

Indian teaching workforce and the rise of AI

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Would you counsel a young person you cared about to choose a career in education? Even after 75 years of Independence, why has India failed to effectively address chronic teacher absenteeism and eliminate single-teacher schools, despite growing literacy and extensive policy efforts? How can we expect quality education when 1 in 4 teachers are actively considering abandoning their profession, with approximately 900,000 teachers planning to leave before each school year begins? (McKinsey survey of 1800 educators, 2023).

These questions have rattled the global order for decades and continue to perplex specifically the Indian demographic, yet remain stubbornly unanswered. India's knowledge economy has a fundamental flaw: we expect academicians to work for free while paying consultants premium rates. This cultural narrative romanticizing academic poverty creates a vicious cycle. When we undervalue academics financially, we signal that knowledge production isn't economically significant. Bright minds migrate to law firms, consulting and tech, weakening the very institutions that drive innovation.

The systemic issues in education are becoming too massive to continue ignoring. Burned-out teachers, embattled administrators and support staff stretched to the breaking point, all point towards a fragile educational ecosystem on the brink of disaster. And it's catching up with us.

From rural Karnataka where only 16% of grade three students can perform simple arithmetic, to metropolitan cities where 600,000 teaching positions have been eliminated nationwide since 2020, the crisis transcends geographical boundaries. The haunting reality persists: while society universally acknowledges education as the cornerstone of progress, we simultaneously witness the systematic abandonment of those entrusted to deliver it, teachers, who find themselves at the center of this crisis.

Teachers play a pivotal role in society. They are at the forefront of equipping the next generation with the skills they need to thrive. Teachers in general form the democratic ideals, social cohesion and economic competitiveness of every nation. But despite this, they have long struggled to gain and maintain the status of a prestigious profession (Kraft & Lyon, 2024).

The current workforce, however, is not able to keep up with the demand. Each new academic year typically spurs reporting on the dearth of educators in national and local publications. The problem is not just current teachers exiting the field, it's that fewer people are entering the profession to replace them.

The pandemic has amplified these existing cracks in the system, even the return to the classroom has not signified a return to normalcy for many educators. For decades, employee turnover, burnout, work-life balance struggles, layoffs, and organizational culture have fueled a frenzy in personnel economics literature, but post-COVID trendlines reveal these effects have become increasingly endemic within academia, reshaping the higher-education landscape.

The challenges of helping students recover academically and emotionally, coupled with staffing shortages, have led to increased workloads, leaving many teachers overworked and overwhelmed. A recent study published in the *Educational Researcher* reveals that teachers experienced higher rates of anxiety during the pandemic, surpassing even those reported by healthcare workers.

At a time when logging 70 hours per week has become a war cry in the national discourse, we often overlook the silent, unpaid overtime of Indian educators. The same 70 hours spent by a tech executive sipping coffee in a company pantry, enjoying paid international trips and countless perks are spent by teachers preparing course materials, grading answer sheets, and instructing students. Their lives in other words are as different as liquor and licorice.

In her seminal paper, Tomas identified and empirically validated five governing factors affecting

teacher turnover and personnel satisfaction- burnout/fatigue, management support, working conditions, interpersonal relationships, and career change, all of which are represented in the figure below. Tomas's categorization offers a nuanced view of the workforce vulnerabilities ranging from excessive paperwork, interpersonal conflict and external economic opportunities that drive the talent away.

The five factors that the researcher identified in the study affecting teacher turnover are burnout and fatigue, management support, working conditions, interpersonal relationship, and career change shown in Figure 1.

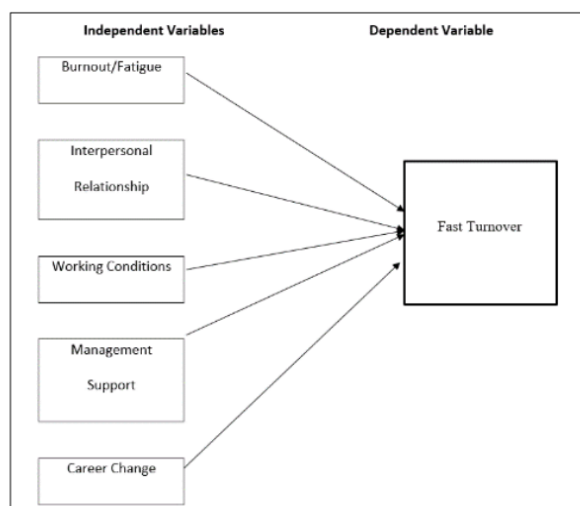


Figure 1 Conceptual Framework

Figure 1: (Source): Source: Tomas, M. A. S. (2024). "Factors influencing fast turnover of teachers: Impact on personnel's satisfaction." *World Journal of Advanced Research and Reviews*, 24(02), 1676–1685.

As more teachers quit, those left behind are loaded with extra responsibilities- increasing their chances of burnout and eventual resignation. A teacher's time, energy and attention are limited,"says Schroderveteran educator and author of *Teach From Your Best Self*. "When we remove responsibilities from teachers that don't directly contribute to student learning, we give them the mental bandwidth they need to bring their best to their students."

He continues his assertion by the fact that many teachers are now reluctant to encourage young people into a profession they perceive as challenging and underappreciated. A 2022 representative survey found fewer than one in five Americans would recommend teaching as a career. This hesitancy, combined with a grossly underfunded education sector, fuels a growing exodus as qualified graduates pursue higher-paying opportunities outside academia.

Existing literature has indicated that burnout indirectly negatively influences student learning through its effects on increasing teacher attrition. Stressed or burned-out teachers tend to be more likely to leave the classroom and make a contribution to an unstable and possibly poorer quality teaching workforce, hence negatively affecting student learning (McLeskey & Billingsley, 2008; McLean & Connor, 2015). In particular, reduced personal accomplishment(RPA) appears to exert a direct negative influence on students' eventual attaining of long-term IEP outcomes, while being indirectly influenced by the other two burnout components: emotional exhaustion(EE) and depersonalization(DP) , either through student engagement alone or through both teaching quality and student engagement.

In India, more than 9.5 million educators serve diverse educational sectors; however, resource disparities and uneven distribution persist. The administrative burden placed on teachers, exacerbated by tasks such as data entry and election duties, has become a primary factor in diminished teaching capacity and increased attrition. Over 65% of teachers report being overworked due to non-teaching responsibilities, undermining their ability to focus on pedagogy and student engagement (National

Achievement Survey, 2021).

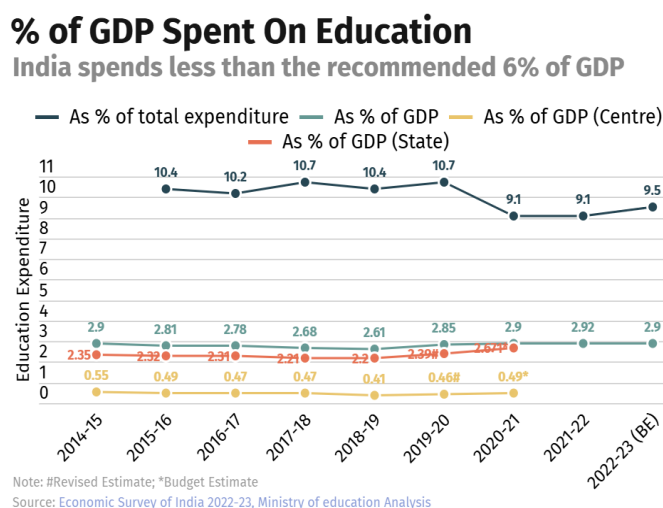


Figure 2: Percentage of GDP Spent on Education in India (2014–2023). (Source: *Economic Survey of India 2022-23, Ministry of Education Analysis*; Adapted from official budget data.)

Often, education policies are designed in a manner that put the educators on the backseat with students being the primary target audience. What gets overlooked is that students can only thrive when their teachers are supported and not overwhelmed. This is the gut punch honest truth that teachers live with every day - felt both emotionally and financially. In most professions, compensation signals value, but for educators, that truth fails to hold.”

Recognizing these persistent challenges, policymakers have begun to design interventions aimed at easing the pressure on teachers while enhancing educational outcomes for students. To address these challenges, various digital initiatives have been launched. PM e-VIDYA, for example, launched in 2020, is a government program that aims to give digital education access to all 26 crore students in India. It provides resources through online platforms, including 12 dedicated DTH TV channels and educational podcasts. Additionally, DIKSHA, developed by NCERT, serves as a national digital platform. It offers interactive content, lesson plans, worksheets, QR code-integrated textbooks, and professional development modules. Similarly, ePathshala, which started in 2015, promotes educational e-resources such as textbooks, audio, video, and periodicals that are helpful for students.

Building teacher competence is another government focus. The NISHTHA program focuses on a teacher training program helping 4.2 million teachers with training modules focused on higher-order thinking skills, teaching examples and experiential learning approaches, thus helping develop modern teaching skills.

Technology integration is also emerging as a crucial focus area. In India, where government school teachers are overburdened with non-teaching tasks, the Delhi government’s initiative, announced on April 22, 2025, is to train teachers in AI tools for tasks like creating PowerPoint presentations, editing images, and generating extracurricular ideas.

Meanwhile, educational platforms like Byju's, Vedantu, Unacademy, and PW have introduced AI features for resolving doubts and providing personalised learning. New ed-startups such as SpeEdLabs and ConveGenius are also working on AI-based revision tools and doubt resolution with GPT-powered tutors and chatbots. In addition, virtual classrooms have become an important way to link teachers with students worldwide. This is especially helpful in rural areas where it's hard to find teachers or for students who can't afford costly educational services.

Despite significant government and private investment in digital education initiatives, fundamental gaps remain, preventing existing solutions from tackling India’s main educational challenges. Current

platforms like PM e-VIDYA, DIKSHA, and AI tutoring systems mainly focus on delivering static content. They overlook the need for monitoring real-time classroom engagement. Some of these models even train teachers to use individual AI tools for presentations and data management, but these solutions require a lot of manual operations, failing to provide an integrated framework. The fragmented nature of existing systems creates critical inefficiencies since these platforms operate as disconnected systems with no inter-platform communication or coordinated intelligence. Additionally, digital platforms provide static multilingual content but lack in figuring out individual learning patterns, offering no predictive capabilities for identifying struggling students. These gaps need to be addressed with an integrated AI-human collaboration framework that combines integrated real-time monitoring, autonomous workflow management, and adaptive personalisation for the overall development of the students, at the same time reducing teachers' burden.

As established above, the low hanging fruits of digital content and fragmented administrative reforms have been a drop in the ocean, failing neither to relieve the systemic pressures on educators nor restoring the integrity of the profession.

This prompts us to articulate key propositions that could direct future research and policy maker attention which are as follows:

P1: Integration of autonomous AI agents into teacher workflows will substantially decrease time spent on administrative and non-pedagogical tasks enabling them to focus more on high value instructional activities.

P2: When applied to real-time classroom monitoring, AI tools have the potential to boost student learning outcomes and improve educator retention, counteracting cyclical turnover and burnout.

Drawing on this, we propose a comprehensive AI-in the Loop Framework that leverages autonomous AI agents while preserving essential human oversight and pedagogical decision-making. This innovative approach uses automation that amplifies human capabilities by 5-6 times.

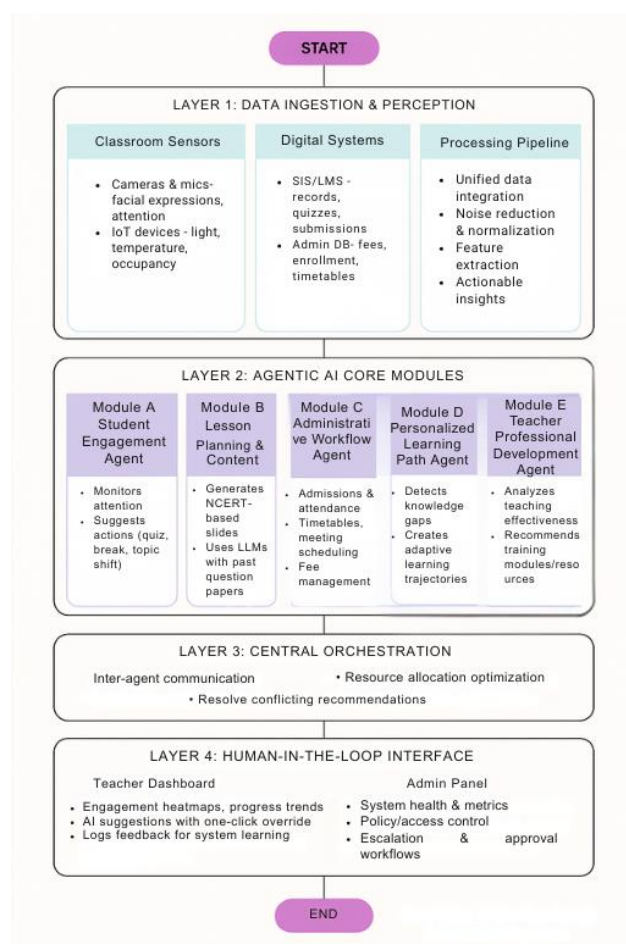


Figure 3: Hierarchical structure of the AI-in-the-loop education framework, illustrating the system architecture across different layers

The backbone of our proposed framework is an intelligent data ecosystem. The framework begins with data ingestion and perception layer. Deployed cameras, microphones and IoT sensors in various classrooms, capture real-time student engagement indicators such as facial expressions and attention patterns. These sensory data is integrated seamlessly with existing Student Information Systems, Learning Management Platforms, and administrative databases, creating a personalised data ecosystem that processes data using advanced pipelines employing feature extraction, noise filtering, and multi-modal fusion techniques to generate actionable insights which will be helpful for the teachers.

At the system's core lies an agentic AI module ecosystem comprising five specialised autonomous agents that operate independently while collaborating to optimise outcomes. The Student Engagement Agent continuously monitors students' attention levels and emotional states, instantly alerting teachers if more than half of the class appears inattentive. The model suggests the most effective action (considering all relevant parameters which have high correlation)—such as taking a short break, conducting a quick quiz, or changing the teaching topic. Research shows that such real-time monitoring can improve classroom engagement by up to 30%.

The Lesson Planning and Content Generation Agent revolutionises curriculum delivery by automatically producing NCERT-based lesson plans, teaching slides, personalised worksheets. All NCERT materials, along with previous years' question papers, are fed into the LLM which in turn does pattern recognition, instance based learning for frequently asked questions and highlighting important topics. This agent reduces teacher preparation time by 60% at the same time help students with important questions and worksheets.

The Administrative Workflow Agent addresses the bureaucratic burden by autonomously processing

admissions applications, managing attendance through facial recognition technology, scheduling management meetings, creating timetables, handling fee collections and sending alerts to parents in case the fee is not paid. This automation removes the administrative tasks that take up 25-30% of teachers' time, letting educators concentrate on improving their skills and providing personalized mentorship to students.

The Personalised Learning Path Agent learns patterns and analyses individual student performance data to identify knowledge gaps and generate adaptive learning trajectories, ensuring no student feels left out or unattended. This intelligent system tracks the delta change in students thus predicts learning outcomes.

Simultaneously, the Teacher Professional Development Agent supports educators by identifying skill development opportunities, and curating professional learning resources aligned with NISHTHA standards. This also helps in forming a supportive, data-driven professional educator community .

Crucially, the central orchestration ensures peaceful operation through sophisticated inter-agent communication protocols and workflow coordination systems. This master coordination layer manages resource allocation, resolves conflicts between competing recommendations.

However, the framework maintains a comprehensive Human-in-the-Loop interface that presents AI recommendations via dashboards consisting of graphs, change in performance of students over time and other actionable insights thus preserving teacher's ultimate decision-making authority. Educators can approve, modify, or override any AI suggestion with single-click controls, while the system learns from their feedback to improve future recommendations.

As a conclusion the study validates on the intricate facets of teacher burnout, cynicism, ineffectiveness and exhaustion, indicative of a multifaceted challenge that necessitates a comprehensive approach. The existing solutions limit their reachability to students leaving educators at the mercy of a growing policy paralysis trying to juggle the tradeoff between adding value by teaching or overwhelming themselves with administrative workload. In the age of organizational and technological metamorphosis, Artificial Intelligence and automation position themselves as potential troubleshooters.

The study, drawing inspiration from existing Agentic AI frameworks, formulates that a comprehensive multi-agent framework combining AI speed and scalability with human judgement, empathy and ethical oversight can overhaul the pressing problems faced by educators, safeguarding against blind automation while amplifying educator impact. As Shaufiel states metaphorically, it is like the blowing out of a candle or a fire, when the fire does not get enough material to feed on, it will be extinguished. Resources and support have to be supplied in order to keep this “fire”, as in enthusiasm and commitment.

flow.