



SYSTEMIC FAILURES IN MEDICAL EDUCATION GOVERNANCE: THE 2024 MDCAT SCANDAL IN KARACHI, PAKISTAN

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ABSTRACT

The study critically evaluates the systemic institutional failures in medical education governance in Pakistan in the context of the 2024 Medical and Dental College Admission Test (MDCAT) scandal that took place in Karachi, Pakistan. As a qualitative case study, evidence from forensic materials, case law, media reports, and stakeholder interviews was triangulated to reveal significant failures in the exam's institutional integrity, due diligence, and compliance. It was evident that the exam paper had been leaked and impersonated by central institutions, including IBA, NED University, and DUHS. The paper discusses the broader implications of these failures on trust, meritocracy, and healthcare quality and offers evidence-based recommendations for institutional and regulatory reform.

1. INTRODUCTION

Medical education in Pakistan is the entrance point for a professional career and is the backbone of the national healthcare delivery system. Unfortunately, the 2024 MDCAT

scandal in Karachi revealed inefficiencies associated with governance at the structural and systemic levels, across the academic, regulatory, and legal levels. The allegations of mass impersonation, access to leaked

examination papers, and complicity from university staff all raised serious questions regarding the credibility of, and viability of, the merit-based admission process. This paper contextualizes the MDCAT crisis within the broader scenario of educational misgovernance and regulatory inertia in Pakistan.

2. Background of the Study

The MDCAT provides the central gatekeeping mechanism for medical and dental colleges in Pakistan. In 2024, a series of irregularities in the administration of this exam created a crisis of legitimacy. The institutions at the heart of the controversy, including IBA, DUHS, and NED University, were later confirmed by law enforcement and cybercrime to be involved in substantial misconduct (Quetta Voice, 2024; Shah & Abbas, 2025). These developments indicate that the issue is larger than individual misconduct and signify institutional malpractices and decay, as well as a regulatory collapse.

3. Significance of the Research

This research is significant in three principal ways:

- (1) It attempts to fill a major evidence gap in respect to empirical governance analysis in Pakistani medical education,
- (2) it offers a model for vulnerability assessment in high-stakes testing, and,
- (3) It considers implications for public confidence, the responsibility of institutions, and the way health care is organized and delivered.

4. Scope of the Research

This study investigates the MDCAT 2024 examination in Karachi. The scope entails institutional responses from IBA, DUHS, and NED University, regulatory responses from PMDC, and responses from the political, academic, and student communities.

5. Rationale of the Research

Existing literature has acknowledged broad corruption in medical education, but it lacks

case-based, granular evidence on operational breakdowns. This study seeks to address that gap and contribute to policy discussions by analyzing real-time failures through verified primary and secondary sources.

6. Conceptualization of the Study

The research conceptualizes the MDCAT scandal as a multi-dimensional governance failure, combining administrative mismanagement, regulatory capture, and ethical erosion. Institutions that were expected to uphold meritocracy were either complicit or grossly negligent.

7. Research Objective

To evaluate the governance and regulatory breakdowns that enabled the MDCAT 2024 scandal.

To analyze the roles of key institutions in facilitating or failing to prevent malpractice.

To offer evidence-based recommendations for policy and procedural reforms.

8. Theoretical Framework

Institutional Theory and Principal-Agent Theory frame this study. Institutional Theory explains how entrenched norms and behaviors undermine formal regulatory mechanisms. Principal-Agent Theory illustrates how asymmetric information and misaligned incentives between regulatory bodies and educational institutions lead to systemic failures.

9. Figure 1 represents the Conceptual Framework:

The Conceptual Framework

Domain	Key Issues	Implications
Administrative	Identity fraud, exam logistics	Enables impersonation, confusion
Regulatory	PMDC inaction, lack of oversight	Permits malpractice to flourish
Technological	Digital leaks, unsecured platforms	Facilitates pre-exam paper sharing
Ethical	Staff complicity, bribery	Violates integrity, erodes trust

Explanations:

Domain	Role in the Scandal
Administrative	Weak logistics and poor identity verification enabled impersonators to bypass protocols during the exam process.
Regulatory	PMDC's lack of oversight and fragmented policies allowed malpractices to remain unchecked across institutions.
Technological	Unsecured digital platforms facilitated the leaking and sharing of exam content before the official test.
Ethical	Staff complicity, bribery, and lack of internal accountability undermined integrity and damaged public trust.

10. The Review of the Literature

Governance challenges associated with medical education in Pakistan are entrenched and complex. Waheed Khan, Sethi, and Wajid (2020) suggest that commercial interests have often trumped ethical concerns, resulting in the commodification of education and a loss of academic integrity. The situation has been compounded by regulatory-political alliances that favor organizational expediency and prioritize expedient processes rather than consultation with stakeholders and sound educational practice (Waheed Khan et al., 2020).

The unchecked growth of private medical colleges adds another layer of complexity. Institutes are now estimated to extract up to Rs. 80 billion annually from tuition fees, with little supervision and minimal oversight. Some critics argue that the expansion of educational institutes encourages profit-centered admissions, thereby undermining quality standards (Pakistan Today, 2025; Umair, 2023). The Express Tribune (2016)

previously revealed how those licenses were obtained through bribery, which affirmed that regulatory loopholes enable exploitative practices.

Political interference and professional guilds have also allowed blatant regulatory capture to flourish within this sector. As Sethi and Wajid (2022) describe, the sector has become so opaque that academics are further sidelined, and self-serving interests of individual actors abound. Political interests may be crucial for developing broad policy reform, such as reforming education as part of a system where limited resources can encourage rent-seeking behavior (Hanif, 2012), but not at the expense of the quality and integrity of the education.

The MDCAT was designed as a fair and meritocratic screening tool, but has become synonymous with malpractice. Multiple leaks, impersonations, and technical glitches have undermined its legitimacy (Shah & Abbas, 2025; Dawn, 2021). These failures are not unique to Pakistan; international studies warn that decentralized and commercially driven systems often face such vulnerabilities (OECD, 2023; Soemantri et al., 2020).

Inconsistencies in test content and format, as well as allegations of out-of-syllabus materials, further diminish trust. Though digitalization was intended to modernize testing, unequal access to technology and technical failures have heightened inequities associated with students from rural or lower-income and socioeconomic status (Hanif & Siddiqui, 2011; Ezeala et al., 2020).

Moreover, disparities in educational opportunity are compounded by access to preparatory resources. Urban and affluent students benefit from better coaching and insider networks, while less privileged candidates face systemic disadvantages—compounded by paper leaks that reward the well-connected (Latif, 2025).

Efforts toward quality assurance through accreditation and faculty development have been sporadic. Departments of Medical

Education often lack defined roles, trained personnel, and institutional support (Ali et al., 2012; Tahir & Amir, 2021). While private colleges show isolated innovations, national consistency remains elusive (The News on Sunday, 2018).

Despite these setbacks, some argue that the introduction of a unified MDCAT and emerging accreditation policies indicate incremental progress (Sethi & Wajid, 2022). International evidence affirms the potential of centralized exams—if implemented transparently—to raise standards (Soemantri et al., 2020). However, the continued operational failures of MDCAT point to reforms that are either superficial or poorly contextualized (Shah & Abbas, 2025). This section surveys the existing body of research and investigative journalism on standardized exams in Pakistan and systemic vulnerabilities in regulatory oversight. While most studies focus on student performance metrics, few delve into the exam security infrastructure or institutional governance failures.

The main themes are

- Exam Integrity in Developing Economies: Previous studies by Khan et al. (2021) show that the limited digital infrastructure and a lack of invigilation are all exploited for high-stakes tests.
- Regulatory Issues: Research on PMDC and similar agencies has documented variable standards and a lack of central oversight and complaint procedures (Ahmed, 2022; Malik, 2023).
- Comparative observations: Examination of regional comparisons, such as India's NEET system, reveals the use of biometric authentication and radical proctoring technology, with potential pathways to replicate and improve MDCAT reforms.

11. Problem Statement

There is a lack of empirical research that documents operational breakdowns in medical

entrance testing in Pakistan. Existing studies focus on general corruption or educational decline but do not analyze specific mechanisms, actors, or consequences. This study fills that gap by dissecting the MDCAT 2024 scandal in Karachi using firsthand interviews, forensic data, and court rulings.

12. Research Methodology

This study is a qualitative case study design. It seeks to develop a rich contextualized understanding of systemic governance failures uncovered by the 2024 MDCAT (Medical and Dental College Admission Test) scandal in Karachi. The case study method suits the study of complex phenomena in a real-world context. It highlights the interplay among institutional frameworks, stakeholder values, and procedural irregularities.

Site Selection:

The study focuses on three major institutions centrally implicated in the MDCAT administration and scandals—the Institute of Business Administration (IBA), Dow University of Health Sciences (DUHS), and NED University. These institutions were selected based on their roles as exam administrators, their geographic and symbolic importance in Karachi's medical education landscape, and their direct involvement in the controversies as documented through court inquiries and media investigations (Sindh High Court [SHC], 2024; Express Tribune, 2025).

Data Collection:

An extensive data triangulation process, at both stages to improve the study's value and mitigate bias, employed multiple sources of data collection. Primary data consisted of semi-structured interviews of purposive sampling of the stakeholder community in this context. The stakeholder community examples included MDCAT students, university administrators, legal specialists familiar with the proceedings, and the educational regulatory community. Secondary data consisted of forensic reports from the

Federal Investigation Agency (FIA) Cyber Crime unit that presented evidence of the detailed cyber audit tracing the MDCAT paper leak; official court judgment and/or orders by the Sindh High Court; and media reports on the investigatory process on the administrative implications for MDCAT operational failures, as well as the public's response (Quetta Voice, 2024; Dawn, 2024; 24 News HD, 2024).

Critical Analysis:

Thematic coding was used to analyse the wealth of qualitative data. The interview transcripts and documentary evidence were hardly analysed to identify recurrent patterns with respect to central themes, especially proof of the exam papers leaks, impersonation incidents, institutional collusion/oversight failures, regulatory non-compliance, failures to be meaningful and purposeful actions to desperately resist cheating in credentialing relationships to public trust with degrees and diplomas. These analytical materials are presented throughout the various appendices for reasons of transparency and to help contextualize the research and findings. Triangulation of data types, interviews, forensic evidence, news/mass media records, and trial documentation served as a tool for cross-research validation checks to reinforce some analytic validity to explore all the dimensions of this 'scandal'.

Discussion on the main themes

1. Institutional Decay and Governance Challenges

- The MDCAT scandal exemplifies severe institutional decay within Pakistan's medical education governance. The signs of decay include fragmented administrative oversight, internal staff complicity, and a failure to uphold meritocratic principles in student admissions.
- The investigative findings demonstrate the collusion of university officials and invigilators to carry out fraud through

impersonation and exam paper leaks (FIA forensic reports, SHC decisions).

- The Pakistan Medical and Dental Council (PMDC, now Pakistan Medical Commission - PMC) has engaged in regulatory lethargy, without any enforcement mechanisms, with integrity or responding quickly to breaches. Some regulatory bodies have argued that they have made strides in efforts to move towards collective weaknesses, as demonstrated by the implementation of a common MDCAT and accreditation. The current state of regulation has reflected advancements in governance efforts (PMC Accreditation Standards, 2022). Despite the above, frequent scandals suggest that the governance efforts in Pakistan are incomplete and inadequately implemented.

- In relation to the benchmark of international best practice as adopted by the World Federation for Medical Education (WFME) for medical schools, the regulatory system of governance in Pakistan is mainly focused on infrastructure and headcounts, rather than learning outcomes, systemic risk assessment, or ethical oversight (WFME, 2017; PMC Accreditation Standards, 2022).

- In contrast, OECD countries engage in fair, centralized, and transparent medical school admissions systems to reflect their integrity. For instance, having unique identity verification protocols, computerized exam papers, and third-party oversight inhibits and reduces the opportunity to commit fraud (OECD, 2023). Pakistan's fragmented administration contrasts sharply with these models.

2. Regulatory Inertia and Responsiveness

The PMC/PMDC's failure to act decisively following repeated breaches of the MDCAT signifies regulatory inertia and, in turn, systemic weaknesses.

The Sindh High Court criticized PMC for weak enforcement and slow reforms post-leak discovery, necessitating judicial intervention to mandate exam retakes (SHC, 2024).

- Regulatory focus remains on promulgating frameworks rather than ensuring their real-world effectiveness and continuous monitoring (Waheed Khan et al., 2020).
- Defenders cite resource constraints and the regulatory body's recent institutional establishment as mitigating factors, claiming a transition period toward improved governance (PMC, 2023 Postgraduate Regulations). Critics contend that persistent scandals reflect deeper governance culture problems beyond nascent institutional capacity.
- Nationally, other countries like India have recently reformed their medical education regulation by creating the National Medical Commission with stronger statutory powers and transparent standards for admission and accreditation. This represents a regional benchmark highlighting Pakistan's lag (Research on NMC, 2021).
- Globally, recognized standards combine legal authority, stakeholder engagement, regular auditing, and public accountability, features where Pakistan's PMC shows regular and consistent gaps (E.g., ECFMG adherence to WFME standards).

3. Ethical Compromise and Commercialization of Medical Education

Ethical compromise, propelled by commercialization and politicization in medical education, permeates admission processes and institutional behavior.

- The explosive growth of the private sector has intensified pressure to maximize revenue through arbitrary fee hikes and dubious quotas on the number of admissions (Pakistan Today, 2025).
- Commercial interests generally take precedence over educational meritocracy and ethical obligation to create an environment that permits exam malpractice to thrive (Waheed Khan et al., 2020; Express Tribune, 2016).

Advocates of privatization contend that competitive possibilities improve quality and access to higher education. There is, however, a lack of adequate regulatory oversight to mitigate against those possibilities, demonstrated by the lack of procedural controls in the MDCAT scandal.

- Internationally, regulated privatization with transparent financing and admission oversight is standard, e.g., many OECD countries enforce caps, audits, and scholarship provisions (OECD, 2019; Soemantri et al., 2020).

Pakistan's PMC accreditation attempts to align standards with WFME guidance, but the enforcement gap allows unethical commercial practices to persist unchecked.

4. Exam Integrity and Admissions Gatekeeping

The integrity of high-stakes exams, such as MDCAT, underpins the quality of medical education and the erosion of public trust. Unfortunately, the 2024 scandal reveals systemic governance vulnerabilities by allowing systemic paper leaks, impersonation, and process manipulation without accountability of a governing authority.

Forensic analyses confirm paper leaks occurred well before exam administration, with social media dissemination amplifying unfair advantage (FIA, 2024; Quetta Voice, 2024).

Impersonation cases, verified by law enforcement and video evidence, reveal weak identity verification processes and institutional collaboration in malpractice (24 News HD, 2024).

Efforts such as exam digitization and the establishment of standard formats for tests are underway to reach modernization objectives in the assessment. However, digital divides and technical failures will exacerbate inequalities and create more vulnerabilities (PMC, 2022 Accreditation Standards).

- Many countries are employing biometric identification, random seat allocation, secure printing, and encrypted digital assessments to ensure exams are vitally secure (Ezeala et al., 2020; OECD, 2023).
- Pakistan's current administration of examinations (decentralized exam centers and manual verification) does not meet these globally accepted standards.

13. Findings of the study

The findings of this study reveal a multilayered failure in the governance and administration of the MDCAT, which culminated in widespread malpractices and public disillusionment.

Confirmed Paper Leak Before Exam:

The FIA's extensive cyber forensic audit found conclusive digital evidence that the MDCAT test paper was leaked significantly before the scheduled examination time. The leak was traced to an unauthorized use of examination access materials almost 14 hours before the test commencement, creating extensive availability of examination content throughout social media platforms and messaging apps (Quetta Voice, 2024; SHC, 2024).

Impersonation During Tests:

Multiple reports and documented evidence, including first information reports (FIRs) filed with law enforcement and video surveillance footage analyzed by investigators, substantiated cases where individuals impersonated legitimate candidates at test centers, including at IBA and NED University locations (24 News HD, 2024).

Institutional Complicity:

Forensic investigations uncovered links indicating complicity of certain institutional staff or affiliates. Phone metadata analyses and financial transaction reviews revealed suspicious patterns consistent with staff facilitating unauthorized access to exam content and assisting impersonators (FIA Report cited in SHC, 2024).

Regulatory Failures by PMDC:

The Pakistan Medical and Dental Council (PMDC), responsible for regulatory oversight, was found to have failed in enforcing appropriate robust safeguards or coordination with the universities administering the MDCAT, nor had it taken necessary action on the pile of evidence amassed from stakeholders. Despite the overwhelming evidence that decrypting a secure MDCAT is feasible, the PMDC failed to update its security protocols, instead relying on an outdated SOP. The Sind(h) High Court decision attributed this regulatory inertia to being the key enabler of this fraud, specifically the inconsistencies and disconnects between policy prescriptions and operational implementation (SHC, 2024; IBA Karachi Press Release, 2024).

Erosion of Public Trust:

Interviews with students, parents, and educators revealed a profound erosion of public confidence not only in the MDCAT examination process but in the broader medical education system. The reported scandals heightened perceptions of systemic corruption that endangers the legitimacy of future medical practitioners. This also diminishes trust in healthcare quality (Stakeholder interviews, 2024; Dawn, 2024). Interviews with students and parents expressed disillusionment and skepticism about the value of merit, which led some to consider education opportunities abroad.

This study has clear implications:

Policymakers must prioritize regulatory reform, emphasizing outcomes, risk management, and transparent governance over infrastructure-centric metrics.

Ethical culture strengthening and commercial regulation in medical education must accompany technical upgrades like biometric exam monitoring.

- Cross-sector stakeholder collaboration is essential to rebuild trust, an imperative for healthcare quality assurance.

14. Case Study: Pre-MDCAT Systemic Manipulation in Sindh's Intermediate Examinations (2022–2024)

The 2024 MDCAT scandal cannot be fully understood in isolation. It was preceded—and arguably enabled—by a sustained breakdown in the integrity of Sindh's intermediate (FSc) examination system. From 2022 to 2024, evidence points to widespread result tampering, forgery, policy bias, and governance voids that created the structural conditions for the MDCAT crisis. This case study examines the pattern of exam malpractice and state complicity in Sindh's education boards, as well as its downstream impact on medical college admissions.

14.1 Evidence of Manipulation in Intermediate Exams

Tampering with Award Lists

In 2023, an inquiry committee scrutinized 601 pre-medical and pre-engineering cases and confirmed deliberate tampering of award lists. In many cases, marks were inflated by more than 10 points per subject, disproportionately benefiting candidates from select rural boards (The News, 2023).

Forgery and Document Irregularities

Evidence from 2023 answer sheets reveals that hundreds of scripts were missing QR codes, invigilator signatures, or even official stamps. Board officials admitted to leaving signature spaces blank, stating they could be "signed later" — effectively destroying the chain of custody and validation protocols (Pakistan Today, 2023; The Nation, 2023).

14.2 Policy Decisions That Skewed Equity Syllabus Reductions and Delayed Grading Reform

In 2024, the Sindh provincial government endorsed a 25% cut to the intermediate

students' syllabus, given the government's awareness that the affected rural boards had inadequate syllabus coverage. This decision was specifically directed to benefit selected boards within the province. However, Sindh also did not implement a nationwide CGPA-based grading system like Punjab and KPK, further widening the inter-provincial gap (Dialogue Pakistan, 2024; Express Tribune, 2024).

14.3 Impact on Medical Enrollments

This manipulation translated into statistically significant distortions in MDCAT merit lists. Urban students, who performed well in MDCAT but were marked lower in intermediate results, lost out on aggregate-based admissions. Over 50% of students from Sindh boards reportedly failed institutional entrance exams like NED's despite showing high scores in manipulated intermediate exams. Merit seats in medical colleges were filled by students whose academic records were later flagged by inquiry reports (Pak Observer, 2024).

14.4 Governance Breakdown

No Permanent Controllers: Sindh's educational boards operated under ad-hoc leadership with no accountability mechanisms in place.

Destroyed or Unavailable Records: There were instances of missing evidence or audit trails (2022-2023) for multiple answer sheets during investigations.

Outsourcing as Crisis Management: In 2023, the Sindh government adopted a policy of outsourcing the exam administration. This was a reactive policy lacking transparency and accountability (Pakistan Today, 2023).

14.5 Critical Link to MDCAT 2024

The manipulation of intermediate marks inflated the cumulative merit rankings of compromised candidates. Combined with the paper leaks and impersonations in MDCAT

2024, this created a dual pipeline of fraud—one at the board level and the other at the entrance exam level. Regulatory bodies like PMDC and Sindh's education ministry failed to reconcile this mismatch, allowing fraudulent candidates to game the system at both ends.

This case study reinforces the argument that the MDCAT scandal was not an isolated governance failure but the climax of a systemic erosion of meritocracy across Sindh's secondary and tertiary education sectors. When seen in tandem, the pre-MDCAT fraud and the MDCAT execution failures expose:

- A broken accountability chain from provincial boards to higher education regulators.
- State-enabled manipulation via skewed policy (syllabus reduction, no CGPA grading).
- An overwhelmed regulatory apparatus, unable to act on red flags flagged years earlier.

15. Limitations

- Limited to Karachi-based institutions; findings may not generalize nationwide.
- Access to PMDC internal records was restricted.
- Some stakeholders withheld detailed testimony due to fear of repercussions.

16. CONCLUSION

The MDCAT 2024 scandal not only demonstrates the immense difficulties in medical education in Pakistan. More critically, there is a distinct display of institutional decay in educational institutions with little accountability, transparency, and professional ethics. More than an isolated incident of exam fraud, it showcases blatant institutional decay in a context of fractured governance, complacent regulators, and ethical fragility. If anything, the collusion and operational failures by so many actors should be a warning of how vested interests and weak governance have conjoined to close any

viability for merit, and thus, closing off the potential of public health, and also dampening accompanying public trust.

Addressing these issues will require a comprehensive approach. We need technical interventions that include stringent digital security, guidelines for identity verification, and transparent examination processes to validate itself. These technical interventions will not be sufficient. We need an institutionally deep moral and ethical recommitment from both the federal agencies that regulate the health workforce, including medical education, and educational institutions. We need a recommitment to a culture that emphasizes professionalism, accountability, transparency, and professional ethics, as well as a commitment to prioritizing the public's interests over personal or commercial needs.

Only through sustained commitment to such systemic reforms can Pakistan begin to repose confidence in its overall medical education infrastructure. Ensuring an equitable and credible admissions process is not only a regulatory obligation but also foundational to producing competent and ethical healthcare professionals capable of addressing the public health needs of the nation more broadly.

17. Ethical Considerations:

Informed Consent: All the participants were aware of the detailed nature and the scope of the research. Written or verbal informed consent was acquired before data collection. This is congruent with the ethical principles that underpin the qualitative investigation.

Conflict of Interest Disclosure: The authors affirmed throughout the research that they have no financial or personal interests. The disclosure does not influence the study's design or the outcome of this inquiry.

Data Transparency and Integrity: The data disclosed in this research were transparent in their collection and analysis. To facilitate the credibility and the possibility of replication,

source documents, coding activities, and methodological procedures are made available in the appendices.

Funding Statement: The study completed was the result of independent scholarly work. No external funding source supports this research. The work alone shows the authors' academic curiosity and commitment to the field.

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Appendix 1: Qualitative Coding Matrix for MDCAT Governance Failure Study

Code Category	Theme/Concept	Source Type	Examples	Analytical Purpose	Explanation
Governance Failure	Weak institutional oversight	Interview, court judgments	"No standard SOP for biometric verification"	Identify systemic administrative gaps	Refers to structural flaws in how institutions like IBA, NED, and DUHS manage exam logistics, identity verification, and internal accountability. Lapses in SOPs and invigilation protocols allowed impersonators to operate with minimal risk.
Impersonation Tactics	Proxy candidates, fake IDs	Media reports, FIA documents	Arrests under Section 419, 420	Profile operational techniques used for exam fraud	Highlights the methods used to cheat the system. Includes the use of look-alikes, forged IDs, and

					coordination with corrupt staff. This theme explores the operational side of fraud during the MDCAT exams.
Digital Security Breach	Paper leaks via WhatsApp	FIA forensic report	Device tracking and metadata evidence	Understand technological vulnerabilities	Focuses on the technological vulnerabilities exploited to share exam content. Investigates how platforms like WhatsApp were used to circulate answers, and how forensic tools traced data exchanges back to administrators or syndicates.
Legal Accountability	Judicial criticism, remedial action	Court rulings, legal expert interviews	PMDC outsourcing failure highlighted by the court	Examine formal recognition of governance lapses	Captures how the Sindh High Court and other legal entities responded. Includes rulings, sanctions, and commentary on the PMDC's failure to safeguard exam integrity. Shows how legal frameworks interact with regulatory enforcement.
Public Trust Erosion	Sentiment of betrayal	Student interviews, news editorials	"We studied honestly but were mistreated."	Assess stakeholder impact and reputational fallout	Based on stakeholder interviews and media narratives. Explores emotional responses from students, parents, and faculty who feel deceived by the institutions and system they trusted. Key for understanding reputational impact.

Regulatory Gaps	Policy misalignment across provinces	PMDC documentation	No national question bank standard	Recommend structural reforms	Identifies inconsistencies between federal and provincial exam policies. For example, varying MDCAT syllabi and a lack of unified digital safeguards create loopholes for malpractice. Crucial for policy reform recommendations.
Triangulated Themes	Recurring cross-source patterns	All data types	Impersonation, leak culture, opacity	Validate core themes through multiple lenses	Synthesizes common threads across interviews, media reports, forensic data, and legal documents. Ensures multiple, independent sources support findings and strengthens the validity of your analysis.

Appendix 2: This table presents compiled data collection sources and analytic methods for the MDCAT scandal case study in the current academic contexts:

Component	Description	Purpose/Role	References
Data Collection			
Stakeholder Interviews	Semi-structured interviews with students, university officials, legal experts, and regulators involved in MDCAT administration.	Captures firsthand perceptions, experiences, and insights regarding exam administration, irregularities, and institutional behavior.	(Stakeholder interviews, 2024; Waheed Khan et al., 2020)
FIA Forensic Reports	Cyber forensic audit reports from the Federal Investigation Agency's Cyber Crime unit analyzing digital evidence of exam leaks.	Provides objective, technical evidence confirming the timing, methods, and scope of paper leak incidents.	(Federal Investigation Agency, 2024; Quetta Voice, 2024)

Court Judgments	Official rulings and orders from the Sindh High Court concerning MDCAT proceedings, exam retake orders, and regulatory directives.	Grounds the legal and regulatory framework, clarifies institutional accountability, and documents formal responses to scandal.	(Sindh High Court, 2024; IBA Karachi Press Release, 2024)
Media Investigations	Investigative journalism reports and news coverage documenting events, public reactions, and expert commentary on the MDCAT case.	Provides contemporaneous, accessible accounts and triangulates institutional claims and public sentiment.	(Express Tribune, 2025; Dawn, 2024; 24 News HD, 2024)
Analysis			
Thematic Coding	Systematic qualitative coding of interview transcripts and documents to extract recurrent themes such as exam fraud, institutional failure, and trust erosion.	Enables identification of key patterns, facilitators, and consequences of the scandals.	(Braun & Clarke, 2006; Stakeholder interviews, 2024)
Triangulation	Cross-validation of findings by comparing data across interviews, forensic reports, court documents, and media sources.	Increases reliability and depth of interpretation by integrating multiple data perspectives and types.	(Denzin, 1978; Quetta Voice, 2024; Sindh High Court, 2024)

Explanation:

(a) The **Data Collection** section outlines multiple complementary sources: direct human accounts from interviews provide depth and an insider perspective; forensic reports supply technical, evidence-based confirmation of leaks; legal judgments supply official fault and protocol evaluations; and media investigations offer contemporaneous societal impact and additional scrutiny.

(b) The **Data Analysis** section details rigorous qualitative methods: thematic coding to render complex qualitative data comprehensible and organized by emergent themes, and triangulation to ensure that interpretations are robust by cross-verifying them across independent data streams.