Measuring Education Performance in India and Suggestions for Improvement

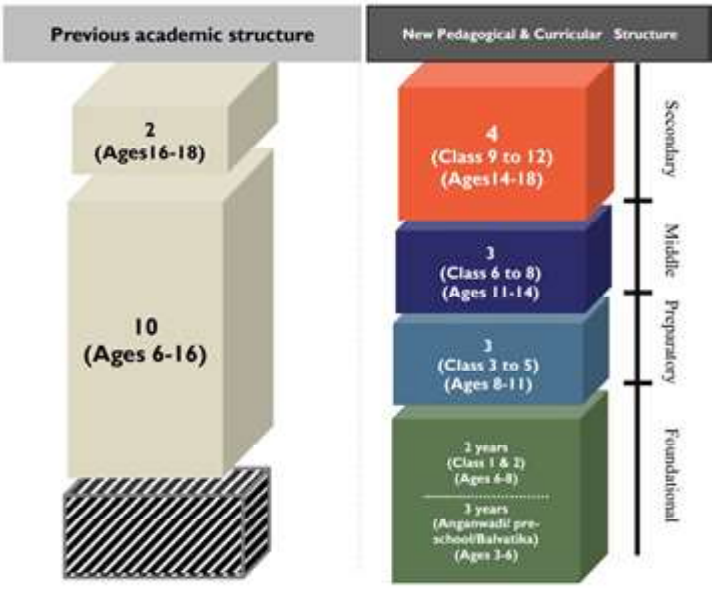
Aaditya Tiwari*

The challenges of the Indian Education system are varied. On the one hand, there is a need for quality teachers, improved infrastructure, appropriate curriculum, and efficient governance structures. Conversely, an assortment of actors is also supposed to make sense of this mesh. Mudaliar Commission[1] was established in 1952 regarding secondary education and suggested diversifying the school curriculum, making vocational education part of the course. Kothari Commission[2], or the National Education Commission in 1966, was the first policy initiative by the Government of India to streamline school education in the country. An important recommendation was to standardise the education system into the 10+2+3 format in India. Education became part of the concurrent list from the state list under the Forty Second Amendment Act, 1976, brought in during the emergency[3]. National Policy of Education (NPE) was brought under the Rajiv Gandhi Administration in 1986 (later modified in 1992).[4] It launched 'Operation Blackboard' to improve the primary education status across the country. *Sarva Shiksha Abhiyan* under the Atal Bihari Vajpayee government made universalising primary education a mission, and the Right to Education was made into a fundamental right. National Education Policy (NEP) 2020[5] is the latest policy intervention brought by the Narendra Modi government after a gap of almost three decades. The Union Cabinet adopted the National Education Policy 2020 on July 29, 2021. The focus of NEP 2020 is different from previous policies in that it puts a lot of weight on the quality of education.

The vision of the policy aspires to 'provide high-quality education to all and thereby make India a global knowledge superpower'[6]. Some of the commitments in the policy include:[7]

1. Changing the school structure from the current 10+2 to 5+3+3+4 model to make learning more holistic.
2. Focus on Early Childhood Care and Education (ECCE).
3. Achieve the goal of universal foundational literacy and numeracy in primary schools by 2025.
4. Expose at least half the school and higher education students to vocational training by 2025.
5. Adopt innovative mechanisms to group or rationalise schools by 2025.
6. Ensure all students are school-ready when they enter school in first grade by 2030.
7. Prioritise bringing out-of-school children back into the educational fold. Aim to stop further drop out from schools and achieve 100% enrolment from preschool to grade 12 by 2030.

*Aaditya Tiwari is a governance and sustainable development professional who graduated from SIPA, Columbia University. He has a decade of experience in India's development sector, including roles at think tanks, political administration, and the UN.



(Source: NEP 2020)

8. Making teacher education multidisciplinary by 2030.

These commitments are ambitious and an uphill task given the current state of schools in India[8]. 1.5 million schools, 265.2 million children, and 9.5 million teachers[9] are at stake, and the economic cost of failing this demographic will be enormous.

Peter Drucker is attributed to the quote, 'What can't be measured, can't be improved.' India doesn't have the challenge of measurement per se, but it is ineffective at using the data collected for improvement. Some multiple datasets and indexes fail to guide policymakers in making informed choices—for instance, the challenge of zero-enrolment schools. Several state governments like West Bengal[10] and Arunachal Pradesh[11] have shut down zero-enrolment schools, which were opened to comply with the Right to Education policy but hadn't seen any admission for a long time. It is also important to define objectives towards which performance is being measured. Currently, whatever measure happens is used to rank states and districts, and the expectation is that a sense of competition will motivate lagging regions to perform better. Ideally, this exercise should be able to define factors causing a particular set of schools to outperform other schools in the same area.

This essay examines methods currently used to generate data and measure performance in India and explores the feasibility of employing sixteen equity indicators12 prepared by the National Academy of Sciences, Engineering, and Medicine in the United States.

Existing performance measuring mechanisms:

Unified District Information System For Education Plus (UDISE+)[13]

The District Information System for Education (DISE) was piloted in 1995 to measure and monitor the implementation of the government scheme for

primary grades. A similar management system, SEMIS, was launched for grades 9-12 in 2008-09. A 'Unified District Information System for Education' (UDISE) was prepared by integrating DISE and SEMIS in 2012-13. An updated version of UDISE called UDISE+ was introduced in 2018-19 with improved mapping, capture and verification of data.

UDISE+ isn't an index but an elaborate collection of data on school management, student enrolment in different categories, the number of teachers, etc. It also measures data on various infrastructure developments, such as toilets for girls and boys, libraries, computer labs, the Internet, etc. UDISE+ then presents specific findings that are basic representations of cumulative data without analysis.

National Achievement Survey (NAS)[14]

NAS is a national-level survey that identifies learning level outcomes for students in classes three, five, eight, and ten. The purpose of the survey is to identify continuous learning and skill gaps. The first NAS survey was conducted in 2017; the latest was in 2021. It measured students in classes three and five on language, math, and environmental science; class eight kids on language, math, science, and social science; and class ten students on language, math, science, social science, and English.

Performance Grading Index (PGI)[15]

Introduced in 2017-18, PGI was developed to provide insights into the status of school education across India. PGI collects data from the Department of School Education and Literacy, MoE and the following sources:

a. Unified District Information System for Education (UDISE+)
b. National Achievement Survey (NAS) of NCERT
c. Mid-Day Meal website (MDM portal)
d. Public Financial Management System (PFMS)
e. Shagun PortalEL (This portal was launched in 2019 to integrate .23 million education websites across India.)

Methodology

PGI measures seventy indicators under two main categories: outcomes and governance & management. Under the outcomes category, there are four domains:

Categories	Domain	Indicators	Sub Indicators	Total Weight
1. Outcomes	Learning Outcomes (LO)	9	0	180
	Access (A)	8	0	80
	Infrastructure & Facilities (IF)	11	2	150
	Equity (E)	16	18	230
2.Governance Management(GM)	Governance Process (GP)	26	6	360
Total	**5**	**70**	**26**	**1000**

(Source: PGI 2020-21 Report)

1. Learning Outcomes And Quality (measures nine indicators obtained from Shagun and NAS)
2. Access (measures eight indicators obtained from UDISE+ and Shagun)
3. Infrastructure & Facilities (measures 11 indicators obtained from UDISE+, Shagun and MDM portal)
4. Equity (measures 16 indicators obtained from NAS, UDISE+ and Shagun)

The governance and Management category measures one domain: governance processes (it measures 26 indicators obtained from UDISE+ and Shagun).

School Education Quality Index (SEQI)[16]

NITI Aayog developed the School Education Quality Index (SEQI) to evaluate the performance of schools in states and UTs. The index focuses on outcomes, strengths, and weaknesses and helps with policy interventions. The first report was launched in 2019.

SEQI measures two categories under outcomes and governance processes. Outcomes are further divided into four domains.

Category 1: Outcomes

- Domain 1: Learning Outcomes
- Domain 2: Access Outcomes
- Domain 3: Infrastructure & Facilities for Outcomes
- Domain 4: Equity Outcomes

Category 2: Governance Processes Aiding Outcomes

Challenges with Current Measurements:

1. The Performance Grading Index is a very elaborate exercise, given its reliance on 70 varied indicators that source information from multiple portals. The data used by PGI is challenging to access, and the platform for interacting with the index isn't very user-friendly.
2. The National Achievement Survey interface is interactive but has too many data points in one window. Also, the averages are compared among districts and states; there

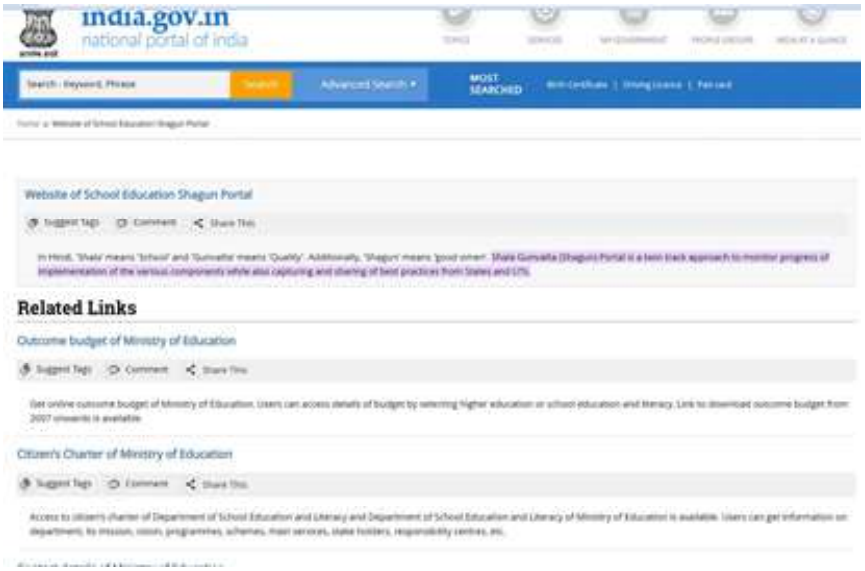
Table 1: Summary of Index Categories and Domains

Category	Domain	Number of indicators	Total weight
1. Outcomes	1.1 Learning Outcomes	3	360
	1.2 Access Outcomes	3	100
	1.3 Infrastructure & Facilities for Outcomes	3	25
	1.4 Equity Outcomes	7	200
2. Governance Processes Aiding Outcomes	Covering student and teacher attendance, teacher availability, administrative adequacy, training, accountability and transparency	14	280
Total		**30**	**965**

(Source: School Education Quality Index, 2019)

can be a more efficient way to compare data instead of averages, which hides information on inequality.

3. The National Achievement Survey isn't an annual feature. The first survey was in 2017, and the second was in 2021. To see year-on-year growth, this survey has to be a yearly feature. No other national survey happens at such a scale.
4. The National Achievement Survey should be used to identify skill gaps in language, math, and science, which will help policymakers plan and allocate resources more efficiently.
5. The equity indicators under the PGI and NAS measure the difference in math and language performance between scheduled caste and general category students, rural and urban students & minorities and general category students. Some indicators measure infrastructure facilities for children with special needs and boy and girl toilets. However, more than these data points are needed to understand or measure performance and learning outcomes gaps.
6. UDISE+ data is elaborate regarding physical and social infrastructure, but the interface needs to become more user-friendly, allowing comparisons across years. It also needs to depict the growth trajectory of the factors it measures.
7. Data on Midday Meals isn't centrally available. Different states provide this information differently without a uniform format.
8. Shagun Portal needs to be reworked entirely as the interface could be better.
9. The School Education Quality Index hasn't been published since 2019. Data management methods need to be overhauled and made more scientific. In 2016, a group of scientists and organisations published an article in Scientific Data that presented guiding principles on scientific data



management. These are called the FAIR principle, which means data should be Findable, Accessible, Interoperable, and Reusable[17].

Building Equity Indicators for India

The National Academy of Sciences, Engineering and Medicine, US, set up a committee which came out with a report in 2019 titled 'Monitoring Educational Equity'[18]. The report identifies 16 key indicators that may affect students' education, such as 'differences in the conditions and structures in the education system'. These indicators have been chosen to highlight gaps and their potential causes and look for interventions to fill them. The report proposes to measure inequities under two categories:

A. 'Disparities in Outcomes': to assess disparity in academic performance

B. 'Equitable Access to Resource and Opportunities'

The attributes of such indicators, as per the report, are:

1. Able to measure academic outcomes over time.
2. Bring out disparity among subgroups within populations.
3. Indicators should be helpful across different geographies and at different times.
4. Grade level appropriateness.
5. Factor in a context that impacts education.
6. Frequently produce an easy-to-understand summary of statistics.
7. Use scientifically sound methods.
8. Include continuous inputs from relevant research or other developments.

Disparities in Outcomes

Domain A: Kindergarten Readiness

Various studies in neuroscience suggest that around 85% of a child's brain development happens by the age of 6[19]. The early years of education are critical in a child's overall development. Proper interventions at this stage can help bridge gaps among children from disadvantaged backgrounds. The report suggests measuring disparity in two skills under this domain.

1. Indicator 1: Disparity in Reading and Numeracy skills
2. Indicator 2: Disparity in Self-regulation and Attention skills

Reading and numeracy skills can be measured using the National Achievement Survey. While the National Curriculum Framework, 2005[20] focuses on skills like discipline, attention, etc., they must be incorporated into early childhood educators' training.

Domain B: K–12 Learning and Engagement

Attendance and performance in school tests are directly and positively relevant to learning and attainment. Measuring group differences can help narrow down the gaps.

3. Indicator 3: Disparity in attendance
4. Indicator 4: Disparity in overall performance and being on track to finishing schools
5. Indicator 5: Disparity in reading, math and science scores.

Shagun portal provides attendance data and indicators the National Achievement Survey can cover 4 & 5.

Domain C: Educational Attainment

Education is a means to better opportunities

and an improved lifestyle. Ideally, education in schools should be able to prepare students for college and financial opportunities.

6. Indicator 6: Disparity in graduating on time
7. Indicator 7: Disparity in readiness for after-school opportunities like college, employment opportunities, or armed forces.

Annual board results will be used to identify gaps in on-time graduation. Currently, there is no mechanism to capture post-secondary education avenues for children.

Equitable Access to Resources and Opportunities

Domain D: Extent of Racial, Ethnic, and Economic Segregation

A child's exposure depends on the peers they study along and grow with. Schools in low-income areas or with most students from low-income or disadvantaged groups tend to perform poorly, leading to poor opportunities later.

8. Indicator 8: Disparity in the concentration of poverty or the presence of diverse groups of students in the school.

The UDISE + surveys can capture this data. Section 12 1(c) of the Right to Education[21] promises admission to up to twenty-five percent of the maximum capacity of seats in class 1 to economically weaker and disadvantaged children. It provides them with free and compulsory education until school completion. Effective implementation of this section will increase the diversity within schools.

Domain E: Equitable Access to High-Quality Early Learning Programs

Pre-elementary schools play a vital role in kindergarten readiness and the child's overall development. Geography, economic conditions, and family background influence access to pre-elementary education. Access to high-quality early learning programs can lead a child to different life paths.

9. Indicator 9: Disparities in access to and participation in high-quality pre-elementary programs.

The National Education Policy has focused on early childhood education and care (ECCE). It suggests delivering high-quality pre-elementary education by building well-ventilated, well-designed, child-friendly, and well-constructed infrastructure. Also, ECCE centres should be co-located with Anganwadi (rural childhood care centre) or existing primary schools wherever possible. This can be incorporated and measured through the UDISE+.

Domain F: Equitable Access to High-Quality Curricula and Instruction

Access to a rigorous curriculum and quality teachers play a critical role in a child's learning process. Exposure to a diverse curriculum, including science, geography, economics, technology, laboratories, languages, art, and history, makes students well-rounded. A single teacher can inspire an entire classroom, but there needs to be conclusive evidence on what teacher traits contribute to student achievement and outcomes. Experienced and more qualified teachers should be distributed equitably rather than in a concentrated manner.

10. Indicator 10: Disparities in access to experienced and qualified teachers in diverse subjects.

11. Indicator 11: Disparities in access to and enrolment in rigorous coursework like programs and international baccalaureate.
12. Indicator 12: Disparities in curricular breadth with absence in availability of subjects like economics, geography, etc.
13. Indicator 13: Disparities in access to high-quality academic support like tutoring.

Indicators 10, 12, and 13 can be easily measured using the UDISE+ and database. For Indicator 11, state governments or CBSE can take the initiative to adapt to rigorous curricula phase by phase.

Domain G: Equitable Access to Supportive School and Classroom Environments

Physical and emotionally safe environments address a child's socio-emotional and academic requirements. While there is a focus on building safer infrastructure, more emphasis has to be placed on supportive environments by providing access to counselling staff, social services, etc.

14. Indicator 14: Disparities in school climate regarding perception of safety, support, trust, etc.
15. Indicator 15: Disparities in non-exclusionary discipline practices like suspensions and expulsions
16. Indicator 16: Disparities in non-academic support for student success

Indicator 14 can be measured by adding it to the National Achievement Survey. It can also be measured by involving school management committees. Indicator 16 can be measured through the UDISE+. However, the available data sources have no mechanism to measure indicator 15.

Conclusion

National Education Policy 2020 talks of Socio-Economically Disadvantaged Groups (SEDGs) like the scheduled castes, tribes, minorities, children with special needs and women as underrepresented, cutting across all inequities. It mentions the disparity due to lack of access, quality of good schools, teachers and poor infrastructure. As the Indian economy grows, these disparities have to be reduced. The current education system will provide the bedrock that India requires for the skilled workforce; if attention is not paid to building an equitable landscape, India might face unintended consequences. Hence, it must improve performance measurement in school education and build indicators enabling policymakers to make informed decisions.

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