

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES

FROM GURUKUL TO COACHING CULTURE: TRANSFORMATION OF EDUCATIONAL ETHOS IN NORTH INDIA

Dr.Nilaya Kumar Mishra

PhD

ABSTRACT

The Indian subcontinent's educational tradition spans more than three millennia, from the residential gurukul system rooted in Vedic pedagogy to the colonial macaulayite school framework and, most recently, to the commercially driven coaching institute culture that now dominates competitive examination preparation across North India. This paper examines the structural, pedagogical, and ethical dimensions of this transformation, with particular focus on the emergence and consolidation of the coaching industry in cities such as Kota (Rajasthan), Allahabad, Patna, and Dehradun as dominant nodes of educational aspiration in the Hindi Belt. Drawing on historical analysis, ethnographic fieldwork conducted in four coaching hubs between 2019 and 2024, quantitative survey data from 620 students and 84 educators, and a critical review of policy literature, the study argues that the shift from gurukul to coaching culture represents not merely a change in pedagogical method but a fundamental transformation in the ethical conception of education itself — from a holistic formation of the person within a community of knowledge to a narrow, anxiety-driven optimisation of examination scores within a market-mediated system. The paper documents the psychological, social, and intellectual costs of this transformation, interrogates its structural determinants in competitive examination design and public employment scarcity, and proposes a post-coaching pedagogy framework that seeks to recover the relational and formative dimensions of the gurukul tradition within a contemporary institutional context.

Keywords: Gurukul, coaching culture, educational ethos, North India, Kota factory, competitive examinations, pedagogy transformation, Hindi Belt education, student mental health, educational commodification

I. INTRODUCTION

Education in the Indian tradition has never been merely instrumental. The earliest systematic account of Indian pedagogy, embedded in the Taittiriya Upanishad's Shikshavalli, frames the transfer of knowledge as a sacred covenant — a sustained, intimate relationship between guru and shishya conducted within a shared domestic and ecological space, oriented not toward employment or status acquisition but toward the progressive formation of a person capable of ethical action in the world. This conception of education as formation — as the shaping of character, judgment, and moral sensibility alongside intellectual capacity — runs through the diverse philosophical traditions of the subcontinent, from the Buddhist monastic university tradition of Nalanda and Takshashila to the Sufi scholarly networks of medieval North India, the madrasa curriculum of Awadh, and the Sanskrit tol institutions of Varanasi and Mithila [1].

Against this backdrop of formative educational traditions, the emergence of the coaching institute as the dominant educational institution of contemporary North India represents a rupture of remarkable depth and speed. In cities such as Kota in Rajasthan — which hosts an estimated 150,000 to 200,000 students annually enrolled in coaching institutes preparing for the Joint Entrance Examination (JEE) for the Indian Institutes of Technology and the National Eligibility cum Entrance Test (NEET) for medical colleges — education has been entirely reconstituted as a commodity: purchased, standardised, delivered in factory-scale classrooms, and evaluated exclusively through the production of rank-list positions [2]. The student in this system is not a shishya being formed; she is a consumer receiving a service and, simultaneously, a unit of production whose rank validates the commercial reputation of the institution that processed her.

The human costs of this transformation are increasingly well-documented in the psychological and sociological literature: anxiety disorders, depression, and suicidal ideation at rates significantly above national youth averages; family debt bondage incurred to finance coaching fees; the intellectual narrowing produced by years of single-minded examination preparation; and the social isolation of students displaced from home communities into the anonymous dormitory ecosystems of coaching cities [3]. Yet the structural analysis of how this system came to displace the richer educational traditions of North India, and of what precisely has been lost in educational-ethical terms, remains underdeveloped. This paper addresses that gap.

II. CONCEPTUAL FRAMEWORK: EDUCATIONAL ETHOS FROM GURUKUL TO COACHING

2.1 The Gurukul Model: Formation, Relationship, and Cosmos

The gurukul — literally the household (kul) of the teacher (guru) — was the foundational institution of brahminic education for approximately two thousand years, from its earliest Vedic articulations to its formal displacement by colonial educational policy in the nineteenth century. Its essential characteristics, as reconstructed from textual and inscriptional sources, included the residential co-habitation of students with the teacher's family; the integration of intellectual instruction with domestic labour, ritual practice, and moral formation; a curriculum structured around the progression of the student's capacities rather than a fixed syllabus timeline; and a pedagogical relationship of acknowledged personal asymmetry combined with profound mutual obligation [4].

This model was neither uncritically egalitarian — access was structured by caste, gender, and geography in ways that systematically excluded most of the population — nor uniformly excellent in the quality of knowledge transmitted. But it embedded educational practice within a thick ethical framework: the guru bore personal moral responsibility for the formation of the student, the student's progress was measured by the integrated development of knowledge, character, and social capacity, and the curriculum was oriented toward an explicitly articulated conception of human excellence (vidya) that went far beyond examination performance. Crucially, the gurukul operated outside the market: guru-dakshina (the student's gift to the teacher at the completion of study) was offered after learning was complete and was calibrated to the student's means, not to a pre-determined fee schedule [5].

2.2 Colonial Interruption and Post-Colonial Continuity

The Macaulay Minute of 1835 and the subsequent anglicisation of Indian higher education did not destroy the gurukul tradition immediately; indigenous pathshalas, madrasa networks, and Sanskrit tols continued to function into the twentieth century, and several reformist movements — including the Arya Samaj's Dayananda Anglo-Vedic schools and the Theosophical Society's educational institutions — attempted hybrid syntheses of gurukul formation and modern curriculum. But the bureaucratic-competitive architecture of colonial government created the examination as the decisive mechanism of status allocation, progressively subordinating educational practice to examination preparation as the route to government employment [6].

Post-independence India's decision to retain and dramatically expand the competitive examination architecture — IIT-JEE (1961), UPSC Civil Services, State Public Service Commissions, medical entrance examinations — while simultaneously failing to expand public employment and educational capacity proportionately, created the structural conditions for the coaching industry. When the supply of desirable government positions and elite professional training seats is radically insufficient to meet the aspirations of an expanding middle class, and when examination performance is the exclusive criterion for allocation, intense investment in examination preparation becomes entirely rational at the household level even when it is socially and educationally destructive in aggregate [7].

2.3 The Coaching Institute as Educational Institution

The coaching institute, as it has evolved in North India over the past four decades, is an institution whose entire organisational logic inverts the ethical priorities of the gurukul. Where the gurukul was residential and relational, the coaching institute is transactional and anonymous. Where the gurukul's curriculum was individualised to the student's development, the coaching institute delivers standardised content at industrial scale. Where the gurukul measured success by the formation of the whole person, the coaching institute measures success exclusively by examination rank. Where the gurukul was oriented by a philosophy of knowledge as human transformation, the coaching institute is oriented by a market logic of rank production as revenue generation [8].

This inversion is not merely descriptive; it has profound consequences for what students learn, how they understand knowledge, and what they become through the educational process. The gurukul's concept of vidya — knowledge as illumination, as the development of powers of understanding and ethical judgment — is replaced in the coaching system by jankari (information), specifically the bounded set of facts, formulae, and problem-solving routines necessary to score above a cutoff on a specific examination. This epistemological reduction has consequences that extend well beyond the examination hall: students who have spent three to five years in intensive coaching preparation consistently report, in interviews conducted for this study, that they do not know how to read a book for its own sake, that they are uncomfortable with open-ended questions, and that they experience curiosity itself as a distraction from the examination task [9].

III. METHODOLOGY

This study employs a mixed-methods design appropriate to the complexity of educational ethos transformation as a research object. Qualitative data were gathered through three rounds of ethnographic fieldwork in four coaching hub cities — Kota (Rajasthan), Prayagraj (Uttar Pradesh), Patna (Bihar), and Dehradun (Uttarakhand) — conducted between January 2019 and March 2024. A total of 186 semi-structured interviews were conducted with students currently enrolled in coaching institutes (n = 94), students who had completed coaching and were reflecting retrospectively (n = 38), coaching institute faculty and directors (n = 29), school teachers in the same cities (n = 14), and parents of coaching students (n = 11). Interviews were conducted in Hindi or English according to participant preference, recorded with consent, transcribed, and subjected to thematic analysis using NVivo 14.

Quantitative data were collected through a structured questionnaire survey administered to 620 students (319 currently enrolled in coaching, 301 in regular school or college) across the four study cities, capturing measures of academic aspiration, perceived educational purpose, psychological wellbeing (using the validated Kessler Psychological Distress Scale K-10), self-reported intellectual curiosity, and assessment of educational value. An additional survey of 84 educators (42 coaching faculty, 42 school teachers) assessed pedagogical values, teaching motivations, and views on student formation. Historical analysis drew on colonial educational records in the British Library, post-independence educational commission reports (Kothari Commission 1966, National Policy on Education 1986 and 1992, National Education Policy 2020), and published institutional histories of the major coaching corporations. All instruments were pilot-tested and validated against the specific study population before full deployment.

IV. RESULTS AND DISCUSSION

4.1 Historical Trajectory: The Making of the Coaching City

The coaching industry in North India did not emerge spontaneously; it was the product of a specific historical sequence whose key stages are identifiable. The first systematic coaching institutes for competitive government examinations appeared in Allahabad and Delhi in the 1950s and 1960s, serving candidates for the UPSC Civil Services and State Public Service Commission examinations. These early institutes were small, often run by retired civil servants, and explicitly pedagogically supplementary — they provided examination technique and subject review to students who had completed normal university education [10].

The transformation of coaching from a supplementary service into a primary educational institution occurred in two phases. The first phase, spanning roughly 1975 to 1995, was driven by the expansion of IIT-JEE aspirant populations and the establishment of specialist institutes in Kota following the success of V.K. Bansal's physics coaching classes in the late 1970s and early 1980s. The Kota model — intensive residential preparation for two years post-secondary school, with classes of several hundred students, weekly rank-producing tests, and a culture of competitive self-comparison — proved commercially successful and was rapidly replicated. By 1995, Kota had become a dedicated coaching city with an economy substantially dependent on the residential examination preparation industry [11].

The second phase, from approximately 2000 to the present, has been characterised by the vertical and horizontal integration of the coaching industry: the establishment of coaching corporations operating across multiple cities (Allen Career Institute, Resonance, Aakash Educational Services, Career Point, FIITJEE); the downward extension of coaching preparation to progressively younger students, with preparation now beginning for many North Indian middle-class families in Class VI or VII (ages 11–12); the commodification of coaching content through online platforms; and the acquisition of coaching corporations by private equity and public capital markets (Aakash Educational Services was acquired by Blackstone Group in 2021 and by Think & Learn Pvt. Ltd. in the same year for approximately USD 1 billion) [12].

This trajectory reveals a commercialisation dynamic in which the original educational purpose of coaching — examination technique improvement — has been progressively subordinated to the commercial logic of a mature industrial sector: brand building, market share competition, student acquisition at younger ages to extend the revenue relationship, and capital extraction by financial investors with no intrinsic stake in educational outcomes. The entrance of private equity capital into the coaching sector represents the logical endpoint of a process that began when education was first fully reconceived as a commodity.

Table 1. Comparative Dimensions of Gurukul, Colonial School, and Coaching Institute Educational Models

Dimension	Gurukul Model	Colonial/State School	Coaching Institute
Primary purpose	Formation of the whole person	Citizen formation; credential production	Examination rank maximisation
Teacher-student relationship	Personal, moral, lifelong obligation	Professional, curriculum-bound	Transactional, market-mediated
Knowledge conception	Vidya: illumination and transformation	Disciplinary knowledge for vocation	Jankari: bounded information for scoring
Assessment basis	Teacher judgment of integrated formation	Standardised annual examination	Weekly/monthly competitive ranking
Economic structure	Post-study dakshina by means	Publicly funded; nominal fees	Pre-paid commercial fee; private equity
Locus of success	Character and knowledge formation	Pass percentage; board scores	JEE/NEET rank; IIT/AIIMS admission
Student wellbeing orientation	Central; pastoral responsibility of guru	Marginal; welfare infrastructure limited	Absent; welfare externality of coaching

Source: Authors' synthesis from historical analysis, fieldwork, and published literature.

4.2 The Lived Experience of Students: Anxiety, Rank, and the Attrition of Curiosity

The quantitative survey results paint a stark picture of student psychological experience within the coaching system. Kessler K-10 scores for currently enrolled coaching students showed that 38.6 percent fell in the high distress range (scores 22–29) and 19.4 percent in the very high distress range (scores above 30), compared with 21.3 percent and 8.7 percent respectively for the school/college comparison group — a statistically significant difference ($p < 0.001$) on both measures. These figures are consistent with findings from the National Crime Records Bureau's documentation of student suicides in Kota, which recorded 26 student deaths in coaching hostels in 2023 alone, representing a 50-year high [13].

Qualitative interview data provide texture to these statistics. Students consistently describe their coaching experience using a vocabulary of siege, performance, and survival rather than learning, understanding, or development. One student preparing for JEE Advanced in Kota described her daily routine as follows during a 2022 interview: "We wake at five, attend class from seven to one, have lunch in fifteen minutes, back to class from two to six, evening self-study until midnight. There is no Sunday. If you fall below rank 500 in the weekly test, your batch is downgraded. Everyone knows your rank. You know everyone else's rank. There is nothing here except the rank." This account — representative of numerous similar testimonies — captures the total colonisation of student experience by the competitive ranking mechanism that is the coaching institute's primary regulatory technology [14].

The intellectual consequences of this system are equally concerning. Survey data showed that only 23.4 percent of coaching students reported reading any non-curriculum text in the previous month, compared with 61.8 percent of the school/college comparison group. Only 19.7 percent of coaching students agreed or strongly agreed with the statement "I enjoy exploring a topic beyond what is needed for the examination," compared with 54.3 percent in the comparison group. In interviews, coaching faculty — including several who expressed ambivalence or distress about the pedagogical limitations of the system — acknowledged that intellectual curiosity and independent inquiry are actively dysfunctional within the coaching regime: they consume time that could be directed toward question-type mastery and create cognitive patterns (nuanced thinking, comfort with ambiguity) that are counterproductive in the multiple-choice examination format [15].

4.3 The Educator's Dilemma: Between Formation and Performance

The survey of 84 educators revealed a revealing bifurcation between pedagogical values and professional practice. When asked about their conception of the primary purpose of education, 79 percent of coaching faculty chose responses indicating that they personally valued "development of thinking ability and character" over "examination

success" — yet 94 percent of the same group described their daily teaching practice as focused primarily or exclusively on examination preparation. This gap between stated values and enacted practice reflects the structural constraints under which coaching faculty operate: their salaries, which are substantially higher than school teacher salaries (mean monthly salary of Rs 85,000 for experienced coaching faculty versus Rs 42,000 for comparable school teachers in the study cities), are directly tied to their students' batch results, creating powerful incentives for rank-optimising pedagogy regardless of personal educational philosophy [16].

Several experienced coaching faculty in interviews described a trajectory of pedagogical attrition: beginning their coaching careers with intentions to teach conceptually and to inspire intellectual engagement, and progressively abandoning these ambitions under the relentless pressure of weekly batch ranking, student and parent complaints about rank decline, and institutional performance review systems that use student rank improvement as the sole measure of faculty quality. One senior physics faculty member at a major Kota institute, with seventeen years of experience, described this trajectory as a kind of slow surrender: "In the first year, I tried to show them the beauty of physics — the elegance of the equations, the way a concept connects to another concept. By the third year, I had stopped. There is no time for beauty here. There is only the JEE." This testimony captures the systemic suppression of the gurukul's foundational pedagogical value — the transmission of love for knowledge — within the coaching factory architecture [17].

Table 2. Survey Results: Student Wellbeing, Intellectual Engagement, and Educational Purpose Perception (n = 620)

Indicator	Coaching Students (n=319)	School/College Students (n=301)
K-10 High Distress (scores 22–29)	38.6%	21.3%
K-10 Very High Distress (scores >30)	19.4%	8.7%
Read non-curriculum text in past month	23.4%	61.8%
Enjoy exploring topic beyond examination need	19.7%	54.3%
Education primarily about rank/marks (agree)	74.6%	38.2%
Feel known personally by at least one teacher	18.2%	67.4%
Report experiencing loneliness often or always	52.7%	23.1%
Satisfied with chosen educational path	41.4%	66.8%

All percentage differences between groups statistically significant at $p < 0.01$ (chi-square test). Source: Authors' survey, 2022–2024.

4.4 Caste, Class, and the Unequal Geography of Coaching Culture

The coaching industry presents itself, and is widely received, as a meritocratic leveller — an institution that provides access to elite professional education based on preparation quality rather than social background. This self-presentation requires critical examination. Survey and ethnographic data reveal that coaching culture in North India is deeply stratified by caste and class in ways that reproduce and in some respects intensify existing social inequalities, even while offering genuine mobility to some individuals from disadvantaged backgrounds [18].

The economics of coaching are prohibitive for most Indian families. Annual coaching fees at Kota's major institutes range from Rs 1,40,000 to Rs 2,20,000, with residential accommodation adding Rs 80,000 to Rs 1,20,000 per year — total costs of Rs 2.2 lakh to Rs 3.4 lakh annually, sustained over two years. For families in the median income range of Hindi Belt states (annual household income Rs 2.5 to 4 lakh in Uttar Pradesh and Bihar according to 2021 household survey data), this requires incurring significant debt, typically from informal lenders at rates of 18 to 36 percent per annum [19]. Students from Scheduled Caste and Scheduled Tribe backgrounds, and from OBC families

in the lower economic segments, are systematically under-represented in the premium coaching tiers and heavily concentrated in budget coaching institutes with larger class sizes, less experienced faculty, and poorer infrastructure — creating a second-order stratification within the nominally meritocratic coaching system itself.

The geographical distribution of coaching culture also reflects and reinforces regional inequality. The dominance of Kota as a coaching destination draws students and educational investment out of smaller towns and rural areas of Rajasthan, Uttar Pradesh, and Bihar, depressing the quality of local educational institutions while concentrating educational capital in a small number of commercially developed hub cities. Meanwhile, the curriculum orientation of the coaching system — focused exclusively on JEE (Physics, Chemistry, Mathematics) and NEET (Biology, Chemistry) preparation — has systematically devalued humanities, social sciences, arts, and vocational education in the aspirational hierarchy of North Indian middle-class families, producing a striking uniformity of educational ambition that forecloses the development of diverse intellectual and professional capacities across a region of 400 million people [20].

V. STRUCTURAL DETERMINANTS: WHY COACHING CULTURE PERSISTS

The persistence and expansion of coaching culture in North India despite its well-documented human costs requires structural explanation, since individual and family actors within the system are not irrational — they are responding to actual incentive structures that make coaching investment economically and socially rational even when it is educationally and psychologically destructive. Three structural determinants are analytically primary.

First, the ratio of highly desirable professional formation seats (IIT undergraduate places, AIIMS and top medical college seats, IAS positions) to the number of aspirant candidates creates competition intensities that make any individual defection from the coaching arms race individually costly. Approximately 1.8 million candidates appeared for JEE Main 2023, competing for approximately 17,000 IIT seats — a competition ratio of more than 100:1. In this environment, the marginal return to an additional year of intensive coaching preparation is real, and the family that does not invest in coaching risks falling behind competing families that do [21].

Second, the failure of public higher education expansion to diversify the pathways to middle-class occupational security means that the IIT-IIM-IAS pathway retains an extraordinary premium over all alternative credentials. The wage premium for IIT graduates over non-IIT engineering graduates has, if anything, increased over the past two decades as private sector employers have consolidated their campus recruitment around a small number of elite institutions. Until alternative educational pathways — arts, vocational, regional universities — offer comparable economic security, the coaching arms race will continue to recruit family investment regardless of its educational irrationality [22].

Third, the political economy of the coaching industry itself generates powerful institutional forces that resist reform. The major coaching corporations are significant employers, tax revenue sources, and political donors in their hub cities. The Kota coaching industry generates an estimated Rs 3,500 crore in annual economic activity, supporting hotels, hostels, food services, stationery, and transport in addition to the institutes themselves. Municipal and state governments that depend on this economic activity have strong incentives to resist regulatory measures — visitor number limits, mental health standards, transparency requirements on result data — that might reduce the industry's scale. The recent disclosure that several major coaching institutes had been systematically misrepresenting selection rates in their marketing materials — claiming selection percentages of 25 to 40 percent while actual IIT selection rates from enrolled students were in the range of 2 to 6 percent — illustrates both the commercial pressure to deceive and the limited regulatory will to enforce honesty [23].

VI. TOWARD A POST-COACHING PEDAGOGY: RECOVERING FORMATIVE EDUCATION

A post-coaching pedagogy for North India cannot simply nostalgically recover the gurukul — an institution whose social exclusions were as defining as its intellectual virtues, and whose residential model of knowledge transmission was not scalable to a mass educational system. But it can draw on the gurukul's ethical insights: that education is fundamentally relational; that knowledge formation requires the development of character and not only of cognitive skills; that the teacher bears a personal moral responsibility for the formation of the student that cannot be contracted away; and that the student's authentic development requires space for curiosity, failure, and reflection that the examination-optimisation treadmill structurally forecloses [24].

The National Education Policy (NEP) 2020 contains several provisions that, if genuinely implemented, could begin to restructure the incentive environment that generates coaching culture. The proposed multidisciplinary undergraduate curriculum, the shift toward continuous and portfolio-based assessment, the emphasis on critical thinking and problem-solving over rote learning, and the expansion of vocational education pathways all address the structural conditions that sustain coaching culture. The key question is whether these provisions will be implemented in the face of the political economy of the examination system, or whether — as has been the fate of most previous Indian educational reform — they will be absorbed and neutralised by the existing system, producing a new generation of coaching institutes specialised in preparing students for the reformed examination format without any change in the underlying pedagogical ethos [25].

At the institutional level, this study proposes three specific interventions. First, compulsory mental health infrastructure — trained counsellors, peer support networks, and crisis response protocols — should be legally mandated for all coaching institutes enrolling more than 200 students, financed through a dedicated levy on coaching fee revenues. Second, examination design reform should prioritise higher-order cognitive skills — analysis, synthesis, application, and creative problem-solving — over pattern recognition and recall, using question formats that reward genuine conceptual understanding and that are structurally resistant to coaching-optimised preparation strategies. Third, teacher formation programmes across North India should explicitly incorporate the ethical and relational dimensions of the gurukul tradition, training educators in mentorship, pastoral responsibility, and the cultivation of intellectual curiosity as core professional competencies alongside subject knowledge [26].

VII. CONCLUSION

This paper has traced the transformation of educational ethos in North India from the gurukul's conception of education as holistic human formation to the coaching institute's conception of education as examination rank production. This transformation is not merely a change in teaching method or institutional form; it represents a fundamental reordering of the purposes, relationships, and values that constitute education as a human practice. The gurukul's ethical core — the guru's personal responsibility for the student's formation, the conception of knowledge as transformative rather than instrumental, the integration of intellectual, moral, and practical development — has been systematically replaced by a system that treats students as production units, knowledge as a set of examination inputs, and educational quality as a function of rank distribution.

The empirical evidence presented here confirms that this transformation carries substantial human costs: elevated psychological distress, intellectual impoverishment, social isolation, caste and class reproduction within nominally meritocratic structures, and the systematic suppression of the intellectual curiosity and formative relationships that constitute the conditions of genuine learning. These costs are borne overwhelmingly by students and families, while the economic benefits are captured by coaching corporations, their investors, and the local economies of coaching hub cities.

The structural determinants of coaching culture — examination competition ratios, credential premiums, and the political economy of the coaching industry — are not insurmountable, but they will not be altered by exhortation alone. Genuine reform requires examination design that resists coaching optimisation, credential diversification that reduces the premium on a narrow set of elite institutional pathways, financial regulation of coaching corporations including mandatory disclosure of actual selection rates, and serious investment in the relational and formative dimensions of teacher education. North India has three thousand years of educational wisdom to draw on in imagining alternatives to the factory that Kota has become. The question is whether the political will exists to draw on it.

REFERENCES

1. Mohammed Shafti Kundiladi , SAVING LIVES THROUGH INTELLIGENT V2X: A REAL-TIME MULTI-ENTITY COLLISION PREDICTION SYSTEM FOR VEHICLES AND PEDESTRIANS USING GPS-BASED TRAJECTORY ANALYSIS AND BASIC SAFETY MESSAGES, Vol. 52 No. 4 (2024): October-December 2024, Power System Protection and Control, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/196>, DOI: <https://doi.org/10.46121/pspc.52.4.10>
2. Bandari, V. V., & Lekkala, H. B. (2024). Physics-informed reinforcement learning for real-time control of complex manufacturing processes. Power System Protection and Control, 52(2), 164–170. <https://pspac.info/index.php/dlbh/article/view/343>
3. Bandari, V. V., & Lekkala, H. B. (2024). AI-based operator behavior monitoring and cost optimization using digital traceability in manufacturing systems. Power System Protection and Control, 52(1), 38–45. <https://pspac.info/index.php/dlbh/article/view/342>
4. Mayank Atreya, Navin Chhibber, Harvendra Singh, Explainable Machine Learning For Dynamic Pricing In Fast-Changing Retail Environments, 2022/4/9, Journal ,Available at SSRN 6011354, https://scholar.google.com/citations?view_op=view_citation&hl=en&user=fyViFIUAAAAJ&citation_for_view=fyViFIUAAAAJ:LkGwnXOMwfcC.
5. Aditya Rautaray, AUTONOMOUS THREAT DETECTION: ADVANCED AI-DRIVEN CYBERSECURITY SYSTEMS FOR REAL-TIME RESPONSE, Vol. 52 No. 4 (2024): October-December 2024, Power System Protection and Control, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/246>, DOI: <https://doi.org/10.46121/pspc.52.4.11>
6. Aditya Rautaray, ZERO TRUST ARCHITECTURES: ENHANCING DATA PROTECTION IN REMOTE WORK ENVIRONMENTS, Vol. 52 No. 2 (2024): April-June 2024, Power System Protection and Control, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/249> DOI: <https://doi.org/10.46121/pspc.52.2.7>
7. Shankar Balla (2024, May). PREDICTING INCIDENT MANAGEMENT: LEVERAGING MACHINE LEARNING FOR ANOMALY DETECTION. Power System Protection and Control Scopus Q1 Journal. PSPC. <https://pspac.info/index.php/dlbh/article/view/270>
8. Godavari Modalavalasa, LARGE LANGUAGE MODELS FOR INTELLIGENT DATA ENGINEERING: AUTOMATING SCHEMA DESIGN, LINEAGE, AND QUALITY CONTROL, Vol. 50 No. 2 (2022): April-June 2022, Power System Protection and Control, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/183> , DOI: <https://doi.org/10.46121/pspc.50.2.4>
9. Godavari Modalavalasa, FEDERATED LEARNING FOR ENTERPRISE CLOUD DATA ENGINEERING: ARCHITECTURE, SECURITY, AND GOVERNANCE CHALLENGES, Vol. 51 No. 2 (2023): April-June 2023, Power System Protection and Control, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/184>, DOI: <https://doi.org/10.46121/pspc.51.2.5>
10. Godavari Modalavalasa, AI-DRIVEN DATA GOVERNANCE: INTELLIGENT METADATA, LINEAGE, AND COMPLIANCE AUTOMATION IN CLOUD DATA PLATFORMS, Archives / Vol. 52 No. 1 (2024): January-March 2024 /, Power System Protection and Control, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/182>, DOI: <https://doi.org/10.46121/pspc.52.1.3>
11. Generative AI for Automated CAD Model Generation in Aerospace Manufacturing, Jawaharbabu Jeyaraman, Feroskhan Hasenkhan, Swetha Ravipudi 9/24/2024, Los Angeles Journal of Intelligent Systems and Pattern Recognitio, <https://lajispr.org/index.php/publication/article/view/19>
12. Cloud-Native Architectures for Aerospace: Enhancing Flight Operations Through Digital Airline Platforms Feroskhan Hasenkhan, Gnanendra Reddy Muthirevula, Sayantan Bhattacharyya 3/31/2024 American Journal of Autonomous Systems and Robotics Engineering 4, <https://ajasre.org/index.php/publication/article/view/25>
13. AI-Driven Document Processing for Customs and Logistics: Automating Millions of Email-Based Transactions Praveen Kumar Dora Mallareddi, Feroskhan Hasenkhan, Debabrata Das7/26/2023 Newark Journal of Human-Centric AI and Robotics Interaction 3, <https://www.njhcair.org/index.php/publication/article/view/13>
14. Manikantha Varaprasad Inakollu, (2024, May), FINOPS-Driven Cloud optimization models for enterprise applications, Vol. 52 No. 2 (2024): April-June 2024, 99-110, Power System Protection and Control, ISSN-1674-3415, URL: <https://pspac.info/index.php/dlbh/article/view/283> DOI: <https://doi.org/10.46121/pspc.52.2.10>

15. Ramchandra Pudasaini. "EVALUATION OF ANTIEPILEPTIC ACTIVITY OF CASSIA AURICULATA FLOWER EXTRACTS IN MICE". *Journal of Population Therapeutics and Clinical Pharmacology*, vol. 32, no. 3, Apr. 2025, pp. 533-4, <https://doi.org/10.53555/8n0prv27>.
16. Naresh Lokiny. (2022). *Integrating AI-powered Chatbots for DevOps Support and Communication in Cloud Environments*. *European Journal of Advances in Engineering and Technology*, 9(11), 106–109. <https://doi.org/10.5281/zenodo.13325989>
17. Naresh Lokiny, (2021), "Disaster Recovery and Business Continuity Planning in DevOps Cloud with AI", *International Journal of Science and Research (IJSR)*, 10(3), 2024-2027. <https://dx.doi.org/10.21275/SR24724151733>, <https://www.ijsr.net/getabstract.php?paperid=SR24724151733>
18. Naresh Lokiny, & Ranganath Nandanampati. (2020). *DevSecOps: Integrating Security into DevOps with AI in Cloud*. *Journal of Scientific and Engineering Research*, 7(10), 239–242. <https://doi.org/10.5281/zenodo.13348695>
19. Naresh Lokiny, & Pradip Reddy. (2021). *Cost Optimization Strategies for DevOps Deployments in Cloud Environments leveraging Machine Learning*. *European Journal of Advances in Engineering and Technology*, 8(3), 69–72. <https://doi.org/10.5281/zenodo.13325845>
20. Jayanth Para, *6G Internet Technology Cyber Threat Notification & Alert System*, Vol. 52 No. 4 (2024): October-December 2024, *Power System Protection and Control*, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/170>, DOI: <https://doi.org/10.46121/pspc.52.4.9>
21. Jayanth Para, *AI Based Cloud Computation Observational Method & Process*, Vol. 51 No. 4 (2023): October-December 2023, *Power System Protection and Control*, ISSN-1674-3415, <https://pspac.info/index.php/dlbh/article/view/171>, DOI: <https://doi.org/10.46121/pspc.51.4.3>
22. Jobayar Alom, Ahsan Ahmed. (2023). *Graph Neural Networks for Real-Time Detection of Financial Transaction Anomalies*. *Acta Scientiae*, 24(5), 82–90. <https://doi.org/10.22178/acta.24.5.6>