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Education: how to better target public spending

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With nearly €180 billion allocated in 2022, education represents one of the largest components of public expenditure in France. Nevertheless, the outcomes of the education system remain misaligned with this significant financial commitment: student performance—particularly in mathematics—is deteriorating, and social inequalities are among the most pronounced across OECD countries. Furthermore, a sustained decline in student enrolment due to demographic change creates a window of opportunity to reconsider the allocation and strategic use of educational resources.

This Note examines public education spending through the lens of a new indicator—the Marginal Value of Public Funds (MVPF)—which assesses the net social return of each euro invested. Far from replacing democratic deliberation, this tool is intended to inform budgetary decisions by comparing education policies in terms of both their costs and their impacts on beneficiaries' well-being.

The analysis is structured around four main pillars: classroom and curriculum organization, the development of student skills, teacher training and support, and the strengthening of school-family engagement. For each policy lever, the Note draws on robust empirical evidence from France and comparable contexts, and applies the Marginal Value of Public Funds (MVPF) to compare their cost-benefit profiles.

Several education policies are identified as self-financing: by enhancing student competencies, they lead over time to higher wages and, in turn, increased tax revenues that more than offset their cost to public finances. Notable examples include class size reduction at the primary level, tutoring, adaptive digital learning tools in mathematics, targeted interventions to strengthen socio-emotional skills, intensive formats of continuing teacher training, pedagogical inspections, and initiatives that foster parental involvement. In contrast, the public return on spending is very low—or even negligible—for grade repetition, sporadic and poorly targeted teacher training, and investments in computer equipment.

Far from being a fiscal burden, education spending emerges as one of the most effective uses of public funds. However, returns vary significantly across policy measures, highlighting the need to target resources toward interventions whose effectiveness is robustly demonstrated—both to enhance student learning outcomes and to reduce inequalities. In light of the trade-offs imposed by fiscal constraints and demographic decline, the approach proposed here provides a coherent and strategic framework. This framework should be further strengthened through large-scale experimentation, investment in data infrastructure, and improved cost measurement.

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Education policies under pressure from demographic change

Education is one of the largest components of public expenditure in France. In 2022, domestic education spending was estimated at €180 billion, including nearly €120 billion financed by the central government and local authorities for school education alone.[1] The French education system serves over 12 million students in primary and secondary education and employs approximately 1.2 million staff, including 850,000 teachers—making the Ministry of National Education the country's largest public employer. The magnitude of this spending gives education policy a central role in shaping public finances and long-term social investment strategies.

In 2021, France allocated 5.4% of its GDP to education across all levels—slightly above the OECD average of 4.9%.[2] Average spending per student reached €9,352, compared with €8,838 across the OECD. However, this aggregate figure conceals significant disparities by level of education: per-student spending in primary education remains 11% below the OECD average (€7,293 vs. €8,212), while in secondary education it is 13% higher (€10,427 vs. €9,194).[3]

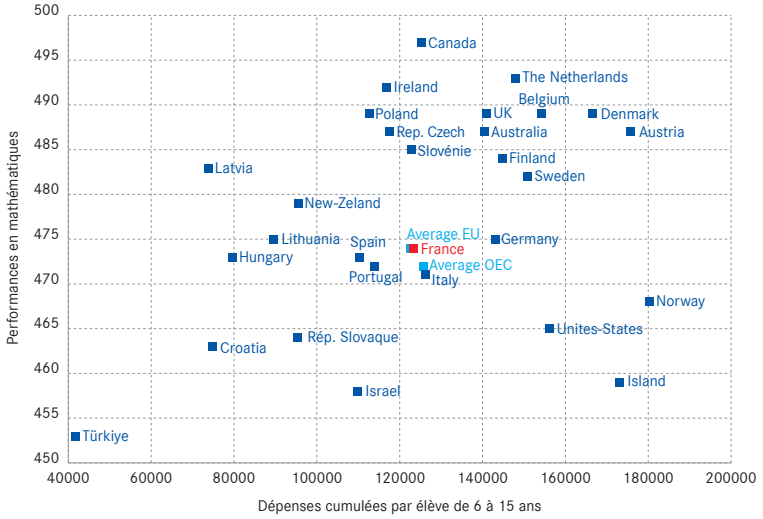
Despite this significant budgetary effort, French students' results in the PISA international assessments (reading, mathematics, and scientific literacy) remain close to the OECD average (**Figure 1**). However, performance in mathematics has been steadily declining for over three decades.[4]

From an equity standpoint, the situation is particularly troubling. France is among the OECD countries with the highest levels of educational inequality, with student outcomes strongly correlated with socio-economic background. In PISA 2022, the performance gap in mathematics between advantaged and disadvantaged students reached 113 points, compared to an OECD average of 93. Socio-economic status accounted for 21% of the performance variance in France, versus 15% on average across OECD countries.

These findings point to a suboptimal return on public education spending—less due to the overall level of investment than to its inefficient allocation, particularly to the detriment of primary education and the most vulnerable students. Other countries, such as Canada, Estonia, Ireland, Japan, and Poland, achieve stronger outcomes with comparable or even lower per-student spending.

Finding 1. Despite above-average investment levels compared to the OECD, education spending in France proves less effective than in many comparable countries. Student performance, particularly in mathematics, remains below expectations, while socio-economic disparities in achievement are among the highest in the developed world.

Figure 1. Expenditure per pupil and performance in mathematics



Reading: In France, the cumulative expenditure per pupil aged between 6 and 15 was €85,133 in 2021, and the average mathematics score of French pupils in PISA 2022 was 474. **Scope**: OECD countries excluding Chile, Colombia, Costa Rica, Luxembourg, Mexico, Switzerland and Turkey. **Source**: OECD (2024): Education at a Glance, graph C1.6.

The question of how effectively public funds are used in education is becoming increasingly pressing as the French education system faces a major demographic shift (**Figure 2**). Since the early 2010s, the birth rate has been in continuous decline, with the annual number of births falling by 20% between 2010 and 2024. This trend has already led to an 8% drop in enrolment in primary education since the 2015 peak, with a further 9% decrease projected by 2029. The decline is expected to continue at least until 2035. In secondary education, enrolment is also projected to fall by between 4% and 5% by 2029, with further reductions likely to extend through to the late 2030s.

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[1] DEPP (2024): Repères et références statistiques 2024.

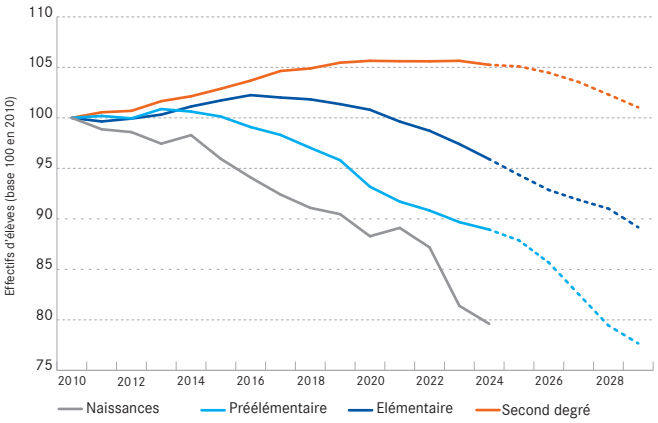
[2] OECD (2024): Education at a Glance 2024.

[3] Several factors may explain this imbalance. In primary education, spending per pupil is driven down by relatively low teacher salaries (in France, a primary school teacher with 10 years' seniority earns 17% less than his or her counterparts in OECD countries) and by larger class sizes (see below). Conversely, at secondary level, a number of factors contribute to higher unit costs: the diversity of streams and options on offer at lycée - particularly in the vocational stream - as well as a significantly higher proportion of ancillary services (school transport, boarding schools, canteens, school medicine), which account for 12.2% of education spending in France compared with an OECD average of 5.6%.

[4] See Martin R., Renault T. and Roux B. (2022): "Baisse de la productivité en France: échec en "maths"?", CAE, *Focus* no. 91.

Finding 2. The continued decline in the birth rate is subjecting the education system to a lasting demographic shock. By 2029, primary school enrolments will have fallen by 16% compared to their 2015 peak, and the downturn observed in secondary education is expected to continue through the late 2030s.

Figure 2. Change in births and pupil numbers (base 100 in 2010)



Interpretation: Between 2010 and 2024, the annual number of births fell by 20%, while the number of pupils in pre-elementary education fell by 11%. **Note**: Enrolment projections for the period 2025-2029 are shown in dotted lines; for secondary education, they correspond to the 'intermediate' scenario adopted by the DEPP. **Sources**: DEPP: Information notes no. 25.12 and no. 25.13; Insee: vital statistics and estimates.

This demographic shift opens up an unprecedented window of opportunity to rethink how resources are allocated to education. The decline in student numbers requires major decisions regarding the use of available resources, as the resulting fiscal space could be mobilized in various ways: reducing class sizes, strengthening targeted support for struggling students, investing in digital learning tools, expanding continuing professional development for teachers—or, conversely, reducing the number of teachers to redirect resources toward other public policy priorities.[5]

To guide such decisions effectively, it is essential to rely on a rigorous assessment of the balance between costs incurred and expected benefits. In this regard, the Marginal Value of Public Funds (MVPF) offers a valuable framework: it enables comparisons across education policies—and, more broadly, all public policies—based on their social return per euro spent.

Measuring the effectiveness of education policies

An index to assess the efficiency of public spending: the MVPF

Introduced in the 2010s, the Marginal Value of Public Funds (MVPF) has become a reference tool for evaluating the effectiveness of public policies.[6] This indicator measures the social gain generated by a policy for each euro of public spending, taking into account both fiscal and behavioral effects. The methodological foundations and limitations of the MVPF are discussed in detail in a Focus associated with this Note.[7]

The MVPF is defined as the ratio between the total benefit to beneficiaries (ΔB) and the net cost to the state (ΔC - ΔE), where ΔC denotes the gross fiscal cost of the policy and ΔE the induced tax revenue—for example, through increased beneficiary income or reduced social transfers. The numerator ΔB captures the change in well-being for all recipients, including both direct effects (positive or negative) such as improvements in education, income, employability, or health, and indirect effects stemming from externalities, such as reductions in crime.

An MVPF greater than 1 indicates that a policy yields a positive net social return: each euro of public spending generates benefits that exceed its net fiscal cost. Some policies may even present an "infinite" MVPF, when the induced tax revenues fully offset—or surpass—the initial cost. Such policies are considered self-financing. This is notably the case for some early childhood interventions, whose long-term effects on educational attainment, labor market integration, and health reduce public spending and increase tax receipts, ultimately allowing the state to recoup its investment.[8]

Beyond the headline value of the indicator, policy comparisons can and should incorporate equity considerations. From a normative perspective, it is both possible and desirable to assign greater weight to benefits accruing to low-income or vulnerable populations. A policy with a lower MVPF may thus be socially preferable to another if it benefits groups whose welfare gains are of higher social value. This analytical framework allows for a reconciliation of economic efficiency and social justice in public policy evaluation. The MVPF is not a substitute for democratic deliberation, but a tool to inform it—by making explicit the implicit social value of redistribution embedded in each policy choice.

[5] Delaunay I. et al (2024): "Revue de dépenses : dispositifs en faveur de la jeunesse", Inspection générale des finances et Inspection générale de l'Éducation, du Sport et de la Recherche, Report no. 2023-M-107-03 / 23-24 122B, April.

[6] Hendren N. and Sprung-Keyser B. (2020): "A Unified Welfare Analysis of Government Policies", *Quarterly Journal of Economics*, 135(3), pp. 1209-1318. For a review of studies using the EDP index and a detailed presentation of the methodology, see policyimpacts.org.

[7] See Fajeau M., Grenet J., Landais C., Laveissière E. (2025), "The Marginal Value of Public Funds Applied to the Sourdun Boarding School of Excellence", Focus du CAE, no. 111.

[8] Johnson R. and Jackson K. (2019): "Reducing Inequality through Dynamic Complementarity: Evidence from Head Start and Public School Spending", *American Economic Journal: Economic Policy*, 11(4), pp. 310-349.

Assessing the Costs and Benefits of Education Policies

Applying the Marginal Value of Public Funds (MVPF) to education policies raises several methodological challenges.

The first challenge lies in the valuation of benefits. Education policies can affect a wide range of individual and collective outcomes — academic achievement, labor market integration, health, civic engagement, criminal behavior, and more. While some effects are relatively straightforward to measure—such as performance on standardized assessments or graduation rates—others are more difficult to quantify, either because they are harder to observe empirically or because they are complex to express in monetary terms. In practice, most impact evaluations of education policies focus on learning outcomes, typically expressed in standard deviation units.[9] While this approach does not capture all dimensions of well-being, it provides a comparable and synthetic metric across studies. It also offers a conservative estimate of policy benefits, as cognitive skills tend to correlate positively with broader aspects of well-being.

A second methodological difficulty stems from the long-term horizon over which the benefits of education policies materialize—often decades after implementation. While some delayed effects, notably on employment outcomes and adult earnings, have been documented in the literature, such data remain limited. As a result, it is often necessary to infer long-term benefits from short-term outcomes, such as improvements in test scores, using conversion factors derived from existing research. One key parameter in this exercise is the estimated relationship between a one standard deviation gain in academic performance and future earnings. Based on French data, this elasticity is estimated at 9.5%, consistent with estimates found in the broader international literature.[10]

Finally, a third challenge concerns the comprehensive estimation of costs. Evaluating a policy's efficiency requires accurately accounting for all resources mobilized during its implementation—staff salaries, training time, coordination, instructional materials, infrastructure, and more. Yet, such data are often incomplete or imprecise, particularly in older studies or in less documented settings. Moreover, transferring cost estimates across contexts requires careful methodological adjustments to reflect the institutional and organizational specificities of each education system.

A first application of the MVPF to French education policies

This Note presents a first application of the Marginal Value of Public Funds (MVPF) to a selected set of education policies in France for which sufficiently robust impact evaluations are available. The objective is to illustrate the relevance of this approach in guiding public investment decisions in the education sector.[11] However, this exercise remains exploratory in nature: it covers only a subset of existing policies and does not aim to be exhaustive.[12]

The selection of education policies analyzed in this Note is based on three main criteria. First, the scope is limited to policies under the responsibility of the Ministry of National Education, i.e., those focused on primary and secondary education. Interventions related to early childhood or higher education are not included. Second, the analysis prioritizes policies that have been rigorously evaluated using experimental or quasi-experimental methodologies. While the focus is on studies conducted in France, international evidence is also considered when the evaluation contexts are deemed sufficiently comparable. Third, the selected policies are those that have been the subject of recent public debate in France and whose implementation appears institutionally feasible. This final criterion excludes certain well-documented policies abroad—such as charter schools in the United States or performance-based pay schemes—that would face major institutional hurdles in the French context.

The remainder of this *Note* reviews four broad categories of levers that could enhance the efficiency of public education spending: classroom and school organization, the strengthening of student learning outcomes, teacher training and support, and finally, parental engagement.

Classroom and School Organization

The effectiveness of education spending is closely linked to how school pathways and learning conditions are structured. While some interventions—such as reducing class sizes in primary education or establishing boarding schools of excellence at the upper-secondary level—have proven effective, others, such as grade repetition, are both costly and of limited efficacy according to the research literature.

[9] On the interpretation of effects expressed in standard deviation units, see Box 1 in Fajeau M., Grenet J., Laveissière E. (2025), "L'effet des compétences scolaires sur les salaires futurs", Focus du CAE, No. 112.

[10] See Focus no. 112: ibid.

[11] The references of the studies used and details of the assumptions used to calculate the EDP index are presented in Fajeau M., Grenet J., Laveissière E., Leonetti O. (2025): "Efficacité des dépenses publiques: sources et hypothèses de calcul", Focus du CAE, n°114.

[12] For an accessible summary of recent work in the economics of education, see Behaghel L., Grenet J. and Gurgand M. (2023): Économie de l'éducation, La Découverte, collection "Repères".

Reducing class sizes: proven gains in primary education

France stands out for having larger average class sizes than most other EU countries for which data are available. Although the introduction of reduced class sizes in CP and CE1 (first and second year of primary school)[13] in priority education networks (REP), beginning in 2017, led to a significant decrease, the average class size in primary schools was still 2.7 pupils higher than the EU average in 2023 (21.7 vs. 19.0). The gap is even wider at lower-secondary level (collège), where French classes average 25.6 pupils compared to 20.7 in other EU countries.

The impact of class size on learning outcomes has been extensively studied.[14] Evaluations based on experimental or quasi-experimental variation[15] consistently find significant effects in primary education, with gains typically ranging from 1.5% to 2.5% of a standard deviation in student performance per pupil removed from the class. These effects tend to be more pronounced for students from disadvantaged backgrounds. Similar findings emerged from the French Ministry of Education's evaluation of the REP+ CP class-size reduction, which found an average gain of 1.62% of a standard deviation in end-of-year assessments per additional pupil removed.[16]

Several studies from the United States and Sweden also document long-term benefits: students in smaller classes are more likely to attend higher education and earn higher incomes in adulthood.[17]

Applying the MVPF to class-size reduction in primary education suggests that this is a self-financing policy (i.e. an "infinite MVPF")[18]: assuming a gain of 1.62% of a standard deviation per pupil, and a 9.5% increase in wages per standard deviation improvement in skills, the additional tax revenues generated over the long term would be sufficient to offset the direct costs—primarily the hiring of additional teachers.

In secondary education, evidence on the effects of smaller classes is more limited and less conclusive. A French study exploiting thresholds for opening new classes in middle-schools suggests that the impact is about half the size of that observed in primary school.[19] Even so, the estimated MVPF remains above 7: for each euro invested—after accounting for induced fiscal returns—the policy would yield more than seven euros in social benefits via higher future earnings. However, the confidence intervals around these estimates are wider.

These findings support using the fiscal space created by demographic decline to reduce class sizes where evidence is strongest. In primary education, this means prioritizing classes in priority education networks that have not yet benefited from class-size reductions—such as early childhood, CE2, and potentially CM1 and CM2. Outside of priority education, reductions could target schools serving the most socioeconomically disadvantaged students. In lower-secondary education, given the uncertainties around the magnitude of effects, a targeted pilot program should be implemented in a sample of schools. This would allow for a one-year impact evaluation to calibrate the scope and intensity of a broader rollout.

> **Recommendation 1**: Use the budgetary margins opened up by the demographic downturn to further reduce class sizes at primary level, targeting priority contexts, and experiment with this policy at lower-secondary level.

Grade repetition: a costly policy with unproven benefits

Rather than addressing class sizes or instructional quality, France has long relied on grade repetition as the primary means of supporting students in difficulty. Widespread until the early 1980s, the practice gradually declined—until the 2024 "Choc des savoirs" policy announcements signaled a reversal.

However, the effectiveness of grade repetition is strongly questioned by the academic literature.[20] While some studies

[13] From 2020, class splitting has been extended to kindergarten classes in priority education areas.

[14] For a summary of this literature, see Bouguen A., Grenet J. and Gurgand M. (2017): "La taille des classes influence-t-elle la réussite scolaire?", Institut des politiques publiques, Note IPP no. 28.

[15] See in particular the pioneering studies by Krueger A. (1999): "Experimental Estimates of Education Production Functions", *The Quarterly Journal of Economics*, 113(2), pp. 487-532, and Angrist J. and Lavy V. (1999): "Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement", *The Quarterly Journal of Economics*, 114(2), pp. 533-575.

[16] DEPP (2021): "Évaluation de l'impact de la réduction de la classe de CP et CE1 en REP+ sur les résultats des élèves et les pratiques des enseignants", working paper no. 2021.E04.

[17] Krueger A. and Whitmore D. (2001): "The Effect of Attending a Small Class in the Early Grades on College-Test Taking and Middle School Test Results: Evidence from Project STAR", *The Economic Journal*, 111(468), pp. 1-28. Chetty R., Friedman J., Hilger N., Saez E., Schanzenbach D., and Yagan D. (2011): "How Does your Kindergarten Classroom Affect your Earnings? Evidence from Project STAR", *The Quarterly Journal of Economics*, 126(4), pp. 1593-1660. Fredriksson P., Öckert B., and Oosterbeek H. (2013) : "Long-Term Effects of Class Size", *The Quarterly Journal of Economics*, 128(1), pp. 259-285.

[18] Fajeau M., Grenet J., Laveissière E., Leonetti O. (2025), "Economic Efficiency of Reducing Class Size", *Focus du CAE*, no. 113.

[19] Piketty T. and Valdenaire T. (2006): 'L'impact de la taille des classes sur la réussite scolaire dans les écoles, collèges et lycées français. Estimations à partir du panel 1997 et du panel secondaire 1995", *Les Dossiers-Enseignement scolaire*, no. 173, MEN-DEP.

[20] See for example Manacorda M. (2012): "The Cost of Grade Retention", *The Review of Economics and Statistics*, 94(2), pp. 596-606; Schwerdt G., West M. and Winters M. (2017): "The Effects of Test-Based Retention on Student Outcomes over Time: Regression Discontinuity Evidence from Florida", *Journal of Public Economics*, 152, pp. 152-169.

report short-term benefits for learning outcomes in primary school, these gains tend to fade quickly and are only observed when repetition is combined with intensive remedial support (e.g., tutoring, smaller class sizes, experienced teachers). In the absence of such targeted measures, repetition shows no significant short-term impact on learning, and some studies even highlight adverse effects on student behavior, including increased absenteeism and disciplinary issues. Over the long term, research generally points to null or negative effects—particularly due to a heightened risk of early school leaving.[21]

These modest or negative outcomes must be weighed against the high fiscal cost of repetition. According to estimates for France, the average cost of an additional year in 2015 was approximately €6,000 for a primary student, €8,400 for a middle school student, and €11,500 for a high school student, for a total annual cost close to €2 billion.[22] These direct costs are compounded by indirect ones, such as lost earnings due to delayed entry into the labor market and potential social costs—such as the increase in juvenile delinquency documented in recent U.S.-based research.[23]

In light of these findings—which imply a MVPF close to zero or negative—grade repetition emerges as one of the least cost-effective strategies for supporting students with learning difficulties.

Ability groups vs. needs-based groups: uncertain effectiveness

The heterogeneity of student achievement levels poses a major challenge for the education system, and differentiated instruction is widely seen as a necessary response to better tailor teaching to individual learning needs. In practice, this approach can take many forms, both in how students are grouped and in the pedagogical content and methods used.

Research suggests that permanent groupings—such as ability-based classes lasting a full year or more—do not improve average student outcomes and tend to exacerbate inequalities, whether linked to prior achievement or socioeconomic background.[24] These negative effects are often attributed to the stigmatizing and static nature of such arrangements, which may reinforce a fixed mindset regarding academic potential.

By contrast, transitional and flexible grouping strategies, such as temporary needs-based groups or small cooperative learning teams, show more promising results. Programs that have demonstrated positive effects on learning typically rely on short-term groupings focused on specific skills, with group composition regularly adjusted based on teacher-led assessments. This model emphasizes ongoing adaptation to students' evolving needs rather than maintaining a stable ranking of learners. However, rigorous impact evaluations remain limited, and significant uncertainty persists around the conditions for effective implementation—especially regarding alignment with various instructional methods (e.g. personalized learning, mastery-based teaching, explicit instruction, integration of digital tools, etc.).

The groupings introduced in sixième (Grade 6) at the start of the 2024 school year, as part of the Choc des savoirs initiative, represent a hybrid model—somewhere between level groups and needs-based groups, though their underlying logic appears closer to the former. This configuration introduces uncertainty regarding their potential effects, particularly when compared with more evidence-backed interventions such as tutoring (see below). In this context, scaling up the policy across all middle school levels, as initially planned, would appear premature without a rigorous evaluation of its impact after the first year of implementation.

> **Recommendation 2**. Avoid relying on grade repetition, which entails high fiscal costs and has not proven effective in supporting struggling students. Refrain from scaling up needs-based grouping across lower-secondary education without prior rigorous evaluation of its effects.

Boarding schools of excellence: the Sourdun example

Targeted education policies can yield substantial returns for specific student populations. The Sourdun boarding school for excellence, established in 2009, was designed to provide a structured and supportive learning environment for motivated students from disadvantaged backgrounds. It channels significant resources toward lower- and upper-secondary students with intermediate academic performance, offering residential education away from the family home, small class sizes, and specially selected teachers.

The program was evaluated through a randomized assignment protocol involving 395 students who applied in 2009 and 2010. The findings point to substantial benefits: 68% of admitted students earned a general baccalauréat (compared to 47% in the control group), and 43% completed higher education (vs. 26%), with even stronger outcomes among

[21] Jacob B. and Lefgren L. (2009): "The Effects of Grade Retention on High School Completion", *American Economic Journal: Applied Economics*, 1(3), pp. 33-58. Eren O., Depew B. and Barnes S. (2017): "Test-Based Promotion Policies, Dropping Out, and Juvenile Crime", *Journal of Public Economics*, 153, pp. 9-31.

[22] Benhenda A. and Grenet J. (2015): "Evaluation du coût du redoublement", Institut des politiques publiques, *IPP Report* No. 7.

[23] Eren O., Lovenheim M. and Mocan H. (2022): "The Effect of Grade Retention on Adult Crime: Evidence from a Test-Based Promotion Policy", *Journal of Labor Economics*, 40(2), pp. 361-395.

[24] For a summary of this literature, see Aisenberg L. and Lobut C. (2023): "Différenciation des apprentissages: quelles modalités pour quels impacts", *Note IDEE* n° 1.

students who spoke a language other than French at home.[25] Based on estimated returns to education, the policy is associated with an 11% increase in beneficiaries' future earnings. Despite its high cost—approximately €21,600 per student per year, twice the national average for secondary education—the program demonstrates a high Marginal Value of Public Funds (MVPF), estimated at 4.5.

The Sourdun example illustrates how ambitious, well-targeted educational interventions can transform the trajectories of students lacking the social or familial support typically associated with academic success. However, two important caveats remain. First, the results cannot be generalized to other boarding schools for excellence that have since been established, many of which operate under different conditions. Second, allocating substantial resources to motivated, mid-performing students raises equity concerns: the most disadvantaged students—who often require more intensive support—continue to receive comparatively limited funding in the broader context of priority education.[26]

Recommendation 3. Develop intensive and targeted educational programs, modeled on the Sourdun boarding school for excellence, while ensuring they are complementary to policies aimed at supporting the most disadvantaged students.

Strengthening student learning

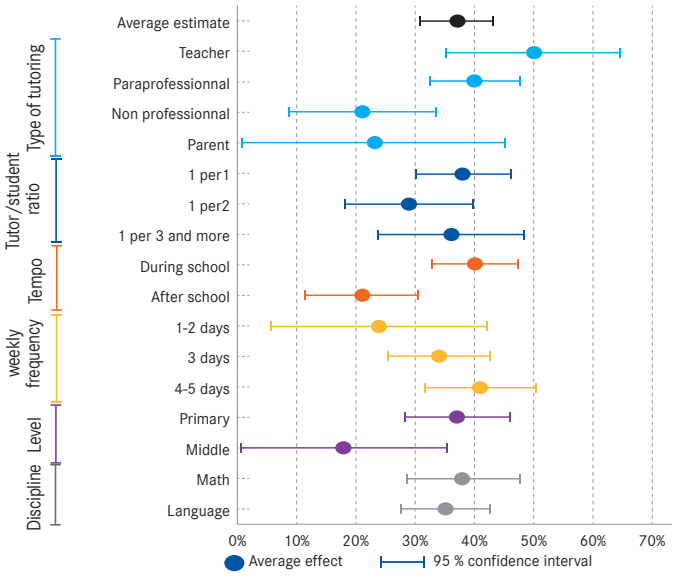
Among the education policies subjected to rigorous impact evaluation, several interventions focused on enhancing student learning stand out for their favorable cost-benefit profiles—namely, tutoring, the development of socio-emotional skills, and the use of digital learning tools.

Tutoring: convincing results

The latest PISA results for France highlight a troubling rise in the proportion of students facing serious academic difficulties (i.e., performing below Level 2 on the PISA scale): between 2012 and 2022, this share rose from 22% to 29% in mathematics, with similar increases observed in reading comprehension and science literacy. These learning deficits are particularly concerning given their persistent, adverse effects in adulthood—ranging from lower earnings to reduced employment prospects.

To address these gaps, tutoring – understood as supplementary instruction provided individually or in small groups – emerges as one of the most effective interventions, according to the literature. A recent meta-analysis finds an average impact of +37% of a standard deviation on academic outcomes.[27] Although the magnitude of effects varies depending on the tutor's profile, student age, subject matter, and session frequency (see Figure 3), the gains generally range from 20% to 50% of a standard deviation.

Figure 3. Meta-analysis of the effects of tutoring



Notes: Each point represents the estimated average effect of a type of tutoring on student performance, expressed in standard deviation units of the observed score. These effects are calculated as weighted averages, taking into account both intra-study variance (linked to measurement error) and inter-study variance (linked to heterogeneity of results). The horizontal bars indicate the 95% confidence interval around the estimate. **Sources**: 96 randomized evaluations of tutoring schemes listed in Nickow A., Oreopoulos P. and Quan V. (2020): *op. cit*.

Efficiency estimates derived from these evaluations indicate that tutoring is self-financing, regardless of the type of tutor employed, due to its substantial long-term benefits. However, the most promising model – both in terms of impact and scalability – is tutoring delivered during school hours in primary education, using paraprofessional tutors (such as teaching assistants or university students). In the French context, it would be especially relevant to explore the large-scale mobilization of undergraduate and master's students as tutors, potentially integrating this activity into their academic program—for example, by granting ECTS credits as part of their coursework.[27]

[25] Behaghel L., de Chaisemartin C. and Gurgand M. (2017): "Ready for Boarding? The Effects of a Boarding School for Disadvantaged Students", *American Economic Journal: Applied Economics*, 9(1), pp. 140-164. Behaghel L., de Chaisemartin C. and Gurgand M. (2024): "Breaking the Barriers to Higher Education: The Long-Term Benefits of a Boarding School for Disadvantaged Students", working paper. Fajeau M., Grenet J., Landais C., Laveissière E. (2025): *Focus du CAE*, no. 111, *op.cit*.

[26] In 2018, the Cour des Comptes estimated that a secondary school pupil in a priority education school cost the State 25% more on average than a pupil in a school outside the priority education system.

[27] Nickow A., Oreopoulos P. and Quan V. (2020): "The Impressive Effects of Tutoring on PreK-12 Learning: A Systematic Review and Meta-Analysis of the Experimental Evidence", *NBER working paper* No. 27476.

Investing in socio-behavioural skills

Beyond strictly academic skills, PISA results reveal that French students significantly lag behind in socio-emotional skills such as self-efficacy, perseverance, self-esteem, and sense of belonging. Yet research consistently shows that these skills are not only critical for learning but also predict long-term professional success, even when controlling for academic achievement.[28]

Evidence from both French and international pilot programs demonstrates that targeted interventions can effectively strengthen these skills, yielding positive impacts on student engagement and academic outcomes—often at relatively low cost.[29] For example, a program developed by the association Énergie Jeunes was implemented in 97 disadvantaged lower-secondary schools to enhance students' sense of self-efficacy and reduce social and academic fatalism.[30] Its evaluation found significant improvements in classroom behavior and academic performance (+3% of a standard deviation in 6th grade, +5% in 9th grade). With an estimated cost of just €65 per student, the intervention displays an infinite Marginal Value of Public Funds (MVPF)—i.e., it is self-financing.

Other initiatives, such as the Active Citizenship Program funded by the European Commission, have also demonstrated effectiveness. This program engages students through participatory practices—voting, structured debates, and collaborative projects—and has been shown to improve civic attitudes (+13% of a standard deviation), enhance the school climate, and reduce disciplinary sanctions and absenteeism.[31]

Given their low cost and demonstrated impact, these programs merit broader deployment—especially in schools facing heightened social and academic challenges.

Recommendation 4. Scale up tutoring programs to enhance support for students in difficulty. Implement evidence-based programs to strengthen students' socio-emotional skills, with priority given to schools most exposed to social and educational disadvantage.

EdTech: conditional potential

The expansion of digital technologies has opened new avenues for teaching and sparked growing interest in their integration into education policy. However, research findings point to mixed results, which depend heavily on the conditions of implementation.[32] Merely providing equipment—such as computers or tablets — without accompanying pedagogical support generally has limited impact.[33]

By contrast, interventions that integrate interactive digital content, tailored to students' proficiency levels and embedded within structured teaching practices, yield more promising outcomes. Experimental studies have shown that adaptive learning software (computer-assisted learning), particularly in mathematics at the primary and secondary levels, can generate learning gains of up to 50% of a standard deviation, at moderate cost. These interventions are often self-financing, with an infinite Marginal Value of Public Funds (MVPF).

While EdTech is not a silver bullet, the literature underscores that it can serve as a powerful pedagogical lever, provided it is meaningfully adopted by teachers and integrated coherently into instructional practices. In France, classroom use of digital tools — especially in mathematics — remains limited. Moreover, existing EdTech solutions are rarely subjected to rigorous impact evaluations, leaving considerable uncertainty about their actual effects on learning. Given this context, it is essential to experiment systematically with promising EdTech tools, evaluate their effectiveness, and clarify the conditions under which they can enhance teaching and learning outcomes.

Recommendation 5: Experiment with and evaluate EdTech solutions to identify the most effective digital tools, particularly in mathematics, and encourage their integration into teaching practices.

[27] The mobilization of 400,000 tutors - i.e. around 20% of students at bac+1 to bac+5 level - paid at the minimum wage for 20 hours a year, would make it possible to provide, in groups of 3 pupils for each tutor, 3 hours of weekly support for 20 weeks to the 10% of primary school pupils with the most difficulties. The cost of such a measure would be around €290 per pupil per year, which is far less than the benefits estimated in the literature: almost €10,000 in private gains (in the form of higher future salaries) and €6,500 in fiscal externalities per pupil (see Focus 114, *op. cit*).

[28] Algan Y., Huillery E. and Prost C. (2018): "Confiance, coopération et autonomie: pour une école du XXIesiècle", Les Notes du CAE, no. 48.

[29] Algan Y., Constantin J., Delpeuch S., Huillery E. and Prost C. (2018): "Plusieurs expérimentations de programmes à visées éducatives", Focus du CAE, no. 26.

[30] Huillery E., Bouguen A., Charpentier A., Algan Y. and Chevallier C. (2025): "The Role of Mindset in Education: A Large-Scale Field Experiment in Disadvantaged Schools", *The Economic Journal*, forthcoming.

[31] Briole S., Gurgand M., Maurin E., McNally S., Ruiz-Valenzuela J. and Santín D. (2025): "The Making of Civic Virtues: A School-Based Experiment in Three Countries", *American Economic Journal: Economic Policy*, forthcoming.

[32] Escueta M., Nickow A., Oreopoulos P. and Quan V. (2020): "Upgrading Education with Technology: Insights from Experimental Research", *Journal of Economic Literature*, 58(4), pp. 897-996.

[33] In contrast to this observation, the initial results of an evaluation of the 2015 Digital Plan suggest that the provision of individual tablets has a positive effect on pupils' learning. Measured between the end of class 5e and entry into seconde, these effects are estimated at between 9% and 12% of a standard deviation in mathematics and between 14% and 25% in French. See Azmat G., Fougère D., Lermite A. and Lobut C. (2022): "L'impact du numérique sur les apprentissages des élèves: évaluation d'une politique d'équipement à grande échelle", DEPP, Document de travail n° 2022.E4.

Training and supporting teachers

Teachers are central to student success and represent the largest share of education system expenditures. As such, investments in their training and professional support are among the most powerful levers for improving the efficiency of education spending.

Teacher value added: a lever to be better exploited

Research in the economics of education consistently emphasizes the critical role of teachers in driving student learning outcomes, while also documenting substantial variation in their effectiveness. Compared to an average teacher, a teacher in the top 15% of the most effective of the distribution—equivalent to one standard deviation above the mean—can improve student achievement by 10% to 20% of a standard deviation per year.[34]

A landmark study by Chetty, Friedman, and Rockoff in the United States[35]showed that early exposure to a high value-added teacher not only improves academic achievement in the short term, but also produces long-term benefits: increased access to higher education, higher adult earnings, and a greater likelihood of residing in a more advantaged neighborhood. When extrapolated to the French context, their calculations suggest that a highly effective teacher could generate cumulative earnings gains of approximately €92,000 per class. Based on this estimate, a policy that improves teacher effectiveness by just 10% of a standard deviation over a career would be self-financing (infinite MVPF) as long as its cost remains below €71,000 per teacher.[36]

These findings underscore the strong economic returns that can result from improving teaching quality. However, the literature remains cautious regarding the mechanisms to achieve this goal. Observable teacher characteristics – such as seniority, degrees, or contract status – explain little of the variation in value-added. While evidence on the effectiveness of recruitment strategies or financial incentives (e.g. performance-based bonuses) remains inconclusive, more robust findings support investments in in-service training and professional evaluation systems that include personalized feedback.

Rethinking in-service teacher training

In France, more than €1 billion is spent annually on in-service teacher training. A large share of this cost is linked to the need to replace teachers during training periods, which imposes a significant organizational burden on schools. In-service training is the leading cause of teacher absences outside of sick leave—accounting for 18% of all absences and one-third of those not covered by substitutes. This model, both costly and of uncertain pedagogical value, raises legitimate concerns about the actual effectiveness of in-service training as currently designed and delivered.

Impact evaluations reveal that the effectiveness of professional development programs varies widely, depending on their intensity, content, and connection to classroom practice. Traditional formats—short, general-purpose sessions with limited targeting—are most often found to be ineffective at shifting instructional practices or improving student outcomes.[37]

In contrast, intensive and sustained training programs—often longer in duration, discipline-specific, and paired with regular follow-up (e.g., coaching, classroom observation, and personalized feedback)—tend to yield more encouraging results. The most effective of these programs are self-financing, with a Marginal Value of Public Funds (MVPF) greater than one.

One French pilot program illustrates both the promise and the limitations of such intensive formats.[38] Conducted with primary school teachers, the initiative offered 80 hours of training over two years, focused on science instruction. Combining theoretical input, simulations, and in-class support, the training aimed to foster concrete application of scientific methods in the classroom. Teachers were asked to design and implement lesson plans directly inspired by the training content. In the short term, student learning gains reached approximately 12% of a standard deviation. However, the effects declined over time in the absence of post-training reinforcement, underscoring the importance of ongoing support to ensure sustained improvements in teaching practice.

Today, in-service teacher training in France still relies heavily on a low-intensity, low-integration model. This view is widely shared by both academic research and teachers themselves.[39] It calls for a strategic reorientation: investing in

[34] Jackson C., Rockoff J. and Staiger D. (2014): "Teacher Effects and Teacher-Related Policies", *Annual Review of Economics*, 6, pp. 801-825.

[35] Chetty R., Friedman J. and Rockoff J. (2014): "Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood", *American Economic Review,* 104(9), pp. 1633-1679.

[36] The wage gain per pupil is estimated as the product $\theta \times \delta$, where θ measures the impact, in standard deviations of school performance, of exposure to a teacher whose value added is one standard deviation above the mean, and δ the effect of a one standard deviation improvement in school performance on future wages. Taking θ=0.10 and δ=0.095, we obtain a salary gain per pupil of around €4,200, or €92K for a class of 22 pupils. Assuming a teacher works for 30 years and teaches a class of 22 pupils each year, a 10% improvement in value added translates into a cumulative fiscal externality (discounted at 3%) of €71k.

[37] See the literature review in Bellue S., Bouguen A., Gurgand M., Munier V. and Tricot A. (2023): "When Effective Teacher Training Falls Short in the Classroom: Evidence from an Experiment in Primary Schools", Economics of Education Review, 103, 102599. "The Production of Human Capital in Developed Countries: Evidence from 196 Randomized Field Experiments" in Banerjee A. and Duflo E. (ed.) *Handbook of Field Experiments*, vol. 2, p. 95-322.

[38] Bellue S., et al (2023): ibid.

[39] According to the results of the Talis 2018 international survey, more than a third of French teachers say they have a high need for in-service training to implement individualized teaching approaches, and almost a quarter express this need with regard to teaching pupils with special educational needs.

formats that are practice-anchored, discipline-specific, and supported over time. Such investments must also be paired with rigorous evaluation frameworks to ensure they deliver measurable and lasting benefits for student learning.

Recommendation 6: Reform in-service teacher training by prioritizing intensive, targeted, and practice-based formats, accompanied by rigorous evaluations to measure their long-term impact.

Strengthening teacher assessment

In many countries, teachers are evaluated through pedagogical inspections, followed by individualized feedback aimed at improving their practices. In France, the frequency of inspections remains low – on average once every seven years– which contrasts with international standards. Yet research shows that these evaluations can have a positive effect on student learning.

In the United States, a program combining pedagogical inspection with personalized feedback improved student achievement by around 10% of a standard deviation, with lasting effects on subsequent cohorts.[40] In France, a recent study also identified significant gains linked to pedagogical inspections, though more modest in scale: between 3% and 5% of a standard deviation at lower-secondary level, and up to 10% for students in priority education.[41] Given the low cost of the scheme–estimated at less than €100 per student in the French study–these benefits suggest that pedagogical inspections are self-financing.

These findings underline the potential of formative assessment as a lever for improving teaching practices. Given its low unit cost, it would be relevant to increase its frequency and better connect it to in-service training. Evaluation could thus serve as a basis for offering teachers targeted training paths, directly based on classroom needs identified through observation.

Recommendation 7. Strengthen the role of formative teacher evaluation by increasing the frequency of pedagogical inspections and linking them more closely with in-service training.

Involving parents

Strengthening the link between schools and families–particularly those facing linguistic or social difficulties–is an important lever to improve children's school monitoring and promote their academic success. Several experiments have shown that simple, targeted, and low-cost interventions can generate measurable effects on pupils' behavior and academic performance.

A prominent example is the Mallette des parents programme,[42] piloted in 2009 in the Créteil education authority before being extended to other regions. With a modest cost (estimated at around €8 per pupil), the program offered three meetings over two months involving parents, teachers, and interpreters, along with workshops to support school monitoring, particularly in language and digital skills. Its evaluation showed very significant effects: a 15% of a standard deviation reduction in absences and sanctions, and an 8% of a standard deviation improvement in academic performance.

Digital school monitoring tools, such as ENT platforms or Pronote software, also show strong potential to foster family involvement.[43] Several experiments in France and abroad have demonstrated that simple interventions–such as the automated sending of text messages or short messages to parents–can reduce absenteeism and, in some cases, improve academic outcomes, with gains up to 10% of a standard deviation. These effects are stronger when the information is directly accessible, without requiring login to a platform. Given their negligible cost, such interventions are self-financing, even when their impacts are moderate.

These findings argue for better integration of families into the educational community, by investing in mechanisms that facilitate access to school information and encourage greater parental engagement in learning support.

Recommendation 8. Strengthen parental involvement through awareness initiatives within schools and the development of accessible digital school information tools, tailored to families' needs.

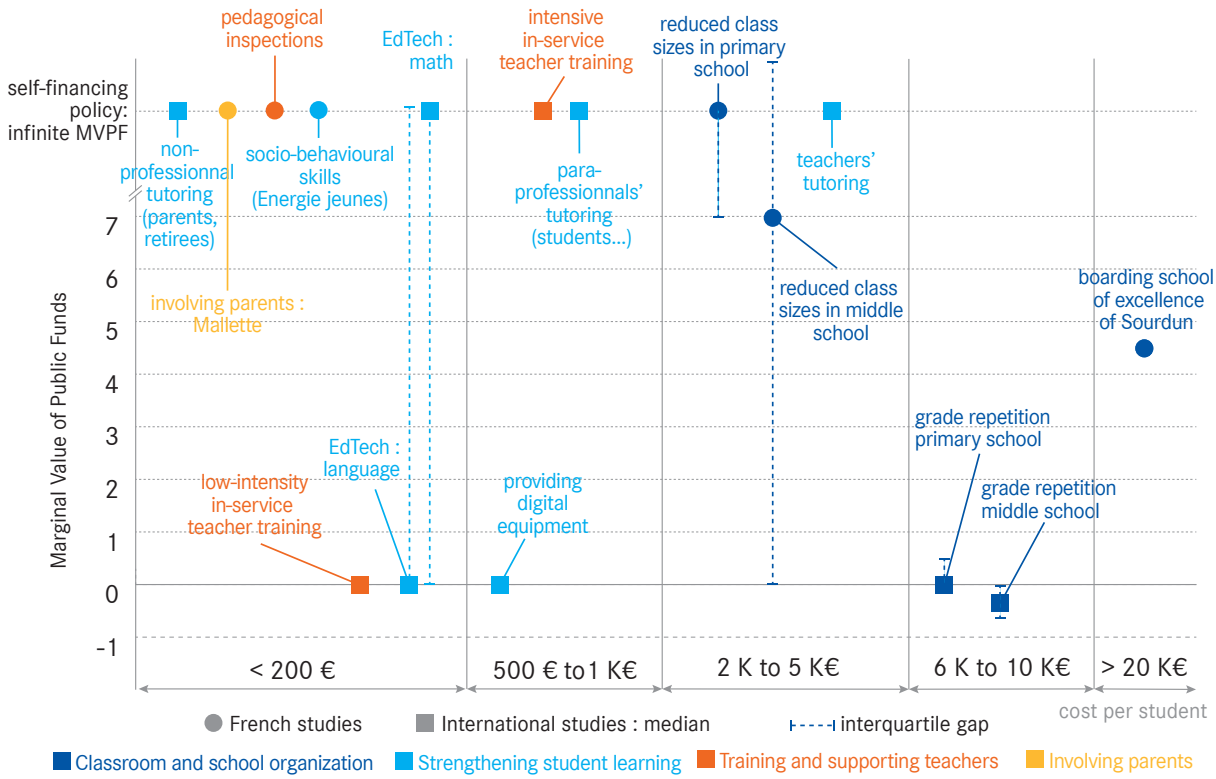
[40] Taylor E. and Tyler J. (2012): "The Effect of Evaluation on Teacher Performance", *American Economic Review*, 102(7), pp. 3628-2651.

[41] Briole S. and Maurin E. (2022): "There's Always Room for Improvement: The Persistent Benefits of a Large-scale Teacher Evaluation System", *Journal of Human Resources*, 59(4), pp. 1150-1179.

[42] Avvisati F., Gurgand M., Guyon N. and Maurin E. (2013): "Getting Parents Involved: A Field Experiment in Deprived Schools", *The Review of Economic Studies*, 81(1), pp. 57-83.

[43] Escueta M. et al (2020), *op. cit.*

Figure 4. Marginal Value of Public Funds: overview



Reading: This graph presents the Marginal Value of Public Funds (MVPF) for various educational policies, depending on their annual cost per student. An EDP greater than 1 indicates that the social benefit generated is higher than the net cost for the State. The MVPF is said to be infinite when the policy is entirely self-financing by the tax revenue it induces. Circles represent estimates from French data studies, squares those from international research; The vertical dotted lines indicate the interquartile gap of the MVPF calculated from the estimates available in the literature. **Sources**: Focus No 111 for a presentation of the methodology, and Focus No 114 for the list of mobilized studies and the calculation hypotheses.

Conclusion: a framework to be enriched

Figure 4 provides an overview of the Marginal Value of Public Funds (MVPF) associated with the education policies examined in this Note, ranked by their cost per pupil. This perspective highlights that education spending stands out as one of the most efficient uses of public funds: many policies exhibit a high — sometimes infinite — MVPF, reflecting their ability to pay for themselves through long-term gains. This finding stands in contrast to other areas of public spending, particularly tax and social policies targeting adults, where the MVPF rarely exceeds 2.[44] In a context of tight budget constraints and declining school enrolment, these results invite a more nuanced view of the idea that the national education budget could be an easy source of savings without lasting negative consequences.

The figure also reveals that cost per pupil is not a reliable indicator of policy effectiveness. Some expensive interventions, such as grade repetition, are of limited effectiveness, whereas others — like class size reductions in primary schools or the boarding school for excellence in Sourdun — show high MVPF values. This argues for allocating resources based on demonstrated effectiveness rather than apparent cost alone.

The framework presented here is meant to evolve as new impact evaluations are produced and access to data improves. In particular, it would be useful to incorporate additional dimensions not explored in this Note, such as the allocation of teachers across schools or the effect of wage levels on the attractiveness of the teaching profession.

In this respect, three priorities emerge. First, expand the use of large-scale experiments in real-world implementation conditions, which remain underdeveloped in France. Assessing educational policies in the field — particularly through randomized controlled trials — is crucial to reducing uncertainty about the effectiveness of various interventions.

Second, make systematic use of administrative data to evaluate education policies. While progress has been made, data quality in primary education still needs improvement. Ministerial databases should be enriched with currently unavailable information (such as the "needs groups" introduced in 2024), and researchers' access to data on school monitoring, pupil assignments, and teacher transfers should be

[44] See Hendren N. and Sprung-Keyser B. (2020): *op. cit.* figure VI(A).

improved. Furthermore, linkages with data on employment, income, health, and justice are essential to fully understand the long-term effects and externalities of education policies.[45]Third, improve cost estimation. Despite major advances in impact evaluation over the past two decades, full cost assessments of education policies remain incomplete. Yet, calculating the MVPF requires a comprehensive accounting of all resources involved. Identifying these costs precisely – beyond aggregate budget lines – is essential to ensure meaningful policy comparisons.

Recommendation 9. Develop large-scale experiments under real implementation conditions, facilitate secure access and matching of administrative data to expand impact evaluations, and precisely map the resources mobilized in order to fully account for the costs of education policies.

[45] While several Northern European and Anglo-Saxon countries have introduced secure procedures enabling researchers to cross-reference educational data with other administrative sources, such matches are rarely authorized in France.

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