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THE SYSTEMIC DISTORTION OF SCIENTIFIC INTEGRITY IN INDIAN RESEARCH

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ABSTRACT

This paper examines the systemic crisis undermining scientific integrity in Indian academia. Despite India's rising global rank in research output and innovation metrics, a critical analysis reveals a growing disparity between quantitative productivity and qualitative rigor. The study identifies a triad of institutional failures driving this crisis: a "publish or perish" culture that incentivizes quantity over quality, chronic underinvestment in R&D coupled with inequitable fund distribution, and a bureaucratic administrative system that stifles autonomy. These factors have led to a proliferation of ethical breaches, including fake peer review, data falsification, and plagiarism, resulting in a high retraction rate and a severe reproducibility crisis. The erosion of objectivity is further compounded by political interference and the encroachment of pseudoscience. The consequences are profound, damaging the global credibility of Indian research and posing tangible risks to evidence-based policymaking and public welfare. The paper concludes that the central challenge is not intellectual capacity but a profound governance failure. It proposes a multi-dimensional reform agenda centered on establishing independent oversight, promoting open science, incentivizing collaboration over competition, and embedding ethics training throughout the academic pipeline to rebuild a culture of integrity and restore trust in Indian science.

KEYWORDS: research integrity, publish or perish, retraction crisis, predatory journals, research ethics, scientific misconduct.

INTRODUCTION

The pursuit of knowledge rests fundamentally upon the scientific method, an empirical approach developed over centuries that governs how knowledge is acquired and validated [1,2]. This method mandates a systematic procedure involving careful observation, inductive reasoning to form a testable hypothesis, rigorous testing through experimentation, and subsequent modification or rejection of the initial conjecture based on empirical results. Crucially, any valid scientific inquiry demands that a hypothesis must be falsifiable [2]. While the detailed procedures vary greatly across scientific domains, the underlying commitment to testing and evidence remains universal. Failures in scientific output are thus characterized not merely by intellectual shortcomings, but by a demonstrable inability or unwillingness to uphold these rigorous, self-correcting methodological commitments due to compounding external pressures [3].

The philosophical integrity of science relies upon core values that serve as intellectual guardrails against human error and bias. Foremost among these is rigorous skepticism. Critical thinking represents the cognitive and metacognitive skills required to support an epistemological commitment to scientific methodology [4]. Evidence suggests that a belief in knowledge being complex and requiring critical evaluation positively correlates with strong critical thinking skills [5].

Complementing skepticism is the ideal of scientific objectivity. Objectivity mandates that scientific claims, methods, and results should not be influenced by personal interests, value judgments, or community bias [6,7]. These ideal forms the basis for the authority and trustworthiness of scientific knowledge within society. Objectivity, however, is continuously challenged by inherent philosophical debates, including issues of confirmation bias [8]. Subsequent analysis of the Indian scientific landscape reveals that the system actively amplifies these inherent challenges, making the attainment of genuine objectivity exceedingly difficult for many researchers [9].

India has established itself as a significant global contributor to knowledge production, recognized among the top five nations globally in space exploration [10]. The country has seen a rapid increase in intellectual property creation, with nearly one lakh patents granted in fiscal year 2024 [11]. India's standing has improved significantly on the Global Innovation Index (GII), moving from 81st place in 2015 to 40th in 2023 [11]. Moreover, India's emergence as a “knowledge superpower” is being increasingly recognized worldwide [12].

This outward appearance of success, however, masks a fundamental instability rooted in financial neglect. India's Gross Expenditure on R&D (GERD) as a percentage of GDP has remained stagnant at approximately 0.7% for a decade, significantly trailing comparable nations like South Africa (0.83%) and Brazil (1.16%) [10]. This critical pitfall highlights a foundational disconnect: the system strives to attain the status of a "knowledge superpower" based on rapid publication growth while failing to provide the core financial investment necessary to sustain fundamental, high-quality research [13]. This disparity creates a high-pressure environment where quantity is favoured over quality, forming the structural foundation for ethical compromises [14].

Despite India's growing scientific infrastructure and achievements, unscientific attitudes, administrative pressures, and systemic flaws often distort the true spirit of the scientific method, leading to errors, biases, and ethical lapses [9,15,16].

2. Cognitive Bias and Misinterpretation of Data

2.1 Confirmation Bias and Cognitive Dissonance

The ideal of scientific objectivity is often weakened by natural human thinking biases [6, 7]. One of the most common is confirmation bias, which means people tend to notice and accept information that supports what they already believe, while ignoring or downplaying evidence that challenges it [8].

This bias can be seen when policymakers ignore scientific findings that go against their existing views, for example, dismissing warnings about environmental damage from large infrastructure projects because they prefer to stick with familiar ideas about economic growth [8]. Such behavior substitutes factual analysis with subjective narratives, illustrating how personal or institutional biases can skew the interpretation of empirical data. This form of selective reasoning undermines the self-corrective nature of science and impedes evidence-based policymaking [4].

2.2 Misuse of Statistics and Misrepresentation of Results

One major weakness in research methods is the frequent misuse and misunderstanding of statistics, especially the P-value. Studies show that even experienced researchers, including psychologists, often get this wrong. They sometimes think the P-value tells them how likely it is that the hypothesis is true, or that a low P-value automatically means the results can be repeated [17]. This misunderstanding reflects a deeper problem in the system, where researchers focus too much on whether results are "statistically significant" instead of

whether they are meaningful, rigorous, or reliable [3]. By giving more importance to numbers than to the actual quality and context of the data, science risks becoming more about appearances than genuine understanding.

2.3 Case Examples from Indian Academia

The institutional pressure to publish rapidly amplifies the temptation for data manipulation and inflated claims [9]. Multiple high-profile retraction cases from Indian research institutions highlight this erosion of integrity. For instance, the National Centre for Biological Sciences withdrew a paper after the discovery of manipulated images, and a Drug Safety study on the long-term safety of Covaxin was retracted following evidence of data inconsistency and misrepresentation [15].

This pattern aligns with broader findings indicating that fake peer review, data fraud, and plagiarism are among the most frequent causes of retractions in Indian academia [18]. Such practices exemplify the "obsession with novelty over accuracy," driven by the pervasive publish-or-perish culture [19,20]. The willingness to distort data for recognition reflects a deep-seated systemic failure rather than isolated individual misconduct [21].

2.4 The Need to Balance Intuition with Empirical Discipline

Scientific progress thrives when intuition, the creative basis of hypothesis formation, is tempered by empirical discipline through careful experimentation and validation [2]. The bedrock of scientific integrity depends on sustained commitment to shared values such as honesty, accuracy, efficiency, and objectivity [22].

When this delicate balance is lost, belief-based thinking supplants reality-based inquiry, allowing cultural, ideological, or institutional biases to infiltrate scientific reasoning [23]. Therefore, cultivating a culture of critical self-reflection and methodological rigor is indispensable for maintaining the credibility and transformative potential of science.

3. Influence of Funding, Politics, and Administrative Agendas

3.1 Corporate Influence and Commercial Priorities

The allocation of research funds often dictates the direction of inquiry, creating a structure in which commercial viability frequently outweighs fundamental or curiosity-driven investigation [24]. Political prioritization of funding leans heavily toward applied, short-term, or high-visibility outcomes; for instance, the defence research budget far exceeds that of the Ministry of Science & Technology [13].

Although modern corporate governance emphasizes ethical conduct and transparency through frameworks such as ESG and CSR, institutional culture often favours researchers who can secure grants by aligning proposals with national or commercial agendas [25]. This dynamic implicitly pressures scientists to pursue "quick wins" and applied solutions, diverting intellectual resources from high-risk, foundational research that drives long-term innovation [10].

3.2 Political and Institutional Bias

Political interests often threaten scientific objectivity by reinforcing existing biases within institutions. Policymakers tend to interpret evidence in ways that support their pre-existing beliefs or agendas [8]. This leads to flawed or selective decision-making, where independent research on environmental hazards or pollution control is ignored in order to protect political or economic priorities [4].

Moreover, reports document restrictive policies, censorship, and political interference in universities, forcing scholars to self-censor or tailor conclusions to nationalistic sentiment, undermining the independence and skepticism essential to the scientific process [26]. Such interference erodes academic freedom, limiting the ability of scientists to challenge dominant narratives and engage in open, critical discourse [27].

3.3 The Role of Bureaucratic Hierarchies

Indian academia remains constrained by an administrative system rooted in a colonial legacy of centralized control, marked by risk aversion and a "procedure purity over substantive correctness" ethos [28]. This bureaucratic inertia generates contradictory regulations that stifle autonomy and slow innovation.

Administrative inefficiency extends into academic-integrity implementation. Seven years after the UGC 2018 anti-plagiarism regulation, progress remained minimal due to limited awareness and the absence of fully functional Academic Integrity Panels [29]. Such procedural congestion acts as a non-intellectual barrier, consuming researcher energy in compliance rather than fostering creative, independent scholarship.

3.4 Ethical Concerns

The governance systems that manage Indian research, including grants, peer review, and promotions, often reward conformity instead of curiosity. This structure builds ethical problems into the very design of research institutions.

1. **Skewed Grant Allocation.** Government funding is disproportionately concentrated among elite institutions such as IITs, IISc, and AIIMS, while smaller universities, private colleges, and regional centres receive minimal support [24]. This imbalance limits equitable participation in national research agendas.
2. **Perverse Promotion Metrics.** Academic advancement is tethered to publication counts rather than quality, sustaining the "publish or perish" culture that prioritizes volume over rigor [16], [19]. This metric-driven system discourages long-term, high-impact exploration.
3. **Systemic Peer Review Failure.** Under pressure to meet quantitative targets, many researchers resort to unethical shortcuts; fake peer review has been identified as a leading cause of paper retractions in India [18]. The persistence of such practices reflects deep-rooted flaws in oversight, mentorship, and institutional accountability.

4. Human Error, Oversight, and the Culture of Mediocrity

4.1 Cognitive Limitations and Methodological Flaws

Research integrity depends on core values such as honesty, accuracy, and objectivity [22]. However, many Indian researchers lack adequate training in methodology and statistics, blurring the line between honest mistakes and misconduct. For instance, studies show widespread misunderstanding of basic statistical concepts like P-values [17], while outright data falsification continues to violate fundamental research standards [21]. These shortcomings enable a culture where pseudo-science can flourish under the appearance of productivity [3].

4.2 Peer Review Failures

The peer-review system, meant to safeguard research quality [30], has severely deteriorated in India. Under pressure to publish quickly, reviewers often lack the time or expertise to properly evaluate manuscripts [18]. This breakdown is quantifiable: fake peer review alone causes approximately 33% of Indian paper retractions [18], demonstrating a systemic collapse in quality control and accountability.

4.3 The Herd Mentality in Academia

Indian academia's hierarchical structure encourages conformity and discourages dissent. The "publish or perish" environment [20] particularly affects early-career researchers on short-term contracts [31], who depend on supervisors for career advancement. This power dynamic

discourages junior researchers from challenging authority or reporting misconduct [32], ultimately stifling innovation and promoting ethical compromises.

4.4 Administrative Neglect

Administrative systems often maintain mediocrity because of slow and rigid bureaucracy. Although institutions are meant to uphold research integrity [22], in practice this rarely happens. A clear example is the weak enforcement of the UGC's 2018 anti-plagiarism rules [29]. This outdated, colonial-style approach values procedure more than purpose [28], forcing researchers to focus on paperwork and compliance instead of meaningful scientific progress.

5. Reproducibility and Reliability Crisis

5.1 The Replication Crisis

The core of scientific integrity, which is reproducibility, is becoming weaker in Indian research. The strong pressure to produce new and high-impact papers discourages researchers from doing important replication studies [4]. This pressure also contributes to data fabrication, which accounts for about 17.2% of all research retractions [18]. When other researchers cannot confirm the results of a study, it undermines trust in the entire scientific system [3,21].

5.2 Publication Bias

The system disproportionately rewards "positive" results, creating a bias against null or confirmatory findings [16]. Early-career researchers, seeking quick publications for career advancement, are driven toward trendy topics rather than meaningful, innovative work [32]. This bias creates a misleading impression of progress while hiding methodological flaws [20], ultimately devaluing careful, rigorous research [18].

5.3 Institutional Inertia

Institutional responses to misconduct are often slow and ineffective. Retracted papers frequently continue to be cited, spreading misinformation [15]. Administrative rigidity prevents meaningful reform [28]. Experts emphasize that transparency through data-sharing, open methodologies, and open peer review is crucial for accountability [18,24]. Without these measures, the reproducibility crisis will continue to worsen.

5.4 The Role of Journals and Regulatory Bodies

The quality control system in Indian research is deeply weakened. Fake peer reviews are the main reason for paper retractions in the country [18]. At the same time, the rise of predatory journals, which are widespread in India, allows poor-quality research to get published easily [20]. To rebuild global trust in Indian science, regulatory bodies such as the DST and UGC need to enforce ethical standards more strictly [33,13] and ensure greater transparency in research governance.

6. Ethical and Societal Implications

6.1 Consequences of Flawed Findings

Compromised research creates real-world dangers. When flawed studies are accepted as fact [15], they pollute the scientific record [21] and continue to spread misinformation even after retraction [18]. The consequences are particularly severe in fields like medicine and engineering, where false findings can directly endanger lives [20]. When policymakers use distorted research, it leads to poor decisions that may prioritize economic growth over critical environmental or public health concerns [8], highlighting the urgent need for integrity safeguards.

6.2 Erosion of Credibility

Frequent misconduct has severely damaged the global reputation of Indian science [18]. The country has one of the world's highest rates of publication misconduct [3], undermining its standing and reducing opportunities for international collaboration and funding [10]. The rise of predatory journals further discolours this reputation, stigmatizing researchers and casting doubt on India's status as an emerging knowledge power [12,20].

6.3 Moral Responsibility of Researchers and Institutions

Rebuilding trust requires a fundamental ethical shift. Integrity must become a non-negotiable standard [22], with researchers and their mentors taking full responsibility for the accuracy of their work [34]. Beyond individual accountability, institutions must create environments that reward ethical behavior rather than just numerical output [24].

6.4 The Role of Scientific Administrators

Addressing this crisis requires strong administrative leadership. A proposed multi-level approach includes establishing an independent National Research Oversight Body and implementing a National Research Integrity Bill to ensure consistent auditing, mandatory

ethics training, and strict consequences for misconduct [35]. Such systemic reforms are crucial for restoring global confidence in Indian research.

7. Reform and Renewal

7.1 Training in Research Ethics, Statistics, and Critical Reasoning

The foundation for meaningful reform begins with education. Implementing mandatory courses in research methodology, ethics, and scientific reasoning from undergraduate levels would embed ethical awareness early in academic careers [3]. These programs must emphasize critical thinking and skepticism, as these skills are fundamental to proper scientific practice [4]. Continuous professional development through workshops and institutional integrity programs is equally crucial for maintaining high standards of data literacy and ethical decision-making across all disciplines [22].

7.2 Establishing Independent Oversight Bodies

Systemic integrity requires robust, independent oversight mechanisms. The establishment of a National Research Oversight Body (NROB) would represent a significant step toward ensuring consistent enforcement of ethical standards [35]. This independent body could implement the proposed National Research Integrity Bill, conduct comprehensive research audits and impose appropriate penalties for academic misconduct [35]. Strengthening institutional review systems through independent misconduct committees would further enhance accountability and prevent conflicts of interest [18].

7.3 Promoting Open Science and Transparency

Transitioning toward open science practices is essential for rebuilding trust in research. Mandatory data sharing, methodology disclosure, and pre-registration of experiments would ensure greater accountability and enable proper validation of findings [35]. The adoption of open peer review processes would address the systemic issues that currently enable data manipulation and fake reviews [18]. Such transparency measures are fundamental to restoring scientific credibility [3].

7.4 Incentivizing Collaboration Over Competition

Reforming the current hyper-competitive academic model is crucial for sustainable progress [16,19]. Institutions should shift their focus from quantity to quality by rewarding collaborative efforts, methodological rigor, and long-term societal impact. By redefining success metrics, the research community can encourage work that is methodologically sound

and ethically grounded, moving away from the current emphasis on publication numbers [18].

7.5 Encouraging Leadership Accountability

Leadership commitment is essential for institutional renewal. Senior researchers and administrators must take responsibility for creating environments that prioritize integrity [22, 34]. Regulatory bodies such as the DST and UGC should implement consistent quality assessments and mandatory ethics training to foster a culture of mentorship and excellence [13]. Through such leadership-driven initiatives, India can build a resilient research ecosystem based on responsibility and ethical practice.

8. The Paradox of Productivity

8.1 The Quantitative Leap vs. The Qualitative Chasm

India's research landscape presents a striking paradox: while publication numbers have skyrocketed to 370,595 faculty publications in 2024 [9], this quantitative success hasn't translated into quality. The country ranks only 28th in research quality globally, with a low Category Normalized Citation Impact (CNCI) of 0.879 [14]. This quality deficit stems primarily from chronic underinvestment in R&D, which has remained stagnant at 0.67% of GDP - significantly lower than leading research nations like Israel (6.3%) and South Korea (4.9%) [10,11]. The evidence clearly shows that India's focus on quantity without corresponding quality investment has created a widening gap between output and impact.

8.2 Inequitable Funding Distribution and Institutional Bias

The funding crisis extends beyond overall underinvestment to severe distribution inequalities. Government research support concentrates overwhelmingly in elite institutions like IITs and IISc [24], while smaller universities and regional centres receive minimal assistance. This creates a two-tiered system that perpetuates colonial-era hierarchies [28] and stifles innovation diversity across the country [29]. The result is an academic ecosystem where a privileged few have adequate resources while the majority struggle with basic research infrastructure, ultimately limiting India's overall scientific potential.

8.3 The Applied Research and Policy Myopia

India's research priorities reflect a concerning short-term focus, with political and budgetary preferences favoring immediate applications over fundamental exploration [13]. This policy shortsightedness is evident in the budgetary allocation disparity: the Defence Research and

Development Organisation received ₹23,264 crore compared to only ₹16,361 crore for the Ministry of Science & Technology [13]. By prioritizing politically palatable projects with visible outcomes over curiosity-driven research, India risks undermining the scientific objectivity and independence essential for sustainable advancement [26].

9. Systemic Deterioration

9.1 The "Publish or Perish" Leviathan

The "publish or perish" culture has become the primary driver of ethical decline in Indian academia. The mandatory requirement for indexed journal publications for career advancement [16] has created a system that prioritizes quantity over quality [19]. This institutional pressure has significant psychological consequences, generating chronic anxiety among researchers and compromising their ethical decision-making [16]. The system effectively incentivizes shortcuts, pushing scholars toward quantity-driven practices [20] and forcing them to sacrifice research integrity for professional survival [18].

9.2 The Retraction Crisis

The dramatic increase in research output has been paralleled by a concerning rise in retractions. Between 2001-2010 and 2011-2020, retractions by Indian authors grew by 32%, primarily due to fake peer review, data fraud, and plagiarism [18]. The data reveals a disturbing pattern: fake peer review alone causes approximately 33% of retractions, while data falsification accounts for 17.2% and plagiarism 14.8% [18,36]. Perhaps most alarmingly, retracted papers continue to be cited extensively, with an average of 42.1 citations per paper [15], perpetuating misinformation and further eroding global trust in Indian research.

Table 1: Analysis of Research Misconduct Leading to Retractions in India (Key Trends)

Type of Misconduct	Prevalence (Example Study)	Growth Trend (Average Multiplier)
Fake Peer Review	Leading cause (≈33% of retractions)	High fluctuating growth (5.5×)
Data Fraud/Falsification	Significant share (≈17.2%)	Increasing
Plagiarism	Significant share (≈14.8%)	Steady average growth (1.2×)

Source: 360info, 2024; arXiv, 2025

Table 1 demonstrates a systemic breakdown in research oversight, revealing that misconduct is not an aberration but a direct by-product of institutionalized publication pressure [21]. The data confirms that fake peer review is the most prevalent form of misconduct, showing explosive growth and highlighting a critical failure in the quality control system. The significant rates of data fraud and persistent plagiarism further illustrate how the "publish or perish" environment structurally incentivizes ethical breaches rather than rigorous scholarship.

9.3 The Proliferation of Predatory Academia

The "publish or perish" culture has spawned a damaging counterpart: the rapid growth of predatory journals. These exploitative publications profit from researchers' desperation to meet institutional publication targets [20]. India has become a major global hub for such outlets, providing an easy pathway for publishing substandard or fraudulent research [18].

This trend is directly fueled by an academic system that prioritizes publication quantity over scientific quality [20]. The resulting high-volume, low-integrity publication culture has severely damaged trust in Indian research, both domestically and internationally [14], further diminishing the global credibility of the country's scientific enterprise.

10. The Human Cost and Administrative Pathology

10.1 The Bureaucratic Quagmire

India's scientific progress is significantly hampered by an administrative system characterized by colonial-era, centralized decision-making [28]. This bureaucratic environment prioritizes procedural compliance over substantive quality, creating complex regulations that stifle scientific autonomy and innovation [28]. Reform efforts are consistently undermined by systemic inertia, as evidenced by the poor implementation of the UGC 2018 anti-plagiarism regulation, which has failed to establish functional Academic Integrity Panels and suffers from widespread awareness gaps [29]. This combination of rigid bureaucracy and weak enforcement perpetuates inefficiency and obstructs meaningful reform.

10.2 Crippling Delays in Financial Support

The administrative failure is most acutely felt in the chronic delays of financial support for researchers. Early Career Researchers (ECRs) frequently experience stipend delays of eight to thirteen months, creating severe economic hardship [33]. These delays transform research from an intellectual pursuit into a struggle for financial survival, causing mental distress and career regret among scholars [33]. Such financial instability not only hinders research

progress but also reduces India's global scientific competitiveness, demonstrating how bureaucratic inefficiency creates real human and professional costs [25].

10.3 Ethical Dilemmas of ECRs and Hierarchical Pressure

The hierarchical structure of Indian academia places intense pressure on early-career researchers, particularly those in temporary positions [31]. These scholars face a critical ethical choice between pursuing innovative, long-term research and focusing on trendy topics that guarantee quick publications [32]. This power dynamic creates intellectual dependency, making ECRs vulnerable to authorship abuse and ethical compromises as survival mechanisms [20]. The lack of institutional safeguards, accountable mentorship, and job security forces many young researchers to prioritize conformity over ethical standards.

11. Corrupting Epistemology

11.1 Political Influence and the Erosion of Objectivity

Scientific objectivity in India faces serious challenges from political and ideological pressures. Policymakers often interpret evidence to support existing government narratives, showing strong confirmation bias. This problem is worsened by declining academic freedom, where restrictive policies and political interference lead researchers to self-censor. When open questioning and skepticism, which are essential to science, are discouraged or punished, the integrity of the scientific process is jeopardized.

11.2 The Pseudoscience Encroachment

The distinction between empirical science and cultural belief has become increasingly blurred, allowing pseudoscientific concepts to enter academic discourse. This trend sometimes manifests through claims rooted in cultural pride, including the promotion of products like cow urine and manure for applications without empirical validation [27]. Even scientific techniques are sometimes co-opted for demonstrating "miracles," fundamentally undermining the spirit of scientific inquiry [37]. As experts emphasize, only "reality-based thinking as opposed to belief-based thinking must carry weight" [23] in genuine scientific endeavour.

12. CONCLUSION

The fundamental challenge confronting Indian science is not intellectual capability but a severe crisis in governance and ethical practice. While the scientific method provides rigorous principles for inquiry [1,2], human biases within a dysfunctional system undermine its proper application [8,17]. Evidence confirms that widespread research misconduct stems

from systemic failures, administrative breakdowns, and policies that actively discourage ethical conduct [3,15,19].

Restoring scientific integrity requires comprehensive cultural and structural transformation. This ongoing effort demands collaboration across all sectors of the research community [24,34]. Immediate reforms must include overhauling research evaluation systems, strengthen oversight mechanisms, and shift decisively toward quality-focused assessments [14,25]. Systematic self-correction is essential for rebuilding public trust and ensuring science serves societal welfare [16,26].

Authentic scientific advancement cannot be achieved through mere numerical targets or infrastructure expansion. It must be grounded in cultural commitment to epistemic humility and ethical rigor [3,23]. The ultimate challenge involves ethical governance that promotes reality-based thinking [4,37] and maintains the highest professional standards [3,24]. By cultivating researchers dedicated to truth and accountability, India can realize its potential for credible, high-impact science [12,28].

Table 2: Comparative Investment and Quality Metrics in Scientific Research.

Metric/Country	India	Global Leaders	Source
Gross Expenditure on R&D (GERD) as % of GDP	~0.7% (stagnant for a decade)	Israel (6.3%), South Korea (4.9%), U.S. (3.46%)	The Economic Times, 2025; Kinesis Magazine, 2025
Global Rank in Research Quality	28th	–	IBEF, 2025
Quality Metric (CNCI Score)	0.879 (Low impact)	–	PLOS One, 2025
Global Publication Rank (Volume)	3rd	China (1st), U.S. (2nd)	IBEF, 2025
Publications in Indexed Journals (2024)	370,595 faculty publications	–	360info, 2025

Table 2. illustrates the "productivity paradox" in Indian science [14]. Despite being 3rd globally in publication volume [10], India's research quality ranks 28th with a low Category Normalized Citation Impact (CNCI) of 0.879 [3]. This disparity between quantity and impact is fundamentally linked to chronic underinvestment, with a Gross Expenditure on R&D (GERD) stagnant at ~0.7% of GDP—dwarfed by Israel (6.3%) and South Korea (4.9%) [11,13]. The pressure to produce a high volume of publications, like the 370,595 faculty

outputs in 2024 [9], without commensurate funding for quality, creates a system that incentivizes quantity over rigorous, high-impact research.

Table 3: Distribution of Retracted Publications by Institutional Type.

Institution Type	Contribution to Retractions	Source
Private Institutions/Universities	60%	360info, 2025; Indian Inst. Sci. Acad., 2025
Public Institutions/Universities	33.7%	360info, 2025
Medical Institutions	6.7%	Postgrad. Med. J., 2025

This data reveals a critical concentration of research misconduct within India's academic ecosystem. Private universities and institutions are disproportionately responsible for a striking 60% of all retracted publications, far outpacing public institutions (33.7%) and medical colleges (6.7%) [18,21].

This uneven pattern shows that the "publish or perish" culture, fueled by the drive for accreditation and rankings, creates intense pressure in the private sector. This pressure can lead to misconduct, including fake peer reviews and data fraud, which are major reasons for retractions. The data highlights that the integrity crisis is not uniform but concentrated, emphasizing the need for targeted ethical reforms and stricter oversight in private institutions.

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