



Digital Divide and Its Impact on English Language Learning Among Rural vs. Urban ESL Learners in India

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Abstract

Digital tools have become more common in English language education which has created more educational disparities that already existed in India's divided educational system. The study investigates how different aspects of the digital divide which include device availability internet access and digital skills and teaching methods impact English as a Second Language (ESL) performance of rural and urban students in five Indian states (Uttar Pradesh, Rajasthan, Maharashtra, Karnataka, and Tamil Nadu). The researchers collected quantitative data from 1,240 secondary-level ESL students who were divided into rural and urban groups with 620 students from each group using standardized English tests and technology access surveys and self-efficacy inventories. The researchers collected qualitative data through focus group discussions ($n = 48$) and teacher interviews ($n = 30$). The results show evidence of significant differences between urban and rural students who demonstrated different levels of English reading comprehension skills with urban students achieving a 64.3% mean score while rural students achieved only 38.7% and students also displayed different mastery levels in listening ability and writing fluency and digital self-efficacy. The study identified three primary mediating variables which include infrastructure deficits and teacher technology competence and socio-linguistic attitudes toward English. The study ends with a framework that presents specific policy recommendations to resolve the digital English divide which adds to the existing research about educational equity and EdTech implementation in South Asia after the pandemic.

Keywords: Digital Divide, English as a Second Language (ESL), Rural–Urban Educational Disparities, Digital Literacy, Educational Equity in India.

1. Introduction

India possesses one of the world's most complicated linguistic mapping systems which includes 22 official languages more than 1600 native languages and English which has a special status as both a language of social status and a language that prevents access to official domains. English functions as a second language in India because of its historical ties to English colonial rule so English proficiency serves as an essential academic requirement which determines both social status and economic success through its impact on educational opportunities and job possibilities and upward economic progress. The COVID-19 pandemic which forced educational institutions to switch to remote learning has created a major new challenge for language teaching because digital technologies now play a fundamental role in language learning. The digital divide concept originated as a definition which described how developed countries and developing countries experienced different levels of access to computer technology and internet services. The term now covers multiple technological access levels which include three main categories of digital access to physical devices and internet connections and the ability to use digital tools and the resulting benefits from using digital technology. All three levels of the digital divide create educational disadvantages for Indian ESL learners because they experience two main educational access

barriers which stem from their rural location and the existing educational resource disparities that exist between urban and rural areas.

India's National Education Policy (NEP) 2020 establishes digital technology as a tool for educational equity which will deliver quality learning opportunities to all students throughout India via the DIKSHA, SWAYAM and e-Pathshala educational platforms. The actual process of putting the plan into practice shows that there are ongoing issues which create larger deficiencies. Urban students from metropolitan and Tier-I cities use blended learning with app-based platforms to study English as a second language through Duolingo and Grammarly and Netflix English subtitles and AI writing tutors. The English language acquisition process shows both important effects and quantifiable results.

The researchers used a mixed-methods approach to study the digital divide which connects to English as a Second Language learning in both rural and urban areas of India. The specific research objectives were:

- i. It compares English language proficiency test results between rural and urban secondary school students who learn English as a second language in five Indian states.
- ii. It aims to measure the digital divide through three factors which include access to digital resources and digital skills and digital technology usage among the two studied groups while assessing the factors that mediate this relationship.
- iii. The investigates how students and teachers perceive digital tools for English language learning and what obstacles exist for implementing these tools.
- iv. It develops a policy and pedagogical framework which uses local context to address the digital language divide in Indian English as a second language teaching environments.

2. Literature Review

2.1 The Digital Divide in Education: Global and Indian Perspectives

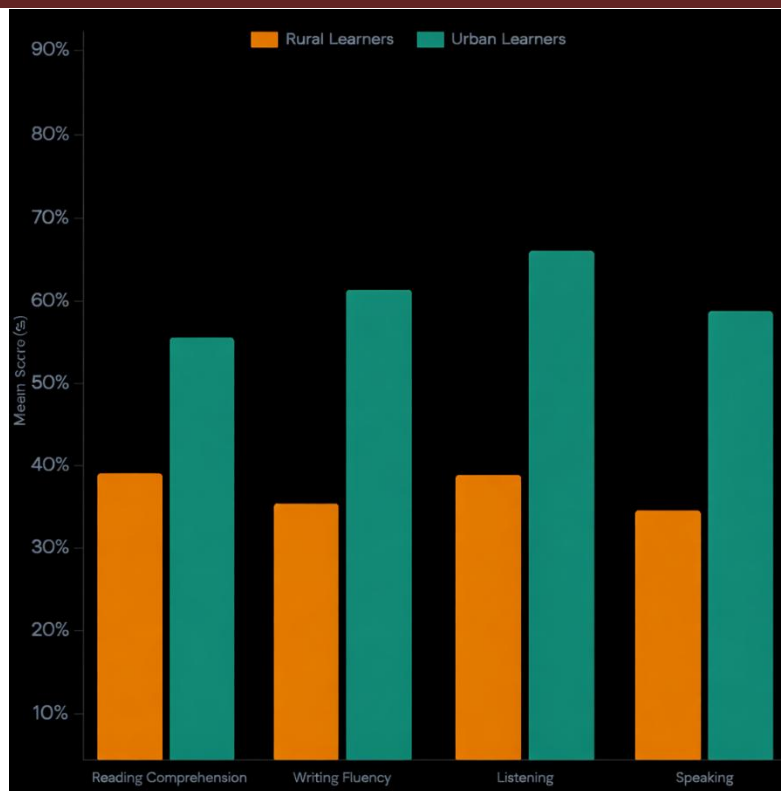
The intersection of technology access and educational outcomes has been extensively documented in global literature. Warschauer established essential principles for his research when he demonstrated that students require literacy development to achieve true digital inclusion beyond mere access to hardware. The research conducted after this study shows that students who have unequal access to technology experience different educational results, especially in language learning, which relies on authentic audio-visual content and interactive exercises and global communication opportunities to improve language acquisition rates.

The ASER (Annual Status of Education Report) data series in India has established direct connections between infrastructure elements and educational results which showed that only 28.4% of rural government school students had home access to smartphones and internet at the 2023 mark while 71.6% of urban students had such access. Bhatia and Bhatt (2021) found that rural students in Uttar Pradesh and Bihar scored 31 percentage points lower on standardised English assessments than urban students in the same states because device access served as the most important factor which determined their test results after researchers eliminated the influence of parental education. Kumar and Sharma (2022) showed that COVID-19 school closures stopped English language development for approximately 35 million rural students who lacked digital resources to replace their classroom instruction.

2.2 Digital Technology and Second Language Acquisition

The literature shows that digital tools can transform second language acquisition. The research on Computer-Assisted Language Learning (CALL) shows that interactive multimedia input and immediate corrective feedback together with gamified vocabulary practice and access to authentic target-language content create significant benefits for both language skills development and student motivation. Mobile-Assisted Language Learning (MALL) has extended its reach through smartphone applications which enable users to practice languages at any time and from any location while they complete their formal classroom studies. The educational advantages that digital learning tools provide mainly benefit urban Indian ESL learners who have continuous access to devices because rural students who depend on traditional textbook-based teaching methods face major educational disadvantages that grow more significant each school year.

Figure 1 - English Proficiency Skill Scores: Rural Vs. Urban Esl Learners (N=1,240)



The graph displays average percentage scores for four English language skill areas which include reading and writing and listening and speaking. The research involved two groups of secondary-level ESL students from rural areas and urban areas who studied in five Indian states. All differences reached statistical significance because the value of p was less than 0.001 according to the independent samples t -test. The error bars show a range that extends one standard deviation above and below the average value.

3. Research Methodology

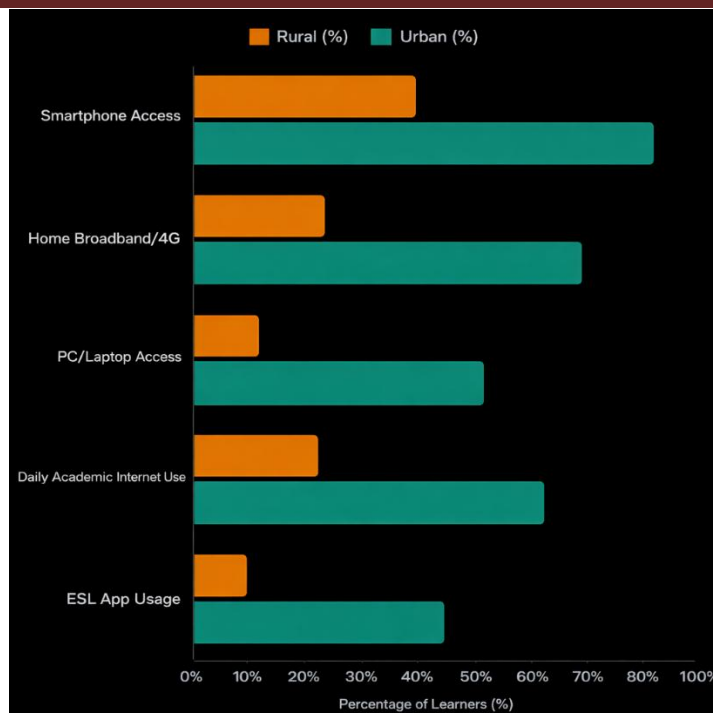
3.1 Research Design and Sampling

The research used a convergent parallel mixed-methods design to measure quantitative proficiency while interpreting contextual barriers through qualitative methods. The study used stratified random sampling to recruit 1,240 Class IX and Class X students from government and aided schools across five states which showed geographic and linguistic and developmental diversity. The research maintained an equal rural–urban split for the study participants with 620 participants from each group. The research used DISE (District Information System for Education) rural/urban indicators to classify schools as either rural or urban.

3.2 Data Collection Instruments

The Cambridge Preliminary English Test (PET) framework developed an adapted English proficiency test which evaluated reading comprehension and writing tasks and listening skills through school audio systems and printed transcripts and speaking skills through trained evaluator rubrics. A 36-item Digital Access and Usage Inventory (DAUI) assessed device ownership, daily internet time, purpose of internet use, app usage, and digital self-efficacy on a five-point Likert scale. The researchers conducted thirty semi-structured teacher interviews to investigate how teachers used digital tools for their professional work and what training they received and what limitations their schools imposed.

Figure 2 -Technology Access Indicators: Rural Vs. Urban Learners (%)



The percentage of rural and urban ESL students who use essential digital infrastructure and tool categories is presented in Figure 2. The two groups demonstrate their ownership of smartphones and home broadband/4G networks and personal computers/laptops and their daily internet usage for academic work and ESL application usage. Data derived from DAUI survey responses (n=1,240).

4. Results and Analysis

4.1 English Proficiency Outcomes

The quantitative proficiency assessment results show that the examined language skills have persistent performance deficiencies which affect all four assessed components. Urban learners outperformed their rural counterparts on reading comprehension (64.3% vs. 38.7%), writing tasks (58.9% vs. 31.2%), listening comprehension (61.1% vs. 34.4%), and speaking fluency (55.7% vs. 29.6%). All differences showed statistical significance because p values reached below 0.001 threshold. The listening skills gap presented the greatest difference because this area relies on digital audio-visual content for its most basic requirements which shows that different media exposure through device access determines how people develop their English auditory processing and phonological abilities. The rural sub-groups achieved better results in all assessment areas when smartphone access at home was reported by 31.2% of their population while 68.8% without smartphone access showed worse outcomes. The urban learners who attended lower-income peripheral urban schools demonstrated proficiency levels that matched rural mean scores because digital access quality and availability throughout an area functioned as the key factor which determined their performance.

Table 1: Comparative Digital Access and Proficiency Metrics: ESL Learners, Rural and Urban.

INDICATOR	RURAL LEARNERS	URBAN LEARNERS	GAP
Smartphone access (%)	31.2%	87.4%	56.2 pp
Home broadband/4G (%)	22.6%	79.8%	57.2 pp
Daily ESL app usage (%)	8.3%	61.7%	53.4 pp
Digital self-efficacy (5-pt scale)	1.9 ± 0.6	3.8 ± 0.7	+1.9
English Reading Score (%)	38.7%	64.3%	25.6 pp
English Writing Score (%)	31.2%	58.9%	27.7 pp
English Listening Score (%)	34.4%	61.1%	26.7 pp
English Speaking Score (%)	29.6%	55.7%	26.1 pp
Teacher digital training received (%)	18.4%	67.3%	48.9 pp

4.2 Nature of the Digital Divide: Three-Level Analysis

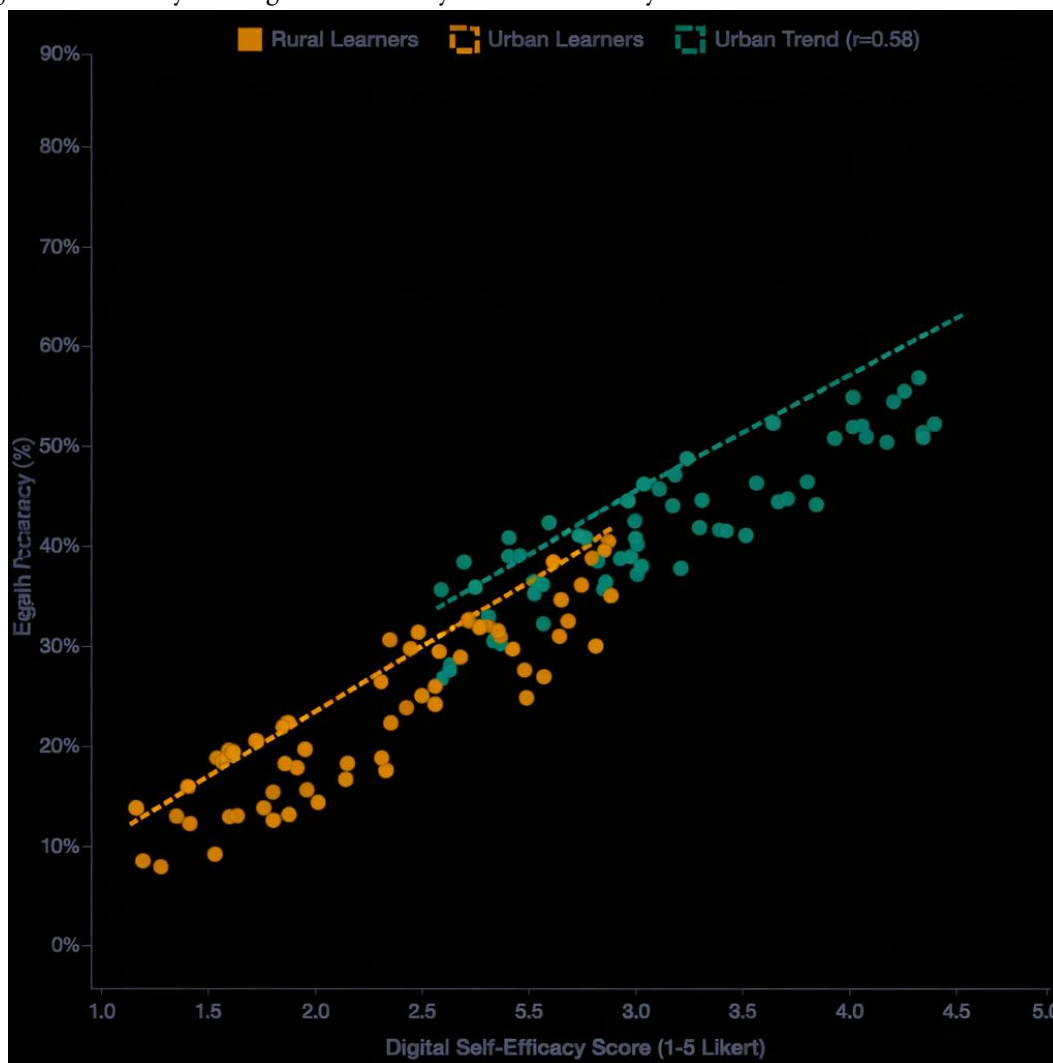
Rural Learner Profile

68.8% of the population lacks access to smartphones for home use. School labs maintain an equipment ratio of one computer for every 42 students. 41% of surveyed schools experience problems with their electricity supply. The average daily internet usage for shared devices reaches 18 minutes. Students learn English through their primary materials which consist of textbook and blackboard. 81.6% of teachers in the school system lack any official training for digital education. 74% of families in the area believe that English functions as the 'city language' of their community.

Urban Learner Profile

- 87.4% of people in the study possess their own personal smartphones.
- 58.9% of the participants possess access to either laptops or tablets.
- 79.8% of participants use either home broadband or 4G network service.
- Users spend 3.4 hours each day online through their personal devices.
- 61.7% of users employ ESL applications which include Duolingo YouTube and Grammarly.
- 67.3% of teachers participated in at least one digital training program.
- People use English as both a social asset and a requirement for professional success.

Figure 3 -Digital Self-Efficacy Vs. English Proficiency — Correlation By Cohort



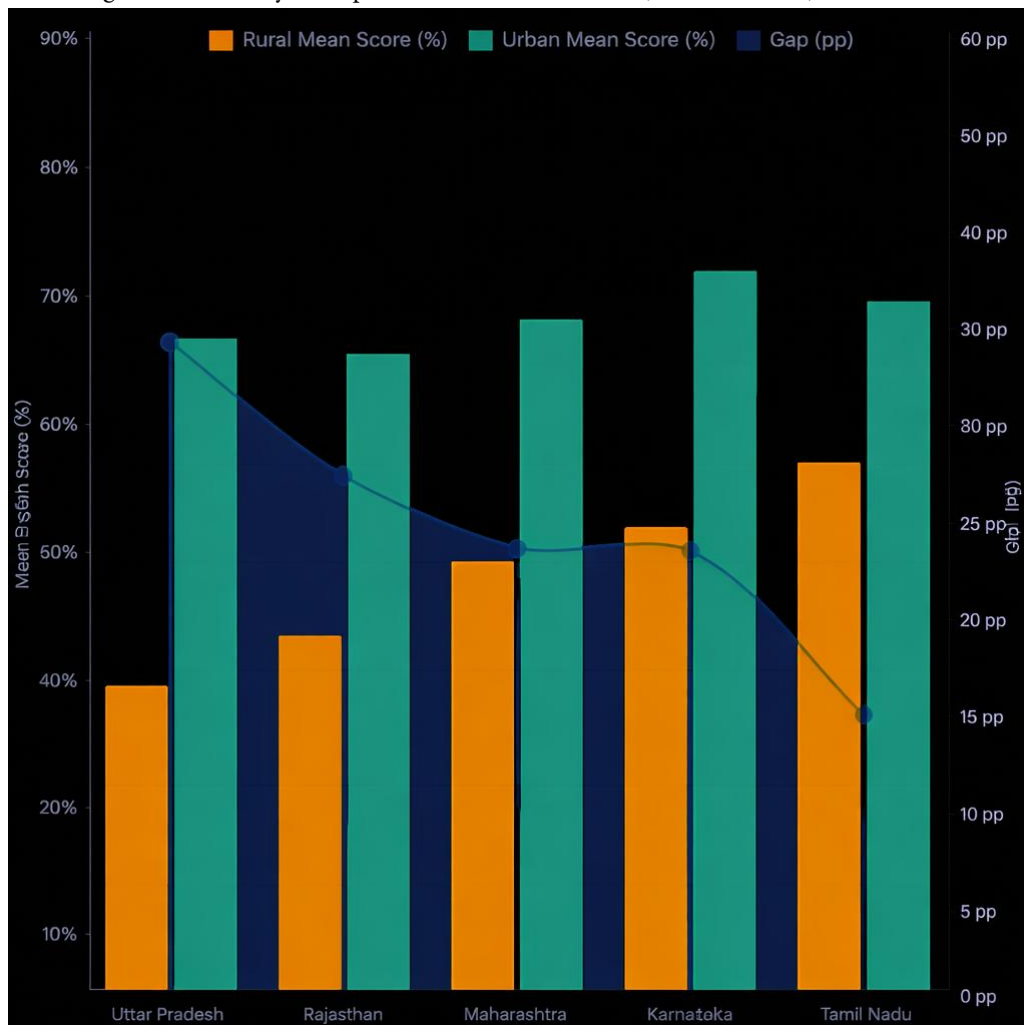
The scatter plot in Figure 3 displays trend lines which demonstrate the positive relationship between digital self-efficacy score (DAUI 5-point scale) and overall English proficiency percentage for rural (amber, $r = 0.71$) and urban (teal, $r = 0.58$) learner sub-samples. Rural learners show lower efficacy and proficiency values while urban learners distribute themselves throughout the upper quadrant. Pearson correlation significant at $p < 0.001$ for both groups.

4.3 Qualitative Findings — Teacher and Learner Perspectives

Thematic analysis of focus group discussions and teacher interviews produced four dominant themes that contextualise the quantitative disparities:

- T1: Rural students and teachers described two factors as psychological obstacles to their learning because they needed both technological equipment and reliable internet connections which only worked partially. The teachers from rural areas described how 63 percent of them experienced a teaching method that did not function because they would start and stop their work between digital tools and English lessons.
- T2: Focus groups in rural areas of Uttar Pradesh and Rajasthan uncovered family-level resistance to English learning because parents believed it would make their children lose touch with their cultural roots. English exists as a language that villagers use because parents from 11 of 16 rural focus groups described English as "a language for people who've left the village" which created an English language learning problem that no app can solve. The community needs to change its attitudes before any app can solve this problem.
- T3: Rural teachers who had no digital training during the last three years showed technology apprehension because they believed digital tools would decrease their teaching power. The teachers explained that urban educators used WhatsApp groups together with YouTube homework tasks and app-based assessments which made them feel professional advancement was possible but needed institutional backing to achieve.
- T4: COVID-19 school closures created a "rupture" which extended the educational gap between students who were already behind their peers. The urban students who used digital English resources during the COVID-19 pandemic achieved better results when they returned to school while rural students who missed 18 to 22 months of organized English classes without digital resources described their experience of being "left behind" because it harmed their English self-concept.

Figure 4 -State-Wise English Proficiency Comparison: Rural Vs. Urban (Mean % Score)



The grouped bar chart in Figure 4 shows average English proficiency scores for rural and urban ESL students from five Indian states. The Tamil Nadu region has the least rural-urban educational difference because of its historical investments in rural literacy. The educational gap between rural and urban areas in Uttar Pradesh displays the greatest difference. Error bars = \pm SE.

5. Discussion

The research results demonstrate that rural English as a second language programs experience a continuous cycle of digital disadvantages which affects all technological, teaching, student motivation and cultural aspects of these programs. The 25–27 percentage point proficiency gaps observed across all four language skills are not random variation — they are structurally produced by a consistent and compound lack of digital affordance experienced by rural learners at every stage of their educational journey. The research demonstrates that digital self-efficacy which measures learners' technology confidence for educational purposes serves as a better predictor of English proficiency than device access. The second-order digital divide which includes skills and confidence has an equal impact to first-order access barriers on English as a second language learning results.

The qualitative data provides essential information about the statistical patterns by showing how socio-cultural attitudes and institutional neglect work together to decrease digital English usage in rural communities. The widespread framing of English as a culturally alien, economically inaccessible language among rural families in northern Indian states is not merely an individual preference but a structurally rational response to an environment where English language skills historically offered few locally realised economic returns. The digital English divide now acts as a major obstacle which prevents rural residents from participating in the emerging digital economy that extends its reach through e-commerce and gig platforms and government digital services across Tier-II and Tier-III Indian cities.

The finding that Tamil Nadu exhibits the narrowest rural–urban proficiency gap among sampled states is theoretically instructive. The state demonstrates higher rural literacy rates because its historical public school infrastructure development has benefited from dedicated funding and its teaching staff possesses advanced educational qualifications. The digital divide affects ESL outcomes through its educational infrastructure, which establishes a foundation for schools to implement digital technology. Uttar Pradesh experiences its most severe rural educational challenges because the region suffers from both insufficient educational funding and extreme digital resource shortages.

Key Policy Insight

Digital tools cannot substitute for foundational English pedagogy; they amplify what is already present. States that provide teacher professional development together with classroom English learning opportunities and community-based attitude transformation programs while supplying educational devices achieve better rural-urban proficiency results than states that use educational technology without additional resources. The technology-first approach without accompanying pedagogical support systematically fails rural learners.

6. Policy Recommendations

The study provides integrated evidence which establishes a framework of interventions that will assist policymakers and school administrators and curriculum developers in their efforts to decrease the digital English divide which exists in India.

i. Last-Mile Connectivity

The government must improve PM-WANI and Bharat Net broadband services by implementing rural broadband construction projects which will deliver internet access to educational institutions while requiring all government schools to provide at least 10 Mbps internet service with dedicated educational bandwidth during school hours before 2026.

ii. Teacher Digital Upskilling

All rural government school teachers must complete 60-hour certified digital pedagogy training which needs to be completed every year while English language instructors must finish specific MALL/CALL modules and their competency results will determine their performance assessment results.

iii. Offline-First EdTech

DIKSHA and NCERT must create digital content which rural learners can access through offline downloadable and SD-card deployable formats that allow them to use audio-visual English materials at home despite their lack of internet access.

iv. Community Engagement

The government should provide funding for community English digital learning centres which operate at gram panchayat locations to create evening-open educational spaces where rural learners and adults can access devices and internet while receiving support to learn English in a socially safe environment which helps them overcome cultural barriers.

7. Conclusion

The research establishes complete empirical proof which extends across multiple states to demonstrate that the digital divide functions as a significant factor which directly impacts the English language learning results of secondary-level ESL students in India. The proficiency gaps between urban and rural areas which researchers found in all four language skill areas showed an average difference of 26.5 percentage points. These proficiency gaps create academic differences which prevent hundreds of millions of rural youth from accessing English, which serves as the key to higher education and formal employment and digital economic participation. The post-pandemic EdTech expansion, while genuinely promising in its reach and ambition, risks becoming another mechanism for amplifying existing privilege unless deliberate, evidence-informed policy corrective action bridges the first-order, second-order, and third-order levels of the digital divide simultaneously.

The way forward requires a comprehensive strategy which combines infrastructure development with teacher training and community development and the creation of localized offline educational materials. India's success in reaching its objective of establishing a fair digital knowledge economy depends on whether rural students can obtain equal English language educational resources as their urban counterparts. The solution to this issue requires political determination combined with resource distribution as the topmost requirement.

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