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Original Article

Teacher Guidance and Students' Digital Learning Competence in Government Secondary Schools: Evidence from the Digital India Initiative in Kamrup Metropolitan District

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ABSTRACT

The Digital India initiative has accelerated the adoption of technology-enabled learning in Indian schools; however, the availability of digital platforms and devices does not necessarily ensure meaningful classroom integration or improved learning experiences. In government secondary schools, students' ability to use digital resources for learning may depend substantially on the guidance, pedagogical support, and digital competence of their teachers. This study examines the role of structured teacher guidance in developing students' digital learning competence within the broader context of India's digital education agenda. This report examines the critical nexus between teacher guidance and student digital learning competence within government secondary schools, with a specific focus on the Digital India initiative in Kamrup Metro, Assam. Evidence indicates that teacher digital pedagogical competence (DPC) is a significant predictor of student outcomes, accounting for approximately 58% of the variance in student digital competence [3]. In the context of the Digital India program, platforms such as DIKSHA and PM e-VIDYA have become central to secondary education, yet their effectiveness remains constrained by localized challenges [7], [11]. In Kamrup Metro and the broader Assam region, students exhibit high technological adaptability despite low-to-moderate levels of formal digital competency [5]. Approximately 72.5% of secondary students in the Kamrup district possess average digital competency, though significant disparities persist based on gender, school management, and urban-rural location [13]. Major implementation hurdles include inadequate internet connectivity, insufficient school-based ICT infrastructure, and a substantial gap in teacher training, with only 36% of teachers reporting adequate digital preparation in some rural contexts [1], [5]. To achieve the goals of the National Education Policy (NEP) 2020, this report suggests that dual-focus interventions targeting both digital infrastructure and long-term teacher pedagogical support are essential for bridging the digital divide in Northeast India [6], [15].

Keywords: Digital India, teacher guidance, student digital learning competence, digital pedagogical competence, digital classrooms, government secondary schools, DIKSHA, Assam, Kamrup Metro, digital divide

INTRODUCTION

The Digital India Initiative, launched by the Government of India, aims to transform the country into a digitally empowered society and knowledge economy. Within the educational sector, this transformation is guided by the National Education Policy (NEP) 2020, which emphasizes the integration of technology to improve access, equity, and quality of learning [12], [15]. Central to this strategy are platforms like the Digital Infrastructure for Knowledge Sharing (DIKSHA) and PM e-VIDYA, which provide multimodal access to education and teacher coaching resources [11], [14].

In the state of Assam, and specifically the Kamrup Metropolitan district, the implementation of these initiatives faces unique geographic and socioeconomic conditions. While urban centers like Guwahati provide better access to technology, government secondary schools often struggle with the "digital divide"—the gap between those with access to modern ICT and those without [19], [20]. Evidence suggests that simply providing hardware is insufficient; the role of the teacher as a guide is paramount in translating digital access into digital competence for students [3], [23]. This report analyzes how teacher guidance, supported by Digital India frameworks,

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influences the digital learning competence of students in Kamrup Metro's government secondary schools.

Review of Related Literature:

Teacher Digital Pedagogical Competence (DPC) and Student Outcomes

The literature emphasizes that teacher support is a direct and positive driver of student engagement. Shao et al. (2025), in "Teacher Support and Secondary School Students' Learning Engagement: A Moderated Mediation Model," highlight the roles of academic self-efficacy and psychological resilience in this relationship. Zairjanovich and Taryanikova (2026), in "Teacher Digital Pedagogical Competence as a Predictor of Students' Digital Competence in Mobile Learning Environments," similarly identify teacher digital pedagogical competence as an important predictor of students' digital competence. Together, these studies suggest that teacher guidance is both a pedagogical and motivational process.

Carvajal Morales et al. (2026), in "The Pedagogical Transfer Chain in the DigCompEdu Framework from a Teacher-Reported Perspective: A Predictive Analysis Using PLS-SEM and ANN," extend this discussion by examining how teacher-reported competence is transferred into student empowerment. Sarkar and Singh (2026), in "Exploring the Role of ICT in Enhancing 21st-Century Skills among Adolescents," argue that ICT can support 21st-century skills but that inadequate technological pedagogical content knowledge may restrict outcomes to basic technology use. This body of research supports examining guidance through scaffolding, inquiry, feedback, assessment, and digital citizenship rather than through device access alone.

Digital India and National Platforms

Zadkhande and Chaudhari (2026), in "Exploring the Impact of Digital India Initiatives on Secondary School Education: A Systematic Literature Review," frame digital initiatives as multidimensional reforms concerned with access, implementation, and educational quality. Raza (2026), in "DIKSHA as AI-Enabled Digital Public Infrastructure: Transforming Secondary Pedagogy in India," describes DIKSHA as a digital public infrastructure intended to support secondary pedagogy. Mandala et al. (2026), in "Digital Learning Platform Adoption, Learner Engagement, and Achievement in Indian Secondary Schools," connect platform adoption with questions of engagement and achievement. Taken together, these studies indicate that platforms become educationally meaningful only when teachers help students interpret, apply, and evaluate digital resources.

Chuttar and Rathod (2026), in "Reframing Indian Education: Digital Learning and Critical Thinking Post-NCF 2023," argue that digital learning should support critical thinking rather than merely increase technology exposure. Avtar (2026), in "Digital Education Under NEP 2020: Implementation Challenges and Policy Recommendations," similarly emphasizes the implementation challenges that can weaken policy outcomes. This literature therefore supports a teacher-guidance perspective in which DIKSHA, PM e-VIDYA, and related platforms are treated as resources that require instructional mediation, inclusive design, and sustained professional development.

Regional Evidence: Assam and Northeast India

Medhi and Baruah (2026), in "Bytes and barriers: Understanding digital divide in Kamrup metropolitan and Morigaon districts of Assam, India," identify the digital divide as a local interaction among infrastructure, connectivity, and social conditions. Pathak et al. (2026), in "A Study Of Digital Literacy And Online Learning Among Teachers And Students In Assamese Secondary Level Schools With Particular Reference To Kamrup Metro District," report low-to-moderate digital competency among teachers and students in Assamese secondary schools. These studies provide important regional context, but their findings should be treated as published evidence rather than as new data collected for the present manuscript.

Kalita and Baishya (2025), in "Technology-Mediated Learning and the Digital Divide: Challenges Faced by Scheduled Tribe Students in Higher Education in India," highlight language and cultural barriers that can limit inclusive technology-mediated learning. Although the population differs from government secondary-school students, the study signals the need to examine language-friendly resources and culturally responsive guidance in Assam. Garg et al. (2020), in "Effect of COVID-19 on School Education System: Challenges and Opportunities to Adopt Online Teaching and Learning," and Joshi (2024), in "Impact of Online Learning Platforms on Student Engagement in India," further show why access, engagement, and pedagogical support must be considered together.

Research Question

How does teacher guidance and digital pedagogical competence influence the digital learning competence of students in government secondary schools of Kamrup Metro under the Digital India Initiative?

Research Objectives

1. To examine the relationship between teacher digital pedagogical competence and students' digital learning outcomes in government schools.
2. To assess the current status of student digital competence in the Kamrup Metropolitan district.
3. To identify the infrastructural and pedagogical barriers hindering the effective implementation of Digital India initiatives (DIKSHA, PM e-VIDYA) in the region.
4. To evaluate the role of teacher training and guidance in bridging the digital divide among secondary school students in Assam.

METHODOLOGY:

This report is based on a systematic evidence review of 220 papers concerning teacher digital learning in India and 74 papers specifically focused on digital education evidence in Assam and Northeast India. The research utilized a "desk methodology" or secondary data collection approach, gathering insights from peer-reviewed journals, conference papers, and government reports indexed in databases like Google Scholar [22].

The analysis focused on:

Quantitative Metrics: Beta coefficients, regression values (R^2), and chi-square results related to teacher-student competence links.

Thematic Synthesis: Categorization of barriers (infrastructural, socioeconomic, and pedagogical) identified in regional studies of Kamrup Metro and Assam.

Instrument Analysis: Review of frameworks such as DigCompEdu and SELFIE used in literature to measure digital competency [2], [9].

No primary fieldwork or original participant datasets from Kamrup Metro were utilized; findings for the district are derived from existing literature, notably Pathak et al. (2026) and Neog et al. (2024) [5], [13].

Analysis and Interpretation:

The Predictive Power of Teacher Guidance

The analysis reveals that teacher guidance is not merely supplementary but central to digital learning. Evidence indicates that digital access and literacy are strong predictors of academic digital usage ($R^2 = 0.502$), with literacy being the more potent factor [6]. When teachers integrate ICT through inquiry-based and constructivist pedagogies, they significantly enhance higher-order cognitive development and collaboration among adolescents [17]. Conversely, inadequate teacher TPACK limits these transformative outcomes, often resulting in digital tools being used for basic tasks rather than deep learning [17].

Status of Digital Competence in Kamrup Metro

In Kamrup Metro, there is a marked contrast between technological adaptability and formal competence. Students often show greater adaptability than their teachers, yet their formal competency remains "low to moderate" [5]. The reported 72.5% average digital competency among Kamrup students suggests a baseline readiness, but the "digital disparity" remains high [13]. Gendered restrictions and socioeconomic status further exacerbate this, as students from higher-SES backgrounds and males often report greater access and literacy [1].

Implementation Barriers

The evidence points to a multi-layered set of barriers in Assam:

1. **Infrastructure:** Only 18% of schools in some rural contexts reported reliable connectivity, and computer access at home remains as low as 20% [1]. Network connectivity issues are prevalent even in semi-urban areas of Assam [9].
2. **Training Gap:** A critical shortage of teacher preparation exists, with some studies showing only 36% of teachers have received formal digital training [1].
3. **Language and Accessibility:** The lack of digital learning materials in the Assamese language and the absence of language-friendly platforms hinder Scheduled Tribe students and those in provincialized schools [8], [18].

CONCLUSION

The Digital India Initiative has laid the groundwork for a technological revolution in Indian secondary

education, but its success in Kamrup Metro is heavily dependent on the "teacher factor." Teacher digital pedagogical competence accounts for the majority of student digital learning gains, yet a significant training-infrastructure gap persists in government schools. While students in Kamrup Metro demonstrate significant technological adaptability, their digital competence is limited by inadequate school infrastructure and a lack of structured teacher guidance. The transition from "offline realities" to an "online era" requires more than just digital access; it necessitates a pedagogical shift where teachers are empowered to facilitate digital citizenship, inquiry-based reasoning, and inclusive learning.

SUGGESTIONS:

1. **Universal Infrastructure Expansion:** Prioritize the expansion of stable internet and power facilities in government secondary schools, particularly in the riverine and remote areas of Kamrup Metro [12], [26].
2. **Continuous Professional Development:** Implement long-term, interactive teacher support programs (similar to the nTERA model) that focus on digital pedagogy and TPACK rather than basic ICT literacy [11], [13].
3. **Localized Digital Content:** Develop and disseminate quality e-content in the Assamese language through platforms like DIKSHA to bridge the linguistic and cultural divide [8], [26].
4. **Equity-Focused Interventions:** Launch targeted digital literacy programs for female students and those from lower socio-economic backgrounds to address the persistent digital divide [1], [24].
5. **Strengthening Formative Assessment:** Leverage AI-enabled features on national platforms to provide teachers with better tools for monitoring student progress and digital self-efficacy [11], [14].

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