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# The Use of AI in English Language Teaching: Challenges in Rural India

**Anita Tukaram Rodage[1], Dr. Namdkumar Shinde[2]**

[1]Research Scholar, School of Humanities, MIT-ADT University, Pune

[2]Head, Department of English, School of Humanities, MIT-ADT University, Pune

*Corresponding author email:* anita.rodage@mituniversity.edu.in

*Email (Co-author):* nandkumar.shinde@mituniversity.edu.in

***Abstract***

*The use of Artificial Intelligence (AI) in English Language Teaching (ELT) is a potential new development in education globally. In India, although urban schools have slowly begun to adopt AI powered tools for language learning, many objects and issues are still serious barriers to implementation in the rural area. This research work studies barriers to the adoption of AI for ELT in rural India. Barriers include digital infrastructure gaps, internet accessibility, teacher training, digital literacy and social and economic issues. Combining secondary data and case study evidence, this research work shows the gaps between urban and rural education environments and systemic issues creating the digital divide. The research identifies many cultural and linguistic mismatches between the AI tools and local context, arguing for the inclusion of contextual research into affordable AI solutions. The findings suggest ways to begin to articulate the on-going debate on equitable access to quality English education in India, providing next research on pathways for education authorities, educators and AI developers.*

***Keywords:*** *Artificial Intelligence (AI), English Language Teaching (ELT), Rural Education, Digital Divide, Language Learning Technology*

## Introduction

### *English Language Teaching in India: A Brief Overview*

As an international language and a tool for enhancing social and economic mobilization, English is exceptionally prized in the Indian education system. There are many elements of English Language Teaching (ELT) in corporate school curricula right across an extensive nation.

Nevertheless, there are major discrepancies between urban and rural areas in both the effectiveness as well as the standard of English teaching.

Urban students often have better access to well-educated teachers, resources for education, and English-rich environments. By contrast, rural India still faces challenges associated with a lack of qualified teachers, limited funding, and few chances for English language engagement. Such differences have effects not only on language proficiency but also on broader learning outcomes and chances of employment.

***Rise of AI in Education***

Artificial intelligence (AI) is disrupting education and improving the education sector by automating testing, giving learners immediate feedback, and personalising learning. Research has shown that artificial intelligence (AI)-tools such as chatbots, speech recognition tools, grammar correction apps, adaptive learning platforms, and virtual assistants have tremendous potential in English Language Teaching (ELT) and improving language acquisition in these fields. AI resources can create simulated interactive environments providing individual help to address the many needs of learners. World-wide, AI is being employed to help learners catch up, especially where it is not feasible to have sufficient human resources. A large AI push is underway; in India, this is augmented by efforts from both public and private sector partners responsible for helping to digitally transform India.

***Importance of Studying Rural Contexts***

Despite the promising applications of AI in education, there is still a significant imbalance in application. A considerable portion of the population in India inhabits rural areas, many of which still struggle with basic forms of digital infrastructure like electricity, internet connectivity, and access to smart devices. Furthermore, a significant number of educators, and their learners from rural areas, do not have the capacity to use AI tools because they lack the old-fashioned form of digital literacy. Severity is then added by the linguistic and cultural diversity that complicates adoption of standardized AI solutions. Ultimately, it is important to assess how to achieve access, inclusivity and relevance of technology-based innovations like Artificial Intelligence (AI) - especially since rural learners often represent the most underserved cohort of learners in education. To be able to ensure that AI-based education neither accentuates existing inequalities, but rather acts as a positive force to bridge any gaps that do exist, it is important to understand the particularities that rural is faced with above and beyond those already evident.

***Objectives of the Paper***

This research paper aims to:

1. Examine the current status of English language teaching in rural India.
2. Explore the role and potential of artificial intelligence in enhancing ELT outcomes.

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3. Identify the key challenges and barriers to implementing AI-based ELT in rural areas.
4. Suggest practical recommendations to make AI-based language learning more inclusive and effective in rural Indian contexts.

## 2. Understanding AI in ELT

### *What is AI in the Context of ELT*

Artificial Intelligence (AI) refers to the replication of human intelligence processes in machines. In the case of ELT, AI means being able to adopt intelligent technologies to support and facilitate the language learning and teaching process. AI tools in ELT allow learners to engage with technology that simulates a human tutor, by analyzing what students input, giving feedback, identifying things to improve, and changing a learning path. AI has the distinct advantage of immediate response time to student input and thus real time adaptability, scope and scalability, as compared to traditional teaching methods.

AI based ELT will assess the proficiency of a learner, the learners learning styles, and then respond with guided activities or explanations tailored to the learners needs. All of the AI-based systems will be dependent on all information being collected in a database, identifying patterns based on historical norms and learning and adapting them by using natural language processing (NLP), integrating language in ways that are interactive and adaptable. If there are no trained teachers available in rural or low resource environments, AI can help replicate the role of a teacher with consistency and access to learning support services.

### *Examples of AI Tools in ELT*

There are several types of AI tools currently used for English language learning and teaching around the world:

- Chatbots and Virtual Tutors: AI chatbots are conversational agents that provide students with opportunities for real-time conversation with a companion learner. The chatbot often provides a risk-free environment for students to practice speaking and listening (for example, Duolingo's chatbot or Google Assistant based learning prompts, etc.).
- Speech Recognition Systems: Programs or applications such as Google's Read Along or Microsoft's Immersive Reader use speech recognition. These applications assist students with pronunciation, which also aids fluency and reading skills with instant corrections and feedback in an engaging way.
- Adaptive Learning Platforms: Artificial intelligence powered learning platforms (i.e. Squirrel AI, Carnegie Learning, etc.) that are based on learning data are emerging and adjusting the modalities for delivery of content based upon the desired user dependency on their strengths and weaknesses of the user. The platforms are capable of providing customized exercises,

assessments, feedback, and ultimately, next steps for the user maintaining individualized learning and progress.

- Grammar and Writing Assistants: AI systems such as Grammarly, Write & Improve by Cambridge or QuillBot can detect grammar errors, enhance word choice vocabulary, and even better the structure of sentences. All of these systems allow the learner to develop and finesse their writing proficiency.
- Automated Assessment Tools: These AI uses for education can assess essays, determine speaking proficiency of students and give analytic feedback on student performance which will take up time of the teacher and to provide reliability with evaluation.

### *Global Trends in AI-Based ELT*

AI is progressively being integrated and embraced on an international level in ELT, particularly in countries that plan to engage with ed-tech solutions in response to teacher shortages and efforts to improve overall language proficiency. The countries that lead the field in terms of long-term implementation of AI-powered platforms for comprehensive language training are the US, China, and South Korea; indeed, the field is growing in Europe and there are AI-enabled language assistants used in educational institutions (both public and private) throughout Europe (and other countries), however, millions of learners are receiving AI-powered English instruction in China through Liulishuo. Organizational interest at the international level by bodies such as OECD and UNESCO is exploring how AI can help address equitable access to education. In terms of its potential across multiple territories, AI has proven to be effective in advancing self-paced, learn anytime/anywhere models for students, developing approaches to assist students with disabilities, and delivering individualized learning experiences within multilingual contexts. Nonetheless, the digital divide remains a considerable challenge. Whether you are in an urban setting to benefit from the availability of those improvements, in rural areas and underserved groups still often don't have the infrastructure to access, for example, AI tools. Therefore, the challenge and need, is not only to build advanced AI tools, but also to ensure accessibility, affordability, and utility for varied learner groups, particularly in developing countries such as India

## 3. Current Status of ELT in Rural India

### *Educational Landscape in Rural India*

Rural India comprises a large section of the nation's student population but has persistent problems with providing quality education. The difference between the educational systems in rural and urban areas is especially glaring in the area of English. While most states have English as a subject at the primary level, the quality of instruction and learning outcomes in rural areas remain inadequate due to systemic limitations. Rural schools in India face long-standing problems of inadequate resources, unqualified teachers, and out-dated pedagogical practices; these limitations severely impact the efficacy of English Language Teaching (ELT).

**Shortage of Trained English Teachers**

The main issue in rural ELT is the lack of trained teachers. Many rural teachers, often at the primary and middle school levels, have challenges with their own fluency and willingness to use English. Teacher training programs are often lacking or outdated and with little emphasis on new methodologies or digital literacy. As a result, learners then have poor instruction in English, leading to little proficiency in English and lower desire to learn the language.

***Inadequate Infrastructure and Learning Materials***

Rural schools often have minimal facilities such as libraries, language labs and digital technologies. Even if devices, such as computers and projectors, are accessible, they may only be used occasionally when teachers receive formal training and are regularly maintained. Schools might not have access to updated English textbooks, graded readers, or other interactive materials. Because of this, students engage in rote learning and translating from their language, rather than developing speaking skills and comprehension.

***Socio-Economic and Linguistic Barriers***

Students from rural areas in India are often from economically stressed households which limits their access to private tuition, or hinder their access to digital learning tools. In multilingual states the medium of instruction may not even be the child's first language. Privileged students view English as language; wealthy students view it as more of a subject, a confidence-inducing class detached from their everyday use of the language. This distance limits motivation and confidence in learning English for rural students.

***Limited Exposure to English Outside the Classroom***

Compared to urban students, rural students access to English in their everyday lives is very limited. For the most part English is not used at home, and neither in the markets nor in the community where English is often reserved for the school context. Learners generally do not have opportunities to practice the skills learned in "real life" contexts which decreases their retention of language and speaking skills.

***Opportunities and Government Initiatives***

Even with these challenges, attempts are underway to better ELT in rural regions. Government initiatives like the Samagra Shiksha Abhiyan seek to leverage digital infrastructure and bolster teacher training. Some state governments have launched English-medium schools, or "model schools" in rural belts to better the urban-rural divide. NGOs and private educational technology companies have launched pilot projects on low-cost digital English learning tools in villages. AI-based tools seem to be yet a minimal, experimental part of these interventions..

**4. Challenges in Using AI for ELT in Rural Areas**

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While Artificial Intelligence (AI) could transform English Language Teaching (ELT), applying it in rural India has a number of obstacles and challenges, not only related to technology but also due to social, economic, and institutional factors.

**Lack of Digital Infrastructure**

One of the main hindrances in rural India is the lack of digital infrastructure. Many rural schools do not have computers or if they have computers, they are older ones and not properly maintained. Mobile connectivity is unreliable; in some remote areas, it does not exist at all. Even if mobile networks can be accessed, the costs of mobile data can be considerable for families on low incomes. Without stable access to the internet, through mobile or wifi, or adequate access to up-to-date digital equipment, the use of AI-enabled ELT apps will be, at best very difficult, if not impossible.

**Low Digital Literacy**

Most rural teachers and students, despite the increased availability of smartphones, are not digitally literate. Many teachers do not even know how to use smartphones, computers or educational apps, and generally require further support in order to use more complex AI-enabled applications. This disconnect across digital access and practices emerges from the labouriousness of transporting AI into the conceptual and practical realm. Teachers will require work, and support, to be able to utilise any of these technologies or consider integrating them into their teaching, and students will therefore be unable to appropriately leverage use of these technologies.

**Language and Cultural Barriers**

AI tools for ELT are often made for a global audience, and may not consider the multilingual and multiculturally diverse India. The app's interface language or accent recognition and cultural references may not be usable or relatable for rural Indian learners, creating confusion, disinterest or misuse of the tools. Worst of all, there is often no localised content, which does not even provide the learner the necessary means to find connections between their mother tongue and English.

**Costs and Access**

Many AI-based educational tools may be helpful to rural Indian learners and educational systems but we have to bear in mind that many have subscription fees, and/or the market controlled by corporations will require expensive hardware aimed for mass consumption like smartphones or tablets that rural families living in economic hardship are not going to prioritise. Even government schools often do not have a budget line for ordering or maintaining these to a reasonable standard in a timely fashion.

**Resistance to Change and Absence of a Policy Framework**

While many teaching pedagogies are still based on traditional methods and means, there is still a resounding resistance to evolving and fitting technology into the classroom in rural contexts. Teachers may view the AI as a threat rather than a support system. The fear of being replaced or losing power and authority in the classroom often influences this view of AI, impacting rural teachers' ability to use AI in classrooms.

Similarly, while national education policies espouse digital learning, the lack of local application strategies, funding and follow-up, especially in rural contexts, often leads to a lack of policy support.

**Gender and Social Inequity**

Gender inequities create barriers to access to AI in rural education contexts. In some rural contexts, girls are less likely than boys to own a mobile device or attend school. Additionally, caste and class may influence who is given the opportunity for the new learning experiences proposed by AI. Without careful opportunities for equitable access, AI tools may exacerbate, rather than diminish, social inequity.

**Quality and Relevance of AI Tools**

Many of the AI applications available for ELT do not align with the learning objectives and outcomes set out in Indian curricula. Some tools focus primarily on skills associated with test-taking rather than communicative competence, while others are out of step, either proposing activities that are too advanced or too basic for the target learners to engage with. There are no context-specific AI tools for rural learners to draw upon, so even though tools will be provided, their pedagogical usefulness may often be limited.

**5. Case Studies / Field Observations**

To represent a ground-level perspective, the following section examines examples of AI-based initiatives in English Language Teaching (ELT) in rural India, particularly Maharashtra and similar states. The examples demonstrate the possibilities and the challenges that accompany an attempt to incorporate AI into rural ELT.

**Case Study 1: Pratham's 'Hello English' Pilot in Rural Maharashtra (Success)**

**Location: Nandurbar District, Maharashtra**

Context: Pratham, a well-known NGO in the education field, undertook a pilot project within some Zilla Parishad schools in tribal villages located in the Nandurbar district, using the mobile application 'Hello English'. This app is used to teach kids how to speak English through AI-based technologies, including the ability to recognize voice, adapt to individual learning, and play interactive games.

**Intervention:**

Students were given the opportunity to use smart phones, during school hours, in a supervised environment. Access to local language support, and audio instructions, initially helped to alleviate hesitation. Teachers received a basic introduction to the app for facilitating the sessions.

**Outcome:**

1. Students demonstrated an improved vocabulary, pronunciation, and confidence, within the 3-month pilot.
2. Peer support increased as the children started helping each other navigate the use of the app.
3. Teachers reported that students were much more engaged and excited about English.
4. There was limited usage of the app outside of school because students did not have personal devices and internet access.

**Challenges:**

1. Network issues in a number of the villages impacted the performance of the app.
2. Teachers needed ongoing support to use the tool meaningfully in their teaching.

Conclusion: Overall, the success of the pilot suggests that learning through AI can be beneficial for children in tribal/rural areas when implemented alongside localized support and teacher involvement, despite structural limitations.

**Case Study 2: Failure of a Centralized EdTech Rollout in Rural Uttar Pradesh**

**Where: Banda district, Uttar Pradesh**

Context: As part of a central government digital initiative, tablets along with English learning software were distributed to a group of rural schools in Uttar Pradesh.

Intervention: The software was designed to use AI to assess learner proficiency and adapt the difficulty. However, the intervention did not incorporate customization, support for local languages, or adequate training for teachers.

**Outcomes:**

- The majority of devices were either unused or only partially used due to a lack of training.
- The AI system did not account for the students' limited exposure to English and the cultural context.
- Schools locked the devices in their offices to "protect" them.
- There were no monitoring mechanisms in place to assess how, if at all, they were being used, and/or what impact, if any, that would have had.

Conclusion: This case study demonstrates how top-down, tech-first initiatives like this AI attempt often fail in rural contexts where no training, customization, or ownership is provided to the end-users.

**Lessons learned from Maharashtra's new English Language Cell (State-led approach)**

Recently, staff from the education department of the state of Maharashtra established an English Language Cell (ELC) with a mandate to influence and improve English Language Teaching (ELT) across all government schools, particularly in rural and semi-urban areas. In selected talukas across the state, the use of some AI based applications, e.g. "Read Along by Google", have been piloted and encouraged at a cluster-based level.

**Initial Findings:**

- Usage was better in schools where the headmasters were active in supporting teachers.
- Usage increased with integration of the application to school library periods.
- Support from Block Education Officers (BEOs) and NGOs was important.

This developing model shows promise and suggests that AI tools can be successfully used if developed within a government supported, teacher led approach.

**6. Recommendations and the Way Forward**

In order to reduce the gap between the opportunities for Artificial Intelligence (AI) in the English Language Teaching (ELT) of students' lives in rural India and the academic and technological realities, we need a multifaceted and context specific approach. Below are some key recommendations to address the existing challenges and transition into effective AI implementation in rural ELT contexts.

**Building Digital Infrastructure**

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Any effort to integrate AI must first address the issue of digital infrastructure. The local, state, and national governments and the private sector must fund initiatives:

- Expand fixed and high-speed internet connectivity to rural, remote, or isolated areas through public-private partnerships.
- Establish a subsidy or other cost-sharing arrangement to provide the access to smartphones, tablets, and computers at little or no cost to rural schools.
- Create community learning centers, and designate shared access to AI tools into those hubs.
- Then we must consider maintenance, backup, and technical support.

**Teacher Training and Capacity Building**

Teachers are at the heart of successful AI integration. Thus, continuous capacity building is needed to:

- Build teachers' digital literacy and confidence using AI tools.
- Familiarize teachers with AI applications for language learning.
- Encourage blended learning to ensure AI can augment the role of the teacher rather than replace it.
- Training should be practical, in local languages, and accessible online and offline.

**Development of Localized and Culturally Relevant Content**

AI tools must be contexted to the linguistic and cultural environments that rural learners inhabit. In doing so, developers and policymakers should:

- Design AI-powered ELT applications in local languages so rural learners can easily relate to and navigate learning.
- Include rural stories, contexts and idioms to foster student understanding.
- Link content to state syllabi, and intended communicative skills, rather than to grammar or examinations.
- By localizing content, we can create shared feelings of connection through engagement while reducing alienation from learning materials.

**Cost-Effective and Inclusive Solutions**

AI tools should be accessible and inclusive to support equity, which can include:

- Advocating for open-source AI tools and/or low data AI platforms.
- Allowing different pricing structures and/or free access to basic functions for rural, isolated or remote learners.
- Partnering with NGOs and CSR organizations to fund AI-based ELT for at-risk learners in under-served communities.
- With an emphasis on ensuring inclusion for girls, students from marginalized communities, and students with disabilities.

**Policy Integration and Monitoring**

In order to address AI-enhanced ELT within a wider set of educational reforms, policymakers need to:

- Include AI-assisted language learning within teacher education programs.
- Devise budget allocations for digital education as a component of rural development investment.
- Initiate monitoring agencies to measure the efficacy, equity, and scalability of AI-enhanced interventions in ELT.

- Policy should enable flexibility in connecting to different rural contexts, and be rooted in good principles of pedagogy.

**Facilitating Public-Private Cooperation**

Cooperation between government agencies, technology companies, higher education institutions and non-profits should include:

- Pilot testing and evaluating scalable AI-based ELT models in rural schools.
- Developing ethical guidelines for the responsible and equitable use of AI in education.
- Sharing best practices and innovations between regions to contribute to sustainability of development.

Such partnerships can foster innovation, ensure accountability, and amplify impact.

**7. Conclusion**

AI is one area of potential to transform ELT in rural India by democratizing access to quality, personalized English language education and bridging the urban-rural educational divide. This conception is hindered by a multitude of socio-economic, infrastructural, and pedagogical barriers.

Significant barriers exist to successful effective application of AI tools in English Language Teaching in rural India due to limited digital infrastructure, low levels of digital literacy, inadequate teacher training, socio-cultural obstacles, and lack of content related to local communities. However, these barriers must be confronted holistically and we cannot depend on technology alone for the barrier to be addressed, as we need to engage the use of a developmental approach to put humans in the center of the learning goals scope, inclusive considerations, relevant contexts, and sustained engagement.

This article has made a strong case for strategic investment in infrastructure, teachers' capacity, and policy influenced by the need for AI tools developed upon specifying rural learners' needs. As such, realizing the potential of AI in education will require concerted action amongst government, education and training systems, technology developers and civil society. The purpose of introducing AI is not just to introduce AI in rural classrooms but for the development of learners with communication competence; confidence and opportunities for socio-economic enhancement. AI has the potential to develop a powerful ally for achieving a more socially just and linguistically empowered India if it is introduced with the correct intent.

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