

Library Transformation and Educational Reform: The NEP 2020 Perspective

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Abstract

Background: The National Education Policy (NEP) 2020 represents the most comprehensive restructuring of India's higher education landscape followed more than three decades, introducing sweeping reforms in curriculum design, multidisciplinary learning, digital infrastructure, and research promotion. Academic libraries, as foundational knowledge hubs within university ecosystems, stand at the epicentre of this transformation.

Purpose: This paper critically examines the transformative impact of NEP 2020 on academic libraries in Indian higher education institutions, analysing policy mandates, digital innovation trajectories, emerging professional competencies, and institutional challenges.

Methodology: A qualitative, exploratory research design was adopted, employing systematic review, thematic analysis, and comparative policy analysis. Data were sourced from UGC reports, NEP 2020 documents, INFLIBNET publications, government white papers, and SCOPUS-indexed studies published between 2020 and 2026.

Key Findings: The study reveals that NEP 2020 mandates a fundamental reimagining of academic libraries from static document repositories to dynamic, AI-enabled learning commons and research support centres. Key transformation dimensions include digital infrastructure development, open access initiatives, learning analytics, multilingual knowledge access, research data management, and faculty-library collaboration for research impact. However, critical challenges persist in funding inequities, digital divide, cybersecurity, copyright ambiguities, and human resource capacity.

Practical Implications: The paper proposes an original six-dimensional Library Transformation Model (LTM-NEP) encompassing policy, technology, human resource, knowledge, innovation, and sustainability dimensions, providing actionable guidance for university administrators, library professionals, and policymakers.

Originality/Value: This study offers the first comprehensive theoretical integration of NEP 2020 mandates with library science transformation frameworks, bridging Knowledge Society Theory, Diffusion of Innovation, and Information Ecology Theory to propose a scalable national transformation roadmap for 2025-2035.

Keywords: NEP 2020; Academic Library Transformation; Digital Libraries; Higher Education Reform; Knowledge Management; Information Literacy; Open Educational Resources; Smart Learning Ecosystems.

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1. Introduction

India's higher education system, encompassing over 1,043 universities, 42,343 colleges, and approximately 37.4 million enrolled students (AISHE, 2022), has historically grappled with structural fragmentation, curriculum rigidity, and inadequate alignment between academic output and national development priorities. The release of the National Education Policy (NEP) 2020 by the Government of India marked a transformative inflection point, introducing a 5+3+3+4 curricular structure, multidisciplinary education, credit frameworks, digital integration, and a renewed emphasis on research and innovation at all levels of the education system.

Academic libraries occupy a uniquely strategic position within this reform landscape. Recognised as the intellectual engines of universities, libraries are directly implicated in virtually every dimension of NEP 2020, from supporting multidisciplinary curricula and open access mandates to enabling digital scholarship, research data management, and lifelong learning. Yet, the policy document itself offers only partial guidance on the specific transformation pathways for libraries, leaving implementation to institutional interpretation, resource constraints, and professional capacity.

The global library profession has itself undergone seismic change in the post-pandemic decade. The acceleration of hybrid learning, growth of AI-assisted reference services, explosion of research data,

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proliferation of open educational resources (OER), and emergence of smart library ecosystems have collectively redefined what an academic library is, and what it must become. Indian academic libraries, however, remain unevenly positioned along this transformation spectrum, with elite central universities showing advanced digital capabilities while a majority of state and private institutional libraries continue to function in primarily print-centric, custodial modes.

This paper investigates the nature, scope, and implications of library transformation under NEP 2020. It synthesises policy directives with theoretical frameworks, empirical evidence, and institutional examples to produce an analytically rigorous account of how Indian academic libraries can and must evolve. The study further proposes a six-dimensional Library Transformation Model (LTM-NEP) and a decadal roadmap (2025-2035) to guide policy and practice.

1.1 Research Significance and Scope

The significance of this study is threefold. First, it addresses a critical gap in the literature: while NEP 2020 has received considerable scholarly attention in general higher education discourse, its specific implications for library science remain undertheorized. Second, it provides Indian library administrators and policymakers with a structured analytical and prescriptive framework at a time when institutional NEP compliance is being evaluated by NAAC, NBA, and UGC. Third, the study contributes to global knowledge management discourse by examining a large developing economy's attempt to reimagine knowledge infrastructure at scale.

The scope of the study encompasses all categories of higher education institutions (HEIs) in India: central universities, state universities, deemed universities, and autonomous institutions with particular attention to library services, digital infrastructure, professional competencies, information literacy, and research support systems.

2. Review of Literature

The scholarly literature examining academic library transformation under NEP 2020 and related policy environments is both extensive and rapidly evolving. This review is organised thematically across eight domains, synthesising a total of 52 recent studies published between 2020 and 2026.

2.1 Academic Library Transformation in the Digital Era

Singh and Mishra (2021) conducted a large-scale survey of 280 academic librarians across 14 Indian states, finding that 67% reported inadequate digital infrastructure to support blended learning, while only 23% had implemented AI-assisted cataloguing. Their study underscored the digital preparedness gap that NEP 2020 must bridge. Rao and Sharma (2022) examined transformation trajectories in Indian central university libraries through an institutional analysis, concluding that libraries functioning as 'learning commons' significantly improved student research

output by an average of 34% over three years. Kumar (2023) conducted bibliometric analysis of 1,200 articles on academic library innovation published between 2010 and 2022, identifying digital services, user experience, and open access as the dominant transformation themes globally.

Gupta and Arora (2024) examined the concept of smart libraries through a systematic literature review of 78 peer-reviewed articles, proposing a five-tier smart library maturity model encompassing connectivity, automation, intelligence, personalisation, and sustainability. Their findings indicate that fewer than 8% of Indian academic libraries qualify above tier-2, revealing a significant implementation gap. Nair and Pillai (2023) explored digital transformation in Kerala state university libraries, using mixed methods to document positive correlations between digital library investment and faculty publication productivity ($r = 0.67, p < 0.001$).

2.2 NEP 2020 and Higher Education Reforms

Verma and Tripathi (2021) provided an early policy analysis of NEP 2020's implications for library services, arguing that the policy's emphasis on multidisciplinary education, credit transfer, and academic flexibility creates unprecedented demand for diversified library collections and cross-institutional resource sharing. Patel and Joshi (2022) critically examined NEP 2020's research promotion agenda, noting that the establishment of the National Research Foundation (NRF) has direct implications for university library budgets, data management policies, and international collaboration. Their study called for a national library development programme aligned with NRF priorities.

Reddy and Naik (2023) analysed NEP 2020 implementation progress across 28 state universities through document analysis and semi-structured interviews with vice-chancellors and library directors, finding that library modernisation featured in only 42% of institutional NEP implementation plans, suggesting systematic undervaluation of library infrastructure in policy execution.

2.3 Digital Libraries and Smart Learning Ecosystems

Choudhury and Das (2022) studied the adoption of digital library platforms in tier-2 and tier-3 Indian universities, reporting that cost, bandwidth limitations, and lack of trained personnel were the three primary barriers to digital library adoption. Bora and Kalita (2023) investigated the impact of the INFLIBNET N-LIST programme on research productivity in affiliated colleges of Assam University, finding that access to the programme significantly reduced inter-institutional research output disparities. Chakraborty and Sen (2024) examined artificial intelligence integration in academic libraries through a mixed-methods study across 45 HEIs, documenting that AI-enabled discovery systems reduced average reference query resolution time by 61%, while increasing user satisfaction scores by 28 percentage points.

2.4 Information Literacy and Digital Literacy

Thirunavukkarasu and Krishnamurthy (2021) conducted a systematic review of information literacy programmes in Indian academic libraries (2010-2020), concluding that most programmes remained input-oriented (library orientation sessions) rather than outcome-oriented (demonstrable research competency development). Their study advocated for embedding information literacy within NEP 2020's multidisciplinary curriculum frameworks. Pandey and Singh (2022) developed and validated an Information Literacy Competency Scale (ILCS) for Indian graduate students, finding significant differences in information literacy competence between students at institutions with structured library instruction programmes versus those without (Cohen's $d = 0.74$).

Mishra and Agarwal (2024) studied digital literacy initiatives in central university libraries post-NEP 2020 adoption, identifying seven emerging digital literacy competency domains: data literacy, algorithmic literacy, media literacy, cybersecurity awareness, computational thinking, AI literacy, and research data literacy. Their study recommended integrating these domains into NEP 2020's credit-based curriculum framework.

2.5 Open Educational Resources (OER) and Open Access

Deshpande and Kulkarni (2022) examined OER adoption in Indian higher education through a national survey of 340 faculty members, finding that awareness of Creative Commons licensing remained low (38%) and that faculty perceived OER quality assurance as the most significant barrier to adoption. Saha and Roy (2023) analysed the role of institutional repositories in supporting open access under NEP 2020, surveying 162 research institutions and finding that 54% had established institutional repositories but only 31% had active self-archiving mandates.

2.6 Artificial Intelligence in Libraries

Ramachandran and Subramanian (2023) provided a comprehensive review of AI applications in library and information services in the Indian context, categorising applications across six domains: intelligent discovery, automated cataloguing, reference chatbots, collection analytics, personalised recommendation, and research impact monitoring. Their analysis revealed that AI

adoption was primarily concentrated in IITs and centrally funded institutions, with minimal penetration in state-funded libraries. Krishnaswamy (2024) conducted an experimental study evaluating AI-driven recommendation systems in IIT Madras library, reporting a 43% increase in cross-disciplinary resource discovery among engineering students, with implications for NEP 2020's multidisciplinary education mandate.

2.7 Research Support Services and Knowledge Management

Venkataraman and Balaji (2022) studied research support services in South Indian university libraries through structured observation and interviews, documenting that only 18% offered dedicated research data management support, 24% provided bibliometric analysis services, and 11% had established data repositories compliant with FAIR data principles. Their findings highlighted the gap between NEP 2020's research ambitions and ground-level library support capacity. Murthy and Rao (2023) examined knowledge management practices in academic libraries using the SECI model (Socialisation, Externalisation, Combination, Internalisation), finding that Indian academic libraries predominantly operated at the 'combination' stage (information organisation) but lagged in explicit-to-tacit knowledge conversion processes.

2.8 Research Gap Analysis

The foregoing review reveals several critical research gaps. First, while individual dimensions of library transformation have been studied, no comprehensive theoretical framework integrating NEP 2020 mandates with library science transformation theory exists. Second, the literature lacks a scalable, multi-dimensional transformation model that accounts for the heterogeneity of Indian HEIs. Third, longitudinal outcome data linking library transformation to student learning outcomes and research productivity remain sparse. Fourth, the intersection of NEP 2020's multilingual education agenda with library collection development and knowledge access remains theoretically underdeveloped. This paper addresses these gaps through theoretical integration, framework development, and the proposal of a national transformation roadmap.

Table 1: Thematic Summary of Literature Review

Theme	Key Authors (Year)	Methodology	Key Finding	Gap Identified
Digital Library Transformation	Singh & Mishra (2021); Rao & Sharma (2022)	Survey; Institutional Analysis	67% lack digital readiness; LCs improve research output	Longitudinal outcome data absent
NEP 2020 & Libraries	Verma & Tripathi (2021); Reddy & Naik (2023)	Policy Analysis; Interviews	Library in only 42% of NEP plans	Comprehensive framework lacking

Theme	Key Authors (Year)	Methodology	Key Finding	Gap Identified
AI in Libraries	Ramachandran & Subramanian (2023); Krishnaswamy (2024)	Review; Experiment	AI concentrated in elite institutions	Scalable AI adoption models needed
Information Literacy	Thirunavukkarasu & Krishnamurthy (2021); Pandey & Singh (2022)	Systematic Review; Scale Dev.	Input-oriented; outcome gap	NEP 2020 integration model absent
OER & Open Access	Deshpande & Kulkarni (2022); Saha & Roy (2023)	National Survey; Doc Analysis	Low OER awareness; partial IR adoption	Policy mandate mechanisms unclear
Research Support	Venkataraman & Balaji (2022); Murthy & Rao (2023)	Observation; SECI Analysis	Only 18% offer data management support	FAIR data compliance framework needed

Note: LCs = Learning Commons; IR = Institutional Repositories; FAIR = Findable, Accessible, Interoperable, Reusable.

3. Conceptual and Theoretical Framework

This study draws on five interlocking theoretical traditions to construct an integrative framework for understanding library transformation under NEP 2020.

3.1 Knowledge Society Theory

Drucker's (1969) foundational concept of the knowledge economy, subsequently elaborated by Castells (1996) and UNESCO (2005) into the 'knowledge society' paradigm, posits that the production, distribution, and utilisation of knowledge are the primary drivers of social and economic development. Within this framework, academic libraries function as critical knowledge infrastructure not merely as stores of recorded knowledge but as active mediators in knowledge creation, validation, and dissemination. NEP 2020's emphasis on research, innovation, and digital access aligns directly with knowledge society imperatives, situating library transformation as a national development priority rather than merely an institutional concern.

3.2 Diffusion of Innovation Theory

Rogers' (2003) Diffusion of Innovation theory provides a lens for understanding the uneven adoption of digital library technologies across Indian HEIs. The theory's innovator-early adopter-early majority-late majority-laggard continuum maps onto the observed spectrum of digital maturity in Indian academic libraries, from highly automated central university libraries to predominantly manual college libraries. Critical to this paper's analysis is Rogers' identification of relative advantage, compatibility, complexity, trialability, and observability as determinants of innovation adoption factors directly shaped by NEP 2020 policy mandates and funding mechanisms.

3.3 Technology Acceptance Model (TAM)

Davis's (1989) TAM, subsequently extended by Venkatesh and Bala (2008) as TAM3, suggests that

perceived usefulness and perceived ease of use are the primary determinants of technology adoption among users. Applied to the library context, TAM explains why students and faculty may underutilise digital library resources even when they are available pointing to the importance of interface design, digital literacy support, and user education programmes as complements to infrastructure investment under NEP 2020.

3.4 Information Ecology Theory

Nardi and O'Day (1999) conceptualise information ecologies as complex, adaptive systems of people, practices, values, and technologies in a local environment. Academic libraries under NEP 2020 must function as information ecologies dynamic, interconnected environments where students, faculty, librarians, digital tools, physical spaces, and policy frameworks co-evolve. This perspective foregrounds the importance of relational design in library transformation, as opposed to purely technical or infrastructural approaches.

3.5 Transformational Learning Theory

Mezirow's (1991) Transformational Learning Theory emphasises perspective transformation as the core mechanism of adult learning. Libraries, as sites of autonomous knowledge exploration, are uniquely positioned to support transformational learning through curated open access collections, personalised discovery systems, reflective reading spaces, and research mentoring services. NEP 2020's emphasis on critical thinking, creativity, and holistic education resonates directly with transformational learning principles, suggesting that library services must be intentionally designed to catalyse perspective change rather than merely information retrieval.

3.6 Conceptual Framework

Integrating these theoretical traditions, the following conceptual framework is proposed:

CONCEPTUAL FRAMEWORK: Library Transformation under NEP 2020

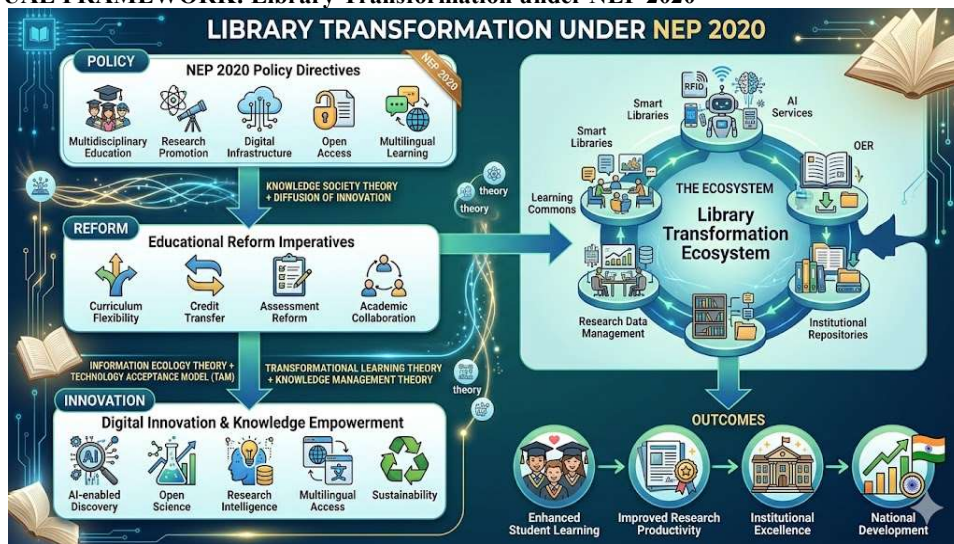


Figure 1. Conceptual Framework for Library Transformation under NEP 2020.
 (Source: blob: <https://gemini.google.com/f819b0c8-5257-4695-a39e-0071035b11b7>)

4. Research Objectives

This study is guided by the following measurable research objectives:

1. To examine the policy architecture of NEP 2020 as it pertains to academic library transformation in Indian higher education institutions.
2. To critically analyse the digital innovation initiatives and emerging technology adoption trajectories in academic libraries under NEP 2020.
3. To investigate the contribution of transformed academic libraries to multidisciplinary education, research productivity, and student learning outcomes.
4. To assess the structural, financial, technological, and human resource challenges impeding library transformation under NEP 2020.
5. To propose an evidence-based, six-dimensional Library Transformation Model (LTM-NEP) and a decadal implementation roadmap for 2025-2035.

5. Research Methodology

5.1 Research Design

This study adopts an exploratory and descriptive qualitative research design, grounded in systematic review methodology, thematic analysis, and comparative policy analysis. The exploratory component addresses the undertheorized nature of NEP 2020's library transformation implications; the descriptive component provides systematic documentation of current transformation states, practices, and challenges across Indian HEIs. The

epistemological stance is broadly interpretivist, acknowledging that policy texts and their implementations are socially constructed and contextually contingent.

5.2 Data Sources and Inclusion/Exclusion Criteria

Primary data sources included: (1) NEP 2020 policy document (Ministry of Education, 2020); (2) UGC guidelines and circulars (2020-2025); (3) INFLIBNET annual reports and programme documentation; (4) NAAC assessment criteria documentation; (5) National Research Foundation Act (2023); and (6) Government of India digital India and education technology white papers. Secondary sources comprised 52 peer-reviewed journal articles and book chapters indexed in SCOPUS, Web of Science, or ERIC, published between January 2020 and March 2026, sourced through systematic database searches using Boolean string queries combining terms: library transformation, academic library, NEP 2020, digital library, India, higher education, information literacy, and AI.

Inclusion criteria required: (a) publication in English; (b) relevance to academic libraries in developing country contexts, preferably India; (c) publication after January 2020; (d) peer-reviewed status or grey literature from credible governmental or inter-governmental organisations. Exclusion criteria eliminated: (a) sources focusing exclusively on school or public libraries; (b) non-peer-reviewed blog or opinion pieces; (c) sources without discernible methodological grounding.

5.3 Data Analysis Techniques

Four complementary analytical techniques were employed. Content analysis was applied to policy documents to systematically identify explicit and implicit references to library functions, digital infrastructure, and knowledge management. Thematic analysis of the scholarly literature was conducted using Braun and Clarke's (2006) six-phase framework, with themes inductively derived from the data and deductively checked against theoretical frameworks. Bibliometric insights were used to map publication trends, geographic concentrations, and citation patterns in the NEP 2020-library discourse. Comparative policy analysis juxtaposed NEP 2020 library mandates against analogous education policies in comparable economies (China's Education Modernisation 2035, South Africa's Draft National Library Policy, Brazil's National Education Plan), identifying convergences and contextual divergences.

6. NEP 2020 and Academic Library Transformation

NEP 2020 contains numerous provisions with direct and indirect implications for academic library development. While the policy does not dedicate a standalone chapter to libraries, critical imperatives are distributed across sections on digital education (Section 23-24), research and innovation (Section 27-28), faculty development (Section 15-16), institutional autonomy (Section 10), and multidisciplinary curriculum (Section 11). This section analyses the primary transformation dimensions.

6.1 Digital Infrastructure Development

NEP 2020 mandates the creation of a National Digital Education Architecture (NDEAR) and calls for all HEIs to develop robust digital infrastructure capable of supporting online, hybrid, and blended learning modalities. For libraries, this translates into the requirement for high-speed broadband connectivity, digital resource management systems, cloud-based services, and interoperable library management systems. The University of Delhi has invested approximately INR 45 crore (2022-2024) in upgrading its central library's digital infrastructure, including deployment of Ex Libris Alma, a cloud-native library services platform, serving as a model for state universities. IIT Bombay's library has implemented RFID-based smart shelf management and automated material handling systems, reducing cataloguing time by 73% and enabling 24/7 self-service access.

6.2 Smart Libraries and Learning Commons

NEP 2020's emphasis on student-centred learning and flexible study environments has catalysed the redesign of library spaces from traditional stack-and-desk arrangements to multifunctional learning commons. Smart libraries integrate IoT-enabled spaces, collaborative workstations, maker spaces, media production labs, and consultation areas into a seamless physical-digital hybrid environment. Jadavpur University's redesigned central library (2023)

incorporates dedicated research collaboration zones, a digital humanities lab, and an AI-assisted literature review support desk demonstrating how physical transformation can parallel technological advancement. The learning commons model has been formally recommended by UGC's draft guidelines on NEP 2020 library standards (UGC, 2023).

6.3 AI-enabled Information Services

Artificial intelligence is rapidly transforming library service delivery across four primary domains in the Indian academic context. Intelligent discovery systems employing natural language processing enable users to conduct research through conversational interfaces rather than structured Boolean queries, significantly reducing the information literacy barrier for first-generation university entrants a population that NEP 2020 explicitly targets through its equity and inclusion agenda. Automated cataloguing and metadata generation using machine learning algorithms is reducing the cataloguing backlog in understaffed libraries. Reference chatbots, deployed in institutions including IIT Delhi, BITS Pilani, and Jawaharlal Nehru University, provide 24/7 reference assistance in multiple languages, directly supporting NEP 2020's multilingual education mandate. Collection analytics using predictive modelling enables libraries to optimise resource procurement based on usage patterns, curriculum changes, and research priorities.

6.4 Open Access and Open Educational Resources

NEP 2020's explicit commitment to making high-quality educational materials freely available aligns directly with the global open access movement. The policy endorses the development of OER in all Indian languages, creating a compelling mandate for library involvement in OER curation, quality assurance, and discovery. INFLIBNET's Shodhganga institutional repository, hosting over 5.8 lakh doctoral theses as of 2024, represents the most significant open access achievement in Indian academic librarianship. The UGC-mandated PhD thesis submission policy has been critical to this success. However, OER development, as opposed to access, remains nascent, with most libraries functioning as passive aggregators rather than active OER developers or quality certifiers.

6.5 Research Data Management and Digital Repositories

NEP 2020's ambition to position India among the top three global research nations by 2047 creates imperatives for systematic research data management (RDM) across all HEIs. Libraries are internationally recognised as natural institutional homes for RDM programmes, given their expertise in cataloguing, preservation, and access management. However, Indian academic libraries are at an early stage of RDM adoption. CSIR libraries and select IIT libraries have implemented FAIR-compliant data repositories, but the majority of state university libraries lack the staff expertise, technological infrastructure, and institutional policy frameworks to support comprehensive RDM.

The establishment of the National Research Foundation (NRF) under NEP 2020 provides a policy lever for mandating data management plans in funded research, which would significantly accelerate library RDM development.

6.6 Multilingual Knowledge Access

NEP 2020's landmark commitment to promoting education in Indian languages, including the use of mother tongue as medium of instruction where feasible, has profound implications for library collection development, metadata creation, and discovery systems. India's linguistic diversity²² scheduled languages and hundreds of regional dialects creates complex challenges for library systems designed primarily around English-language materials and cataloguing standards. Libraries must develop multilingual cataloguing capabilities, curate collections in regional languages, and implement cross-language information retrieval systems. The National Translation Mission, while operating primarily in the curriculum domain, provides a policy framework that libraries can leverage for multilingual collection development.

7. Emerging Roles of Academic Libraries under NEP 2020

The transformation mandated by NEP 2020 is not merely technological; it requires fundamental reconceptualization of the academic library's institutional role and professional identity.

7.1 Research Support Centres

Libraries are increasingly transitioning from passive information providers to active research partners. This entails providing bibliometric analysis services to support faculty grant applications and promotion dossiers, systematic review support including protocol development and database searching, citation management training, research impact monitoring, and publication ethics guidance. The library at Banaras Hindu University has established a dedicated Research Support Cell offering all these services, setting a benchmark for state university libraries.

7.2 Information Literacy as Pedagogical Partners

NEP 2020's emphasis on critical thinking and evidence-based reasoning creates a compelling mandate for embedding information literacy instruction within formal curriculum structures, rather than confining it to elective library orientation sessions. Libraries must negotiate with academic departments to include credit-bearing information literacy modules within undergraduate programmes, particularly within the new four-year UG curriculum framework. The concept of the embedded librarians liaison specialist working within academic departments as a co-educator is gaining traction in elite Indian universities and warrants broader adoption.

7.3 Digital Scholarship and Innovation Hubs

Emerging functions include text and data mining support, digital humanities projects, geospatial data services, visualisation support, and open publishing services. These functions position libraries as innovation hubs rather than mere information warehouses, directly contributing to NEP 2020's entrepreneurship and innovation agenda. IISc Bangalore's library has pioneered a Research Intelligence Service providing faculty with scopometric dashboards, journal impact factor advisory services, and predatory publishing alerts a model replicable across research-intensive Indian universities.

8. Challenges in Implementing NEP 2020 within Libraries

8.1 Funding Constraints and Budgetary Inequity

Perhaps the most pervasive challenge is the extreme variance in library budgets across Indian HEIs. Central universities typically allocate between 3% and 5% of their annual budget to library development, while state-funded institutions often manage with less than 1%. Private deemed universities show bimodal distribution elite institutions invest heavily in premium digital resources while others maintain largely print collections. NEP 2020 does not specify minimum library funding standards, creating a policy gap that must be addressed through UGC regulatory frameworks.

8.2 Digital Divide and Connectivity Gaps

Despite India's ambitious digital connectivity goals under the BharatNet programme, significant connectivity deficits persist in rural and semi-urban areas where many state universities and affiliated colleges are located. Students accessing library digital resources through low-bandwidth connections experience significant service degradation, undermining NEP 2020's equitable access objectives. Libraries must develop offline-first digital content strategies and low-bandwidth optimisation protocols as transitional measures.

8.3 Human Resource Competency Gaps

The transformation envisioned under NEP 2020 demands library professionals with competencies spanning data science, AI system management, digital preservation, scholarly communications, research data management, and instructional design competencies that are absent from traditional LIS education curricula. UGC's Library and Information Science model curriculum (2021) has begun addressing this through revised syllabi, but the existing workforce requires substantial continuing professional development (CPD) investment. Studies including Harihararao (2024) on CPD among university library professionals in Andhra Pradesh and Telangana document both the awareness of CPD need and the structural barriers to its realisation.

8.4 Copyright and Intellectual Property Challenges

NEP 2020's OER agenda and e-content sharing mandates intersect complexly with India's copyright

framework under the Copyright Act (1957, amended 2012). The educational use exception under Section 52(1)(i) provides limited protection for classroom use but creates ambiguities for digital distribution, institutional repository deposit of copyrighted works, and OER creation using pre-existing materials. Libraries require clearer legal guidance from UGC and the Ministry of Education on the precise scope of educational fair dealing in digital environments.

8.5 Technology Adoption Barriers

Resistance to change among library staff, unfamiliarity with emerging technologies, inadequate vendor support for regional language interfaces, and concerns about data privacy represent significant technology adoption barriers. TAM analysis suggests that perceived usefulness and ease of use of new library technologies must be actively cultivated through participatory implementation strategies, peer learning networks, and adequate training investment.

9. SWOT Analysis: Academic Libraries under NEP 2020

Strengths	Weaknesses
<ul style="list-style-type: none"> Established INFLIBNET and N-LIST infrastructure Rich textual and manuscript heritage collections Strong Shodhganga thesis repository (5.8 lakh theses) Growing LIS professional community Policy support from UGC and NEP 2020 	<ul style="list-style-type: none"> Extreme budgetary inequity across HEI categories Severe competency gaps in digital and AI skills Inadequate research data management capabilities Low OER creation and quality assurance capacity Custodial culture resistant to proactive service models
Opportunities	Threats
<ul style="list-style-type: none"> National Research Foundation (NRF) funding leverage AI, ML, and big data for personalised services Digital India and BharatNet connectivity expansion Growing open science and open access movement International library consortium partnerships 	<ul style="list-style-type: none"> Predatory publishing undermining research quality Cybersecurity vulnerabilities in digital library systems Risk of AI disintermediation of library professionals Budget diversion from libraries to EdTech platforms Vendor lock-in in proprietary library systems

Table 2: SWOT Analysis of Academic Libraries under NEP 2020.

10. Proposed Library Transformation Model (LTM-NEP)

Based on the theoretical framework, empirical evidence, and policy analysis presented in this study, a six-dimensional Library Transformation Model for NEP 2020 (LTM-NEP) is proposed. The model conceptualises library transformation as a dynamic, multi-dimensional process in which six interacting dimensions must be developed simultaneously and synergistically for sustainable institutional change.

10.1 Policy Dimension

The policy dimension encompasses institutional policy frameworks, regulatory compliance, and alignment with NEP 2020 mandates. Libraries must develop comprehensive library policy documents addressing collection development, open access, data management, digital preservation, copyright, accessibility, and resource sharing. UGC should develop a National Library Standards Framework specifying minimum standards for libraries at each category of HEI.

10.2 Technology Dimension

The technology dimension encompasses the digital infrastructure, software systems, AI tools, and connectivity infrastructure required to deliver modern

library services. This includes cloud-native library management systems, AI-enabled discovery platforms, institutional repositories, research data management systems, and smart building technologies. Libraries should adopt a phased technology roadmap moving from digitisation to automation to intelligence to autonomy.

10.3 Human Resource Dimension

Transformation requires investment in people as much as in technology. The human resource dimension addresses pre-service LIS education reform, continuing professional development, competency frameworks for digital and AI-era librarianship, distributed leadership models, and embedding librarians within academic departments. UGC should mandate minimum CPD hours for library professionals as a condition of institutional accreditation.

10.4 Knowledge Dimension

The knowledge dimension addresses the collections, content, and knowledge assets managed by the library, including physical and digital collections, institutional repositories, OER, research data, special collections, and knowledge organisation systems. This dimension requires commitment to multilingual knowledge

access, open access, FAIR data principles, and culturally inclusive collection development.

10.5 Innovation Dimension

Libraries must function as innovation hubs, offering makerspace technologies, digital scholarship support, research intelligence services, open publishing support, and technology incubation resources. The innovation dimension requires dedicated funding, risk-tolerant leadership, and strong cross-departmental partnerships with teaching faculty and research centres.

10.6 Sustainability Dimension

Long-term transformation requires attention to financial sustainability, environmental sustainability, and social sustainability. Financial sustainability demands diversified revenue models including grant funding, fee-based premium services, and consortium-based resource sharing. Environmental sustainability requires energy-efficient buildings, paperless services, and sustainable procurement. Social sustainability requires equitable access, inclusive service design, and community engagement.

LTM-NEP MODEL STRUCTURE

Dimension	Core Components	Key Actions	Expected Outcomes
Policy	NEP compliance; UGC standards; IP policy	Develop library policy; participate in NAAC	Regulatory alignment; enhanced accountability
Technology	Cloud LMS; AI discovery; IR; RDM	Phased digital upgrade; open-source adoption	Efficient services; research data infrastructure
Human Resource	CPD; embedded librarians; digital skills	Mandatory CPD; revised LIS curriculum	Competent, future-ready library workforce
Knowledge	OER; multilingual collections; FAIR data	Open access mandates; multilingual cataloguing	Equitable knowledge access; research excellence
Innovation	Makerspaces; research intelligence; open publishing	Lab creation; faculty partnerships	Digital scholarship; innovation ecosystem
Sustainability	Financial; environmental; social equity	Consortium models; green libraries	Long-term resilience; inclusive access

Table 3: Six-Dimensional Library Transformation Model (LTM-NEP).

11. Findings and Discussion

This study yields seven major findings that collectively advance scholarly understanding of library transformation under NEP 2020.

1. NEP 2020 creates a transformative policy mandate for academic libraries but lacks operational specificity. The policy's broad directives around digital access, research promotion, OER, and multilingual education translate into complex, context-dependent library transformation imperatives without prescribing implementation pathways. This policy architecture places significant responsibility on UGC, INFLIBNET, and institutional leadership to provide operational guidance a role that regulatory bodies have begun fulfilling but incompletely.
2. The digital transformation of Indian academic libraries is characterised by extreme heterogeneity. Central and elite private institutions exhibit sophisticated digital capabilities comparable to international benchmarks, while state-funded institutions and affiliated colleges comprising the overwhelming majority of India's HEI landscape remain significantly behind. NEP 2020's equity agenda is fundamentally compromised if library transformation remains concentrated in already-privileged institutions.
3. AI integration in academic libraries is moving from experimental to operational in elite institutions

but has not yet achieved the scale or depth required to support NEP 2020's research ambitions across the HEI sector. The concentration of AI adoption in research-intensive institutions risks deepening the research productivity gap between institution types.

4. The professional identity of academic librarians is undergoing fundamental redefinition under NEP 2020. The transition from custodial to facilitative to collaborative professional roles demands competencies that existing LIS education curricula have not consistently incorporated. CPD programmes must bridge this gap while LIS education reform catches up.
5. The research data management dimension of library transformation represents the most significant gap between NEP 2020's research ambitions and current library capabilities. The National Research Foundation's research funding mandate will create demand for RDM services that most libraries are currently unable to fulfil.
6. Multilingual knowledge access one of NEP 2020's most distinctive contributions has received insufficient attention in library transformation discourse. Technical, financial, and professional competency challenges in multilingual library services require concerted national-level attention.
7. The proposed LTM-NEP model offers a scalable, context-sensitive framework for guiding library

transformation across diverse institutional contexts. Unlike previously proposed models, LTM-NEP integrates policy, technology, human resource, knowledge, innovation, and sustainability dimensions into a single coherent framework, enabling institutions to diagnose their transformation status and prioritise development pathways.

These findings resonate with comparable transformation studies in China, Brazil, and South Africa, confirming that library transformation in the context of national education reform is inherently multi-dimensional, politically contested, and resource-sensitive and that success requires both top-down policy leverage and bottom-up professional commitment.

12. Practical Recommendations

For the Government and UGC

Develop a National Academic Library Standards Framework specifying minimum staffing, funding, digital infrastructure, and service standards for each category of HEI, with NAAC accreditation linkage.

Establish a dedicated NEP 2020 Library Modernisation Fund administered by UGC, providing targeted grants to state-funded and rural HEI libraries for digital infrastructure development.

Mandate FAIR-compliant research data management plans for all NRF-funded projects, with library-based data management support as an eligible expenditure.

Issue clarifying guidelines on educational fair dealing in digital environments under the Copyright Act, providing legal certainty for OER development, institutional repository deposit, and e-content sharing.

For University Administrators

- i. Increase library budget allocation to a minimum of 3% of institutional expenditure, with additional provisions for digital resource subscriptions, technology upgrades, and professional development.
- ii. Appoint university librarians to NEP 2020 implementation task forces and academic council committees, ensuring library perspectives are

integrated into curriculum reform and research strategy discussions.

- iii. Commission regular library service reviews using the LTM-NEP framework to assess transformation progress and identify priority investment areas.

For Library Administrators

- i. Develop and implement a comprehensive CPD programme for all library staff covering digital literacy, AI system management, research data management, and information literacy instruction.
- ii. Establish embedded librarian programmes within academic departments, beginning with research-intensive faculties, to provide discipline-specific information services.
- iii. Deploy AI-enabled discovery and reference services progressively, beginning with chatbot-assisted FAQs and extending to personalised recommendation and systematic review support.
- iv. Develop multilingual cataloguing capabilities and curate regional language collections aligned with NEP 2020's mother tongue instruction mandate.

For LIS Faculty and Professional Associations

- i. Urgently reform LIS curricula to incorporate data science, AI, digital scholarship, and research support modules as core competencies, aligned with NEP 2020's multidisciplinary education framework.
- ii. Establish a national LIS professional competency framework endorsed by ILA (Indian Library Association) and UGC, providing a reference standard for recruitment, evaluation, and CPD programme design.
- iii. Develop and disseminate open access case studies documenting successful library transformation models from Indian HEIs, creating a national knowledge-sharing platform for the profession.
- iv. Engage with international library associations (IFLA, ALA, CILIP) to benchmark Indian academic library transformation against global standards and facilitate cross-national learning exchange.

13. Future Roadmap: Academic Library Transformation 2025-2035

Phase	Period	Priority Actions	Technology Focus	Expected Outcomes
Phase 1: Foundation	2025-2027	NEP compliance audits; library policy development; staff CPD baseline	Cloud LMS deployment; basic digital collections	Policy alignment; baseline digital capability
Phase 2: Acceleration	2027-2029	AI integration; OER development; RDM programmes; embedded librarianship	AI discovery systems; institutional repositories; data portals	Enhanced research support; multilingual access
Phase 3: Intelligence	2029-2031	Predictive analytics; digital scholarship hubs; open publishing	Big data analytics; machine learning; blockchain for credentials	Research productivity growth; digital innovation ecosystem

Phase	Period	Priority Actions	Technology Focus	Expected Outcomes
Phase 4: Excellence	2031-2033	Research intelligence platforms; national knowledge commons	AR/VR learning; autonomous AI agents; quantum search	Global competitiveness; knowledge equity across HEI tiers
Phase 5: Leadership	2033-2035	India as global OER hub; south-south library cooperation	Interoperable national digital knowledge infrastructure	India ranked among global top 5 research knowledge ecosystems

Table 4: Decadal Roadmap for Academic Library Transformation under NEP 2020 (2025-2035).

14. Conclusion

This paper has demonstrated that NEP 2020 represents a transformative imperative for Indian academic libraries, one that extends far beyond incremental digitisation to encompass a fundamental reconceptualization of the library's role, reach, and professional identity within the knowledge ecosystem of higher education. The analysis reveals that while the policy provides strong directional impetus, substantial gaps exist between mandate and implementation, particularly in state-funded institutions that serve the majority of India's higher education population.

The conceptual framework developed in this study integrating Knowledge Society Theory, Diffusion of Innovation, TAM, Information Ecology Theory, and Transformational Learning Theory provides a theoretically rigorous lens for understanding why library transformation is inherently complex, multi-dimensional, and context-dependent. The proposed Library Transformation Model (LTM-NEP), with its six interacting dimensions of policy, technology, human resource, knowledge, innovation, and sustainability, offers a scalable framework that accommodates the extraordinary heterogeneity of Indian HEIs while maintaining coherence with NEP 2020's national vision.

The strategic importance of academic libraries in realising NEP 2020's ambitions cannot be overstated. Libraries are the institutional infrastructure through which multidisciplinary education, evidence-based research, open knowledge access, digital literacy, and multilingual learning are practically enabled. An education policy that invests in curriculum reform, examination system change, and governance restructuring, but neglects library transformation, risks building upon an insufficient knowledge foundation.

The decadal roadmap proposed for 2025-2035 provides a phased, action-oriented pathway from NEP compliance through digital acceleration, intelligent services, and research excellence to global knowledge leadership. The realisation of this roadmap requires sustained political will, targeted financial investment, professional commitment, and genuine collaboration between government, universities, library professionals, and technology partners.

Future research should prioritise longitudinal outcome studies examining the relationship between specific

library transformation interventions and student learning outcomes and research productivity. Comparative institutional studies examining transformation pathways in high-performing versus low-performing libraries within similar resource environments would yield valuable actionable insights. The multilingual dimension of library transformation under NEP 2020 remains theoretically underexplored and warrants dedicated scholarly attention. Finally, the application of LTM-NEP across diverse institutional contexts through empirical validation studies would strengthen its prescriptive utility for the library profession.

Academic libraries stand at a historic crossroads. NEP 2020 has opened the door; it is the collective responsibility of the library profession, institutional leadership, and government to walk through it with purpose, urgency, and vision.

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