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India's education system through the lens of PISA: Governance, curriculum, and teacher-learner development

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Abstract

In this study, I analyze India's education system through the PISA prism of governance structure, curriculum design, and teacher-student development. By examining India in the context of PISA 2021 and comparing education systems across the globe, this research shows systemic assets while pointing to systemic challenges. Governance structures such as the ShaGun portal and the Shaala Siddhi framework show attempts to measure educational quality, but the resource inequity and regional differences remain disproportionately huge. The Indian curriculum is top of its category in theoretical oomph, especially in mathematics and science, but fails abysmally at instilling critical thinking ability as well as practical input that is in high demand as per the PISA framework. Teacher professional development emerges as a key barrier in that, in the absence of adequate training and a competitive student-teacher ratio, despite programs such as the Professional Development Program on Assessment and Emerging Literacy Teacher. Results are clear — competency-based assessments have led to curriculum reforms across nations like Germany and Finland in the aftermath of "PISA shock." Policy implications include a learned need for equity funding models, a 21st-century-aligned curriculum, and intensive teacher support. India can use this to improve its global competitiveness, bridge socioeconomic divides, and promote holistic development of all students—with the present roadmap for how Indian policymakers must balance national policies against international benchmarks.

Keywords: Governance; Curriculum Reform; Teacher Professional Development; Equitable Resource Allocation; Competency-Based Assessment

1. Introduction

In India vast and diverse educational system continues to struggle to conform with international benchmarks such as PISA through the Program for International Student Assessment. This review considers the Indian system through governance, curriculum and teacher-student development weighed against the highest-performing PISA countries. Given the scale and diversity of India's education system, it faces challenges in commensurate to global benchmarks-based like Program for International Student Assessment (PISA). The system is differentiated in Primary (ages 6-14), Secondary (ages 14-18) and Tertiary; presided by a mix of national and state-run bodies. While the Right to Education Act 2009 guarantees free of cost and compulsory education till age of 14, there are many implementation gaps e.g. in remote area where infrastructure deficit and lack of teachers prevent access to school. Socioeconomic division in learning is starker between Urban-Private schools and Rural-Public Institutions. Reforms like the National Education Policy (NEP) 2020; are redefining pedagogy with focus on critical thinking instead of rote learning and incorporating vocational training from Grade 6. But a systemic fragmentation of the form reflected in inconsistent certification standards and curricular autonomy across states has yet to be tackled. The importance of the PISA performance in India

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— it at number 72 out of all 73 countries (in 2009) highlights the urgency of tackling these structural issues for us if we want compete at all internationally.

2. Methods

A systematic literature review was utilized to examine peer-reviewed studies, government reports and policy documents. The study based on governance, curriculum and teacher-student dynamics was selected from the relevant resources with critical analysis the alignment of India in terms of conceptual learning with PISA's focus and equity.

3. Results and Discussion

3.1. Governance and Management

The Teacher certification system in India is a mix of central guidelines with state implementation. For primary, the minimum qualification is a Bachelor of Education (B. ED), while secondary teachers (grades 9–12) need subject expertise with their B.ED. Higher Education faculty have to give a NET for being cleared in their discipline(s) This is then used as a criterion for employment but certification standards vary across the states. However, certification can vary greatly across states. In just some examples of state-level variations, Maharashtra and Tamil Nadu conduct very rigorous testing by way of Teacher Eligibility Test (TET), while the scores in states like Uttar Pradesh or Bihar barely matter — leading to differential quality teacher (Government Authorized Teacher Education Institutions, 2023).

Performance-based incentives (e.g., the experiment in Andhra Pradesh with ref2 tied teacher pay to student test score improvements led to positive returns in math (0.28σ) and language (0.16σ)). While this highlights the potential of accountability mechanisms, its intermittent adoption erodes broader equity within a system (Teacher Performance Pay: Experimental Evidence from India, 2023). Since central bodies, such as National Council of Educational Research and Training (NCERT) and state councils (e.g., SCERTs) provide governance, there is still fragmentation but with self-financing colleges and contract teachers leading to variability in standards (Teacher Standards and Certification Requirements in India, 2023)

3.2. Curriculum Development

India balances national standards with regional inputs in its curriculum development. National Policy on Education provides broad guidelines for implementation, but this has state-level autonomy. Decentralization can introduce heterogeneity, especially in terms of multicultural and conceptual learning integration. Keep in mind that cognitive domains (knowledge, analytical and synthesis) are the main focus, but curricular content is so often destined by rote memorization against PISA's focus on application. Curriculum Development in India (2023) proclaims that reform is essential to better support interdisciplinary, problem-based learning.

3.3. Learner Development

Mechanical training in the form of exam-centric pedagogy that promotes rote learning over conceptual understanding impedes learner development. Yet experimental interventions (like performance-linked rewards) yielded gains on mechanical and conceptual test scores, suggesting that pedagogical shifts may enhance holistic achievement. Socioeconomic disparities also widen these divides, rural and marginalized communities have no access [4] (Teacher Performance Pay: Experimental Evidence from India 2023).

3.4. Professional Enhancement of Teachers

The pre-service training occurs from either (a) government colleges which is organized centrally and locally administered or (b) self-financed institutions which is organized by state governments with permission and registered under their acts. In-service development is not uniform, there are poor accessibility to continuous professional training. The Andhra Pradesh experiment is indicative of the potentials brought by performance incentives but systemic barriers such as contractual employment and uneven state policies remain obstacles to long-term teacher motivation. Uniform training and wider inclusive mentorship programs can address these deficiency (Government teacher education institutions 2023; Teacher performance pay: Experimental evidence from India 2023).

3.5. Support Systems

It includes NCERT curricular materials and state and open universities such as the National Institute of Open Schooling (NIOS). But distribution of resources is increasingly having many dry holes in meeting demand, rural schools having no

infrastructure and much less technology. Performance pay initiatives and central schemes (eg, Samagra Shiksha) could close gaps, but implementation difficulties persist. The work of governments, NGOs and communities must build resilient support structures (Teacher Standards and Certification Requirements in India 2023).

4. Conclusion

India has the capacity for innovative pilot programs as well as well-structured certification frameworks in its educational system. But the lack of systemic alignment with PISA benchmarks can be attributed to systemic fragmentation, curricular rigidity and uneven resource allocation. Everything is centered around teacher accountability, a modern approach to the curriculum and inclusive support systems are what make India a global powerhouse. The NEP 2020 and digital initiatives like PM eVidya mark an accelerating shift in India towards competency-based learning for all and inclusion. The EdTech expansion, expected to reach a $10.4 billion market by 2025 will offer opportunities to close the urban-rural divide through adaptive learning and AI-driven personalization. But growth stops, otherwise, unless we close on teachers training gaps and infrastructure standardization in those economically weaker sections where one third of schools do not have functional electricity.

Compliance with ethical standards

Disclosure of conflict of interest

I hereby declare that there is no conflict of interest related to this research

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