Evidence-Based Policies in Education: Initiatives and Challenges in Europe

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Abstract

Purpose: This article examines the state of progress of evidence-based educational policies in Europe and identifies organizations for the generation and dissemination of evidence. Further, it discusses some of the most relevant challenges facing the development of evidence-informed education policies in Europe.

Design/Approach/Methods: This article analyzes official documents by the European Commission (EC) and other organizations. Literature in the field of evidence-based education worldwide is examined to identify the primary challenges and issues related to the development of a culture of evidence in Europe's education sector.

Findings: The EC has recently prioritized evidence-informed policy and practice in education, increasingly encouraging member states to utilize evidence in the policy decision-making process. According to official documents, this process began in 2006 and has since enjoyed remarkable progress through several initiatives intended to spread a culture of evidence in education. However, several challenges and issues remain regarding the promotion of evidence-informed policymaking.

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Originality/Value: Having prioritized evidence-informed policy and practice, the EC strongly encourages the adoption of evidence in the policymaking process. This article provides a point of reference regarding the initiatives already undertaken and the challenges facing evidence-based educational policies and policymaking in Europe.

Introduction

Researchers first began advancing the need for educational programs and practices to be based on evidence approximately 20 years ago (Davies, 1999; Hargreaves, 1996). A growing number of high-quality studies evaluating replicable programs in real education settings have since been produced, providing evidence to inform the decisions of educators and policymakers (Slavin, 2002). Together with an exponential growth of interest in evidence-based education, policies have been changed to support the use of evidence in decision-making.

According to Davies (2004), *evidence-informed policy* is an approach that "helps people make well informed decisions about policies, programmes and projects by putting the best available evidence at the heart of policy development and implementation" (p. 3). Conversely, *opinion-based policy* bases decision-making on ideological or individual perspectives. Others prefer using the term "evidence-based" rather than "evidence-informed" when referring to the use of evidence in decision-making. According to Slavin (2020), *evidence-based reform* "refers to policies that enable or encourage the use of programs and practices proven to be effective in rigorous research" (p. 21). Rather than the dissemination of "generic principles of effective practice" (p. 22), this definition points to the production of effective and replicable structured programs through experimental evaluation. Nonetheless, European authors and initiatives have tended to prefer the term "evidence-informed education" (e.g., Brown, 2015; Evidence Informed Policy and Practice in Education in Europe [EIPPEE] Project). The use of this term has implications for both the research and policy: In terms of research, sources of evidence extend beyond experimental studies and often include qualitative and mixed methodologies; for policies, the European Union (EU) documents provide guidance rather than stipulations regarding the use of evidence in educational decision-making.

Countries worldwide have already begun changing their policies to encourage the use of evidence in schools. For instance, in 2015, the U.S. implemented the Every Student Succeeds Act (ESSA), which defines different levels of evidence (strong, moderate, and promising) and offers

incentives to schools that adopt a practice based on evidence of its impact. In Europe, policy change in this direction has been slower and specific to each country. For example, the shift toward using evidence in education is accelerating in the UK compared to other countries as a result of the country's efforts in developing educational programs and a long tradition of experimental evaluation. However, this is yet to result in any policy transformation; there is still much to be done to provide educators with various proven programs for each subject from which they can choose.

While interest in evidence has grown in scientific communities across Europe, they are yet to reach a point in which a process of program development and evaluation can be implemented effectively. For example, various official documents from Italy's Ministry of Education (MIUR) advance the importance of using technology in schools, with technological innovations since introduced to almost every class in the country. The "Azione LIM" (Interactive Whiteboard Action) promoted by the MIUR in 2008 provided schools with some 35,114 interactive whiteboards (IWBs)—and the teacher training to use them—for a total cost of EUR 93,354,571. The number of IWBs and the funding provided to Italian schools increased over the following years, with the technology available in 42% of classes by 2016 (MIUR, 2015). This provision is certainly relevant in our society, which is becoming increasingly technology-based, and innovative technology must be provided and used in schools. However, the evidence regarding the effectiveness of these tools also needs to be recognized to ensure their optimal use in the teaching process. According to a large-scale experimental study conducted in the UK, 5 months of IWB use showed a nonsignificant effect size of $+.04$ in English studies and a significant effect in mathematics and science at $+.10$ ($p < .001$) and $+.11$ ($p < .001$), respectively. After 2 years, the effects were almost zero in all subjects ($+.02$ for English, $.00$ for mathematics, and $-.03$ for science; Higgins et al., 2005). A systematic review conducted by Kyriakou and Higgins (2016) found similar results, with the use of IWB revealed to impact on neither students' level of attainment nor the quality of classroom learning.

France provides another recent example of a policy measure partially based on evidence. In 2017, the French Ministry of Education reduced the class size in disadvantaged areas—a reduction from 24 to 12 children per first and second grade class intended to reduce the gap in academic achievement between students from wealthier and poor backgrounds. This required a great deal of investment in additional teachers. Prior to implementing this policy, the French Ministry sought evidence of the impact of class size reduction. More specifically, they drew on a 2003 study conducted by Bressoux et al. (2019) that found positive, albeit small, effects of class size reduction on academic achievement on reading (ES $= +.14$) and spelling (ES $= +.22$). This approach is innovative, particularly in terms of the positive attitude toward the use of evidence in the policy-making process. However, a new study by the same authors shows that the results of class size on academic achievement diminish over time (Bressoux et al., 2019). Furthermore, according to a

recent meta-analysis by the Campbell Collaboration (Filges et al., 2018), the impact of class size on academic achievement has a small but statistically significant effect size on reading (ES $= +.11, p =$ .0003) and a negative effect size on mathematics (ES $= -.03, p = .75$). While reducing the gap between advantaged and disadvantaged students is necessary, evidence suggests that class-size policies might be an overly expensive and relatively ineffective measure. Indeed, numerous meta-analyses (Inns et al., 2019; Pellegrini et al., 2018) have shown the effectiveness of other strategies, such as tutoring by an adult, for enhancing students' academic achievements. Consulting the findings of extant research can lead to more effective and less expensive policy and practice decisions.

Although each country in Europe is responsible for its education, the EU plays a leading role in promoting the use of evidence in the decision-making process at the policy and practice levels. This article considers the promotion of evidence-informed practice and policymaking in the member states of both the EU and the wider Eurydice network.[1] First, based on the European Commission (EC) official documents, this article introduces the state of progress of evidence-informed educational policies in Europe. Second, this article discusses the primary European initiatives intended to conduct program evaluations or inform practitioners about evidence in education. Finally, this article discusses some of the most relevant challenges to the development of evidence-based reform in Europe.

Measures encouraging the use of evidence in Europe

Over the past 10 years, the EC has prioritized evidence-informed policy and practice in education, increasingly encouraging member states to use evidence in the policy decision-making process. This section discusses the various initiatives intended to promote an evidence-based culture in Europe.

The first EU document addressing this was signed by the European Council in 2006. In this respect, the 2006 spring European Council conclusions—"Implementing the Renewed Lisbon Strategy for Growth and Jobs"—stressed the need for a culture of evaluation, thereby encouraging the systematic use of evidence as a basis for the modernization and equalization of the educational system. A subsequent document entitled "Efficiency and Equity in European Education and Training Systems" similarly emphasized the importance of establishing "a culture of evaluation and to promote the validation and dissemination of good practice" (p. 1).

In 2007, the EC released a Staff Working Document entitled, "Towards More Knowledge-Based Policy and Practice in Education and Training." The document repeated relevant information regarding the use of evidence in educational policy in Europe from an Organisation for Economic Co-operation and Development (OECD) publication released earlier that year. The OECD (2007) highlighted the need for high-quality research to inform policy and practice decision-making, including the open discussion of potential methods and sources of evidence.

The 2007 Staff Working Document aimed to provide policymakers and relevant stakeholders with an overview of the actions already undertaken to strengthen the creation, application, and mediation of knowledge and identify the main challenges in this field. Further, it stated that "evidence-based policy and practice should be the driver of reform in education and training systems" (p. 9).

The 2007 Staff Working Document revealed considerable differences in the degree to which individual European countries had tried to improve the relationship between research, policy, and practice. Several countries have started initiatives with the aim of enhancing the quality of educational research and improving the relevance of research to practice. This has typically involved investment in:

- agencies for the coordination of educational research and innovation and the use of evidence in practice (e.g., National Institute for Quality and Evaluation of Education System in Spain and Federal Institute for Educational Research, Innovation and Development of the Education System in Austria);
- large-scale national research programs to investigate issues pertinent to practitioners and decision makers (e.g., Teaching and Learning Research Programme in the UK and the Life as Learning research program in Finland); and
- research centers that conduct studies on priority issues at the national level (e.g., Leading Houses for research in vocational training in Switzerland, and Learning Lab Denmark).

The primary challenges identified in the Staff Working Document (2007) include three dimensions of knowledge-based policy and practice: knowledge creation, which involves the production of research-based knowledge; knowledge application, which involves the use of evidence by policymakers and practitioners; and knowledge mediation, which refers to the brokering of knowledge to make it accessible. In 2007, many EU countries were already actively dealing with these challenges by creating new agencies and institutions in order to make the research more relevant in policymaking, as well as improve research quality. The most difficult challenge to knowledge creation and application involves developing a culture of evaluation in which policymakers and practitioners not only use evidence but also guide the focus of new research. Knowledge mediation faces a hurdle in the designing of strategies that are long-lasting and thus able to ensure effective mediation over time. Examples of brokerage agencies of this nature include the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) in the UK as well as What Works Clearinghouse (WWC) in the U.S.

Although individual countries are responsible for their education and training, the EU has started supporting evidence-based policy and practice in its member states. The call for

policymaking based on evidence was included in the 2009 Council conclusions on Education and Training 2020 (ET 2020), which stated:

> European cooperation in education and training for the period up to 2020 should be established in the context of a strategic framework spanning education and training systems as a whole in a lifelong learning perspective. [. . .] The periodic monitoring of progress towards a set of objectives provides an essential contribution towards evidence-based policy-making. (quoted in EC/Education, Audiovisual and Culture Executive Agency [EACEA]/Eurydice, 2017, p. 6)

These sentiments were restated in the 2015 Joint Report, which noted that "strong analytical evidence and progress monitoring are essential for the effectiveness of the ET 2020 framework" (quoted in EC/EACEA/Eurydice, 2017, p. 6).

Subsequently, "Evidence Based-Policy and Practice: Call for Proposals to Develop Networks of Knowledge Brokerage Initiatives" was launched in 2009. This concrete initiative was intended to strengthen the links between research, policy, and practice. Running from 2010 to 2013, the winning project—the EIPPEE—examined European countries' attempts to link research and policymaking in education through a survey. According to the resulting study,

> The findings from the survey suggest a high level of activity across Europe and demonstrate that a wide variety of approaches has been taken to try to improve the use of research evidence in policy settings. However, there appears to have been relatively little collaboration and coordination of this work at a trans-European level. (Gough et al., 2011, p. 8)

Based on the findings of and resources provided by the project, the EIPPEE made the following recommendations to help member states increase their use of research in policymaking:

1. *Enable links between research evidence and policy*.
2. *Increase the quality, relevance, and availability of research to inform policy* by involving policymakers' perspectives in driving research agendas and expanding the use of systematic reviews of research.
3. *Encourage knowledge, awareness, and skills capacity building in all parts of the research evidence production-to-use system*. This could include participating in networks on this topic as well as providing training for individuals and organizations.
4. *Undertake policy decisions to develop evidence-informed policy in education at the national, regional, and local levels* by increasing the political and financial commitment to evidence-informed education policy.
5. *Increase research capacity in terms of research generation and use*. This may include conducting new evaluation studies.

Although these recommendations reflect the interest of European countries regarding evidence, they were too generic to lead to concrete changes in Europe.

A 2017 Eurydice report provides the most recent and advanced record of evidence-based policies in Europe. This report provides information on the support mechanisms for the evidence-based policymaking of the Eurydice network and offers suggestions for improving the connection between research, practice, and policies. According to the report, the Eurydice network uses several arrangements and knowledge brokerage services to gather evidence in support of policymaking. Most countries have official arrangements and several organizations to provide evidence for policymaking. However, these arrangements differ from one country to another and range from legislation to generic guidelines about whom to consult to provide evidence in policy-making processes. In this respect, the UK is considered to be at the forefront of policy measures that encourage the use of evidence. In 1999, a white paper entitled *Modernizing Government* explicitly stated the UK government's commitment to evidence-based decision-making (Cooper et al., 2009). New research centers were established with government funding between 1999 and 2000, including the EPPI-Centre. More recently, experimental research was conducted by the Education Endowment Foundation (EEF)—an independent charity with government funding active in the generation and transfer of evidence in schools.

Moreover, in 2017, the English government launched the Strategic School Improvement Fund (SSIF) and Teaching and Leadership Innovation Fund (TLIF). The SSIF was provided to support disadvantaged schools with a high proportion of low achievers in order to improve pupil attainment and academic performance. In funding schools, the SSIF expressed a preference for programs supported by evidence of their effectiveness. However, after three rounds of funding over the year, the government announced the cancellation of the program in 2018 (Slavin, 2020). Launched in 2017, the TLIF is intended to improve the outcomes of students through projects that provide professional and leadership development in schools or areas facing challenges. The National Foundation for Educational Research and the Sheffield Institute of Education are using a mixed method approach to evaluate the impact, process, and value for money of the projects funded by the TLIF. As a result of these measures, the UK is the first country in Europe with a legislative provision emphasizing the use of evidence in schools.

However, there is little consistency in the stance of countries toward evidence-informed policy-making and practice. Many European countries do not legally recommend the gathering and use of evidence in the policymaking process (EC/EACEA/Eurydice, 2017). As such, there are relatively few official arrangements that support or facilitate the flow of information in Europe. Meanwhile, in countries like the Netherlands and Germany, policy decision-making involves research agencies and institutions responsible for advising policymakers. For example, the Netherlands Initiative for Educational Research funds and coordinates research and acts as a knowledge broker.

Organizations for the generation and dissemination of evidence in education

Various organizations operating in Europe are committed to promoting an evidence-based culture in education. Several such organizations evaluate programs and practices through experimental studies and research reviews, especially meta-analyses. Others are brokerage organizations focusing on disseminating the connection among research, practice, and policy. This section examines these organizations in greater detail.

Organizations for the generation of evidence

Campbell Collaboration. The Campbell Collaboration is a U.S. center conducting systematic reviews in social and economic fields in order to promote evidence-based policy and practice. The idea for this center originated in a meeting in London in 1999. The meeting was attended by 80 people from four countries—many from the Cochrane Collaboration, a center that conducts reviews in health care. Attendees noted the importance of having a similar center for the social sciences in order to review research on the effectiveness of social, economic, and educational interventions. This resulted in the establishment of the Campbell Collaboration in 2000. In 2007, the international Campbell Collaboration moved its main office to Norway and receives funding from the Norwegian Institute of Public Health.

Danish clearinghouse for educational research. Established in 2006, the Danish Clearinghouse for Educational Research (https://dpu.au.dk/en/research/danskclearinghouseforuddannelsesforskning/about-clearinghouse/method/, Aarhus University) is one of the first centers on evidence-based education in continental Europe. It conducts systematic reviews of research with the aim of informing Danish practitioners working in school contexts.

Education Endowment Foundation. An independent charity in the UK, the EEF (https://educationendowmentfoundation.org.uk) generates new evidence on specific programs and conducts research reviews with a particular focus on disadvantaged students and academic achievement. Further, it offers knowledge mobilization services and initiatives such as the Research Schools Network, which aims to create a network of schools that will support the use of evidence to improve teaching practice.

In November 2010, the Secretary of State for Education announced the plans to establish an EEF in order to help disadvantaged schools raise the level of student achievement. This plan was inspired by the 2009 Race to the Top initiative in the U.S. Launched in July 2011, the EEF declared that it aimed to "develop initiatives to raise the attainment of the poorest pupils in the most challenging schools." The EEF's primary research activities are (i) conducting research reviews and making them available in plain language for teachers and school heads, (ii) providing practical tools based on evidence, (iii) generating new evidence by funding independent evaluations of

programs and practices in order to improve teaching and learning, and (iv) supporting English schools in the use of evidence to raise student attainment levels.

Since its creation, the EEF has funded nearly 200 third-party evaluations—over 150 of which are randomized studies on several programs and tools. Further, it has created the Teaching and Learning Toolkit, providing practitioners and decision makers with an accessible summary of education research and support for the improvement of learning outcomes. The most recent EEF projects have been updating the Toolkit and creating the Education Database, an accessible database comprising evidence on educational interventions from around the world.

EPPI-Centre. The EPPI-Centre (https://eppi.ioe.ac.uk/cms/) was created by University College London's (UCL) Institute of Education in 1995. UCL specializes in (i) developing methods to systematically review research evidence and (ii) conducting reviews of the research produced in different fields. When the initiative was first launched, reviews were conducted in the area of health care. The topic areas have since been expanded to include social care, public health, employment, social and economic development, as well as education. In addition to conducting systematic reviews in the educational and social sciences, the EPPI-Centre examines the research used in decision-making in policy, practice, and everyday life. Thus, it provides guidance on research use and supports the use of evidence in practice.

Institute for Effective Education. The Institute for Effective Education (IEE; University of York, UK) is an independent charity that seeks to improve education for all children by promoting the use of evidence in education policy and practice. The institute works at the school level with teachers and school heads and at the research level by conducting rigorous evaluations and reviews. At the school level, it focuses on improving the quality of teaching and learning by working with schools to support the use of effective practices and programs. Other initiatives, such as "Evidence in Brief"—a joint project with the Center for Research and Reform in Education (CRRE) at Johns Hopkins University—strive to inform teachers and schools about the merits of evidence-informed practices. At the research level, Innovation Evaluation Grants support pilot evaluations of innovations in teaching and learning approaches to improve student achievement. Finally, "Evidence 4 Impact" uses research reviews to render evidence of the effectiveness of specific and available programs using a simple rating system (i.e., strong, moderate, limited, no impact).

Swedish Institute for Educational Research. Established in 2015, the Swedish Institute for Educational Research (https://www.skolfi.se/other-languages/in-english/) performs systematic reviews of educational research and disseminates the results among practitioners in Sweden. Further, the institute provides funding for research projects and identifies areas where relevant research is needed through continued dialog with those who work in the school system.

Top Institute for Evidence-Based Education Research. Top Institute for Evidence-Based Education Research (http://www.tierweb.nl/tier/) was founded as an interuniversity research institute in 2008, with partners at Maastricht University, the University of Amsterdam, and the University of Groningen in the Netherlands. It aims to conduct rigorous research in education as well as produce research results usable for educational practice and policy. The institute focuses on four areas of action: (i) developing educational interventions and evaluating them through experimental studies, (ii) examining the social context of education in order to connect education and the labor market, (iii) conducting activities to link the academic and policy worlds through meta-analyses and the dissemination of knowledge, and (iv) creating a Teacher Academy to transfer research evidence to schools.

Organizations for the dissemination of evidence

Centre for the Use of Research and Evidence in Education. The Centre for the Use of Research and Evidence in Education's (CUREE; http://www.curee.co.uk/about-us) primary objective is the translation of research reports and publications into plain language—that is, making them easy to understand for teachers and policymakers—and materials that can be used in a real school setting. The organization's primary task is not to conduct research but to disseminate the findings of rigorous studies evaluating effective teaching processes and practices. Further, the CUREE works with schools and policymakers through professional development activities and policy analysis in order to assess the quality of government initiatives.

Evidence-Based Teachers Network. The Evidence-Based Teachers Network (https://ebtn.org.uk) was launched to facilitate the sharing of evidence and ideas among teachers, university researchers, and other stakeholders involved in education in the UK. It provides information on evidence-based practices and training for practitioners.

Issues and challenges

While by no means exhaustive, this section identifies several issues related to the development of a culture of evidence use in European educational policy and practice. This section focuses on three challenges: the reusability of evidence and proven programs, expenditure on education and educational research, and effective interventions, key competences, and assessment.

The reusability of evidence and proven programs

Currently, several international projects aim to evaluate the effectiveness of educational programs—generally focusing on academic attainment as a primary outcome—and inform teachers and school leaders on proven interventions. These projects include "Evidence 4 Impact" (https://www.evidence4impact.org.uk/), an IEE initiative and the "Evidence for ESSA"[2] promoted by the CRRE at the Johns Hopkins University School of Education.

Several online databases and resources have been established to provide school professionals with scientifically reliable evidence regarding the effectiveness of teaching strategies. These include the WWC, an initiative by the Institute of Education Sciences, which falls under the U.S. Department of Education; the Teaching and Learning Toolkit, which is maintained by the EEF; and the Best Evidence Encyclopedia created by the Johns Hopkins University School of Education's Center for Data-Driven Reform in Education.

Nonetheless, one of the most relevant issues concerns the generalizability of such evidence—that is, the problem of their external validity. In other words, can the evidence gathered in a specific context be applied in a different one? Referring to educational research as the hardest science of all, Berliner (2002) argued that the study of educational processes is made extremely complex by the variability of teaching and learning contexts:

> Each local context was different, requiring differences in programs, personnel, teaching methods, budgets, leadership, and kinds of community support. These huge context effects cause scientists great trouble in trying to understand school life [. . .] In this hardest-to-do science, educators often need knowledge of the particular—the local—while in the easier-to-do sciences the aim is for more general knowledge. (p. 19)

Evidently, an educational intervention that has been proven to be effective in a given context (e.g., through a randomized controlled trial [RCT]) may not be as effective in a different context. Therefore, the first point that needs to be stressed is the fact that evidence cannot be used as a kind of "recipe book" for reproducing the same results in any context.

While each educational event has its unique characteristics, it also has a certain degree of similarity. The human capacity to recognize such similarities allows us to make predictions and adapt our behaviors. For instance, we suppose that repeated RCTs show a significant effect related to the use of program x, applied according to educational strategy y, to improve given skill z in a primary school. Based on these data, we could affirm that, with a certain level of probability, it will be possible to obtain an improvement in skill z in primary students by adopting the same program x and strategy y. Such a degree of probability will be plausibly lower if the educational context is significantly different, such as employing program x with a different objective, teaching strategy, and/or in a different grade level. As such, evidence provides a scientific knowledge base to support informed decisions in education—a means through which to learn from previous experiences and adapt them to different contexts. Even if a program cannot be applied in a different setting without an appropriate contextual fit, the available evidence provides a reference from which to draw recommendations in designing an educational intervention.

Therefore, according to one of the key principles of evidence-based education, not only is it necessary to know "what works" but also to understand under what pedagogical circumstances a

given intervention is effective. This problem is significant. In some way, it calls to mind what Wiley (2004) termed the "Reusability Paradox" when discussing the reusability of a learning object (LO). According to Wiley, if an LO is effective in a given context—because it is specifically designed for that context—it cannot, by definition, be reused in a different one. Conversely, if an LO is designed to be reusable in many contexts, it will not be particularly effective in any particular context. Likewise, if an educational program is effective in a specific context because it is designed specifically for that context, it will be difficult to reuse it in a different context. By the same token, if an educational program is reusable in many contexts because it is not designed for a specific context, it may not be particularly effective in meeting the educational needs of any one context. As such, the educational effectiveness of a program and its potential reuse are likely to be at odds with one another to varying degrees.

In addition to the central issue of the external validity of evidence, two other "practical problems" may impact the effective reusability of these programs in EU member states. First, these programs are often designed in alignment with specific national standards and/or syllabi, such as those adopted in the UK and U.S. However, there are diverse education systems within the EU. In its review of the organization of mainstream education in Europe, *The Structure of the European Education System* (EC/EACEA/Eurydice, 2018) reported that there are 43 education systems, all of which have different organizational models for primary and secondary schools, language, curricula, and syllabi. Although they share some similarities, each system has its unique organizational model ranging from the decentralized (e.g., Germany) to the highly centralized (e.g., France) structures. Moreover, each may have substantial differences at the local level, depending on the degree of autonomy provided to schools under national law. Accordingly, these differences between European school systems must be considered when developing and/or adopting programs aligned with national and local syllabi.

Second, language can pose a major barrier to the sharing of proven programs. The aforementioned initiatives primarily include programs designed in English and for a specific national context. Consequently, they are not immediately reusable in non-English-speaking EU countries—that is, the majority of member states. There are currently 24 official languages used in the EU member states. Therefore, the development of programs for any country in their local language requires significant effort and advanced expertise in terms of education and research methodology, as well as an adequate economic investment.

Expenditure for education and educational research

Notably, the development and progression of evidence-based policies and initiatives in education require adequate, well-targeted economic investment to support the advancement of educational

research; professional development of school heads and teachers; and the design, creation, and dissemination of supporting resources such as guidelines, effective programs, and assessment tools. Furthermore, due to the aforementioned multilingualism and diverse range of education systems in Europe, it is necessary to ensure adequate investment for all EU member states, particularly insofar as a single source of resources—such as a unique database of evidence—suitable for different national and local systems is unlikely.

According to the most recent statistics provided by the OECD (2018b), education accounts for a significant proportion of public expenditure in all EU member states, with the expenditure generally increasing with the level of education. On average, EU-22 countries spend USD 10,555 per annum per student from the primary to tertiary level (OECD average USD 10,520; U.S. average USD 16,518). However, these figures vary considerably across member states, ranging from USD 5,470 in Greece to USD 22,430 in Luxembourg. According to Eurostat (2019), European governments provide the largest amount of funding for their country's educational sector, followed by the private sector and international organizations.

In terms of the average across EU member states, the total expenditure on education is estimated to be equal to 5.0% of a country's gross domestic product (GDP), with the highest peaks in Sweden (7.1%) and Finland (6.8%), and a 10.6% share of total public expenditure. However, the ratio between government expenditure on education and the GDP decreased over the 2003–2017 period (Eurostat, 2019).

Looking specifically at the OECD average expenditure on nontertiary education (OECD, 2018), 94% of institutions' expenditure is on core educational goods and services (mainly teaching costs but also school buildings, teaching materials, and administrative functions). Remaining funds are used for other ancillary services (e.g., student welfare). However, at the tertiary level, a much lower share of expenditure goes to core services (68%), with roughly 30% of expenditure per student spent on research and development (Figure 1).

Regarding R&D (Research and development) expenditure in the OECD area (2015 data), the total average expenditure on educational institutions for R&D per full-time-equivalent student amounts to USD 911 (OECD average: USD 886; U.S. USD 742). Switzerland, Sweden, and Norway have the highest expenditure on R&D, while Luxembourg, Poland, Latvia, Hungary, and Greece have the lowest.

These data show that while the state of economic investment in education in Europe aligns with the average for the OECD area and U.S., it is characterized by significant internal variability among member states. Therefore, while desirable, a significant increase in total expenditure does not appear to be a priority. On the one hand, it is important to rebalance expenditure on education, thereby ensuring adequate resources for all EU member states in order to facilitate the well-balanced development of evidence-based policy in the European school system. On the other hand, it is necessary to address investments in well-targeted objectives in order to support rigorous
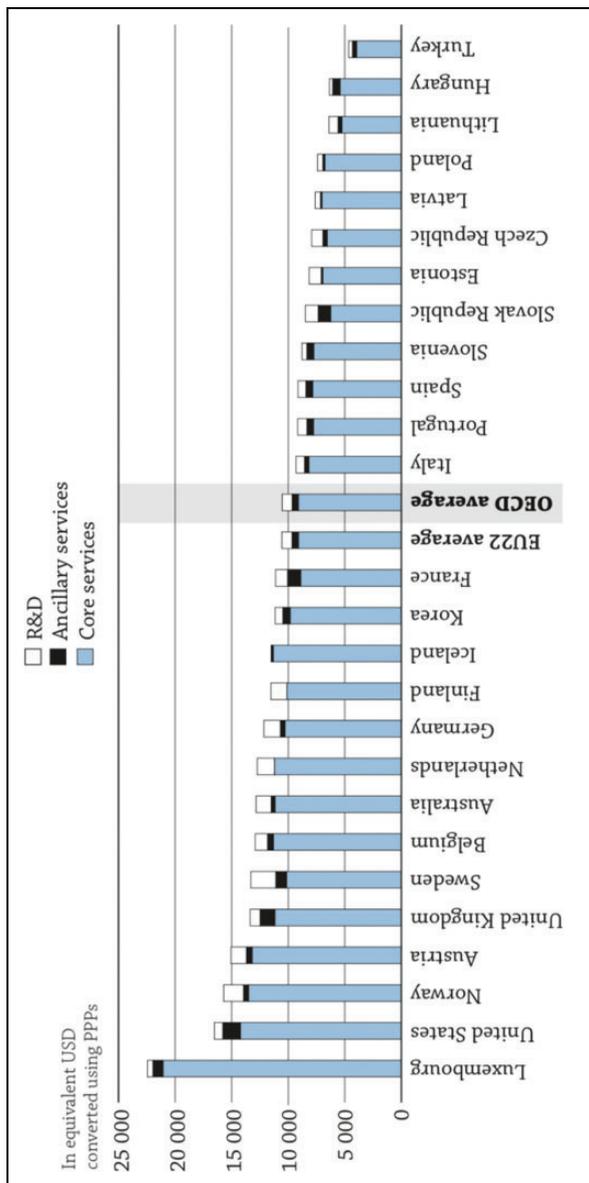
Figure 1. Total expenditure on educational institutions per student by type of service (2015 data).
Source. OECD. (2018a).

educational research, the training of school professionals, and the design and development of guidance material and effective programs.

Effective interventions, key competences, and assessment

Since the early 2000s, European school systems have progressively evolved toward competence-oriented models[3] that currently influence school curricula in EU countries. After the initial "Recommendation of the European Parliament and of the Council on Key Competences for Lifelong Learning" (The European Parliament and The Council of the EU, 2006), a revised "Council Recommendation of 22 May 2018 on Key Competences for Lifelong Learning" was approved (The Council of the EU, 2018). The latter provides a common framework for policymakers and school professionals for the development of a competence-oriented instructional model.

Thus, competences are defined as a dynamic combination of the knowledge, skills, and attitudes[4] a learner needs to develop for "personal fulfilment and development, employability, social inclusion, sustainable lifestyle, successful life in peaceful societies, health-conscious life management and active citizenship" (The Council of the EU, 2018, p. C189/7). To this end, eight key competences were defined: (i) literacy competence; (ii) multilingual competence; (iii) mathematical competence and competence in science, technology, and engineering; (iv) digital competence; (v) personal, social, and learning-to-learn competence; (vi) citizenship competence; (vii) entrepreneurship competence; and (viii) cultural awareness and expression competence.

Literacy competence is defined as:

> the ability to identify, understand, express, create, and interpret concepts, feelings, facts and opinions in both oral and written forms, using visual, sound/audio and digital materials across disciplines and contexts. It implies the ability to communicate and connect effectively with others, in an appropriate and creative way. (The Council of the EU, 2018, p. C189/8)

The following knowledge, skills, and attitudes are identified as essential to the development of literacy competence:

- Knowledge:

> This competence involves the knowledge of reading and writing and a sound understanding of written information and thus requires an individual to have knowledge of vocabulary, functional grammar and the functions of language. It includes an awareness of the main types of verbal interaction, a range of literary and non-literary texts, and the main features of different styles and registers of language. (The Council of the EU, 2018, p. C189/8)

- Skills:

Individuals should have the skills to communicate both orally and in writing in a variety of situations and to monitor and adapt their own communication to the requirements of the situation. This competence also includes the abilities to distinguish and use different types of sources, to search for, collect and process information, to use aids, and to formulate and express one's oral and written arguments in a convincing way appropriate to the context. It encompasses critical thinking and ability to assess and work with information. (The Council of the EU, 2018, p. C189/8)

- Attitudes:

A positive attitude towards literacy involves a disposition to critical and constructive dialogue, an appreciation of aesthetic qualities and an interest in interaction with others. This implies an awareness of the impact of language on others and a need to understand and use language in a positive and socially responsible manner. (The Council of the EU, 2018, p. C189/8)

Regarding the assessment of basic knowledge and skills—such as vocabulary and grammar knowledge, as well as reading and writing ability—there is a well-established scientific literature and growing base of evidence on proven programs (see Baye et al., 2019; Graham & Hebert, 2011; Graham et al., 2012; Slavin et al., 2010, 2019). However, the assessment of competences with a more complex, multidimensional nature poses different issues. For instance, how does one design effective interventions able to develop and assess the effectiveness of "a positive attitude toward literacy," the "disposition to critical and constructive dialogue," the "appreciation of aesthetic qualities," the "interest in interaction with others," the "awareness of the impact of language on others," or the use of language "in a positive and socially responsible manner"?

Similarly, critical issues should be considered when developing effective interventions oriented toward the development of multidimensional competences—currently recognized as fundamental to learners' personal fulfillment and development—including citizenship,[5] personal and social competence and learning to learn,[6] or even cultural awareness and expression.[7] In this respect, critical issues also need to be considered in evaluating the effectiveness of these interventions.

Notably, shifting from the static conception of an instructional model—based on the transmission of basic knowledge and skills strictly related to specific academic disciplines—to a model oriented toward the development of such multifunctional, transversal, and multidimensional competences constitutes a major paradigm change. This requires rethinking not only the curriculum and related syllabi but also teaching practices and assessment strategies. Significantly, while the acquisition of such competences needs to be evaluated in schools, it is more important to assess the ability of students to apply their classroom learnings to their daily lives. This is particularly apt given the nature of these competences as real-life skills. Further, it is essential to ensure that students can continue learning throughout their life span.

Accordingly, the assessment of such competences constitutes a key challenge for European education systems (EC, 2012). The problem of designing and developing effective interventions to support the acquisition of competences is closely related to this. This prompts questions of how we assess these kinds of competences; measure the degree to which they have been achieved by individual learners; define assessment criteria that meet the principles of validity, reliability, and transparency; and what indicators should be used in the process. Sound, reliable knowledge on teaching programs and evaluation strategies is necessary to answer these questions. Regarding these issues, the EC (2012) identified the following key principles:

- Assessment should be fair. In this respect, the purpose of the intervention should be understandable to all those involved—including learners, teachers, parents, and school leaders—and there should be a clear match between objectives and methods. Further, it should consider students' prior knowledge and skills in order to properly assess their progress.
- Assessment should be reliable and valid. Poorly defined objectives will result in vague teaching and learning. Therefore, it is essential to identify clear indicators of expected objectives in order to enhance the likelihood of obtaining a valid, reliable assessment.
- Assessment should be learner-centered and learner-oriented to provide learners, parents, and teachers with valuable information to improve teaching and learning.

Based on the foregoing, the following steps appear to be prioritized for the development of a competence-oriented educational model in EU countries: (i) redefining traditional curricula to create competence-based curricula; (ii) translating key competences into clear objectives; (iii) identifying indicators and successful criteria for each objective; (iv) implementing tests (e.g., authentic tasks) to assess the resulting indicators; (v) improving teacher training, especially in terms of instructional and assessment strategies for key competences; and (vi) realizing and sharing evidence-based resources to support the teaching and learning of key competences (e.g., guidance material, good practices, resources, and assessment tools).

Conclusion

This article reviews the current stage of EU policies encouraging the use of evidence in educational decision-making and offers a brief overview of the main European initiatives intended to inform practitioners about evidence in education. It also identifies some of the most relevant challenges to the development of evidence-based reform in EU school systems.

Overall, while the movement toward the use of evidence in education in Europe appears to be gradually asserting itself through political intent and initiative, it is yet to be systematically incorporated into the practices of the different member states. Europe prefers the term "evidence-informed education," which has implications for the kind of research undertaken and

policies implemented in Europe. Significantly, the EU official documents have encouraged the use of evidence rather than stipulate any concrete lines of action. Nonetheless, several important initiatives have been launched for the generation and dissemination of evidence. However, with the exception of networks created to ensure the greater exchange of evidence-based practices, these initiatives appear disconnected from one another.

Accordingly, in order to ensure a more comprehensive development of evidence-based policies and practices in Europe, certain issues need to be addressed going forward. First, a development road map needs to be defined, with clear recommendations for EU member states in terms of objectives, tasks, roles, and deadlines. Second, education expenditure must be rebalanced across the EU member states, providing adequate resources and addressing investments in the following key initiatives:

(i) The large-scale evaluation of the effectiveness of the various programs used in EU member states to develop a broader and more robust knowledge base. Thus, the EEF provides an excellent reference point.

(ii) In order to translate evidence into practice, the decision-making of school principals and teachers must be informed by the best results of educational research.

(iii) The professional development of teachers in terms of effective strategies and programs oriented toward the development of the eight key competences and their assessment must be enhanced. Thus, teachers' professionalism must be recognized from an economic perspective.

Adequate and easy-to-use support materials conforming to the European competence-based model and aligned with local syllabi need to be developed. These may include an open and multi-language web environment that provides necessary guidelines, effective programs, tools for competence assessment, worked examples, as well as an interschool and interprofessional exchange among teachers, researchers, and policymakers.

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Notes

1. The Eurydice network comprises 43 national units based in all 38 countries of the Erasmus+ program and is intended to ascertain how education systems are organized and operate in Europe. It publishes reports on national educational systems as well as comparative reports on specific topics.

2. The Every Student Succeeds Act is the main federal law governing K-12 education in the U.S. and promotes the adoption of programs with evidence of effectiveness. Introduced in 2015, it replaced the No Child Left Behind Act (https://www.evidenceforessa.org/).

3. In Europe, the debate on school competences originated at the end of the 20th century (Hutmacher, 1997).

4. Knowledge is defined as a composition of "the facts and figures, concepts, ideas and theories which are already established and support the understanding of a certain area or subject." Skills are defined as "the ability and capacity to carry out processes and use the existing knowledge to achieve results." Finally, attitude is defined as "the disposition and mind-sets to act or react to ideas, persons or situations" (The Council of the European Union [EU], 2018, p. C189/7).

5. Defined as "the ability to act as responsible citizens and to fully participate in civic and social life, based on the understanding of social, economic, legal and political concepts and structures, as well as global developments and sustainability" (The Council of the EU, 2018, p. C189/10).

6. Defined as "the ability to reflect upon oneself, effectively manage time and information, work with others in a constructive way, remain resilient and manage one's own learning and career" (The Council of the EU, 2018, p. C189/10).

7. This involves having "an understanding of and respect for how ideas and meaning are creatively expressed and communicated in different cultures and through a range of arts and other cultural forms" (The Council of the EU, 2018, p. C189/11).

Contributorship

Marta Pellegrini and Giuliano Vivanet conceived the present idea. Pellegrini wrote the first part of the manuscript concerning European measures encouraging the use of evidence and organizations. Vivanet wrote the second part concerning issues and challenges on the use of evidence in Europe. The authors critically revised the manuscript together.

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