Chapter 3

Knowledge Mobilisation for Innovation

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Abstract: The term knowledge mobilisation (KMb) describes the process of transferring knowledge (usually from formal research institutions such as universities) into active use by business organisations. KBm includes motivating the agents on both “ends” to engage into the process which should result in more innovation outputs. Whether new knowledge or new research results can be economically used or converted into innovations heavily depends on the social, political, and economic contexts, the available resources, the local potential of a highly skilled and creative labor force, and the knowledge environment in which actors and social systems strive to achieve their objectives. Advanced IT systems are still incapable of substituting human intelligence in many circumstances. A comprehensive literature review of KBm definitions is provided. Mobilisation, to be effective, must not only be well organised, but must also have everything in step. In the business context, the mobilisation of resources can be described as the time needed to launch a new product or service (*time-to-market*). Although knowledge transfer and industry-academia relationships have been subject to research investigations by various authors (some pioneering studies were conducted in Canada), they mainly focus on one sector: healthcare and, to some extent on education. The terms ‘knowledge’, ‘research’ and ‘evidence’ are used to describe a hierarchical relationship where research is a form of evidence and evidence is a source of knowledge. Knowledge is considered the capacity (potential or actual) to take effective action in varied and uncertain situations and innovation efforts should be supported with appropriate knowledge mobilisation strategies that channel much needed resources (especially public funds). One of the promising solutions could be to invest into KBm programmes, according to the highlights described in this chapter.

Keywords: Knowledge mobilisation, science-business relations, knowledge transfer, innovation, systems of innovation

Introduction

Knowledge has always been used by humans to achieve their personal and business goals. There is nothing new in applying knowledge to human work. Engineers working at the pyramids of Egypt had to use advanced knowledge of geometry and physics. The Roman Empire would not develop without the use of advanced knowledge. The issue at hand is that until 100 years the pace of knowledge development was slow and did not affect the lives of individuals as much. We are now witnessing an unprecedented pace of change and the vast amount of knowledge and information we have is posing a great challenge to develop methods for the organization of these knowledge resources. Adults can no longer count on the fact that their current professional skills will be useful throughout their working lives. The rate of knowledge growth in the 21st century correlates with its citizens ability to learn, unlearn and re-learn at a fast pace.

Whether new knowledge or new research results can be economically used or converted into innovations heavily depends on the social, political, and economic contexts, the available resources, the local potential of a highly skilled and creative labor force, and the knowledge environment in which actors and social systems strive to achieve their objectives (Meusburger, 2013). The phenomenon of applying existing knowledge into practice is commonly referred to as 'knowledge mobilisation'. Many research studies (see e.g.: PARP, 2013) indicate that knowledge possessed and produced by research institutions (including universities) in Poland (and elsewhere) is not fully utilized. Large amounts of public funds are being spent to fund research activities, with often low or no meaningful impact on the quality of life and innovation of the economy. The university-business relationships have been subject to research studies for several decades but the concept of Knowledge Mobilisation (KMb) (with its conceptual framework and research approaches) was introduced to the public debate fairly recently (in the last 10 years), mainly focusing on health care sector. Improved KMb can bring benefits to many sectors of the economy, including, healthcare, pharmaceuticals, IT, engineering, consulting, biotech. The pace of knowledge spill-over from research organisations to companies is crucial and the dynamics of the process deserves in-depth investigation, for which a theoretical framework is needed. Therefore, the aim of this chapter is to provide a better understanding of the concept "Knowledge Mobilisation" as one of the prerequisites for innovation, and, in some contexts, an enabler of innovation.

Knowledge as an object of Knowledge Mobilisation efforts

Knowledge is considered as *the capacity (potential or actual) to take effective action in varied and uncertain situations* (Bennet, Bennet, 2004) and a human capacity that consists of understanding, insights, meaning, intuition, creativity, judgment, and the ability to anticipate the outcome of our actions. According to Lundvall (2003) knowledge and information appear in economic models in two different contexts. In the first context, knowledge is a means of rational decision making for *individual agents*. Thus the amount of information at the disposal of those agents determines the quality of deci-

sions and also determines their *ability to process the information*. The other major perspective is one in which knowledge is regarded as an *asset*. Here, knowledge may appear both as an input (competence) and output (innovation) in the production process. Under certain circumstances, it can be privately owned and/or bought and sold in the market as a commodity. Lundvall (2003) maintains that the economics of knowledge concerns specifying the conditions for knowledge to appear as “a normal commodity”, i.e. as something similar to a producible and reproducible tangible product. Alfred Marshall (1920) observed that knowledge is not dispersed evenly but rather concentrated in some centres of gravity which he called *industrial districts*. His principal explanation was that knowledge was localised in a region and rooted both in the labour force and in local institutions and businesses. This phenomenon was later used to explain the success of the Silicon Valley and other industrial regions.

Knowledge represents the mental capacity of individuals and groups of individuals (collective knowledge), including ideas, facts, expertise, and judgments relevant to individuals, team, and organisational performance. The concept of knowledge should be distinguished from other related concepts such as data, information and wisdom¹. The hierarchical pyramid of value was described in relation of knowledge against the other three concepts. While data is considered as raw, unorganized bits of information which have no meaning, information is the result of processing, organizing and structuring of said data. “Information” is an older word which dates back to 1300s with Old French and Middle English origins. Knowledge, in turn, is what humans dispose of, or “know”. Knowledge is subjective, relates to a specific context and much of its nature is still to be discovered. The structure of human brain and its functioning is still subject to intensive research. Tacit knowledge (as opposed to formal, codified or explicit knowledge) is characteristic to an individual. It resembles our DNA imprinted in brain cells. Due to its nature it is difficult to transfer to another person by means of writing down or verbally. We can possess tacit knowledge by means of observing more knowledgeable people and interacting with them. It is best transferred through a master-apprentice relationship. It cannot be easily passed on in form of documents and other codified representations. Knowledge is here divided into four categories which in fact have ancient roots (Lundvall, Johnson, 1994):

- Know-what,
- Know-why,
- Know-how,
- Know-who.

Know-what refers to knowledge about “facts”. The population of Warsaw, ingredients in a vegetable soup, and the date of the Battle of Grunwald are examples of this kind of knowledge. Knowledge is here synonymous with information. *Know-why* refers to knowledge about principles and laws in nature, in human mind and in society. This kind of knowledge has been extremely important for technological development in

¹ Defined as an ability to make good decisions based on knowledge and in absence of all necessary information and data.

certain science-based areas, such as chemical and electric/electronic industries. Access to this kind of knowledge will often make advances in technology more rapid and reduce the frequency of errors in procedures involving trial and error. *Know-how* refers to competences, habits, skills and describes the ability to solve practical and theoretical problems. It is synonymous with tacit knowledge. A manager of a Higher education Institution (HEI) preparing the launch of a new specialty or conducting interviews with applicants for teaching positions uses his tacit knowledge to achieve results. *Know-how* is knowledge which is difficult to share or describe. Networks of cooperating individuals and organisations also constitute tacit knowledge embedded in communities and organizational cultures of the participating partners. Similar networks may be formed by HEI's, especially in the case of mergers and acquisitions. *Know-who* involves information about who knows what and who knows what to do. But it also involves the social ability to co-operate and communicate with different kinds of people and experts (Lundvall, Johnson, 1994). *Know who* describes social knowledge about other people and social relationships. Today social networking sites such as LinkedIn or GoldenLine are substituting for lack of time and ability to engage in face-to-face relationships between professionals. Until recently such role was played by telephone books and yellow pages. Such social and personal relationships are not public – they constitute personal knowledge of each person. They cannot be transferred and, more specifically, they cannot be bought or sold on the market. The Noble-prize winner Kenneth Arrow (1971) explicitly defined the importance of trust by saying: “you cannot buy trust and, if you could, it would have no value whatsoever”.

Knowledge is tacit and socially embedded which means that transfer from one person to another is costly and often impossible. The tacit dimension of knowledge means that organisations cannot afford to neglect the role of trained and experienced professionals. Today, advanced IT systems are still incapable of substituting human intelligence in many circumstances. Especially reliant on tacit knowledge are the business cultures of the east. For example the Japanese business culture emphasizes the importance of tacit knowledge diffused across organizational structure to a high degree. This may cause conflicts in the case of mergers of international organisations. Organisations in the west have a somewhat different approach to knowledge. The Western tradition emphasizes the value of codified knowledge and task specialization. As a result of these conflicting models, joint ventures may turn into arm's length relationships with poor project performance and asymmetry in knowledge transfer.

Lambe (2014) maintains that knowledge consists of two parts: Knowledge (Informing) and Knowledge (Proceeding). This builds on the distinction between “knowing that” and “knowing how” (the *potential* and *actual* capacity to take effective action). Knowledge (Informing) is the *information (or content)* part of knowledge. While this information part of knowledge is still generic information (organized patterns), it is special because of its structure and relationships with other information. Knowledge (Informing) consists of information that may represent understanding, meaning, insights, expectations, intuition, theories and principles that support or lead to effective action. It is considered knowledge when used as *part of the knowledge process* (Lambe, 2014). The second type of knowledge: knowledge (Proceeding), relates to the *process*

and *action* part of knowledge. Note that the process our minds use to find, create and semantically mix the information needed to take effective action is often unconscious and difficult to communicate to someone else and therefore, tacit.

Defining Knowledge Mobilisation (KMb)

In sociology the concept of mobilisation is present in the form of “resource mobilisation theory” which is an alternative interpretation of social movements. The concept of “mobilisation” has also military connotations. Similarly, Jenkins (1982a) has distinguished power resources that provide the means for controlling the actions of targets from mobilising resources such as facilities that provide for mobilising power resources. Here, mobilisation is understood as a process by which a group secures collective control over the resources needed for collective action (Jenkins, 1983). In management science, knowledge mobilisation includes the products, processes and relationships among knowledge creators, users, and mediators (individuals or intermediary organisations that support knowledge brokering). Within KMb knowledge is moved “into active service for the broadest possible common good.” Mobilisation is conducted by increasing “connectivity” or the multidirectional pathways for knowledge discovery, exchange and uptake (Hawkins/ICES). The term KMb involves efforts to bridge the gap between research, policy and practice in order to improve outcomes in various organisations or sectors. It also involves knowledge sharing between research producers (e.g. university researchers) and research users (including professionals or others whose work can benefit from research findings), often with the help of third parties or intermediaries (Knowledge Mobilization Institute; Fazlagić, 2008; Fazlagić, 2012; Fazlagić, 2013a; Fazlagić, 2013b). According to Levin (2008) ‘knowledge mobilisation’ is the relationship between research and practice. It is characterized by a multidimensional approach, longer-term orientation and the political nature of the work in comparison to earlier terms that seem to imply a one directional and linear move from research to practice. KMb could be defined as a set of goal-orientated practices aimed at reducing the gap between what we know and what we do. In the military context, mobilisation, for any kind of war, includes the procurement and training of manpower for military purposes. In the context of education systems, mobilisation may relate to the procurement of knowledge assets correlated with the procurement of financial resources necessary for implementation at institutional and organisational levels and must be synchronised with timetables for training (knowledge development) and strategic deployment. Another term consistent with KMb is “knowledge translation”. The Knowledge Translation (KT) strategy is intended to support and increase the impact of research programs on the quality of life through changing policy, practice, and research. Specifically, the KT Strategy promotes new knowledge from research and innovation (Fazlagić, Erkol, 2015; Fazlagić, Erkol, 2016; Moore, 2016). KMb is an emerging field of inquiry that seeks to strengthen connections between research, policy and practice across sectors, disciplines and countries, attempting to harness the benefits of research for organizational and societal improvement (Cooper, Levin, 2010; Kislov et al., 2014). KMb helps make

research useful to society, and does so in a way that solution seeking can itself inform the research agenda (Fazlagić, 2008; Matheson, Edwards, 2016).

The terms 'knowledge', 'research' and 'evidence' are used to describe a hierarchical relationship where research is a form of evidence and evidence is a source of knowledge (Crilly, 2013). It is often claimed that KMb supports decision-making and innovation. Mobilisation of knowledge could be defined as a set of goal-orientated practices aimed at reducing the gap between what we know and what we do. In the military context, mobilisation, for any kind of war, includes the procurement and training of manpower for military purposes. In the context of education systems, mobilisation may relate to the procurement of knowledge assets correlated with the procurement of financial resources necessary for implementation at institutional and organisational levels and must be synchronised with timetables for training (knowledge development) and strategic deployment (Fazlagić, Erkol, 2015).

The effectiveness of Knowledge Mobilisation

In the business context, the mobilisation of resources can be described as the time needed to launch a new product or service (*time-to-market*). In education, time-to-market can be translated into time-to-problem solution. In a perfect economic system, all resources are perfectly distributed and fully utilised. In social systems, such as the system of education, gaps exist between the stock of their intellectual capital and the degree to which this capital is employed for the benefit of organisations. A helpful metaphor to describe this state could be the concept of strategic readiness proposed by Kaplan and Norton (2004). The capacity of identifying the right knowledge and applying it promptly to solve the problem is what mobilisation of knowledge is all about. According to Pfeffer and Sutton (2000), the gap between knowing and doing is more important than the gap between ignorance and knowing. Organisations that are better at learning and translating knowledge into action understand the virtue of simple language, simple structures, simple concepts and the power of common sense, which is remarkably uncommon in its application (Pfeffer, Sutton, 2000).

The effectiveness of knowledge mobilisation efforts is determined by the following conditions (Fazlagić, Erkol 2015):

- 1) Speed (of transfer or identification: see above): how fast was the knowledge delivered to the end user? How quickly did the end user realise that they possess the right knowledge? Were they made confident that they were able to solve the problem?
- 2) Accuracy of intervention; was the proper type of knowledge applied and delivered to the user? Inappropriate diagnosis of the problem may cause mobilisation of inappropriate type of knowledge.
- 3) Sustainability of knowledge: was knowledge, which was mobilised a quick-fix solution ('a fish') or a sustainable solution ('a fishing rod')?

- 4) Stickiness of knowledge: was the knowledge adequate to the absorptive capacity of the beneficiaries? The recipients of knowledge may not be able to absorb the knowledge due to lack of absorptive capacity. Knowledge which does not fit into the mental models, cultural context, and language of the recipients will not be fully absorbed and, as a result the KMb will be a wasteful effort.
- 5) The role of emotions: emotions may either support or hinder the KMb.
KMb may be enhanced by ensuring that (German, 2008):
 - researchers and practitioners are given the chance to interface regularly in order to help make research both more directly applicable to immediate needs and more easily transferable;
 - the involvement of both academic and service funders in the Communities of Practice (CoP) to help encourage funding practices which would require more actionable research outcomes and evidence of practitioner/researcher collaboration. This would explicitly link their cooperation to the financial aspirations of both;
 - an ongoing performance assessment of the collaborative behaviour and contributions of both practitioners and researchers as a factor of continued funding; and
 - a commitment to foster ongoing outreach to stakeholders in the sector to validate both the assumptions and directions of the CoP forums.

Towards a Knowledge Mobilisation strategy for Innovation

KMb strategy is defined here as a (potential) plan to transfer (translate) knowledge produced or/and available at research institutions, including universities to business practice, including companies. It consists of the following elements:

- 1) research activities, including identification of available knowledge, production of new knowledge, establishing new connections and partnership within the research community, development of new methods and research instruments and posing new research questions;
- 2) dissemination activities, including publications, participation in conferences, social media presence, IP;
- 3) uptake, including validation of research, new research questions, contextualization of research, establishment of good practices;
- 4) implementation benefits, including research informed policy, new research questions, new programme funding, new product development, changes in programmes;
- 5) impact, including citizens served, economic, environmental and health benefits, media and public awareness, vulnerabilities addressed, new research questions.

Such strategy may also consists of the following elements (Phipps, 2018):

- 1) Identification of Partners.
- 2) Partner Engagement.
- 3) Establishing Partner Roles.
- 4) Establishing KT Expertise (related to the definition of roles of partners and expertise needed).
- 5) Knowledge Users Audiences (including: researchers, practitioners/service providers, public, media consumers, decision makers, policy makers, private sector/industry. It is crucial at this stage to establish what audiences will be you prioritised).
- 6) Main Messages to share.
- 7) KT Goals. This stage may include such goals as: generating awareness/interest/practice change/behavioural change/policy action; impart knowledge and tools; inform research/policy/practice).
- 8) KT Strategies.
- 9) KT Process.
- 10) KT Impact & Evaluation. This stage includes research indicators, evaluation of indicators; application of indicators.
- 11) Resources Required.
- 12) Related Budget Items.
- 13) Implementation.

The strategy for KMb should take under consideration the industry context (Table 1). The degree of competition plays an important role in explaining the dynamics of KMb.

Table 1. A matrix to identify four types of knowledge base

Degree of competition Science and technology interface	Competitive environment	Non (or less)- competitive environment
Science model (Science is in a predictive stage, formal R&D is crucial and knowledge is highly codified)	Biotechnology, Semiconductor	Defense equipment
Humanistic model (Learning-by-doing is they key process, formal R and D is of a secondary importance and knowledge is poorly articulated)	Consulting activity	Education (primary school) Early XIX medicine

Source: Adapted from The Development of Knowledge of Different Sectors: a Model and Some Hypotheses, by D. Foray, D. Hargreaves, 2002, Management in Education and Learning, Oxford.

In Canada, Knowledge Mobilisation has a strategic dimension: the impacts of research are a feature of most research funding programs. The Canadian Institutes of Health Research (CIHR) (2012) and most Canadian health charities require grant applicants to articulate a knowledge translation strategy that articulates what impacts will occur and what efforts will be made to achieve them (Phipps et al., 2016)

(Table 2). Every grant application submitted to the Social Sciences and Humanities Research Council (SSHRC, 2015) requires an outcomes statement (what impacts are anticipated) and a knowledge mobilisation strategy (Phipps et al., 2016). Phipps et al. (2016) understand Kmb strategy as a strategy for achieving impacts from research findings. There is a theoretical bias in favour of networks and partnerships, rather than hierarchies or markets, as effective vehicles for organisational learning (Adler, 2001) but there is also scientific evidence not supporting such view (Addicott, McGivern, Ferlie, 2006). Managed networks have been formed in health, partly on the rationale that knowledge will thereby be more effectively shared (Bate, Robert, 2002). Some governments introduced Kmb strategies to promote transfer of knowledge. The Dutch government has made available for schooling, which is about € 9.500 per student per year on average (Rijksoverheid, 2017), which is mostly given to the educating institutions. The government, however, does not only fund universities, but also companies for promoting research. A good example is the Innovation Subsidy, which is a subsidy given to companies for doing research and development projects in collaboration with a research institution. This does not only promote innovation, but also cooperation between research institutions and industries. Next to public funding the Dutch government has also set up a workgroup called ICES/KIS (Interdepartmental Committee Economic Structure of Knowledge Infrastructure), which has been granted a budget of 800 million Euros to stimulate fundamental strategic and industrial research as well as to promote long-term research collaborations and networks to improve the knowledge transfer between science and industry. Arvanitis and Wörter (2007) conducted a study on behalf of the Konjunkturforschungsstelle of the university Zürich about Technology Transfer (TT). They did a survey with 5 categories: informal contacts, technical infrastructure, training activities, research and consulting. As a result, TT was found to affect the innovation power and labour productivity of Swiss companies positively. 28% of the Swiss companies are pursuing knowledge transfer. In Switzerland there is an organisation called Unitectra, that helps to organize TT for the universities Basel, Bern and Zürich. Unitectra is a non-profit organisation that is entirely owned by the three universities. It supports scientists with cooperation with private and public institutions as well as the implementation of research results into new products. Its main services include the commercialization of research results and the support of building a new business. There are also trainings in the field of knowledge transfer and contact points to business partners with regard to technology transfer. Unitectra is about 20 years old, has more than 100 inventions per year with most of them in the pharmaceutical field. Most of the experimental development is financed through private sponsors (>90%), whereas the fundamental research is financed through universities (>70%) (SBFI, 2016, p. 38).

Table 2. Four core elements of knowledge mobilisation planning

Element	Description
Engagement/Audiences	Before Principal Investigators think about what they want to do they need to start with partnerships and forms of engagement with identified audiences. This speaks to the purposefulness of KMb/KT and involves end users in the development of the rest of strategy.
Goals/Objectives	Frame the project in terms what do you want to achieve and how you plan to achieve it. <ul style="list-style-type: none"> • Overall Objective; high level, long horizon • Specific Goals: more granular, measurable; achieving goals by undertaking activities (below) allows you to fulfill your overall objective.
Activities	Articulated of KMb Planning Chart. Activities need to be mapped to specific audiences and correlated to goals and objective. Activities need to speak to academic and non-academic audiences. Identifymetrics and key performance indicators.
Impact, Indicators and Accountability	A longitudinal look at the results of knowledge mobilization plan. Impact are measured at level of end user/receptor/partner by measuring indicators specific to the activities.

Note. Reprinted from Supporting Knowledge Mobilization And Research Impact Strategies In Grant Applications, by Phipps D., Jensen K., Johnny M., Poetz A. (2016). The Journal of Research Administration, (47)2. p. 54.

The Israeli state continues to exhibit its long-standing concern with improving academia–industry cooperation as a way to fuel innovation. It is this concern that has prompted the launch of most of the new OCS support programs that have appeared since 2000. A stream of new programs, including Magnetron, Nufar, Zemer, Nataf, all address such cooperation (Offenhauer, 2008). Working of KMb/KT strategies in a combined total of 53 grant applications has allowed the knowledge brokers at York and NeuroDevNet to identify those characteristics common to weak or strong plans to maximise the potential for research impact (Table 3).

Table 3. Strengths and weaknesses of KMb programmes

Strong KT/Knowledge Mobilisation plan	Weak KT/Knowledge Mobilisation plan
Balances end-of-grant and integrated KT strategies (stakeholder engagement) and has effective engagement of end users throughout the research	Only focuses on end-of-grant (dissemination) products and activities, poor engagements of end users in the research.
Demonstrates understanding of impact being change in policy, practice, behaviour, measured at the level of the end users, not the researcher.	Conflates impact with outputs such as of website page views of video views of documents downloads of conference presentations with are measures of reach and dissemination of research.
Focuses on what the project team will do (i.e. activities)	Literature review about KT with no link to activities.
Includes: KT goals/objectives, activities that support the achievement of those goals/objectives, budget for activities, accountability.	Unfocused, list of activities and stakeholder groups with no unifying goals/objectives, no budget of accountability for KT activities.
Stated evaluation framework for specific indicators.	Poor or no evaluation plan, no indicators.

Note. Reprinted from Supporting Knowledge Mobilization And Research Impact Strategies In Grant Applications, by Phipps D., Jensen K., Johnny M., Poetz A. (2016). The Journal of Research Administration, (47)2. p. 57.

Researchers (Nutley, Percy-Smith, Solesbury, 2003; Nutley, 2003) have found that the early interaction between producers and users of knowledge helps to effectively shape the conceptual dimensions of research and its subsequent adoption. Closer and longer-term interactions between research producers and users is the most effective method of ensuring that knowledge is used (Nutley, Davis, Walter, 2003). The component of tacit knowledge is more highly prized in the social sector than in the areas of scientific and engineering research (Nutley, Percy-Smith, Solesbury, 2003) because its more likely to influence practice. Therefore the sharing of tacit knowledge needs to become a part of knowledge mobilisation in the sector in order for that process to be perceived as legitimate in the eyes of practitioner (German, 2008). Organisational theory, in the context of Kmb and research utilisation, reflects on what characteristics of an organisation (its organisational form) are more likely to promote learning and hence the use of knowledge and research. There is a theoretical bias in favour of networks and partnerships, rather than hierarchies or markets, as effective vehicles for organisational learning (Adler, 2001). However, empirical results have been less conclusive (Addicott, McGivern, Ferlie, 2006). Managed networks have been formed in health, partly on the rationale that knowledge will thereby be more effectively shared (Bate, Robert, 2002). Organisational theory, in the context of Kmb and research utilisation, reflects on what characteristics of an organisation (its organisational form) are more likely to promote learning and hence the use of knowledge and research. Strategic alliances, joint ventures, networks, hierarchies, Professional Service Firms, are all different organisational forms that are considered in the literature in relation to knowledge sharing (Crilly, 2013). Relationships, reciprocity and trust are of interest at the boundaries of organisations as preconditions for effective knowledge transfer and creation (Adler, 2001; Inkpen, 2000; Becerra et al., 2008; Kachra, White, 2008).

KMb relies on evidence of sufficient quality to enable appropriate decision making. Although many established sectors produce well-controlled research with sufficient sample sizes to guide decision making confidently, the KMb process is challenged in sectors where the pace of change outpaces the ability to complete high-quality research methodologies (Lemaire, 2016).

This evidence is analysed under three distinct headings:

- Formal R&D is of secondary importance. The ability to conduct educational experiments is limited, so that many benefits of research and learning are not exploited.
- Most of the practical knowledge remains tacit, so that an important contribution of knowledge codification to the rapid accumulation of human know how is kept at a low level.

There is a great deal of innovation without R&D (*learning-by-teaching*). However, two factors limit the economic value of those innovations: i) Linkages and feedbacks between formal R&D and professional practices are weak so that the practical knowledge of the innovative practitioners is rarely drawn upon by professional researchers. ii) Due to the absence of proper incentive structures, spillovers and diffusion of

innovation kept at low level: much innovation in education, unless it is mandated, does not get beyond the classroom where it has been generated.

Moore et al. (2016) identified seven challenges related to KMB:

- Different contexts,
- Consistency and responsiveness,
- Applicant capacity for knowledge translation,
- Program capability to support knowledge translation
- Rapid learning,
- A systems approach,
- Infrastructure for knowledge translation.

In some sectors of the economy such as education formal R&D is of secondary importance both for the training of people and for the generation of useful innovation. In the words of Murnane and Nelson (1984), R&D should not be viewed as creating 'programs that work' and only provides tidy new technologies to schools and teachers. It is, thus, certainly a mistake to think of educational R&D as industrial or biomedical R&D (i.e. generating knowledge of "immediate" value for solving problems and developing applications) (McPhee, 2016). Most of available literature sources on knowledge mobilisation focus on health but the concept is more generally applicable to other fields, with or without a technology focus. The emphasis is on the mobilisation of the knowledge produced through research. In this way, the insights play an important role in bridging the gap between research and practice (McPhee, 2016).

The core business of technology transfer/commercialization offices is supporting the development of commercialization strategies for grant applications. Furthermore, in Canada for example such offices *"must endorse and work on each new proposal"* (Natural Sciences and Engineering Research Council of Canada, 2016). In many countries, excluding Poland the majority of grant applications require specific strategies to support impacts. If not, how can research managers and administrators support knowledge mobilisation strategies which create the conditions that will maximize impacts of university research? This support is present for commercialization and industry engagement so why not for other sectors and other impacts? Research offices and other units at Canadian universities in the Research Impact network are developing knowledge mobilisation services designed to create grant applications that provide specific knowledge mobilisation strategies to enable future impact (Phipps et al., 2016). York University's Knowledge Mobilisation Unit in Toronto, Canada has been supporting knowledge mobilisation and impact strategies in grant applications for over ten years. The Knowledge Mobilisation Unit has developed standardized processes using tools for knowledge mobilisation planning that structure knowledge mobilisation plans around four key elements: audience/end users; goals of the knowledge mobilisation strategy; knowledge mobilisation activities; evaluation and accountability. The Knowledge Translation (KT) Core facility has been providing services to NeuroDevNet, a national Network of Centres of Excellence, since August 2013. The KT Core is housed within York University's Knowledge Mobilisation Unit and has adapted their method for planning

for use at the beginning of research programs for Autism Spectrum Disorders (ASD), Cerebral Palsy (CP) and Fetal Alcohol Spectrum Disorders (FASD).

KMb activities often take the form of relatively short-term projects dependent on limited funding, which raises issues about the long-term sustainability and quality improvement designed, facilitated and supported by these initiatives (Kislov et al. 2014). It is becoming increasingly recognised that the translation of research evidence into practice undertaken by KMb initiatives has to be supported by developing the internal capacity of healthcare organisations to engage with and apply research, with ‘capacity building’ seen by many as one of the key aims of KMb strategies. The focus of modern research initiatives must be shifted from “undertaking” research projects towards the development of skills required to successfully utilise research in practice.

There is a rich body of literature on KMb in health care. It reveals that “approximately eight to fifteen years elapse from the production of information to when it is used in practice” (Provincial Centre of Excellence for Child and Youth Mental Health at CHEO, 2006). It may take a generation for sector knowledge to filter up through knowledge infrastructures enough to influence community paradigms and then back down to guide community policies and practices more generally (German et al. 2008). Despite researchers and community organisations both being interested in providing better service to community members, expediting this lag via knowledge transfer can consume significant resources and time (Hahn, Subramani, 2000). Much of this delay may be attributed to ideational “zombies” – ideas held to be common within the community despite a lack of evidence or new evidence to the contrary (Provincial Centre of Excellence for Child and Youth Mental Health at CHEO, 2006). These “zombies” are the cultural artifacts of collective assumptions, values and behaviours that have evolved from past knowledge and experience but which underlie current decision making and resist innovation (Schein, 1985). The continued separation between the policy making, practice and research fails to evolve cultural artifacts in line with the general advancement of knowledge and practice, creating a challenge to find the common ground upon which all stakeholders can stand (Nutley, Davies, Walter, 2003). Both new research and new practice must be able to concurrently contribute an evolving set of community assumptions in order for each to find validation in the local paradigm (German, 2008). KMb involves a transfer of knowledge from the “producer” to the “user”. It is often claimed that KMb supports decision-making and innovation. A resources mobilisation strategy provides an essential roadmap, detailing how resources might be leveraged to meet organization’s resource requirement (Taylor, 2012). Publication citations are a proxy for scholarly impact, albeit a contentious proxy (Archambault, Gagne, 2004), especially for the humanities and creative arts (Phipps et al., 2016).

Conclusion

The terms ‘knowledge’, ‘research’ and ‘evidence’ are used to describe a hierarchical relationship where research is a form of evidence and evidence is a source of knowledge. Knowledge is considered the capacity (potential or actual) to take effective action in

varied and uncertain situations. Effective knowledge must not only be well organised, but must also have everything in step. In the business context, the mobilisation of resources can be described as the time needed to launch a new product or service (*time-to-market*) and innovation efforts should be supported with appropriate knowledge mobilisation strategies to channel the resources (especially public funds).

In this chapter, a general description of the concept of knowledge mobilisation was presented. Firms aiming to increase their innovation efforts should look for partnerships with science and research organisations. KMb is more than simply “increasing R&D expenditure”. Contrary to the traditional perspective of innovation where firms are encouraged to increase their R&D spending, KMb is described through the lenses of coordination and organizational efforts which aim to synchronize the processes of many different players in the innovation systems. In many countries such as Canada or the UK, the concept of knowledge mobilisation has gained popularity as a systemic approach to linking research institutions and businesses. Governments in many countries are striving to increase innovation outputs in their economies and stimulate high-tech exports. One such promising solution could be to invest into KMb programmes, according to the highlights described in this chapter.

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