danish Clearinghouse. How the political climate favoring accountability and randomized controlled trials might impact the methodological scope of a knowledge-brokering initiative can be described by referring to the foundation of the Campbell Collaboration in 1999. The mission of the Campbell Collaboration was to conduct systematic reviews on effect studies, with randomized controlled trials regarded as the best evidence. According to Lather (2004), policy-makers seem to strive to limit educational research to one part of research with focus on effect studies and narrowly defined study designs.

Overview of findings

Table 3 summarizes the mapping of our knowledge brokers in education, according to the main categories of affiliation, methodological breadth, and knowledge breadth. Each knowledge-brokering initiative is also categorized according to the institutional logic in which the knowledge function is embedded, namely, science, policy, and practice.

DISCUSSION AND CONCLUSIONS

In this article, we have argued that the organizational affiliation or the organizational embeddedness of the knowledge-brokering function is important, not least because it may determine how the different institutional logics of the policy, science and the practice field are balanced. We also showed how the organization of the knowledge-brokering function may affect the three dimensions of affiliation (autonomy/relevance), knowledge breadth (specialization/interdisciplinarity), and methodological breadth (quantitative/qualitative methods). One of the strengths of our study lies in its descriptive mapping of knowledge-brokering initiatives across seven different countries, providing a broader view on how evidence-informed policy and practice in the field of education are affected by organizational design.

Based on our analysis, there seem to be some patterns regarding how the knowledge-brokering function is organized across the 12 cases analyzed. Specifically, the organizational embedding of the knowledge-brokering function seems to be dominated by a policy–science logic in seven out of the 12 cases. In these seven cases, the knowledge-brokering function is organizationally located in some political–administrative structure within the policy domain.

TABLE 3
Mapping of Knowledge Brokers in Education in Terms of Their Organizational Affiliation and Their Methodological and Knowledge Breadth

<i>Knowledge broker: name, country, year founded (if available)</i>	<i>Affiliation; funders; collaborators</i>	<i>Institutional logic</i>	<i>Methodological breadth</i>	<i>Knowledge breadth</i>
Knowledge Center of Education, Norway, 2013	Research Council of Norway; one of five units of the Division of Society and Health Governmental agency, funded by the Ministry of Education and Research Target group (TG): policymakers; practitioners	Policy/Science	Broad: Systematic reviews including different formal and quantitative and qualitative methods Informed by methods developed by the EPPI Center	Narrow: Education; pedagogics
Danish Clearinghouse for Educational Research, Denmark, 2006	Danish School of Education, Aarhus University Independent unit/ Research institute TG: policymakers; practitioners	Science	Broad: Systematic reviews including different format and quantitative and qualitative studies Informed by methods developed by the EPPI Center	Narrow: Education; pedagogics
SFI Campbell Denmark, 2002	The Danish Center for Social Research (SFI). SFI is an independent research facility under the Ministry of Social Affairs; has been the largest research institution in the field of social research. The center conducts research and carries out commissioned projects in the area of welfare and state policies. SFI Campbell is an independent department of SFI and contributes to improving the knowledge base for the effects of initiatives in the social and welfare sector. Institute sector with strong subject-specific exchange with the university. Research is funded part from a basis appropriation under the Danish Finance Act and in part from foundations. Research institute TG: policymakers; practitioners	Policy/Science	Narrow: Systematic reviews of effect studies (quantitative methods) Informed by methods developed by the Campbell Collaboration	Broad: Social work; interdisciplinary

(Continued)

TABLE 3
(Continued).

<p>The Swedish National Agency for Education's advisory council Sweden, 2008</p>	<p>incorporated in the Swedish National Agency of Education TG: practitioners (school leaders, teachers)</p>	<p>Policy/Science</p>	<p>Broad: Transfers and disseminates three different types of research-based knowledge: websites; research overviews and research-informed development activities. Reviews combine research-based and practice-based knowledge</p>	<p>Narrow: Education; pedagogics</p>
<p>The Swedish Institute for Educational Research, Sweden, 2015</p>	<p>Government agency; separate unit TG: practitioners</p>	<p>Policy/Science</p>	<p>Broad: Systematic reviews, including quantitative and qualitative methods or a combination of both methods (triangulation); dissemination of research-based knowledge to practitioners.</p>	<p>Narrow: Education including preschool, compulsory education and adult learning</p>
<p>The Evidence for Policy and Practice Information and Coordination Center; (EPPI) Center, England, 1993</p>	<p>University College London, funded by different commissioners (e.g., Academy of Medical Educators; Alliance for Health Policy and Systems Research; Learning and Teaching Support Network; Cochrane Collaboration; Danish Clearinghouse for Educational Research; governmental bodies like Department for Culture, Media and Sport; Department for International Development; Department of Health)</p>	<p>Policy/Science</p>	<p>Broad: Development of systematic reviews methods; and methods of using research; development of different databases</p>	<p>Broad: Education, social welfare, health, crime and justice and international development</p>
<p>Center for the Use of Research and Evidence in Education (CUREE), Coventry, England</p>	<p>TG: Policymakers; researchers Independent private company; cooperates with a couple of organizations and individuals to strengthen and inform continuing and further education of teachers TG: practitioners (i.e., teachers); policymakers</p>	<p>Policy/ Practice</p>	<p>Broad: Research reviews and syntheses addressing practitioners; interactive tools and resources</p>	<p>Narrow: Education; all parts of the educational sector</p>

<p>Iterative Best Evidence Synthesis (BES), New Zealand</p>	<p>A public body; affiliated to the Ministry of Education TG: Policymakers and practitioners (e.g., teachers, school leaders)</p>	<p>Policy/Science</p>	<p>Broad: Collecting and dissemination of effective interventions; user-friendly summaries of systematic reviews Broad: Synthesis of state-of-art knowledge from existing bodies of evidence; disseminating of research that is relevant for practitioners</p>	<p>Narrow: Education</p>
<p>Knowledge Network for Applied Education Research (KNAER), Canada, 2010</p>	<p>Cooperation between two university units and the Ministry of Education; funded by the Ontario Ministry of Education. Supports projects within four categories: more effective use of research, networking for further research activities, to strengthen knowledge sharing, research visits. TG: Policymakers, practitioners, and researchers</p>	<p>Policy/Science</p>	<p>Broad: To develop an understanding of knowledge and mobilization of knowledge in the field of Education</p>	
<p>The Netherlands, Organization for Scientific Research (NWO), the Netherlands</p>	<p>Independent public body, under the auspices of the Ministry of Education in the Netherlands TG: Researchers and policymakers</p>	<p>Policy/Science</p>	<p>Broad: Knowledge sharing, dissemination and translation; provides funding to the research community in the Netherlands and supports the research's contribution to society</p>	<p>Broad: Interdisciplinary; collaboration between different stakeholders in society.</p>
<p>The Campbell Collaboration, 1999</p>	<p>International network between researchers and practitioners Secretary affiliated in Oslo, Norway; receives funding from a variety of public and private sponsors, e.g., American Institutes for Research; Canadian Department of Justice; Center for Evaluation of Social Services; Danish Ministry of Social Welfare, Jerry Lee Foundation; Norwegian Institute of Publish Health). TG: Policymakers and practitioners</p>	<p>Science/Practice</p>	<p>Narrow: Systematic reviews over the effect of interventions and dissemination of these</p>	<p>Broad: Interdisciplinary; education; crime and justice; international development; nutrition</p>
<p>Evidence Informed Policy and Practice in Education in Europe (EIPPEE) Network, 2011–2013</p>	<p>European network in evidence-informed policy and practice in education Affiliated at the EPPI Center, University College London; the original EIPPEE project, 2010–2011, was funded by the European Commission. TG: Policymakers and practitioners</p>	<p>Science/Practice</p>	<p>Broad: Systematic reviews of quantitative and qualitative studies; use of evidence-informed knowledge</p>	<p>Narrow: Education</p>

Although these organizational units may have some arm's-length distance to the political leadership, these locations are still hierarchically subordinate to political command structures and command lines. Significantly more organizational diversity can be found in the remaining five cases, where two have a clear science embedding, two have a practice–science embedding, and one of the cases is characterized by a practice embedding.

With respect to the potential implications of the patterns observed in relation to organizational embedding, it seems that knowledge-brokering functions characterized by a combined policy–science logic tend to apply quite broad methodologies while simultaneously being relatively narrow in their knowledge breadth and disciplinary focus. A possible explanation for this pattern is that the policy–science logic may bring about a focus where (sector-specific) political relevance plays a more important role than (broader) societal concerns. Consequently, methodological breadth is ensured within the discipline or sector in question, but where knowledge breadth beyond individual sectoral policy areas is subordinate. This can be interpreted as an organizational embedding where it is seen as important to develop knowledge that fits the political agenda and matches the timing and relevance of political decision-making processes. The positioning within a political–administrative structure may in this sense be explained by a need for and priority of safeguarding specialized sectoral/disciplinary interests rather than societal concerns beyond individual sectoral policy areas.

What is perhaps a bit surprising—not least given the often-mentioned claim that knowledge brokers constitute a way to inform and develop the practice field—is that the organizational embedding of existing knowledge-brokering functions seldom reflects this ambition. While all our cases engage in a range of initiatives directed at improving and informing “practice,” it may be a problem that they seem to have few organizational links to their respective practice fields. A possible implication of this lack of embedding with practice is that this field may become more of a “receiver” of knowledge, rather than a field also engaging in the identification and formulation of knowledge needs and thus as a field that may also influence the knowledge generation and brokering process. Although we have a small sample of cases, it is interesting that it is the internationally oriented knowledge-brokering initiatives (Campbell Collaboration and EIPPEE Network) that are the ones that most specifically combine a science–practice logic in their organization. Therefore, while knowledge-brokering functions organized within individual countries tend to reflect a policy–science logic, a different pattern occurs when we look at international collaborations.

In our sample of cases, we only find two knowledge-brokering units that are organizationally located within a distinct science logic. Given the interest that universities have in the formulation of knowledge production in general, it does not seem that this is reflected in how knowledge-brokering functions are affiliated. It is, however, difficult to say why we tend to see so few knowledge-brokering functions embedded in the science logic, as our data set has limitations on this matter. One explanation may relate to the fact that the science logic seems to be quite well represented in the policy–science balance found in the majority of the knowledge-brokering cases analyzed, and that the science logic is often co-opted by policy. Another explanation could be that only a few universities are able to shield themselves from policy causing an instrumentality in knowledge brokering, indicating diminishing power and influence of a pure science logic in society. A third explanation may relate to the fact that

universities and other knowledge producers may be engaged in a range of informal knowledge-brokering initiatives that are not part of the cases studied in the current article.

To conclude, our study has demonstrated the importance of considering the organizational design of the knowledge-brokering function, and although we should be careful not to read too much into our data, there seems to be a common pattern to locate the knowledge-brokering function in a combined policy–science logic. This pattern may imply a risk of allowing the activities performed by the knowledge-brokering functions to be too heavily dictated by (sector-specific) political priorities and normative values at the expense of the practical and experience-based evidence and (interdisciplinary) societal needs meant to be served by the same knowledge development. Such a detachment of the knowledge production endeavor from the practice field would be in line with what has already been highlighted as an overall propensity and threat within the science institution (Sarewitz, 2016). The findings of the present study may be interpreted as providing only a snapshot of an ongoing process, and where change and transformation may also characterize the knowledge-brokering function in the years to come. Nonetheless, the current study provides clear indications that more attention needs to be paid to how knowledge-brokering functions are organized.

AUTHOR BIOS

Sabine Wollscheid, a senior researcher at NIFU, holds a Ph.D. in sociology from the University in Trier, Germany. She has conducted a number of systematic reviews in the field of social science and education. Her research interests are in literacy studies, inequalities in education, systematic review methods and sociology of knowledge.

Bjørn Stensaker is professor of higher education at the Department of Education, University of Oslo. He is also a research professor at NIFU, the Nordic Institute for Studies in Innovation, Research, and Education. He has a special interest in studies of governance, evaluation, and organizational change in higher education, and has published widely on these issues in a number of journals and books.

Markus M. Bugge works as a senior researcher at NIFU, the Nordic Institute for Studies in Innovation, Research, and Education, and is an associate professor at the Department of Technology Systems at the University of Oslo. He holds a Ph.D. from the Department of Social and Economic Geography at Uppsala University, and has extensive experience from research on the systemic and evolutionary underpinnings of knowledge production, innovation, and innovation policies.

ORCID

Bjørn Stensaker  <http://orcid.org/0000-0002-2109-4902>

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