

From Data Systems to Better Decisions: A Political Economy Approach to Education Accountability Reforms

Insights from the DARE-RC Community of Practice

**Insight
Note**

DARE-RC Theme
Strengthening accountability,
scalability and use of evidence

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ABOUT

This report was produced by the DARE Research Consortium as part of a series exploring learnings across each of the four themes of the research portfolio: Improving Drivers of Learning for Marginalised Children, Strengthening the quality of frontline education provision, Building resilient education service delivery, & Strengthening accountability, scalability and use of evidence

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Introduction

Over the past few decades, there has been a growing recognition that weak education service delivery is not simply a result of inadequate funding (World Bank, 2018). The efficiency and effectiveness with which existing resources are allocated, managed, and translated into services also matter (Andrews et al., 2017). In this context, accountability failures across the education delivery chain have emerged as an important underlying constraint to the provision of quality and equitable education (World Bank, 2003). Accountability relationships among citizens, policymakers, and service providers shape not only the level and allocation schooling inputs, but also how effectively those inputs are converted into improved service delivery and learning outcomes (Pritchett & Honig, 2019).

These concerns have contributed, since the 1990s, to a proliferation of accountability-oriented reforms across low- and middle-income countries, supported in large part by international development partners such as the World Bank (Bruns et al., 2011). Key reforms have included new technology-enabled school monitoring systems, aggregate performance scorecards and indices, community engagement in school governance, greater school autonomy, the provision of information to citizens, and decentralisation reforms. Yet the empirical record of these reforms remains mixed and inconclusive (Banerjee et al., 2007; Bruns et al., 2011; Channa & Faguet, 2016; Elacqua et al., 2021; Fox, 2015; Hanushek et al., 2013). Evidence increasingly indicates that improved data availability does not automatically translate into better decision-making (Hamilton & Hammer, 2017). Similarly, technology can strengthen monitoring and information flows, but it will likely play a limited role in improving accountability when underlying institutional incentives and relationships of power remain unchanged (Pritchett & Honig, 2019). More broadly, the literature on governance and service delivery emphasises that accountability failures often reflect deeper institutional and political economy constraints rather than the absence of technical inputs or monitoring tools (Pritchett, 2015; World Bank, 2003).

Pakistan provides an important context in which to examine these dynamics. Over the past two decades, the country has introduced unprecedented reforms in education data and monitoring systems, with the objective of improving accountability and enhancing the efficiency and effectiveness of public resources (Barón et al., 2024; Kakar & Naveed, 2018; Secondary Education Department, 2020; Zaka, 2018). Yet the effects of these reforms have varied considerably across provinces and districts. This insights brief synthesises insights from a series of discussions convened under the Researchers Community of Practice (R-CoP) thematic cluster on “Accountable Education Systems,” established by DARE-RC to foster collaboration, mutual learning, and knowledge exchange among researchers working on related questions. The discussions brought together researchers examining a range of issues, including school monitoring and education data systems, aggregate performance indices, machine learning and agent-based modelling, citizen mobilisation and bottom-up accountability, and the political economy of spatial inequalities in education. The studies employed diverse methodological approaches,

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ranging from in-depth qualitative case studies and mixed-methods research to randomized controlled trials, geospatial analysis, machine learning, and agent-based modelling. The findings presented in this brief draw on these discussions and have been refined and updated based on preliminary findings shared by DARE-RC research teams. The studies are listed in Table 1.

Several common insights emerge across this body of work. First, Pakistan's education data systems have expanded substantially, but their use for policy and management remains limited and uneven. The information generated is also predominantly input-focused, providing relatively limited insight into system performance and learning outcomes. Importantly, expanding monitoring of inputs has not, on its own, translated into improved education outcomes. This highlights that information systems can strengthen accountability only when the institutional arrangements and incentives necessary to act on that information are also in place. Second, the evidence points to systemic and political economy constraints as important drivers of accountability failures. Technology-enabled monitoring systems and other technical solutions can improve the availability and flow of information, but they cannot substitute for organisational capacity limitations, weak elite commitment, and unequal power relations that constrain the functioning of formal accountability mechanisms. The effectiveness of accountability reforms, therefore, depends not only on whether information is generated, but also on who receives it, who has the authority and incentives to act on it, and whose interests shape the resulting decisions.

Third, the findings highlight the importance of political and institutional context in shaping citizen accountability and decentralisation reforms. Providing information and supporting citizen mobilisation can strengthen community engagement and increase the articulation of demands and grievances. However, greater citizen voice does not necessarily result in their resolution. One explanation is the highly centralized distribution of authority within the education system, which can leave frontline officials with limited discretion to respond to locally identified problems. At the same time, local political and social power relations influence both the ability of communities to articulate demands and the willingness or capacity of political and bureaucratic actors to respond. Finally, the experience of decentralisation illustrates why formally similar reforms can produce very different outcomes across regions. The effectiveness of decentralisation depends critically on the distribution of power, authority, and organisational capacity within which reforms are implemented. Where local actors lack meaningful authority or where existing power configurations favour the use of education for patronage or predatory purposes, decentralisation may have limited effects, or may reinforce existing inequalities rather than improve accountability.

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Table 1 List of studies conducted under this R-CoP

Title of research study	Principal Investigator(s)	Research Questions	Research method
1. The Equity Equation Project: Predictive Modeling of Policy Impact on School Enrollment	PI: Dr Farah Nadeem Co-PI: Dr Faisal Bari, Dr Jessica Alberent Team: Jawad Ali, Anees Amjad, Hamna Dogar, Shahbakht Mubarak, Ghamae Jamal	1. What works to improve the coherence of data systems across stakeholders to support marginalized children's access, quality, and continuity in education? 2. How is data on marginalized children including girls, children with disabilities, and religious minority children collected, managed, and used for decision-making at different governance levels? 3. How can administrative, household survey, and GIS data be combined and applied innovatively to design education policies that enhance access, especially for the most vulnerable learners? 4. What system-level levers can best support policymakers in adopting simulation-based decision tools for improved resource allocation and equitable enrollment outcomes?	Mixed Methods Quant: Secondary datasets, agent-based model prototyping Qual: FGDs, semi-structured interviews Scope: Punjab
2. Uneven State Capacity: Exploring the Political Economy of Sub-National Variation in Education Provision	PI: Rafiullah Kakar District Team Leads: Dr Manzoor Baloch, Dr Jahanzeb Baloch, Dr Barkat Shah, Dr Ayesha Gul, Dr Mumraiz Kasi Team: Mr Bakht Noor, Jameel Ahmed	1. What are the political economy determinants of inter-district differences in education attainment? Sub-questions: o How do differences in the nature of political settlement explain inter-district and intra-district variations? o How do informal institutions, such as local social structures and norms, influence formal education delivery, particularly in relation to female education? o What factors contribute to isolated successes in education provision in otherwise underperforming regions, and how can these lessons inform broader policy and institutional reforms?	Mixed Methods Quant: Data analysis, GIS mapping Qual: KIIs
3. Review of RTSMS System and Exploring its Scalability in Balochistan.	PI: Dr Muhammad Saleem Co-PI: Ms Salma Jafar, Dr Khadeeja Jafar, Dr Abdul Rehman Khan, Dr Gulab Khilji, Dr Sumaira Rahim Team: Ms Fauzia Shaheen, Mr Ali Ahmed Khan	1. How is RTSMS implemented in Balochistan's education system, and what are the key processes, actors, and institutional capacities involved in its functioning? 2. What system-level variables, such as governance, infrastructure, data collection/monitoring, policy alignment, and data use culture, influence the effectiveness of RTSMS in monitoring education system performance indicators in Balochistan? 3. What political, institutional, and contextual factors enable or constrain the implementation and use of RTSMS across administrative levels, and how do these factors affect its performance? 4. What adaptive scaling pathways, including design and implementation adaptations for inclusive gender responsive learning opportunities for children and long-term integration into the Balochistan EMIS can be identified to enhance the effectiveness, responsiveness, and sustainability of RTSMS?	Mixed Methods Quant: Secondary data analysis Qual: KIIs, FGDs, stakeholder engagement
4. 'Can you hear me now?': Experimental Evidence on improving education through non-electoral citizen participation.	PI: Dr Asim Khwaja Co-PI: Dr Tiffany Simmons Team: Hamna Tariq	How citizens can effectively hold government representatives accountable and advocate their policy preferences for their local schools? 1. Are bureaucrats or politicians more responsive to citizen demands? 2. Does external facilitation by an NGO strengthen or substitute for citizen-led action? 3. Are men or women more likely to take action on education issues? 4. Are bureaucrats [politicians] more responsive to men [women]? 5. Does facilitation lead to more action on the part of men [women]? 6. Does facilitation lead to more action on the part of bureaucrats [politicians]? 7. Do these interventions lead to improvements in education service delivery or school quality?	Quantitative Research Randomized Control Trial (RCT)
5. Enhancing Equity and Accountability in Education: Evaluating and Scaling Composite Performance Indices in Pakistan.	PI: Dr Nasir Mahmood Co-PI: Dr Shahid Soraya, Dr Tooba Saleem	1. How do the composite education indices (DPS, IDPS, SSI, DEPIx, and SIF) compare in terms of their design, validity, use, and alignment with international best practices? Furthermore, to what extent do they adequately incorporate equity, gender, and vulnerability considerations? 2. What technical, institutional, and socio-political barriers hinder the sustainability, scalability, and optimal use of these indices? 3. How do regional disparities in governance, institutional capacity, and data infrastructure affect the effectiveness of these indices, and what strategies can improve their applicability in diverse contexts?	Mixed Methods Quant: Data analysis Qual: Stakeholder consultations, comparative case studies

Key Insights

Data reforms

- 1 Pakistan collects more education data than ever before.** For a long time, the main sources of education data were periodic household surveys and administrative data gathered by education departments. Over the past two decades, provinces have strengthened administrative data systems and introduced more systematic school monitoring. Officials now have more reliable information on student and teacher attendance, school infrastructure and basic facilities, and the broader school environment. Much of this data is collected digitally using phones or tablets and uploaded online, giving district and provincial officials near-real time access to the data.
- 2 The expansion of data has supported new scorecards and composite indices designed to turn disparate data into more usable signals and information for decision-making and accountability.** The breadth and complexity of education data have made it difficult for policymakers and demand-side actors to identify the information most relevant for action. Governments at the national and subnational levels have responded by developing composite measures that consolidate multiple indicators into a comparable picture of performance. In Khyber Pakhtunkhwa, the District Performance Scorecard/Integrated District Performance Scorecard (DPS/IDPS) used existing monitoring data to compare district performance and link improvement to incentives. The instrument was developed with the support of the FCDO through the Khyber Pakhtunkhwa Education Sector Programme. In Punjab, the School Improvement Framework (SIF), developed in 2019, shifted the use of monthly school-monitoring data from ranking schools towards identifying and addressing school needs, alongside an action-management system (Muzaffar and Ansari 2023). It also drew on development-partner support. At the national level, the Ministry of Planning, Development and Special Initiatives initiated the District Education Performance Index (DEPIx) to consolidate fragmented education data into a composite district-level measure for planning and public accountability following devolution, with support from the World Bank and FCDO.
- 3 Pakistan's education data remain concentrated on inputs and compliance, with limited information on learning and system performance.** Major gaps in data coverage continue to limit what the education system can diagnose and manage. Learning data exist at the national and provincial levels, but comparable learning data are not systematically available at the district and school levels. Administrative datasets focus heavily on student and teacher attendance, school infrastructure, and the school environment, while periodic surveys provide information on access and equity. Learning outcomes are not yet captured systematically in government data systems, constraining their ability to identify learning problems and track progress over time. This gap has increased reliance on ASER learning data but the methodological validity of this data is questioned by certain government organisations.
- 4 Even within input-focused monitoring, the data do not cover the full delivery chain.** There is limited systematic information on education budget releases, authorisations, and expenditure, making it difficult to connect frontline conditions with the resources available to address them. Teacher attendance is monitored, but comparable information on the performance and actions of actors in the middle and upper tiers of the system is limited. This creates an asymmetry in which frontline actors are more visible to the accountability system than the education managers and policymakers who control many of the conditions under which frontline delivery takes place.

- 5 More data have improved monitoring of frontline inputs without resolving systemic accountability failures.** The primary challenge in Pakistan remains the limited, systemic use of data rather than their availability alone. Monitoring systems have expanded data coverage on frontline inputs but this has not consistently translated into changes in resource allocation, management, or accountability. Persistent gaps in human resources, infrastructure, allied facilities, and school-level budget utilisation remain visible in monitoring data without necessarily generating corrective action. Similarly, composite indices have helped identify deprived areas, but education development budgets continue to be influenced by political considerations, limiting the extent to which sectoral and regional needs shape resource allocation.
- 6 The narrow scope and use of monitoring data has also concentrated accountability on teachers while providing limited information on actors with greater authority over education delivery.** Teacher attendance is a legitimate management concern, but it provides a limited basis for assessing education-system performance when teachers have little authority over staffing, infrastructure, budgets, or other delivery conditions. Information is weakest on the performance of senior education managers and policymakers, even though these actors have greater authority to address many of the constraints faced by schools. Intensive monitoring of teachers in absence of comparable information on more powerful actors may, therefore, increase pressure on frontline staff without addressing the conditions that constrain their performance.
- 7 In Lant Pritchett's terms, Pakistan's current data system reflects a top-down approach to accountability centred on "thin inputs" (Pritchett, 2014) and "process compliance" (Levy et al., 2018).** Government data are weighted towards easily measured inputs and compliance indicators, while information on learning and system performance remains limited. Such "accounting-based" accountability can, at best, make a limited contribution to improving system performance when the indicators being monitored are not the primary constraints on better outcomes (Pritchett & Honig, 2019). Moreover, such reforms can also divert attention from the more pressing and deeper institutional and societal constraints that matter more for service delivery. The experience of Real Time School Monitoring (RTSM) in Balochistan illustrates this risk. RTSM was introduced on the premise that chronic teacher absenteeism was one of the principal causes of poor access and learning outcomes. Yet nearly a decade after its introduction, available evidence indicates that the school-level indicators monitored through RTSM, including teacher attendance, have improved only marginally in some cases and deteriorated in others, while access outcomes in the province have also remained poor.
- 8 The experience points to a problem with the reform's underlying theory of change.** The emphasis on teacher attendance treated absenteeism as a central constraint without adequately accounting for the underlying chronic teacher shortages. In Balochistan, more than two-thirds of primary schools were reportedly single-teacher schools. In such schools, a teacher's absence because of leave or an emergency would result in the school closing altogether. Staffing constraints were, therefore, highly relevant to how attendance data was interpreted and the corrective action chosen. Yet, rather than addressing the underlying problem of teacher shortage, the policy response focused on monitoring the symptom, i.e. teacher absenteeism. The result was a technology-based solution to a problem that was only partly technological in nature. Better information on teacher attendance could not, on its own, resolve the issue of teacher absenteeism. This case illustrates the limitations of top-down, input-centric monitoring approaches in education.

- 9 Better use of existing data requires, among others, greater interoperability and decision tools that leverage emerging technologies, not simply more collection.** The next opportunity is to convert increasingly granular data into actionable information and decision-support systems. The current data regime is characterised by substantial fragmentation and limited interoperability, leaving a gap between the volume of data collected and its use for decisions. Geospatial analysis, machine learning, and agent-based modelling could help policymakers identify underserved population clusters, examine local determinants of access, and simulate how different groups might respond to policy choices. Participants reported that such applications had improved understanding of parental school choice, accessibility constraints, and the needs of marginalised children.
- 10 These applications need not depend entirely on new data infrastructure.** Existing collection systems can be augmented strategically where specific analytical gaps constrain decisions. The priority is to link data across sources, improve interoperability, and build decision-support tools around concrete policy questions. Used in this way, advanced analytics and predictive modelling could strengthen the allocation of resources and the design of policies targeted to local constraints.
- 11 Government ownership is critical to institutionalising and sustaining data reforms beyond donor-funded projects.** A political economy analysis of the data reforms introduced over the past two decades reveals weak alignment of elite interest with them. Nearly all the data-gathering and data-management reforms discussed by participants were designed and financed with donor support. This pattern suggests that donors are filling a gap in government investment in data and monitoring systems, which appear to have limited political appeal. External financing can help establish systems that governments might otherwise have a weak incentive to develop and maintain, but it does not by itself create the government ownership needed to sustain them.
- 12 This raises a central question about what happens when donor-funded projects end.** Data reforms require continued financing, management attention, and institutional use if they are to be integrated in routine government systems. When government commitment to these functions is weak, reforms may remain tied to the projects and funding arrangements through which they were established rather than becoming embedded in government practice. Donor support can, therefore, partially address the financing constraint but it cannot substitute for government ownership. This points to a broader political economy constraint on data-centric reforms in education. When monitoring and accountability are not sufficiently valued within government, external support can establish new data systems without ensuring that they are sustained and institutionalized after project financing expires.

Community engagement and frontline accountability

- 13 Community mobilisation can increase participation without guaranteeing problem resolution and enhanced accountability.** Community engagement does not automatically translate into stronger accountability or faster resolution of education problems. Provision of information and mobilisation support to communities can increase interest and collective action around education and can strengthen engagement with frontline providers and, in some settings, politicians. Participants also noted the persistence of gender differences in participation, with men more likely than women to engage in collective action. Yet greater access to information and enhanced mobilisation do not necessarily produce a corresponding response from the education system.

- 14 Several features of the institutional context help explain this gap.** Communities may have limited influence over decisions that remain centralised above the local level. Similarly, unequal power relations within communities can also limit whose demands are represented and acted upon. The implication is that information and mobilisation can strengthen demand for accountability, but their effects depend on whether decision-making authority, administrative responsiveness, and local power structures allow that demand to produce effective change.

Political economy of decentralisation and accountability reforms

- 15 Politics and power relations shape whether data and accountability reforms produce system-wide change.** Accountability failures cannot be explained by technical weaknesses in monitoring systems alone. A political economy perspective points to the role of power and patronage in shaping how formal rules are implemented. Where powerful actors use education resources for purposes of patronage and targeted delivery, they can influence and undermine formal accountability mechanisms. Teacher absenteeism that persists despite monitoring can reflect these local power relations rather than a simple failure to collect information. Real-time school monitoring systems, therefore, cannot substitute for accountability arrangements that are undermined by politics and unequal power relations. These power relations are shaped by local patterns of inequality and social organisation, including party affiliation, gender, ethnicity, tribal or kinship networks, and other forms of social identity.
- 16 The effects of decentralisation similarly depend on the configuration of power at the local level.** Where dominant local settlements have an open social base and derive legitimacy from a broad constituency, decentralisation is more likely to lead to responsive provision. Where local authority is more authoritarian or contested and legitimacy is weak, decentralised resources can be used for narrower or predatory purposes. Reform initiatives introduced are more likely to persist when they are compatible with the interests of influential actors or do not generate sufficiently strong opposition from them.

Policy Recommendations

Taken together, these findings suggest that strengthening accountability in education requires moving beyond a narrow focus on data, technology, and formal institutional arrangements. The central challenge is not simply to generate more information or create new accountability mechanisms, but to understand and address the political, institutional, and organisational conditions that determine whether information is acted upon, whether citizens can effectively exercise voice, and whether education systems have the authority and incentives to respond. A political economy perspective is therefore essential for understanding why accountability reforms succeed in some contexts but produce limited or uneven results in others.

Pakistan's next phase of education data reform should focus less on generating additional data and more on making existing information useful for decisions, accountability, and resource allocation. The policy response should combine improvements in information systems with changes in incentives, institutional responsibilities, and the coalitions that sustain reform. Key recommendations are as follows:

Assess and strengthen government ownership throughout the design and implementation of data-system reforms: Government ownership needs to be built into the design and financing of data reforms from the outset. This requires shifting the focus of data-system reform from whether a new system can be introduced to whether government will own, maintain, finance and use it as part of its core functions. A political economy analysis of the planned reform should, therefore, precede the decision to proceed, assessing its political and institutional viability and the likelihood of sustained government ownership. Such an assessment should examine whether the reform is likely to be embedded in regular budget allocations and administrative structures and how the information generated will feed into planning, budgeting and other policy decisions. Where government ownership and incentives seem weak, additional investment in data and technology may produce another externally-driven project rather than a durable public-sector capability. The proposed political economy assessment should shape the design of the reform rather than be treated as an issue that emerges after implementation.

Build accountability around the decisions and actors that matter: Accountability systems should provide information across the education delivery chain, not concentrate primarily on teachers and other frontline inputs. Teacher attendance is relevant but it captures only one part of system performance. Data systems should, therefore, progressively provide information on the actions and performance of mid-tier and senior managers and policymakers who have greater authority over staffing, budgets, infrastructure, and service delivery. This would shift accountability from monitoring compliance with a narrow set of inputs towards identifying where constraints arise and who has the authority to address them. It also requires linking monitoring information to management processes. A data point should trigger a defined response where action is warranted, with responsibility assigned to the actor who can address the problem. Without such a link, more intensive monitoring risks producing greater visibility without greater accountability.

Prioritise measurement of learning outcomes in new data collection efforts: The priority for new data collection should be the measurement of learning outcomes at the district and sub-district levels. This will help develop a more coherent picture of learning that can be combined with information on school conditions, staffing, access, and resources.

Use data to identify binding constraints, rather than simply monitor compliance: Data reforms should be informed by a proper diagnosis of binding constraints and a well-designed theory of change. The experience of RTSM in Balochistan illustrates the risk of building a sophisticated monitoring mechanism around an incomplete diagnosis of the problem. Monitoring teacher attendance can identify absence, but it cannot by itself distinguish between avoidable absenteeism and absence associated with staffing arrangements such as single-teacher schools. Before introducing new monitoring reforms or accountability measures, a comprehensive assessment should identify the most binding constraints and establish whether, and to what extent, the proposed reform is likely to address them. This would reduce the risk that technically effective monitoring systems are used to pursue the wrong problem.

Make interoperability and decision support systems the next frontier of data reform: The growing volume of education data creates an opportunity to move from fragmented reporting towards building decision support systems by leveraging geo-spatial data and emerging technologies such as machine learning and agent-based modelling. Governments should prioritize interoperability across administrative, monitoring, financial, geographic, and learning datasets so that information can be combined around concrete policy questions. The objective is not to create a single database for its own sake, but to allow decision-makers to see how different constraints interact across places and levels of the system. Emerging analytical tools, including geospatial analysis, machine learning, and agent-based modelling, can support this shift where they address clearly defined decisions. They could, for example, help identify underserved populations, examine local barriers to access, and explore how households might respond to different policy choices.

Align community participation with real decision-making authority: Community mobilisation should be linked to institutions that can respond to the problems communities identify. Information and collective action can increase engagement with schools and government, but they do not guarantee resolution when decisions remain centralized or when local power relations limit whose demands are heard. Expanding participation without strengthening the channels through which demands can influence decisions risks generating frustration rather than accountability. Reforms should, therefore, clarify which education decisions communities can influence, how grievances are transmitted to decision-makers, and what response is expected. They should also account for unequal participation, including the barriers that limit women's engagement. Community-based accountability is more likely to affect outcomes when information, collective action, and decision authority are connected.

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