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Re-Envisioning Library and Information Science (LIS) Education in India: Curricular Transformation, Pedagogical Disparities, and 21st-Century Competency Integration

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ABSTRACT: Rapid digitalization, algorithmic retrieval and changing information ecosystems have revolutionized modern libraries from being merely physical stores to being hybrid, ubiquitous learning hubs. It is imperative to critically rethink Library and Information Science (LIS) education in particular in a developing country with institutional readiness and curricular delivery range. In light of the structural, infrastructural and pedagogical picture that Parvez and Basavaraj (2021) have constructed based on descriptive analysis and keeping in mind the wider empirical and comparative data, the study examines the context of LIS education in India – including its structure, infrastructure and pedagogy.

When convergent methods of synthesis are used that combine descriptive empirical institutional data (N = 13 University Departments), thematic faculty analyses, and frameworks of faculty training preferences (N = 144), the paper assesses curriculum-workplace conjunction, laboratory infrastructures, and faculty capacity. Results show a significant structural fragmentation; with 61,5% of institutions maintaining legacy 'truncated' degree structures (one-year BLISc/MLISc programs), and 38,5% of institutions implementing modern integrated two-year MLISc programs. While access to basic ICTs is high (92.3% utilizing instructional digital tools), there are significant gaps in computer expertise and infrastructure (e.g., computer labs, integrated library systems), digital repository systems, and computer–educator integration for practice. Advanced ICT applications also become the main professional development need for practitioners with 85.4% identifying it as a CE imperative, thus creating the need for a vital remedial bridge of CE. Finally, the paper offers an evidence-based strategic framework for the Indian LIS education system to meet the 21st-century information competencies, evolving accreditation standards and the international requirements for the 21st-century workforce.

1. INTRODUCTION

The world of higher education and dissemination of knowledge has undergone an unprecedented transformation thanks to the development of Information and Communication Technologies (ICT), cloud computing and mobile networks. Libraries are no longer just repositories of volumes of ink and paper; they are everywhere, omnipresent and learning spaces that provide services dynamically in both physical and virtual environments. The shift from physical gatekeeping to digital intermediation requires a re-thinking of the skills, roles and research methods expected of Library and Information Science (LIS) professionals.The transition from physical gatekeeping to digital intermediation calls for a re-thinking of the competencies, roles and scholarly

practices expected of Library and Information Science (LIS) professionals. LIS professionals hold a critical position in developing economies like India, where they are guardians of rich historical and cultural knowledge systems, yet also serve as enablers in addressing the digital divide, information access, and information overload. According to Parvez and Basavaraj (2021), the faculty of LIS are the prime knowledge producers, mentors and social equity advocates for the evolution of the profession in India. But it is only in terms of institutional practice that the theoretical aspirations are confronted with structural problems. Literature has been constantly calling for the integration of new technologies like Artificial Intelligence, data mining, research data management, and digital curation in the LIS domain, while the educational infrastructure in Indian LIS departments is still not consolidated. However, differences in course design, lab availability, student criteria, and faculty training pose a risk of a misalignment between academic preparation and current information management requirements, resulting in an employability gap. This paper reviews empirical evidence on this reality in the programmatic, infrastructural, and professional development domains. This study aims to present an empirical and comprehensive study of LIS education in India by integrating the conceptual models proposed by Parvez and Basavaraj (2021) along with the various indicators related to LIS institutional status, collaboration pattern between the various disciplines and data on practitioner CE.

2. OBJECTIVES OF THE STUDY

- This study aims to investigate the institutionalization, curriculum pertinence and capacity development framework in the field of LIS education in the digital era in India. Specifically, the objectives of the study are:
- To study the existing academic program design, selection process for the students and the enrolment strength of representative departments of learning in Indian LIS.
- To evaluate the sufficiency of physical infrastructure, IT laboratory environment and instructional technology tools in LIS schools.
- To assess faculty strength, academic productivity and academic profiles against contemporary multi-disciplinary teaching demands.
- To report on the gaps in professional competence and outline the continuing professional development (CPD) needs of working information specialists.
- To design a curricular and institutional intervention plan to make LIS education globally 21st century and in line with the national policy requirements.

3. RESEARCH QUESTIONS

- The first question for RQ1 is, how degree design structures (truncated BLISc/MLISc vs. integrated MLISc) and admissions procedures differs in different LIS academic departments of India?
- RQ2: How well are LIS departments set up in India in terms of having separate IT laboratories, instructional media and modern library facilities that would enable them to impart cutting edge technology skills?
- RQ3: Is there sufficient faculty capacity to cover the theoretical scholarship, advanced technical applications, and mentorship of student research?
- The fourth research question is: RQ4: What are the most acute post qualification knowledge gaps for working LIS professionals and their perspectives of the role of LIS school in providing post qualification education?
- RQ5: How can the integration of cross-disciplinary collaboration (i.e., education faculty, subject specialisms and LIS practitioners) be incorporated into preserve education to develop 21st-century literacies?

4. HYPOTHESES

- H_1: Programmatic and infrastructural capabilities (IT laboratories, specialized departmental libraries, and hardware access) differ significantly across LIS schools based on their funding status and university governance frameworks.
- H_2: Institutional reliance on conventional lecture-based pedagogies is positively correlated with an absence of dedicated, hands-on digital laboratory facilities.
- H_3: A statistically significant divergence exists between the legacy technical skills imparted in preservice LIS university curricula and the operational ICT competencies demanded in contemporary workplace environments.

- H_4: Working information professionals demonstrate higher preference for practical, modular, university-accredited continuing education programs taught jointly by academic faculty and practicing technical experts compared to short-term association-led workshops.

5. LITERATURE REVIEW

Historical Genesis and Evolution of Indian LIS Education

Library training in India has its origins in 1911 when William Alanson Borden, a student of Melvil Dewey, started training programmes with the patronage of the Maharaja of Baroda, Sayajirao Gaekwad III. The program was continued in 1915 by Asa Don Dickinson at the University of the Punjab, Lahore, which is considered to be the first institute of library science in an Indian university and the second in the world. However, after independence, the academic contribution of the discipline increased at a rapid pace under Dr. S. R. Ranganathan, who later became the pioneer in introducing the first formal department of Library Science in the University of Delhi (1947) and the first doctorate in Library Science in the British Commonwealth (1949). In the following decades, national level documentation centres such as INSDOC (now NISCAIR/CSIR-NIScPR) developed special programmes in documentation and information science and IGNOU made distance education in Documentation and Information science accessible to masses of people. Pedagogical and Mentorship Roles of LIS Faculty.Pedagogical and Mentorship Roles of LIS Faculty. LIS teachers create practical inquiries, theories, and critical conversations about information policies and information practices. Parvez and Basavaraj (2021) assert that LIS teachers are not just mere carriers of static techniques, they are key participants in nurturing the next generation of researchers, in evidence-based practices, in fostering intellectual freedom and in ensuring social equity. Faculty's publications in peer-reviewed journals, inter-disciplinary research and national conferences enhance the overall research ecosystem and enable the profession to be responsive to socio-cultural and linguistic differences across India.

Technological Shift: ICT, Ubiquity Embedded and Librarianship

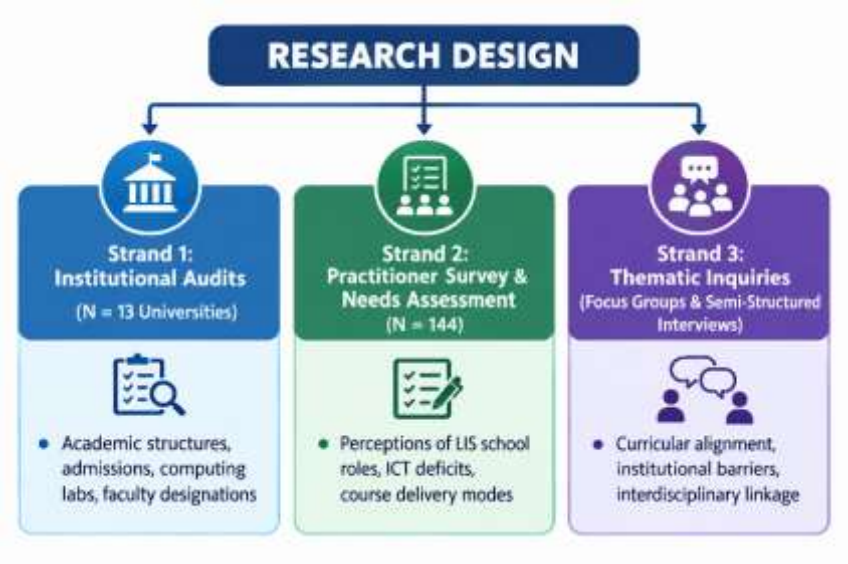
A digital transformation has completely transformed traditional library processes. The way that information is retrieved, cataloged and curated, is distributed, hosted on the cloud and enabled by various information discovery tools that use web-scale principles and metadata ontologies. Academic librarians are being asked to become increasingly "blended professionals," and embedded in the research data management, digital preservation and research metrics functions. But, the incorporation of these skills in Indian library schools has been faced by structural challenges, and there exists a gap between the training provided in the classroom and technical skills that are required by the modern workplace. Continuing Professional Development and Skill Deficits" may refer to the following: Continuing Professional Development and Skill Deficits" can mean: University degrees will not stand still for 30 years of practice. The relevance of first qualifications to the operational context can become significant less in a decade if not CPD. There can be significant loss of relevance of initial qualifications to the operational context within 10 years of graduation if there is no continuing professional development (CPD). Practice based on empirical surveys of practicing librarians shows that there are clear needs for continuing education in integrated library systems (such as Koha), in research software (such as SPSS, NVivo) and in digital repositories (such as DSpace), as well as research design. In developing countries, however, continuing education is often hampered by lack of a pro-active professional association, inadequate funding, negative work culture and absence of any standardized outcome assessments.

6. RESEARCH GAP

- The literature reflects the theoretical histories of the Library development in India and the need of integrating ICT at a macro level but critical empirical gaps in literature exist:
- Integrated Structural-Pedagogical Audits: Most of the studies in India are separately addressing curriculum design, inventory of the infrastructure and faculty productivity as problems.
- Another problem mentioned in the literature, which will be neglected in this study, is the disconnect between educators and preserve work, because the capacity building of 21st century skills is being encouraged repeatedly in education but not in LIS.
- 3. Absence of Co-Designed LIS School Continuing Education: Little empirical research explores how schools structurally provide post-master's certifications in LIS for working professionals that are credit-bearing, modular, and co-designed.

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7. RESEARCH METHODOLOGY



8. Sample Selection and Data Collection

- **Institutional Audit Sample:** Quantitative and qualitative program data were compiled from 13 established university departments of library and information science in Northern India. Data were gathered through structured institutional questionnaires, supplemented by university statutory reports and syllabus analysis.
- **Practitioner Survey Sample:** Quantitative feedback on continuing professional needs was obtained from 144 professional librarians across academic, government, and special library sectors using a validated survey instrument ($\alpha = 0.769$).
- **Qualitative Focus Groups:** Mid-career professionals and academic faculty participated in thematic focus group discussions evaluating the efficacy of current LIS curriculum frameworks.

8.1 Data Analysis, Findings, and Empirical Discussion

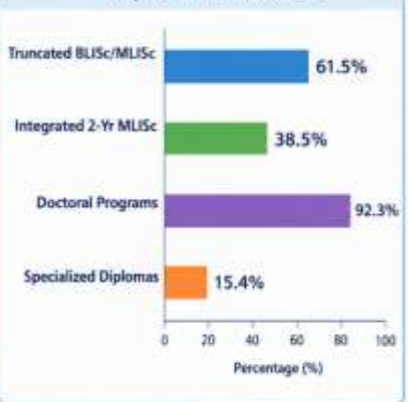
Academic Program Structures and Admission Mechanisms

Institutional Program Offerings (N = 13)

Program Classification	Frequency	Percentage (%)
Truncated Structure (1-Yr BLISc)	8	61.5%
Truncated Structure (1-Yr MLISc)	8	61.5%
Integrated 2-Year MLISc	5	38.5%
Research Degrees (Ph.D. Programs)	12	92.3%
Specialized Diplomas (PGDLAN/PGDM)	2	15.4%

Data Source: Synthesized from Northern India departmental survey.

Program Distribution across Departments (N = 13)



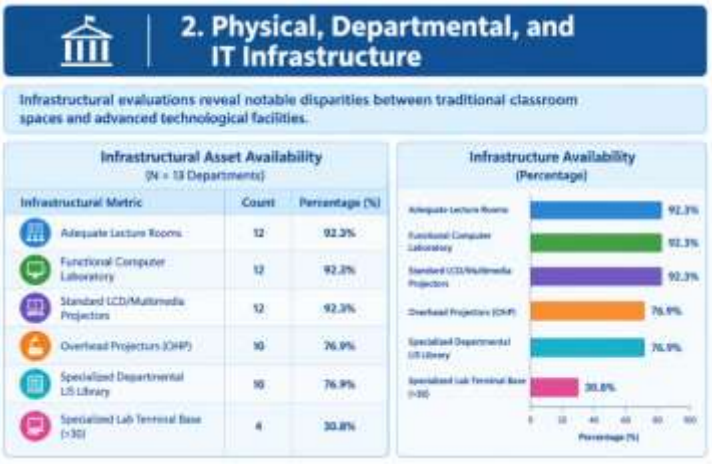
A majority of departments (61.5%) continue to use the legacy truncated structure, consisting of separate, one-year Bachelor's (BLISc) and one-year Master's (MLISc) degrees. Only 38.5% have restructured into integrated two-year MLISc programs. This fragmentation impairs pedagogical continuity and limits the inclusion of semester-long internships and advanced data management courses.

Furthermore, student selection methods vary widely across institutions:

- **Qualifying Examination Marks Only:** 53.8% ($n = 7$)
- **Dedicated Entrance Test Only:** 23.1% ($n = 3$)
- **Combined Entrance Test and Merit:** 15.4% ($n = 2$)
- **Written Test cum Interview:** 7.7% ($n = 1$)

The absence of standardized screening metrics across institutions leads to inconsistent student intake, often admitting candidates who lack fundamental digital literacy and aptitude for research-intensive environments.

8.2 Physical, Departmental, and IT Infrastructure



Data Source: Departmental facility audits.

While 92.3% of departments maintain basic computer laboratories with internet access, terminal availability remains a bottleneck:

- **10–15 Workstations:** 50.0% of departments ($n = 6$)
- **16–20 Workstations:** 16.7% of departments ($n = 2$)
- **26–30 Workstations:** 16.7% of departments ($n = 2$)
- **More than 30 Workstations:** 16.7% of departments ($n = 2$)

Departments that have larger numbers of students may have low workstation-to-student ratios which may lead to students sharing workstations, which decreases the amount of time they can get hands-on experience with open-source library management systems, database schema design and metadata input. Also, only 76.9% have dedicated internal libraries; these libraries contain mainly printed monographs, but there is no institutional repository sandboxes, electronic test-beds or licensed bibliometric tool suites.

8.3 Faculty Demographics and Academic Productivity

The aggregate full-time teaching strength across the 13 surveyed departments totalled 63 faculty positions:

- **Assistant Professors:** 32 (50.8%)
- **Associate Professors:** 16 (25.4%)
- **Professors:** 15 (23.8%)
- **Faculty with Doctoral Degrees:** 44 (69.8%)

Faculty Distribution by Rank:

- Assistant Professors: 50.8%
- Associate Professors: 25.4%
- Full Professors: 23.8%

The distribution of faculty among institutions is extremely uneven. Large central university departments may have eight permanent members, while some state university departments may have only one permanent faculty member, who have to work with a lot of temporary or contractual lecturers. This structural under-staffing leaves faculty members with heavier administrative responsibilities, puts a strain on specialization in teaching and leaves them with less capacity to mentor in interdisciplinary research and publish in high-impact journals.

8.4 Practitioner Continuing Professional Development (CPD) Needs

Data collected from working professionals ($N = 144$) highlight an urgent demand for structured post-degree capacity building:

Practitioner Continuing Professional Development (CPD) Needs

Data collected from working professionals highlight an urgent demand for structured post-degree capacity building.

Rank	Subject Specialization	Responses (n)
1	Computer Applications in LIS	123 (85.4%)
2	Research Software (SPSS, NVivo, EndNote)	122 (84.7%)
3	Digital Library Architecture	114 (79.2%)
4	Modern Collection Management	112 (77.8%)
5	Integrated Library Automation	108 (75.0%)
6	Digital Preservation Techniques	104 (72.2%)
7	Electronic Resource Management (ERM)	98 (68.1%)
8	Web Development & Portal Design	90 (62.5%)
9	Advanced Research Design & Methodologies	86 (59.7%)
10	Information Management & Cloud Systems	84 (58.3%)

Data Source: Practitioner Continuing Education Needs Survey.

The survey indicates that working librarians recognize significant skill gaps in modern technological applications. The five highest-ranked areas focus on computing tools, quantitative and qualitative research software, digital repository frameworks, and library automation.

Regarding preferred instructional formats, professionals showed clear preferences for university-credentialed, in-depth learning programs:

- **Credit-Bearing Modular Courses:** Mean = 4.31 (SD = 0.652)
- **Post-Master's Specialization Certificates:** Mean = 4.30 (SD = 0.779)
- **Hands-on Skill Workshops:** Mean = 4.20 (SD = 1.032)
- **Postgraduate Diplomas:** Mean = 4.21 (SD = 0.847)
- **Academic Seminars:** Mean = 3.85 (SD = 1.054)

Furthermore, respondents indicated that instructional delivery must accommodate working schedules, expressing a strong preference for weekend programs (Mean = 4.64, SD = 0.846) and medium-to-long durations (4–6 month modules: Mean = 3.72; Mode = 5) over brief, superficial single-day workshops (Mean = 2.72; Mode = 2).

Crucially, 89.4% of practitioners emphasized that course instructors should feature a balanced mix of university academic faculty and practicing field experts (Mean = 4.52, Mode = 5), ensuring that theoretical instruction remains directly relevant to practical workplace systems.

9. Proposed Strategic Framework for Re-Envisioning LIS Education

To address the structural challenges identified across program structures, IT infrastructure, faculty distribution, and continuing professional needs, this paper presents a four-tiered strategic modernization framework:

Proposed Strategic Framework for Re-Envisioning LIS Education

STRATEGIC MODERNIZATION FRAMEWORK FOR LIS SCHOOLS	
Tier 1: Academic & Structural Rationalization	• Phase out truncated BLISc/MLISc programs into integrated 2-year MLISc. • Standardize national entrance assessments based on digital aptitude.
Tier 2: Technology Integration & Lab Modernization	• Mandate dedicated IT sandboxes with 1:1 workstation-to-student ratios. • Provide live test-beds for Koha, DSpace, Python, and data management.
Tier 3: Interdisciplinary Synergy & Collaborative Pedagogy	• Cross-list courses with Computer Science and Education faculties. • Establish embedded practicums to teach 21st-century literacies.
Tier 4: Modular Continuing Professional Development	• Launch university-backed, credit-bearing weekend certificate courses. • Co-teach specialized modules using academic faculty and practitioners.

9.1 Structural Rationalization and Curricular Standardization: The academic bodies including the UGC in their own way should gradually stop offering non-integrated, one-year BLISc/MLISc courses, and introduce a uniform two-year degree program in MLISc. Management of admission procedure should involve aptitude based tests to include candidates who have basic skills on analytical reasoning and computer systems.

9.2 Laboratory Re-Engineering: Computing laboratories need to go beyond the Internet browsing terminal and generic word processing. Students should be given their own server sandboxes for setting up and running production level open-source library systems (Koha), digital repository software (DSpace), content management systems, and data analysis environments (R, Python, SPSS).

9.3 Cross-Disciplinary Integration: LIS schools must work closely with faculties of Education, Computer Science and Media Studies to create learning modules that integrate these three disciplines as shown by Latham, Gross and Witte (2013). Preservice librarians and educators need to learn together how to master information literacy frameworks, how to engage in inquiry-based learning and how to use academic data analytics.

9.4 Institutionalized Modular Continuing Education: LIS departments need to have formal CPD cells. Credit-earning, modular, post-master's certifications should be offered at universities for specialized areas (such as Research Data

Management, Digital Forensics, Scientometrics, Health Librarianship) that are delivered jointly by faculty researchers and practicing technical librarians, and should be held during the weekend.

10. CONCLUSION

Indian education at LIS is at a crossroads, where it is solidly rooted in theory and technology but also urgently faces the demands of digital-native environments. Although historically the discipline has grown, there are obvious differences in program design, computing infrastructure and in the real-life incorporation of program curriculum in the current educational delivery systems.

The bridge to be crossed is the shift from a legacy degree, based on a traditional curriculum, to technology-based models with coherent curriculum and modern laboratories. University-approved Continuing Education programs, cross-disciplinary cooperation and the implementation of a balanced co-teaching approach between academia and practice will provide Indian LIS departments with a flexible and research ready and digital information workforce for the 21st century.

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AUTHOR CONTRIBUTIONS

Sapna: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Writing — Original Draft.

Dhaval Bhatt: Conceptualization, Supervision, Validation, Resources, Writing — Review & Editing.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ETHICS STATEMENT

This study involved no clinical, biological or animal experimentation. Participation in the institutional audit, the practitioner needs survey and the focus-group discussions was entirely voluntary, and informed consent was obtained from all respondents prior to data collection. Responses were anonymized, used solely for research purposes, and reported only in aggregate; no personally identifying information about any participant or institution is disclosed.

DATA AVAILABILITY STATEMENT

The datasets generated and analysed during this study — the institutional audit records (N = 13 departments) and the practitioner survey responses (N = 144) — are available from the corresponding author upon reasonable request. The data are not publicly archived owing to confidentiality assurances given to the participating institutions and respondents.

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