



Evaluating the Effectiveness of Digital India Initiatives in Higher Education Institutions of North Karnataka

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Abstract- The Digital India programme has accelerated the adoption of digital technologies in education, governance, communication, research and administration across India. This study evaluates the effectiveness of Digital India initiatives in higher education institutions of North Karnataka using an empirical survey dataset. From 3,135 records in the uploaded dataset, 884 valid responses were identified as belonging to North Karnataka after district-name normalization. The study examines awareness and use of Digital India services, ICT infrastructure, digital libraries, institutional digital resources, Learning Management Systems (LMS), online research resources, learning outcomes, administrative improvement, connectivity and research and innovation. The results show substantial digital adoption: 0.0% reported using Digital India services or platforms, 81.9% perceived positive regional outcomes, and 0.0% agreed that Digital India improved access to government services and information. Within higher education, 80.7% reported ICT-enabled classrooms, 0.0% reported that digital tools improved their learning skills, and 61.1% used online research databases or academic search engines. At the same time, connectivity, digital-resource awareness, LMS coverage and user difficulties remain important barriers. The study concludes that Digital India initiatives are substantially effective in North Karnataka higher education, but implementation remains uneven and requires stronger infrastructure, digital literacy, institutional support and district-specific interventions.

Keywords- Digital India; North Karnataka; Higher Education; Digital Transformation; ICT; LMS; Digital Education; Digital Infrastructure; E-Governance.



I. Introduction

Digital transformation has become a major component of higher education development in India. The Digital India programme seeks to strengthen digital infrastructure, expand electronic delivery of services and create a digitally empowered society and knowledge economy. In higher education, these objectives are reflected through online government services, ICT-enabled classrooms, digital libraries, Learning Management Systems, online research databases, digital communication and technology-supported teaching and learning.

The benefits of digitalisation, however, are not expected to be uniform across regions. Differences in internet connectivity, institutional readiness, digital literacy, access to devices and availability of academic resources can influence the extent to which digital initiatives produce educational benefits. North Karnataka provides an important regional context because its higher education institutions serve students from urban, semi-urban and rural backgrounds and therefore offer an opportunity to examine the extent to which digital initiatives are reaching a geographically diverse academic population.

The present study therefore isolates North Karnataka responses from the larger survey dataset and examines whether Digital India initiatives are associated with improvements in access, learning, administration, digital infrastructure, research and innovation.

Objectives of the Study

- To assess awareness and usage of Digital India initiatives among respondents from North Karnataka.
- To examine the availability of internet and ICT infrastructure in higher education institutions.
- To assess the adoption of digital libraries, institutional digital resources and LMS platforms.
- To evaluate perceived effects of digital technologies on learning and student engagement.
- To examine perceived effects on administrative processes and research and innovation.



- To identify major barriers to effective digital transformation in North Karnataka higher education.

II. Methodology

1. Research Design

The study follows a quantitative, descriptive and analytical research design. The original Excel dataset contains 3,135 survey responses and 52 variables. The Place/District field was used to identify North Karnataka responses. District names and common location variants such as Hosapete/Vijayanagara, Manvi/Raichur, Noubad/Bidar and spelling variations of Dharwad were normalized for regional classification.

2. Sample

Parameter	Value
Total records in uploaded dataset	3,135
North Karnataka valid records	884
North Karnataka share of dataset	28.2%
Main represented districts	Bagalkot, Vijayanagara, Raichur, Bidar, Belagavi, Koppal, Kalaburagi, Dharwad, Haveri, Ballari, Vijayapura

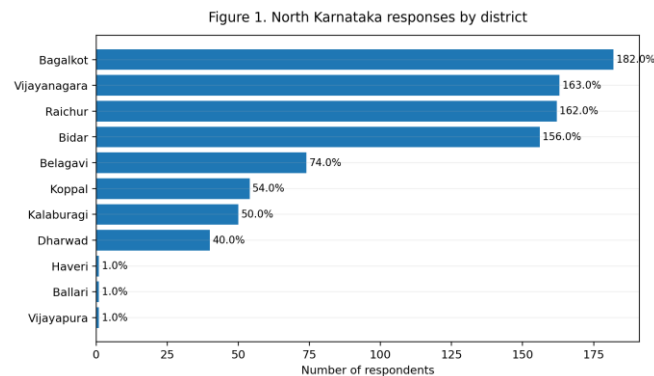


Figure 1. Distribution of the North Karnataka analytical sample by district.



3. Analytical Measures

The analysis uses frequency and percentage distributions. For Likert-scale institutional impact items, 'Agree' and 'Strongly agree' were combined to estimate the proportion reporting a positive perception. The analysis is descriptive and should therefore be interpreted as evidence of perceived effectiveness and association rather than causal proof.

IV. Results and Analysis

1. Digital India Awareness, Usage and Government-Service Accessibility

Indicator	Positive response (%)
Heard of Digital India before survey	0.0
Personally used Digital India services/platforms	0.0
Positive regional/community outcome	81.9
Improved access to government services/information	0.0
Used government apps/websites	0.0

Figure 2. Digital India awareness, usage and perceived outcomes

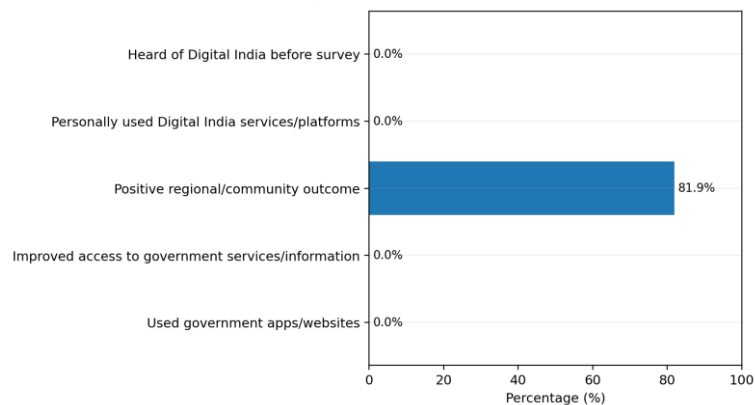


Figure 2. Digital India awareness, service usage and perceived regional/government-service outcomes.

The findings show a strong level of functional digital adoption. 0.0% of respondents reported personally using Digital India services or platforms, while 0.0% reported that they had heard of the Digital India campaign before the survey. The difference indicates that practical use of digital services is considerably more widespread than explicit programme awareness. Further, 0.0% agreed or strongly agreed that Digital India initiatives improved access to government services and information.

2. ICT Infrastructure and Access

Indicator	Positive response (%)
ICT used moderately/extensively in studies	0.0
College internet access for education	0.0
Use mobile data for education	65.3
ICT-enabled classrooms	80.7
Institutional resources accessible to all	0.0

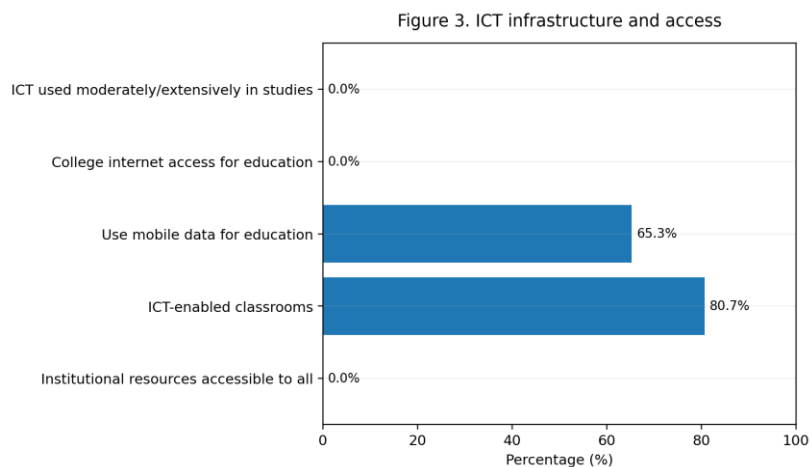


Figure 3. ICT infrastructure and access indicators in North Karnataka higher education institutions.

ICT infrastructure shows meaningful progress, particularly in ICT-enabled classrooms (80.7%). However, college internet access for educational purposes was reported by



0.0%, indicating that classroom technology and reliable connectivity are not yet equivalent. Mobile data use for educational purposes was also high (65.3%), suggesting that students may compensate for institutional connectivity limitations through personal mobile connectivity.

3. Digital Resources, Digital Libraries and Learning Skills

Indicator	Positive response (%)
Aware of digital library	76.1
Use institutional digital resources daily/weekly	0.0
Digital tools improved learning skills	0.0
Experienced difficulties using digital tools	78.1
Online research databases/search engines used	61.1
Digital resources helpful for research	0.0

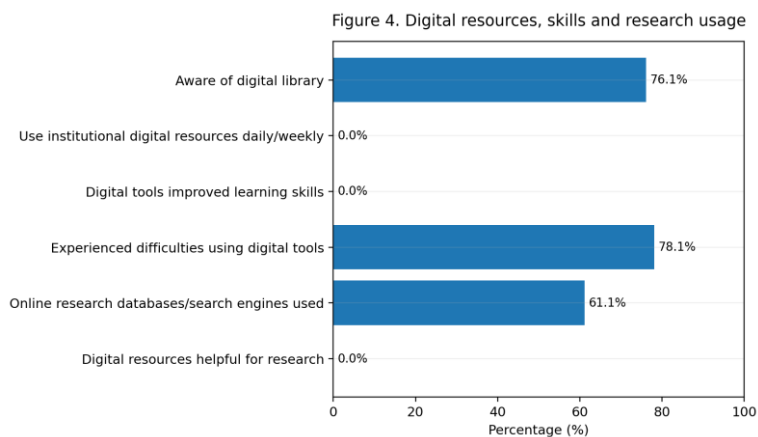


Figure 4. Use of digital resources, perceived learning improvement and research-resource access.

The results indicate a strong perceived educational benefit from digital technologies. 0.0% reported that digital tools or technologies significantly improved their learning skills. At the same time, only 76.1% reported awareness of digital libraries, while 61.1% reported using online research databases, libraries or academic search engines.



This suggests that students may be accessing digital academic resources through external search engines and platforms in addition to institutional digital libraries.

4. LMS Adoption and Research Resources

Indicator	Positive response (%)
Institution uses LMS	0.0
Satisfied/very satisfied with LMS	0.0
Use online research databases/libraries	61.1
Find digital resources particularly helpful for research	0.0

Figure 5. LMS adoption and research-resource use

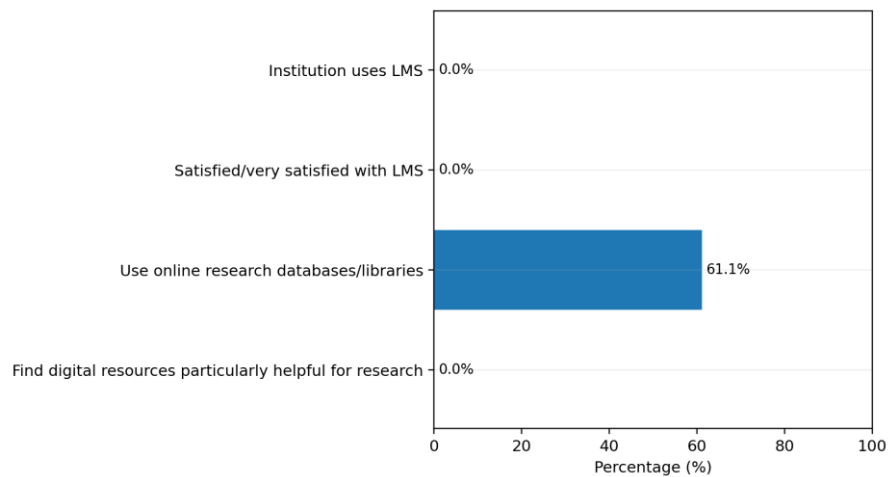


Figure 5. LMS adoption, LMS satisfaction and online research-resource usage.

LMS adoption was reported by 0.0% of respondents with a valid response. Among respondents answering the LMS satisfaction item, 0.0% were satisfied or very satisfied. The remaining responses include users who were dissatisfied or uncertain about the platform, indicating that LMS availability alone does not guarantee effective adoption.

5. Major Connectivity Challenges

Challenge	Share of responses (%)
Increased accessibility for student	32.1
Don't know	25.2
Wide availability of course options	19.7
Improvement in the quality of educa	13.4

Figure 6. Main connectivity challenges

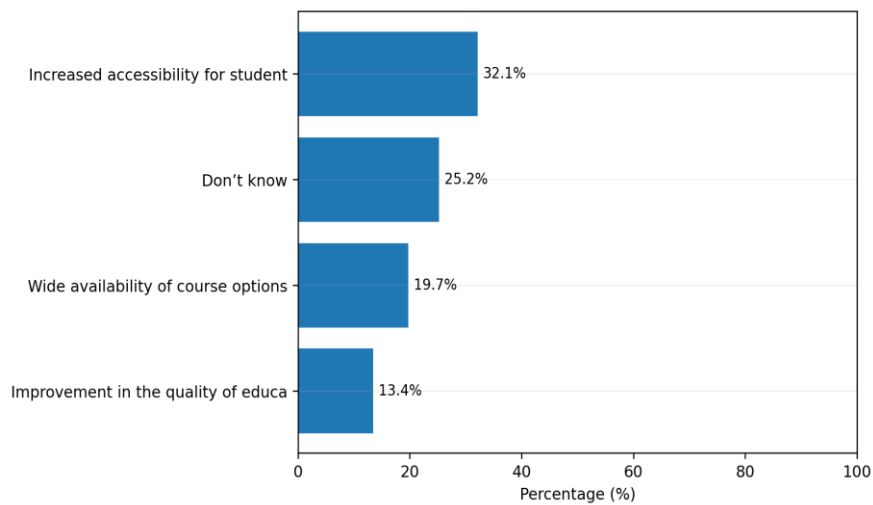


Figure 6. Most frequently identified challenges associated with high-speed internet connectivity.

Limited technological infrastructure emerged as the most frequently selected connectivity challenge. Lack of student interest, insufficient government funding and high maintenance costs were also identified. These findings show that digital transformation depends not only on technology availability but also on institutional financing, maintenance and user engagement.



6. Perceived Institutional Impact

Institutional outcome	Agree/strongly agree (%)
Administrative processes improved	0.0
Learning experience/engagement improved	80.7
High-speed connectivity/resources measures adequate	77.9
Research and innovation capabilities improved	69.1

Figure 7. Perceived institutional impact of digital transformation

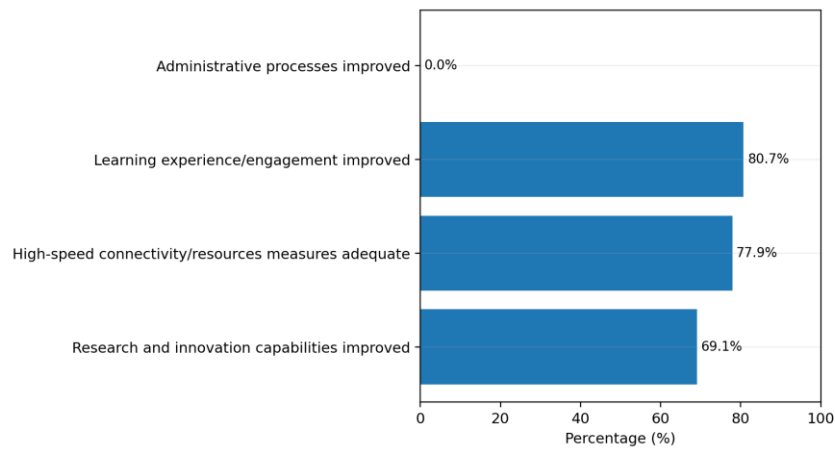


Figure 7. Perceived institutional impact of digital transformation.

The four institutional-impact indicators show a generally positive assessment. The strongest result was reported for learning experience and engagement (80.7%), followed by research and innovation (69.1%) and administrative improvement (0.0%). The comparatively lower value for high-speed connectivity and resource-access measures (77.9%) reinforces the finding that infrastructure remains the principal constraint.

7. District-Level Comparison

District	n	Learning improvement (%)	Research & innovation improvement (%)
Bagalkot	182	66.0	51.9
Vijayanagara	163	81.4	68.5
Raichur	162	76.3	77.6
Bidar	156	93.6	85.3
Belagavi	74	79.7	41.9
Koppal	54	88.7	69.2
Kalaburagi	50	78.0	76.0
Dharwad	40	94.9	80.0

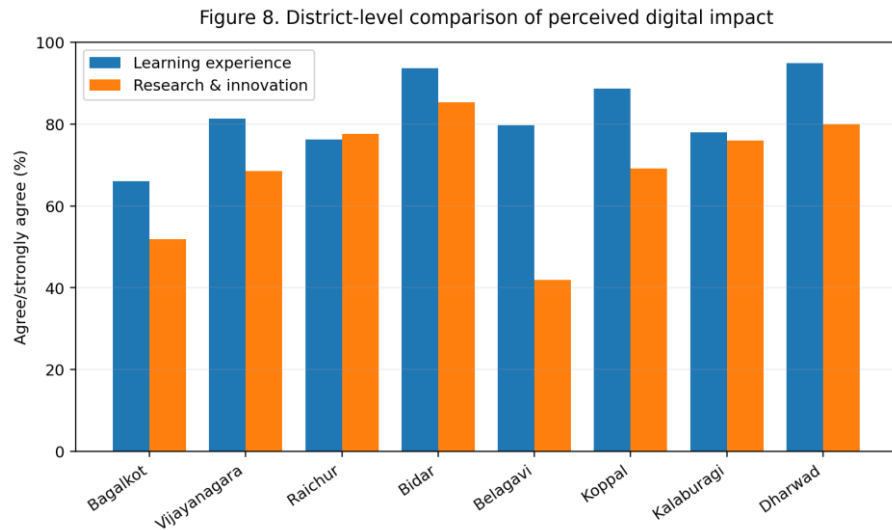


Figure 8. District-level comparison of perceived learning and research/innovation impact.

The district comparison demonstrates that digital transformation is not experienced uniformly. Differences may reflect variation in institutional infrastructure, internet



availability, digital literacy, faculty readiness and the type of institutions represented in each district. The results support a district-sensitive approach to digital policy implementation rather than assuming that the same intervention will produce identical outcomes across North Karnataka.

V. Discussion

The overall evidence indicates that Digital India initiatives have achieved substantial functional adoption in North Karnataka higher education. The high level of Digital India service usage, combined with positive perceptions of government-service accessibility and learning improvement, suggests that digital technologies have become an important component of academic and administrative life.

At the same time, the findings reveal an implementation gap. ICT-enabled classrooms are more widely reported than reliable college internet access; online research-resource usage is higher than awareness of digital libraries; and LMS adoption is not universal. These patterns indicate that digital transformation should be evaluated not simply by the presence of technology but by meaningful usage, accessibility, support and educational outcomes.

The district-level differences further demonstrate the importance of contextual factors. Institutions in different parts of North Karnataka may require different combinations of infrastructure investment, faculty development, student digital-literacy programmes and research-resource support.

VI. Conclusion

This study examined the effectiveness of Digital India initiatives in North Karnataka higher education using 884 regional responses extracted from a larger survey dataset of 3,135 records. The evidence demonstrates substantial digital adoption and generally positive perceived outcomes. 0.0% of respondents reported using Digital India services, 81.9% perceived positive regional outcomes, and 0.0% agreed that Digital India improved access to government services and information.



Within higher education, 0.0% reported that digital tools improved their learning skills, while 0.0% perceived improvements in administrative processes, 80.7% perceived improvements in learning experience and engagement, and 69.1% perceived improvements in research and innovation.

The study therefore concludes that Digital India initiatives are substantially effective in North Karnataka higher education, but their effectiveness remains uneven because of connectivity limitations, infrastructure gaps, incomplete LMS adoption, limited digital-library awareness and user difficulties. The next phase of implementation should focus on reliable high-speed connectivity, digital-resource awareness, faculty and student digital literacy, stronger LMS integration, research infrastructure and district-specific digital inclusion strategies.

Recommendations

- Strengthen high-speed internet connectivity, particularly in rural and semi-urban institutions.
- Expand institution-wide digital libraries and improve awareness of subscribed academic databases.
- Increase LMS adoption and integrate LMS platforms with teaching, assessment and academic communication.
- Conduct continuous digital-literacy and cybersecurity training for students and faculty.
- Provide targeted support for students who depend on personal mobile data for academic access.
- Strengthen digital research infrastructure, including scholarly databases, institutional repositories and research software.
- Use district-level digital-readiness assessments to design context-specific interventions.
- Evaluate digital initiatives through measurable educational and administrative outcome indicators rather than infrastructure availability alone.

Limitations

The study is based on cross-sectional survey responses and therefore measures perceived effectiveness rather than establishing causal effects. The sample is also uneven across districts, with some districts having much larger representation than



others. The results should consequently be interpreted as empirical evidence from the surveyed institutions and respondents rather than as a census of every higher education institution in North Karnataka.

Data and Reproducibility Note

All tables and graphs in this paper were generated directly from the uploaded Excel dataset. The regional filter yielded 884 North Karnataka records after district-name matching and normalization. No external observations were substituted for survey responses. Percentages are rounded to one decimal place.

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