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

Gábor Halász, Eötvös Loránd University, Hungary

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

Introduction

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

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

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

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

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

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

Use of evidence and knowledge mobilisation

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

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

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

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

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

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

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

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

Design-based research

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

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

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

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

Give and take between researchers and policy makers

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

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

The importance of listening

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

Behavioural change takes time

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

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

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

Research-practice partnerships

The Triple Helix and Knowledge Triangle models of innovation in which three parties interact – typically, academia, industry and government was the inspiration for the school-university partnerships discussed earlier (Halász, 2016_[13]). Originally such partnerships were used to improve teacher education (Tsui et al., 2009_[14]) but in the example above it supported researcher training in a doctoral school (Baráth et al., 2020_[15]). The strength of the partnership approach is that it can create highly institutionalised and prolonged researcher-practitioner collaboration in the form of a “third space”, where partners work together

on an equal basis led by their common interest. A particularly advanced form of this model can be seen in the so-called research-practice partnerships of the 1990s in the United States.

A remarkable example of the DUI approach is the Consortium on Chicago School Research created in the 1990s to support city-level school reforms. What one can see in this initiative is the emergence of a dynamic ecosystem with intensive collaboration and communication between university-based researchers, schools and district-level decision makers. The activity of the Consortium was guided by a number of basic principles, summarised below:

(1) If research is to be effective, researchers must pay careful attention to the process by which people learn, assimilate new information and ideas, internalise that information, and connect it to their own problems of practice;

(2) Research must be closely connected over time to the core problems facing practitioners and decision makers;

(3) If research is to build capacity, the role of the researcher and the product of research must change from outside evaluator or expert to engaged and interactive participant in building knowledge of what matters. (Roderick, Easton and Sebring, 2009^[16])

The Chicago model has been replicated in several cities in the United States (Coburn, Penuel and Geil, 2013^[17]; Farrell et al., 2021^[18]). According to Coburn, Penuel and Farrell (2021^[19]), research-practice partnerships (RPPs) have five distinctive characteristics:

1. Their duration is relatively long.
2. They focus on “problems of practice”.
3. They are “committed to mutualism”.
4. They use “intentional strategies to foster partnership”.
5. They produce “original analyses”.

These authors distinguish three major existing forms of RPPs:

1. Research alliances that are typically institutionalised partnerships between research organisations and local education agencies, focusing on “local policy and practice questions”.
2. Design partnerships that aim at creating new pedagogical solutions “in real-world contexts”, typically focusing on “developing and testing instructional materials”.
3. Networked improvement communities that seek “to leverage diverse experiences in multiple settings” and “to understand what change strategies work, where, when, and under what conditions”.

This way of connecting research with practice is in sharp contrast to the model in which the two sides remain in isolated spaces and are connected by brokering actors. The utilisation of research outcomes for researchers in such dynamic knowledge ecosystems is a natural element of the research process; it does not appear as a separate, supplementary task. Beyond the five characteristics listed above, RPPs typically include capacity-building components as well, and have transformative goals; that is, they have the intention to improve practice, often promoting radically new solutions (see an example in Box 8.3).

Box 8.3. Mutual learning through workshopping: An example

Mutual learning was an important spill-over effect of a research project exploring the impact of EU-funded development programmes on daily school practice led by the author of this paper in the middle of the 2000s (Fazekas, 2018^[20]). During the four years of the project, workshops were organised

every month with the participation of policy makers and school practitioners with the aim of mutual knowledge sharing. The dissemination of research outcomes was only one of the goals of these workshops. More importantly, participants continuously informed the research, providing new evidence, leading often to the adjustment or refining of research questions. Researchers in this collaborative activity, incessantly learning from their partners, could not avoid “paying careful attention to the process by which people learn”. They also adapted their language to their partners and were attentive to their needs.

Source: Fazekas, Á. (Fazekas, 2018^[20]), “The impact of EU-funded development interventions on teaching practices in Hungarian schools”, *European Journal of Education*, Vol. 53/3, pp. 377-392.

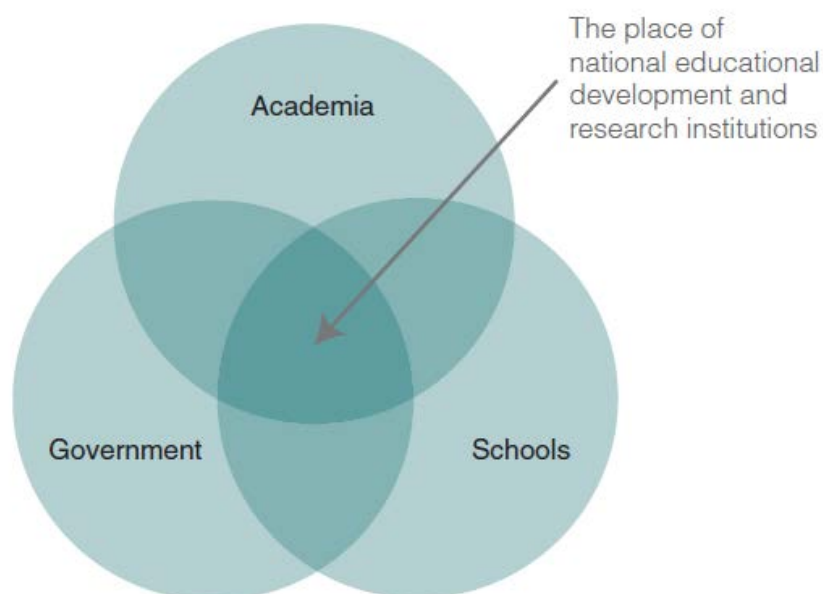
School-university partnerships (SUPs) are a typical and frequent form of institutionalised collaboration between researchers and practitioners. This multifunctional development tool can be used in all education systems, including low-income countries. Not only do they enhance quality in teacher education and professional development, they also promote research-practice dialogue (Halász and Thant Sin, forthcoming^[21]). An advanced use of SUPs to enhance research impact could be observed particularly well in the influential Teaching and Learning Research Program of the United Kingdom. The SUPs created in this programme were highly institutionalised and multifunctional, and functioned in a project-based mode. An example is the Schools-University Partnership in Educational Research (SUPER) project, which was a collaboration between the University of Cambridge Faculty of Education and eight schools (McLaughlin, 2006^[22]).

A key factor in research-practice partnership is the motivation of research organisations to devote time and energy to this kind of action. In the case of universities, this can be facilitated by institutional strategies promoting involvement in “third mission” activities and extending existing knowledge transfer operations to the social area, including education. Selling research outcomes for money and generating extra income through consultancy, as presented in the next section, can also be a driver. This is not always self-evident. Following the author’s move from a government-run research and development agency to a research university it was interesting to see that while knowledge transfer mechanisms were clearly promoted, this was oriented only to provide research support for industrial technology development. Social services were not seen as a relevant target area.

In the faculty of psychology and education where the author taught, being involved in school development and interacting with schools was not a recognised activity taken into account in performance evaluations. This was in strong contrast with the government research and development agency where we developed an explicit organisational strategy in which equal distance and closeness to academia, policy and school practice was a guiding principle as represented in Figure 8.1. This strategic self-positioning of national government-led educational development and research institutes was dominant in most similar institutions and the model was presented at a conference of the leaders of such institutes, celebrating the 20th anniversary of the Consortium of Institutions for Development and Research in Education in Europe (CIDREE) consortium.

The organisational strategy that included the visual model presented in Figure 8.1 had direct and visible implications for the daily operation of our institute, as illustrated in the examples mentioned earlier. Policy relevance and usefulness for practice development would become the norm, as basic as following classical academic standards in writing research reports or publishing results. Our intention was to create *communities of practice* of researchers and practitioners.

Figure 8.1. Strategic self-positioning of national government-led educational development and research institutes



Source: Halász, G. (2010^[23]), “The role of educational research and innovation in improving educational systems: A CIDREE perspective”, in Stoney, S. (ed.), *Beyond Lisbon: Perspectives from Research and Development for Education Policy in Europe*, Consortium of Institutions for Development and Research in Education in Europe (CIDREE).

Consultancy

While research-practice partnership researchers appear as knowledge providers without business interests – which is not necessarily the case as partners often fund activities in common and researchers involved in these activities are paid – consultancy is considered to be an income-generating business. In consultancy work, researchers are selling their knowledge for money.

As the authors of an analysis of knowledge transfer activities in social sciences and humanities stated: Debates on knowledge transfer usually focus on technology transfer and commercialisation. They underlined that “the valorisation of academic results – making the results from academic research accessible to society – has been limited mostly to the economic contribution of universities through the licencing of intellectual property rights and spin-off creation” overlooking “the potential of the arts, humanities and social sciences” (Olmos-P.J., Castro-Martínez and d’Este, 2014, p. 697^[24]). In a book on education consultancy, a whole chapter has been devoted to “researchers as consultants in and outside of universities”, analysing the consultancy activity of four well-known educational researchers (Michael Fullan, Andy Hargreaves; Ken Leithwood and David Hopkins) who have contributed significantly to boosting the impact of educational research (Gunter and Mills, 2017^[25]).

What we are doing when working, for example, as members of OECD examiner teams is providing a consultancy service to governments (who pay for this service). But we also create generalisable new knowledge or research. Many elements of what we do in these missions is not fundamentally different from what we do when implementing research projects funded by research funding agencies. Researchers contracted as project team members by private consultancy companies to design and implement research activities, funded by governments or international organisations, have similar experiences. This is a particularly effective way of using research-based knowledge to support the client of the contracting consultancy company.

Developing skills needed in consultancy work can be an important component of researcher training. The author, when leading a doctoral school, made deliberate efforts to help develop the transversal skills of doctoral students, enabling them to take on client-oriented consultancy activities (see example in Box 8.4).

Box 8.4. Honing researcher skills in the field

The principal of a private school contacted our doctoral school of education, suggesting that the external evaluation of his institution, earlier done by private consultancy companies, could perhaps be performed by our doctoral students. An agreement was made and a team of five doctoral students submitted a proposal to do this job. During the approximately year-long project, the student team pursued classic research activities in the school, interacted intensively with the client and produced, at the end, an academic book presenting the outcomes of this research-consultancy activity (Horváth et al., 2018^[26]). When asked how useful they found this for their researcher skills, the doctoral students affirmed they had learnt more during this project than in many traditional programmes doctoral schools typically offer.

Source: Horváth, L. et al. (2018^[26]), “Kutatási beszámoló az Alternatív Közgazdasági Gimnázium Pedagógiai Programjának bevélel-vizsgálatáról”, AKG as an innovative learning environment. Research report on the examination of the impact assessment of the pedagogical program of the Alternative High School of Economics, Akadémiai Kiadó. Budapest.

The involvement of doctoral students in consultancy activities can be encouraged by national research and innovation policies. This is the case, for example, in France, where the notion of “*doctorant-conseil*” describes “an activity carried out in the form of a mission carried out by a doctoral student in a company, an administration or a local authority, in parallel with his doctoral work within a research unit. The theme of this mission is in the field of skills acquired by the doctoral student throughout her/his career; it does not necessarily present a direct link with her/his research topic”.⁴ This kind of engagement of doctoral students in consultancy work is rare in the field of educational research although it could, directly and indirectly, enhance the impact of educational research.

An interesting example of directly using the knowledge and experiences of doctoral students to improve practice can be found in the Dutch Inspectorate inviting PhD candidates to study the organisation and prepare dissertations about its operation (Nusche et al., 2014^[27]). In this case, a government agency with advanced internal knowledge-management strategy and mechanisms interacted with young researchers to generate new knowledge about its own impact and make its internal processes more innovative.

Using narratives and storytelling

There is abundant literature on the use of storytelling in science communication: Some authors defending this contested form of communication are highly reputed scientists. “Everywhere one looks in science, there are stories,” wrote Nobel prize-winner Roald Hoffmann in his essay on the role of narrative in scientific discovery (Hoffmann, 2012^[28]). He describes in another study the formulation of hypotheses as stories (Hoffmann, 2014^[29]). Storytelling appears not only to be an effective way of communicating scientific content to a non-academic audience but an indispensable tool for making scientific discoveries and communicating them within the academic community. Authors analysing the role of stories in science, including Hoffmann, stress that when temporality and causality are treated there is always a story with a beginning, an unfolding and an end. They also emphasise that our brain needs stories: It has a “narrative hunger” (Morgan and Wise, 2017^[30]; Norris et al., 2005^[31]). And, they often stress that the use of narrative in science is not a way of talking about science but doing science: Narratives are an inherent characteristic

of scientific discovery and argumentation (Newman, 2018^[32]). Research on storytelling shows us that science without stories cannot be real science and the lack of stories is a sign of imperfect science.

Transforming research outcomes into stories without distorting the content, however, is not easy: It requires skills that researchers do not often possess and that we tend to neglect when training researchers. Few teachers in doctoral programmes would react positively to an initiative in which doctoral students are asked to tell their research outcomes in a fictional story form, doing what some authors describe as “fictionalising research data” (Campbell, 2000^[33]). However, it is a serious exercise that would reveal the coherence (or not) of their arguments and their understanding of the complexity of the object they are studying.

Story-telling was used as a dissemination tool, as well, in the two above-mentioned research projects (the Hungarian project in Box 8.4 and the Dutch case). When a publisher invited researchers to present the outcomes of the two projects in a larger volume – already publicly available through the project websites and also in several journal articles – they decided not to write a classic academic book but to experiment with an unusual hybrid form of dissemination with the hope of reaching practitioner readers.

They created a fictional character – Zita, the innovative teacher – who writes a diary in which she records her professional experiences, reading, doctoral studies, and conversations with her colleagues. To make Zita’s experiences more colourful, another fictional character was created: Reijo, the Finnish scientific journalist who travels to Budapest to make a series of interviews with her. In order to present research outcomes related to policy implementation, a third character entered the scene: Xia, the development economist working for the Asian Development Bank, who designs and implements interventions in the education sector in low-income countries. And, to support the presentation of issues related to research methodology, a fourth character joined the story: Miriam, the Zambian educational researcher who acquired her PhD in Finland. The story is told by Reijo, who often meets with his three colleagues, has long conversations with them while travelling, and exchanges many emails with them. On the basis of his notes, he writes a book and finds himself in a controversy with his scientific publisher who hesitates about whether he should publish a book which does not follow the standards of classic academic genre.

After the publication of the book, entitled *The Birth of Knowledge* (Halász and Fazekas, 2020^[34]), a sequel was written which came out one year later with the title *The Second Frontline* (Halász, 2021^[35]).⁵ The author of this chapter uses these books in his master’s-level degree courses for students, practising teachers and school leaders. This has resulted in much feedback from readers, demonstrating the effectiveness of this kind of research communication. Many practising teachers affirmed that they could understand complex content through Zita’s diary and the conversations of the characters, which they would not be willing to assimilate if presented in classic academic form. Some people reported on transformative effects: Inspired by the books they have enriched or plan to enrich their teaching practice with new elements.

Both research projects that inspired the writing of the two hybrid books used mixed methods that combined large-scale surveys providing quantitative data for complex statistical analyses and case studies providing qualitative data in the form of interviews, collected stories, informal conversations and notes on observed classroom and extracurricular activities. Both projects were accompanied by a deep, long and systematic analysis of the relevant literature accompanied with discussions about the readings in a professional community of researchers and practitioners (Halász, 2019^[36]). Using a systematic review of the literature as an institutionalised communication framework is one of the many ways that can generate professional dialogue between researchers and practitioners: This requires a deep understanding of the authors’ thinking and the immediate translation of what they present into practical conclusions. Many of the elements of the stories that later appeared in the books emerged during our case studies and literature analysing community events.

Using teaching to connect research with practice

The last way to connect research with practice, which we mention in this chapter, is by using research in teaching. This might seem banal at first glance but is worth exploring. It may be simply presenting research outcomes in higher education study programmes to future practitioners or to those who enrol in continuous professional development programmes provided by universities or other agencies linked with research. This is a natural practice in teaching in higher education. But it can also be realised in various forms of research-based teaching, which is, again, a common practice in higher education, especially at graduate or post-graduate level. Doctoral education deserves special attention in this respect, particularly in light of the fact that now the majority of doctorate holders in many European countries find employment outside the academic sector (Boman et al., 2021^[37]); that is, many of them become – or remain – practitioners either in the private or public sector. There is a high level of probability that these people will develop a practice that is attentive and responsive to research and will promote research utilisation in their daily work.

Box 8.5. The researcher policy maker: An example

One of the author's doctoral students became a high-level official a few years after defending her PhD in a government agency with regulatory, development and policy implementation responsibilities in the field of higher education. In this position, she created a unit of analysis to support policy decisions and monitor implementation, recruiting several young researchers and launching a number of research and policy evaluation projects. Under her leadership research and the use of evidence became normal practice in a government agency where regulation and legal supervision were almost exclusive activities. This fundamentally transformed the administrative style and discourse in the organisation. Conversations with her made it clear: without the PhD experience, she would and could not have initiated these changes.

Many PhD-holding teachers have been promoted to a “researcher-teacher” status in the framework of a new career promotion system introduced in the middle of the 2010s in Hungary (see Chapter 4, Box 4.3). These teachers submit a research plan when applying to acquire or renew this status. As the reviewer of a number of such applications, the author of this chapter saw many examples of teachers using researcher skills acquired during their PhD studies.

Due to the status of the researcher teacher created by the new career system, this form of practitioner research has become a frequent phenomenon in the Hungarian school system. In addition, many of the “master teachers” (another special status) also do research, development and innovation activities.⁶ Most research activities performed by practising teachers now focus on developing teaching and learning in schools, sometimes in specific disciplinary areas, sometimes in cross-curricular domains but they can also cover extracurricular areas or support school development and school evaluation.

This might have far-reaching implications on how to define the strategic goals of doctoral programmes and how to organise teaching and learning in these programmes. If educating practitioners equipped with professional researcher skills who have positive attitudes towards using research to improve practice become part of the mission statements of doctoral schools, this would directly impact doctoral education. It would impact the design and organisation of doctoral courses, the evaluation of performance, the allocation of credits, the involvement of practitioners in teaching and supervision, and the possible inclusion of internship periods in the process of becoming a doctor.

There is an interesting example of research-practice integration into teaching in an innovation management perspective in the “EIT label”, awarded to higher education programmes by the European Institute of Technology. Of the award's seven principles *knowledge triangle integration* is foremost. This requires a

study programme design “where co-creation and collaboration between education, research and innovation, and business contribute to addressing societal challenges” (EIT, 2021, p. 12^[38]). This configuration can be applied to the education sector as well, in which the “research” pole of the knowledge triangle would be educational research; the “education” pole would be the training of teachers, school leaders and policy practitioners; and the “innovation” (or “business”) pole would be schools and other education sector institutions (including government-based policy-making or policy-implementation agencies). In this model, research is connected to practice through teaching or skills development with a strong emphasis on co-creation and collaboration.

Conclusions

The examples presented in this chapter can help revitalise projects that aim to strengthen research-policy-practice links such as the CERI project on *Strengthening the Impact of Education Research*. The six ways of enhancing research impact can be encouraged simultaneously in every education research and innovation system. Box 8.6 outlines some key recommendations for such initiatives.

Box 8.6. Recommendations for strengthening the research-policy-practice link in education

Use innovation management and knowledge-management approaches

The use of approaches applied in innovation management and knowledge management could significantly enhance knowledge utilisation in the education sector and education policies themselves could benefit from innovation policies. Include innovation in education into national innovations strategies or consider the design and adoption of specific education-sector innovation strategies.

Give equal focus to the DUI and STI modes

The intention to think in non-linear, co-creating, Doing, Using and Interacting (DUI) mode is reflected in research questions where “relationships and interactions” and the skills needed for “co-producing research” are among the key themes. This chapter argues that the DUI mode could receive more attention and existing practices based on this mode could be better explored, especially from a knowledge mobilisation perspective.

Give more attention to design-based research

Design-based research, a typical form of the DUI mode, should receive more attention in initiatives such as the CERI project on strengthening the impact of education research. Survey questionnaires collecting data on facilitating research use should not only reflect the Science, Technology and Innovation (STI) way of thinking about interaction between research, practice and policy. In addition to a focus on the function of mediation or brokerage between the two worlds (research, on the one side and policy and practice, on the other), co-creation, co-production or collaborative design also need attention.

Create communities of practice for researchers and practitioners

Communities of practice can be created through research-practice partnerships, school-university partnerships and other institutionalised forms of co-operation. At the doctoral level, the education of practitioners equipped with advanced researcher skills could become a key programme component and could be better exploited for research use and research impact in the education sector. This could be facilitated by applying the knowledge triangle concept to the education sector, where the “innovation” or “business” pole of the triangle are education-sector service providers.

Include consultancy in the scope

Although consultancy is a particularly effective form of knowledge transfer for enhancing research impact, this way of using and disseminating research-based knowledge has rarely been identified as an important form of knowledge mobilisation or knowledge utilisation. Most knowledge mobilisation analyses ignore it. Consultancy is an important part the activity of many researchers and could be a component of researcher training.

Encourage creative, user-friendly forms of scientific communication

Research outcomes published in academic journals often do not reach practitioners who can make use of them in their practice. Storytelling can reach those who have limited interest in reading research reports or are reluctant to look for scientifically based solutions. National or institutional policies and research funding agencies can encourage the communication of research outcomes via storytelling. This would result in fictional literature, films or theatrical performances conveying research-based knowledge in a form that targets our rational thinking, senses, emotions and motivational energies. This would require more intensive communication and co-operation between scientists and artists, and research on the impact of communicating science through stories.

The six forms of enhancing research impact presented in this chapter highlight not only the social dimension of research utilisation but also the high-level complexity of this process. Analysis of the practice of using research has described this process using the language and the approach of complexity science, underlining its non-linear nature and the difficulties of predicting its outcomes:

“There is increasing evidence that the use of research is emergent, non-linear, iterative and contingent (...) When considered through a complexity lens, research use is a process that is characterised by multiple interactions among many entities co-creating dynamic, non-linear patterns of unpredictable behaviour governed by feedback loops that cause cascading changes throughout the system. (...) users are ‘active problem-solvers and generators of their own knowledge base instead of merely passive receptacles of information and expertise’ (...) Taking into account the contingent, emergent and unpredictable nature of research use would imply acknowledging and accommodating unpredictable outcomes that might emerge over time.” (Lemay and Sá, 2012, p. 479^[3])

Insights from innovation and knowledge-management thinking can offer significant contribution to our analysis of research impact. There are several ways to strengthen the impact of education research, some of them more unusual. Therefore, we should not be too bound to the researcher’s perspective as it focuses by whom and how the knowledge they produce will be used. Rather, we should place ourselves in the position of practitioners. For the latter what counts are the problems and challenges they face in their daily practice. Their concern is not how effectively research-based knowledge can be used in practice but how they can solve their real-life problems and find the knowledge that can support this.

As the authors of a relevant earlier innovation research paper noted: “In many organizations, there is a profound influence on operations and policies derived not from research and development but from the accumulated wisdom of the practitioners” (Johnson and Brown, 1986^[39]). These authors, drawing on earlier research, identified four different forms of “transmission of knowledge”: (1) Research, development, and diffusion (2) Problem solving (3) Linkage (4) Social interaction models. This classification was later applied in analyses of knowledge transfer and utilisation in education (Becheikh et al., 2010^[40]; Nelson and O’Beirne, 2014^[41]).

Attention has often focused mainly on the research, development, and diffusion, and the linkage models; that is, on the dissemination of research outcomes in the case of the former, and on mediation in the case of the latter. Those concerned by innovation, focusing either on micro-level innovation management or macro-level innovation policies, show more interest in the use of knowledge for problem solving and the creation of social spaces to enhance innovative problem solving. In other words, they look at the use of

knowledge from the perspective of those who have to solve problems and cooperate with each other to find new solutions.

This paper asserts that thinking about researcher-practitioner relationships in a DUI mode promotes “problem solving” and “social interaction”, and improves the chances of research utilisation. Taking the perspective and language of innovation and knowledge management helps us understand the practitioners involved in collaborative problem solving. What interests practitioners is research in a contextualised form. They need researcher partners who listen to them, who are willing to cooperate with them in enduring partnerships, and who can understand their everyday language and give specific, contextualised advice to them.

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Notes

¹ See paragraph 37 of the act on “Scientifically Based Research” (Public Law 107–110. 107th Congress. An Act „To close the achievement gap with accountability, flexibility, and choice, so that no child is left behind” (2002_[43]).

² See the box “Assessment: Hungary” in Gordon et al. (2009_[42]).

³ See the project’s website here: www.oecd.org/education/cei/assessingprogressionincreativeandcriticalthinkingskillsineducation.htm.

⁴ See the website “Qu’est-ce que le « doctorant-conseil?” of the University Poitiers (<https://college.ed.univ-poitiers.fr/quest-ce-que-le-doctorant-conseil>). English translation by the author.

⁵ The books have been published in Hungarian but a rough translation of many chapters are available in English.

⁶ In 2020, for example, the researcher-teacher status (acquired five years earlier) of 76 applicants was renewed and 26 new additional applications were approved. The same year 2146 teachers acquired the master-teacher status, with 547 renewals and 1599 new applications (source: Information shared with author by the Educational Authority of Hungary).



From:
Who Cares about Using Education Research in Policy and Practice?
Strengthening Research Engagement

Access the complete publication at:
<https://doi.org/10.1787/d7ff793d-en>

Please cite this chapter as:

Halász, Gábor (2022), "Communication, collaboration and co-production in research: Challenges and benefits", in OECD, *Who Cares about Using Education Research in Policy and Practice?: Strengthening Research Engagement*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/2d9d7988-en>

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