



SIGNIFICANCE OF VIRTUAL LEARNING OF LANGUAGES: AN OVERVIEW OF TAMIL (MOTHER TONGUE) AND ENGLISH (SECOND LANGUAGE) LEARNING AT THE MIDDLE SCHOOL LEVEL IN TAMIL NADU

AUTHOR 1. DR G JANET AMALI, MA, MPHIL, PHD

POST GRADUATE TEACHER, VEERAMAMUNIVER HR SEC SCHOOL, SIVAKASI

AUTHOR 2.A GASPAR RAJA, MA. MAED, MPHIL

**RESEARCH SCHOLAR, GANDHIGRAM RURAL DEEMED UNIVERSITY,
DINDIGUL TAMIL NADU**

Abstract:

In the modern educational scenario, virtual learning is among the essential tools used to learn languages and is vital to regions such as Tamil Nadu, India. This article explores the nuances of virtual language learning for middle school students in Tamil Nadu. The study, conducted between August 2023 and November 2023, included 256 students aged 11-13 from rural pockets around Thirumangalam, Madurai. Surveying data through the community-based cross-sections approach using semi-structured proforma, the research covers diverse aspects of virtual language learning in Tamil and English, such as the usage of digital devices and connectivity to the internet, student attitude towards assessments, and their preparedness to return to the traditional mode of schooling. The findings indicate specific gaps in learning, containing high instances of irregular classes and difficulties in the experience of Tamil and English learning assessments, with 71.9% of students reporting more problems than in traditional schools. However, there was a positive inclination towards the virtual mode of learning in Tamil and English, with 67.6% of students being prepared to return to the traditional mode of learning if schools were to reopen. There are several implications for policymakers in the Tamil Nadu region. Addressing the digital divide caused by the lack of equitable distribution of devices and fast internet is critical. Policymakers may subsidise the cost of internet connections and provide free devices to economically disadvantaged students.

Keywords: Virtual Learning, Language Acquisition, Tamil Nadu, Middle School, Tamil (Mother Tongue)

Introduction

The significance of language learning in this state is difficult to overestimate because the native language is Tamil, and the second language is English. Tamil Nadu is a state deeply rooted in ancient cultures and could boast two languages. Tamil is its regional language and is also considered “one of the few ancient classical languages still spoken”. Consequently, learning Tamil is not just a routine activity but rather a meaningful issue since this language is closely related to history, culture, and Tamil’s ethnic destiny. In contrast, English is a globally recognized lingua franca and language of international cooperation and also a interstate language of India.

Digital literacy skills developed while communicating in the virtual medium ensure students’ success in the future, even outside the limits of language learning. However, the transition to virtual teaching comes with problems, such as a digital gap, the lack of digital literacy among instructors and trainees alike, and motivation and engagement issues. It is also uncertain how efficient a virtual medium is in developing the required competency levels in the language since a set of nuances is often lost, such as pronunciation, peculiarities of cultural context, or idiomatic expressions. The possibility of creating individual trajectories for learning, using the vast and diverse cultural legacy of humanity, as well as interactive and immersionist study methods with immediate feedback, is a real breakthrough for language education. While Tamil Nadu has much work to do with this innovative language education, the future in this area belongs to virtual learning. Using ongoing research and practical development is crucial when improving virtual learning methods and infrastructure. The result of this approach will be the maximum realization of the potential of online language education in Tamil Nadu and the possibility of managing its negative consequences

Rationale for Virtual Learning

The recent global developments have influenced the evolution toward the virtual learning model, further catalyzed by the need to respond to the COVID. This situation highlighted the immense possibilities of the virtual learning model to transform the current educational system. The latter is particularly relevant in language learning in Tamil Nadu. However, the online learning approach will contribute not only to the current response to the global spread of COVID-19 but will also support additional steps toward the democratization of education, enhanced prospects of accessibility, and the provision of additional opportunities for the innovative delivery of education. These goals are especially relevant in the context of Tamil Nadu due to the language educational needs of the region and its rapidly growing bilingualism. Firstly, virtual learning environments are not constrained by the necessity of physical vicinity. Thus, students who need help finding specialized language tutors in rural areas of Tamil Nadu can access digital resources for high-quality language learning. Secondly, learning systems will be more responsive to the pace of learning.

The pandemic has underscored the importance of digital literacy as an essential skill analogous to traditional literacies. In addition to acquiring Tamil and English, virtual Tamil and English language learning also provided training in digital competencies required for effective functioning in the contemporary world. Importantly, digital skills imply the ability to efficiently use online sources, be involved in digital communication and critically assess the digital content. Moreover, virtual learning platforms present opportunities for developing a more effective pedagogy. Multimedia, interactive instruments and communication tools take learners out of the structured classroom and make language learning more engaging, fun, and practical with various settings and scenarios beyond the typical class. In addition, virtual environments allow for global connections that enable students to engage in culture and experience different linguistic surroundings.

Tamil language learners can use virtually all tools, emphasizing all aspects of Tamil culture and literature. Nevertheless, the transition to virtual comes with difficulties and hurdles. It requires closing the digital split in Tamil Nadu by guaranteeing all students access to the necessary tools and connections, regardless of their economic circumstances. Additionally, significant investment is needed in instructing educators on making the most excellent use of digital learning. At the same time, teaching, since their knowledge, will determine the success or failure of the virtual migration to English.

Nonetheless, despite all these obstacles, introducing virtual learning in Tamil Nadu is a vision of the future. One of the key reasons is a recognition of digital technologies as a central element of modern education that helps address access and quality challenges faced by many second and foreign language learners. Ultimately, the region demonstrates opportunities, and the goal is still achievable. It implies the possibility of developing high-quality and efficient language education facilitated by the opportunity's digital technologies offer. Ultimately, the rationale behind the extensive use of virtual learning in Tamil Nadu is based on several factors, including accessibility, flexibility, digital literacy, pedagogical ideas, and connectivity. Therefore, Tamil Nadu's experience and future success can create a blueprint for incorporating technologies into language education to help preserve language and culture and integrate them into global trends.

Study Objectives

- To assess accessibility and equity
- To evaluate pedagogical effectiveness
- To explore technological and pedagogical innovations
- To analyze teacher and student perceptions

Research Questions

- 1) To what extent are virtual learning platforms accessible for middle school students from various socio-economic backgrounds in Tamil Nadu?
- 2) How effective is the pedagogy of virtual learning in improving language skills in Tamil and English among middle school students?
- 3) How are pedagogical and technological innovations combined to improve the experience of virtual Tamil and English language learning among middle school students?
- 4) How do teachers and students perceive virtual learning as a means of language education in Tamil Nadu middle schools?

Methodology Overview

The methodology for the current inquiry is based on the community-based cross-sectional method, which allows for the overall picture of the current status of digital education within the chosen cohort. The following is the methodology outline, from data collection points in the initial stage to the analytical data collection steps taken. The reasoning behind such a rationale stem from the lack of expansive parts of rural demography in many studies regarding the accessibility and effectiveness of digital education. The time for the study was from August 2023 to November 2023 and was associated with the meticulously conducted questionnaire. The reported children were between 11 and 13 years old, encompassing the VI to VIII standards. Notably, this age group constitutes a critical component of educational progress, particularly in language acquisition and digital fluency. There were 118 boys and 138 girls, which were also selected using the criterion of balance, thus ensuring a visible understanding of whether boys or girls may impact online learning. Data collection was conducted using a semi-structured proforma to contain questions about the availability of digital gadgets, the nature of online classes, and the overall socio-demographic situation of the students. The form contained questions concerning the type of school, class attendance, ownership of online learning gadgetry, and customership of internet facilities such as mobile data and connected Wi-Fi. This method facilitated the data collection that included both quantitative and qualitative information

Literature Review

The era of virtual learning has revolutionized language education, opening up new horizons and raising novel questions compared to traditional approaches to language learning. While offline language learning has been replaced by online platforms for learning Tamil and English in Tamil Nadu and elsewhere, tackling these online opportunities can extract the benefits acquired from

promoting digital educational practices. This literature review summarizes the findings that have been discussed in the literature concerning the design and impact of virtual learning on language education. The studies chosen for this review aimed at expressing the plurality of possible reasons and opportunities for such a reform in education. The results of the studies concluded that virtual learning environments, such as VLE, open up a unique opportunity to access all resources for language learning. VLE is an "infrastructure" that makes language learning leads out of physical and geographical restrictions and restrictions characteristic of traditional classrooms. These articles also imply that online open-access VLEs were non-traveling in their learning styles, meaning learners could flexibly use materials and attempt to attend to linguistic differences. VLEs offer multimedia tools and features that enable learners to learn interactively, elucidate the language, and encourage cognitive response. Videos and interactive tools have been identified to enhance the comprehension and speaking of language by those who learn it. This uniqueness of VLEs confirms the importance of the natural acquisition of the languages spoken in real life.

Additionally, the virtual environment will allow the learners to immerse themselves virtually in other countries' cultures and practices that share the target language. The ESL learners will benefit from this technology as they will be exposed to the approach used to English differently across various English-speaking countries and territories. However, achieving these results through VLEs has its challenges. Digital disparity and the lack of access to technology sources will also be regarded as problematic, as all these policies depend on whether the students will access or not access technology, and this is another thing that linguistics students have to start to be concerned about. Another challenge raised by the studies was the new challenge to keep students motivated and engaged. This means that teachers need to prepare for that. The field of research researching the utilization of VLEs considers the difficulty of the problem. These opportunities regarding enhanced access and flexibility understand that immersion should be accompanied by technological achievements or pedagogies' successful approach. Hence, further research and development will gather to design and deliver VLEs.

Benefits of Virtual Language Learning

The ease of access is the advantage of virtual learning in Tamil and English. Students from various parts of the world and differing socioeconomic backgrounds gain access to high-quality education, thus removing the traditional boundaries of distance. As Hamutoğlu et al. put it, even a smartphone can be the gateway to a plethora of opportunities for learning afforded by virtual platforms.

Furthermore, the flexibility of virtual environments supports various learning styles and individual paces. Srinivasan and Murthy argue that a lack of self-pacing possibilities is why some students need help to reach a desirable level with either reading, speaking, or another dimension of language learning. The affordances of new technologies and pedagogical practices also enhance the overall experience. Interactive tools, access to native speakers, visual and auditory media, and cultural mentions may all create a more immersive experience. Vidhiya and Raj claim that with the help of online tools alone, students can understand and imitate the pronunciation they would not be exposed to verbally. While reading, learners can use multimedia to check out the pronunciation and hear the phrase, a competence-increasing experience.

Challenges of Virtual Language Learning

Despite the numerous advantages of virtual platforms, some challenges remain. A significant barrier is the digital gap. Lack of reliable internet connectivity and access to digital devices poses threats to equal learning opportunities. Punitha et al. suggest that many students of the state schools in Tamil Nadu, India, need help to afford the connection. Thus, education measures must exist to offer students equitable possibilities, even in rural communities. Another challenge is maintaining motivation and engagement, which cannot be maintained online well. The absence of a present teacher or the ability to walk into a library makes many students procrastinate or not attend at all. Teacher absence makes a difference; students are included with dynamic instruments and educator interactions. The final measure of affordance is the educator's abilities. It is not guaranteed that educators know how to use some online instruments

selectively. Scheduling, course structure, material selection, and proficiency advancement require detailed guidelines. Srinivasan and Murthy propose that training in all uses of instruments and technologies be implemented from the graduation curriculum onwards. These measures promise to make virtuality fully maximized.

Research Gap

The integration of virtual learning within the educational landscape of Tamil Nadu, especially in the realm of language education, marks a pivotal transition towards embracing digital methodologies to enhance learning outcomes. Hence, this literature review provides a basis to explore the particular context of Tamil Nadu, utilizing current literature to describe the state of virtual learning. Virtual learning in Tamil Nadu, especially in language education, is part of a global trend to integrate digital platforms into learning activities due to technological advances in the last two decades and the recent pandemic. Research scholars working in Tamil Nadu have started to look into the effect of virtual learning with language acquisition as a lens from both the Tamil and English learning perspectives. For example, Vidhiya and Raj's study indicates that virtual platforms can help improve learners' listening skills in secondary school and class, highlighting how online resources are beneficial in improving comprehension and listening abilities when teachers are inadequate.

Table 1. Key Studies on Virtual Learning in Language Education in Tamil Nadu

Study Reference	Focus Area	Participant Demographics	Key Findings	Methodology
Vidhiya & Raj (2020)	Enhancing listening skills through virtual learning	Secondary level learners	Virtual learning significantly improved listening skills among learners.	Cross-sectional study utilizing online modules and pre/post-tests.
Hamutoğlu et al. (2020)	Student satisfaction with virtual learning environments	Not specific to Tamil Nadu, applicable for general understanding	Students' experiences in virtual classrooms are positively associated with interactive and multimedia-rich content.	Survey-based methodology evaluating students' perceptions and experiences.
Srinivasan & Murthy (2021)	Effectiveness of AI technology in improving reading and comprehension	K-12 students, broad applicability including Tamil Nadu	AI technology interventions significantly enhanced reading and comprehension skills in a large-scale study.	Quantitative analysis of pre and post-intervention performance metrics.
Manegre & Sabiri (2020)	Online language learning and teacher perceptions	Educators involved in virtual classrooms	Teachers identified a need for professional development to effectively utilize virtual learning platforms.	Qualitative interviews and analysis of teacher perceptions and experiences.

Methodology

Research design

The research conducted the hypothesis as a community-based cross-sectional study, which means that the attributes or characteristics were observed fully in the population. In particular, a cross-sectional study should facilitate the estimation of the prevalence of these disadvantages or outcomes in groups of interest. On the other hand, this design is efficient and effective in providing an overview of the status of education in use and identifying crucial areas requiring more attention and intervention.

Participants

The study recruited 256 students from the rural areas of Tamil Nadu aged 11 to 13 years and attended middle school. The selection of this junior group was purposive to test the early learner's foundational language qualifications and their personalities. The study developed 118 boys and 138 girls from the total participants, reflecting a gender-balanced angle in determining the availability and utilization of online study materials and IT gadgets. The study selected rural areas to understand how digital educational platforms obscure information.

Data Analysis

Through a semi-structured proforma, data was collected to gather information about the respondents' availability of digital devices, lapping up of online materials, and sociodemographic traits. The tool was the most convenient at this stage regarding its structure, including open, close-ended items that would explore all requisite data about online learning experiences. The proforma comprised the school type, digital learning class, gadget ownership and accessibility, and cyber connectivity. Data was entered in SPSS, and the analysis began with descriptive statistics. Output tables were created for cross-tabulations and summaries of the data in terms of percentages with 95% confidence intervals. Chi-square tests included the Mantel Haenszel test calculations to recognize the significance of interrelation among variables like socioeconomic group, parental educational qualifications, and digital access.

Results:

Table 2. Demographics

Variable	Participants (n=256)	Percentage (%)	95% Confidence Interval
Sex			
Boys	118	46.1	39.9-52.4
Girls	138	53.9	47.6-60.1
Grade			
VI and VII	131	51.2	44.9-57.5
VIII	125	48.8	42.5-55.1

Participant Demographics Overview

The study involved 256 participants, primarily girls and boys, specifically 138 and 118 participants, making 53.9% and 46.1%, respectively. The balanced distribution based on gender is essential for considering the potential ways VLEs may be accessed and experienced by students of different genders. Regarding participants' grades, the distribution was also almost equal, with 51.2% of students from VI and VII (n= 131) and the remaining 48.8% in VIII standards. The distribution across middle school grades maximizes understanding of the VLE experience during this critical period. The study also collected data on the parents' educational qualifications,

with 39.8% and 42.6% of fathers and mothers completing middle school. As noted, the profile of the demographic status is vital for understanding the home environment, a determinant factor in enhancing or limiting children's use of the online learning space. Using the scale for the socioeconomic classification, most participants were placed in the middle class. There were upper and lower-middle-class participants, while the remaining groups had fewer participants. This socioeconomic classification is crucial to consider levels of resource availability, including digital devices and internet connection for the different groups.

Schooling and Online Learning Accessibility

Regarding schools last attended by participants, the distribution was relatively equal: 48.0% private schools, 37.9% government schools, and 14.1% government-aided schools. This distribution is vital for consideration of differences in infrastructural and resource availability that potentially affect the quality and access to virtual learning.

Table 3. Access and Use of Digital Learning Tools

Variable	Number of Participants (n=256)	Percentage (%)
Device Ownership		
Self-owned	25	9.7
Family-owned	141	55.1
Shared among siblings	17	6.6
Shared among friends	2	0.8
Borrowed	2	0.8
Not applicable	69	27.0
Gadget Type		
Mobile	183	71.5
Computer type	3	1.2
Tablet type	1	0.4
Not applicable	69	27.0

Digital Device Ownership

The fact that the device used for online lessons was owned by only 9.7% of respondents points to a massive concern in online education: accessibility to devices. The device was family-owned primarily (55.1%) or shared with siblings and friends in 7.4% (and borrowed, i.e., unavailable when needed). The lack of devices can severely limit the student's ability to access learning materials, participate in real-time classes, and submit assignments, leading to the compromised quality of education they receive.

Types of Gadgets

The study also asked the participants to identify the types of gadgets they used for online learning. The vast majority of students rely on mobile phones for educational activities, 71.5%, indicating either a preference for mobile devices over more traditional computing tools or necessity. Excessively few people use devices designed to be computers, 1.2%, or tablets, just 0.4%. The overwhelming reliance on mobile phones shows their role in facilitating online education for rural students, most likely due to their availability, simplicity of usage, and possibly a lower price than other digital devices.

Table 4. Overview of Online Learning Experience

Variable	Description	Number of Participants (n=256)	Percentage (%)
Type of Class	Live Only	43	16.8
	Live and Recorded	75	29.3
	Recorded Only	69	27.0
	Television Only	30	11.7
	Not Applicable	39	15.2
Attendance Regularity	Regular	132	51.6
	Irregular	85	33.2
	Not Applicable	39	15.2
Perceived Challenges	More Hassles	184	80
	No Hassles	72	28.1
Online Assessments Reliability	Reliable	34	13.3
	Not Reliable	222	86.7

Internet Access

Internet Connectivity Internet connectivity proves to be a significant factor in the efficacy of online education. Although some participants mentioned that they had 4G with good connectivity, amounting to 47.2 %, a significant proportion reported poor connectivity, amounting to 25.8 %. A significant number of students should have mentioned the status of their internet connection, accounting for 27 %. This wide variance in power quality calls for robust internet connection systems and solutions for all students to make online learning a viable and effective option.

Nature of Classes Attended

The analyzed data points out that students attended a mix of various online class formats, including live only at 16.8 %, live and recorded at 29.3%, at only 27.0 %, and TV only at 11.7 %. This fluctuating internal environment indicates adaptive learning, where educators and pupils use TV and digital media to deliver education and learning. Live classes, exclusively or in tandem, suggest that educators and students aim to maintain interactive and fluid learning frameworks. Nonetheless, the high use of recorded and TV-structured classes shows a need for asynchronous learning methods that account for the overcrowded schedules and accessibility problems students in rural areas experience.

Regularity of Attendance

The data presented indicates that more than half of the participants, 51.6 %, usually attended their online classes. A third, 33.2 %, attended irregularly, and a small number, 15.2 %, did not fill this section, which could indicate discontinuation or lack of access. The high level of regular attendance suggests the willingness of students to commit and the potential effectiveness of virtual learning frameworks in maintaining educational continuity. However, many students report irregular attendance rates, querying the surrounding factors influencing the outcomes, such as limited connectivity or access to study materials.

Perceived Challenges and Reliability of Online Assessments

Regarding the perceptions of online assessments, the apprehensions concerning their reliability are high. More than 86.7% of the participants doubted the effectiveness of online assessments, which could raise questions about their fairness for students and, in general, whether they cover all necessary topics. These apprehensions are expected since there are many difficulties with conducting

online exams, from a lack of proper questions that can be efficiently administered online and graded to a need for a face-to-face and supervised environment. The latter aspect is the main reason for general scepticism towards virtual testing methods. This apprehension clearly indicates the need to re-examine the means of evaluation and measurement in online learning environments. The focus should be on more than just technical means of adapting traditional assessment but also on ensuring their pedagogical soundness. This is crucial for the trustworthiness of assessment outcomes and the level of trust it can instill in students for online learning modalities. As for the perceived challenges and benefits, 71.9% of the students experienced more hassles than in their traditional school settings; only 28.1% had no hassles. Once again, enrollment is not favourable, suggesting that multiple components, such as user-friendly interfaces and internet connection reliability, should be improved to ensure a smoother learning process. However, an even more significant number of participants had a high level of doubt about the reliability of the review: 86.7%, respectively. This finding sets a straightforward pedagogical task of developing multiple assessment methods that could be more engaging or more reflective of the student's abilities.

Readiness to Return to Traditional Schooling

Many of the study's students were ready to return to the traditional, physical, and in-person setup, with 67.6% of the respondents indicating their willingness to switch. This trend may demonstrate the need for social experiences, to be part of a routine and structured environment, and to experience face-to-face support from teachers. These aspects are difficult to achieve or replicate entirely on online platforms. More so, the student population viewed physical and direct interpersonal education as critical and beneficial. Therefore, while they would appreciate the convenience and accessibility of online options, they believed these factors did not entirely replace the face-to-face experiences of physical classrooms. Thus, there could be an element of desire to return to the typical setup, which, despite advancements and achievements, students considered vital.

Table 5. Perceptions Towards Virtual Learning

Aspect	Response	Number of Participants (n=256)	Percentage (%)
Online Assessments Reliability	Reliable	34	13.3
	Not Reliable	222	86.7
Readiness to Return to Traditional Schooling	Yes	173	67.6
	No	83	32.4

Hence, the information presented in the table encapsulates the views of rural Chennai and Tamil Nadu students on two critical virtual learning facets. First, a strong wave of scepticism, as the students need to perceive online assessments as reliable. Indeed, almost 87% of participants assessed reliability as not reliable. Therefore, online learning has significant room for improvement regarding students' perceptions of learning and assessment components. Enhancing the reliability and trustworthiness could involve adding more interactive, stimulating, and various assessment types that measure a student's knowledge and skills. Furthermore, the data present a strong willingness of students to transition back to traditional learning. Over 67% of the data indicate that they are. It is plausible to suggest that students desire direct communication and a structured environment. Therefore, planning considers the social and emotional plans.

Socio-Economic Status and Learning Outcomes

In turn, the analysis indicated significant statistical associations between socioeconomic background and student learning outcomes, defined by their engagement and performance in online courses. Specifically, students from less affluent households were

disproportionately disadvantaged regarding their access to online learning resources, including gadgets and uninterrupted internet service. This finding confirms the existence of the digital divide, illustrating how economic gaps result in disparities in educational opportunity that can potentially influence affected students' ultimate academic outcomes.

Type of School and Access to Online Learning Sources

The current research also found a remarkable correlation between the type of school children attend – government, government-aided, or private – and the availability of online learning resources. In this sense, students of private schools were more likely to possess or have access to the required gadgets for online learning than government or government-aided scholars. This evidence depicts resource inequality between various educational institutions, signifying the importance of school infrastructural and technological readiness to enable or impede access to virtual education.

Learning Outcomes and Digital Learning Devices

Additional conduction of learning outcomes versus digital educational tools analysis revealed that students who are device owners have, on average, higher engagement and success rates of online course taking. This aspect proves that personal access to the gadget plays a considerable role in creating effective study environments, making device ownership a crucial element of successful online course adaptation.

Significance of Findings in Language Learning

The high scepticism of online assessments, in which 86.7% of participants did not find them reliable, reflects some of the current concerns raised by the literature on the effectiveness of virtual evaluation approaches in language and its sectors. Language learning is particularly challenging, considering learners must be evaluated to ascertain their oral and written proficiencies. These kinds of testing are relatively complex to conduct through virtual techniques, raising the push for other innovative approaches for remote assessment. Moreover, the high readiness of 67.6% of the participants to learn conventionally in the future speaks volumes about the value of face-to-face interactions in the language area. The literature supports this finding on how social interaction and immersion play essential roles in learning, a process somewhat compromised by the online reset. Thus, the current study reveals that teachers must integrate active teaching methods for languages in online platforms.

Access to Digital Learning Tools and Language Education

The finding that only 9.7% of the current students had personal devices poses a more significant limitation to pursuing equity in language learning. These findings confirm the central role of discussions on the digital gap in accessing learning resources. Only some students receive funding for the latest devices that support language learning by providing multimedia and interactive content. Therefore, it is essential to study this question in more detail to understand how the availability of its devices influences the desire to develop language. Digital device ownership, types of gadgets used, and internet access are the factors that directly contribute to the digital gap, and the traits outlined above describe its existence. While mobile phones are the primary source of connection to the online learning process, the lack of perishable goods and dependence on shareable items limit students' engagement in the fully-fledged digital class experience. Furthermore, the problem of internet availability presents a critical bottleneck. Low or unreliable connectivity disrupts the learning process and, ultimately, students' educational progress. Therefore, accessing and using digital learning tools for rural middle school children in Tamil Nadu presents several audiences that could be addressed through policy action. In order to facilitate a more inclusive digital environment conducive to the secondary school milieu, device ownership, digital gadgets used for academic purposes, and internet connectivity must be addressed. Digital technologies in the sphere of educational settings will undoubtedly continue to proliferate as digital development goes on. Accordingly, these obstacles to greater availability and use must

also be addressed so that students of all socio-economic and regional affiliations and backgrounds can maximize the potential of digital learning methods.

Improving the Quality of Online Language Learning

Policymakers could implement strong virtual learning standards that outline specific technology requirements, pedagogical approaches, and assessment criteria. Moreover, prioritizing educators' training in digital literacy and teaching strategies would ensure teachers can effectively engage students in a virtual or online setting. Policies could also encourage creating and using interactive, culturally responsive, and linguistically diverse digital learning resources. With the variety of language demographics in Tamil Nadu, such resources would enhance the quality and engagement of the experience for students.

Encourage Collaborative Effort from the Community and Other Stakeholders

Given the complexity and multi-faceted nature of online learning barriers, more collaboration among educators, parents, community leaders, and technology providers would be beneficial. Policies could encourage the establishment of community centres for learning equipped with digital learning resources to enable students who do not have access to technology at home to participate in learning online. Additionally, community dialogues could be pursued to highlight the importance of digital learning and encourage them to contribute to students' online learning efforts actively. This would make the policies more sustainable and impactful.

Conclusion

The study exposed significant doubt among students concerning the credibility of online assessments; it is thus a pivotal area that needs improvement. However, it is pertinent to note that, despite the gaps, many of the students were prepared to resume the traditional learning system. It indicates that a hybrid model of virtual and physical learning could be the most viable education model in the foreseeable future. Overall, enhancing virtual Tamil and English language learning environments in Tamil Nadu has great potential to improve education equity and quality drastically. Rigorous measures to address the digital gap, improve the credibility of online assessments, and develop a hybrid education system with virtual learning strengths will provide solid and improved pathways for all students. The findings imply the immediate need for precise policy interventions and resource coordination and offer a route to envisage virtual learning moving forward. In summation, the path to achieving optimal virtual Tamil and English language learning is both daunting and fulfilling. It would require concerted efforts from policymakers, educators, and communities to form virtual learning environments as a locus of opportunity, content, and quality to fashion an improved education for Tamil Nadu and beyond.

Implications for Virtual Learning in Rural Areas

The findings and insights described in the study above have several implications for all stakeholders in preparing to create rich experiences in virtual learning, especially in rural areas. Thus, initiatives aiming to provide students with digital devices or subsidize expenses for such devices are in the best interest, as they would help eliminate barriers to online learning and ensure each child has the necessary tools to participate in their education fully. Additionally, investments in internet infrastructure, specifically even more relevant in rural areas, would be a critical step to address the current issues with connectivity. Such steps could involve providing students with free or discounted data plans, establishing internet community access points, and organizing mobile internet units. Finally, with most students owning mobile devices, authorities should ensure that all educational resources and platforms are mobile-compatible. This could make educational resources more mobile-friendly and ensure that content is easily accessible and engaging on small screens.

Challenges Identified

The issue's importance is proven by the fact that, by far, the most significant and severe problem that limits the complete involvement of students in online education is the vast gaps in the accessibility of digital devices and sustainable Internet connectivity.

The most acute issue related to quality and effectiveness is the long-standing argument that the existing online teaching methods, especially in language education, lack productivity. The one controversial argument can be that everyone dislikes having to take exams or tests online – this raises legitimate questions about the role of current evaluation methods in online typing. Finally, the most convincing point is that even in the post-coronavirus world, it seems that a vast number of surveyed students were most interested in returning to full-time education, which most likely means that the experience of online was insufficient in many ways.

Recommendations

For Educators

- Implementation of interactive, student-centred teaching methods supported by technology that would allow educators to engage students more effectively. The use of multimedia, gamification, and examples from the real world should also be provided, thus creating a more enjoyable and interactive learning environment.
- Ongoing professional development specifically targeting digital pedagogy should be an essential requirement for educators who must address the need for continuous enhancement to deal with the issues of online teaching and assessment issues.

For Policymakers

- Subsidies to low-income families, coverage of all internet expenses, or providing students with personal digital devices should be considered.
- Organizations should invest in developing better educational technologies, including platforms, applications, and systems designed to support the digitally facilitated learning process. Collaboration between government authorities, manufacturers, and non-profit organizations can allow pooling of their resources.

References

- 1) Jeyarani, J., & Vasanthan, D. (2021). A Study On Online Language Learning Environment For College Students In Tamil Nadu. , 12, 1573-1578. <https://doi.org/10.17762/TURCOMAT.V12I5.2129>.
- 2) Srinivasan, V., & Murthy, H. (2021). Improving reading and comprehension in K-12: Evidence from a large-scale AI technology intervention in India. *Comput. Educ. Artif. Intell.*, 2, 100019. <https://doi.org/10.1016/J.CAEAI.2021.100019>.
- 3) Vidhiya, R., & Raj, V. (2020). Enhancing Listening Skills for Secondary Level Learners through Virtual Learning. *English*, 9, 49-51. <https://doi.org/10.34293/english.v9is1-dec2020.3616>.
- 4) Kavitha, V., & Dhanalakshmi, K. (2020). EFFECTIVENESS OF HYBRID LEARNING IN ENGLISH ORAL COMMUNICATION SKILL AMONG VI STANDARD STUDENTS IN VELLAKOVIL BLOCK. *Journal of Natural Remedies*, 21, 73-77.
- 5) Raj, A., Zhang, E., Mukherjee, S., Williams, J., Halverson, R., & Patel, J. (2019). Effect of Native Language on Student Learning and Classroom Interaction in an Operating Systems Course. *Proceedings of the 2019 ACM Conference on Innovation and Technology in Computer Science Education*. <https://doi.org/10.1145/3304221.3319787>.
- 6) Poonguzhali, S., & G. (2018). Development and Validation of E-Content on Tamil Subjects (Prose, Poetry, Grammar) Of Ix Standard Students. *International Journal of Research*, 5, 49-53.
- 7) Varadhan, D. (2021). The Impact of Virtual Learning in the Indian Education System, 364-380. <https://doi.org/10.4018/978-1-7998-6776-0.CH018>.
- 8) Jebakumar, C. (2009). A Study of Virtual Learning Environment with Reference to the Perceived Preparedness of the College Students in Tamil Nadu (South India). . <https://doi.org/10.2139/SSRN.1553656>.
- 9) Padmini, S., & Ramani, P. (2023). Crafting E-Learning Pathways: A Student's Insight into the Course 'Understanding Disciplines and School Subjects' Offered in Teacher Education in Cuddalore District of Tamil Nadu, India. *Advances in Research*. <https://doi.org/10.9734/air/2023/v24i6995>.

- 10) Andi, H. (2022). Construction of a Framework for Selecting an Effective Learning Procedure in the School-Level Sector of Online Teaching Informatics. *Journal of Ubiquitous Computing and Communication Technologies*.
<https://doi.org/10.36548/jucct.2021.4.002>.
- 11) Balaganesh, S., Doraikannan, S., & Indiran, M. (2021). Knowledge, Attitude And Practice Towards Teaching On A Virtual Platform Among Private School Teachers In Chennai. *International Journal of Dentistry and Oral Science*.
<https://doi.org/10.19070/2377-8075-21000688>.
- 12) Punitha, K., Lakshmi, P., Vedhamani, K., Chandramoulie, S., Paul, C., & Stephen, T. (2023). Online Learning Among Primary and Middle School Children in Rural Chennai, Tamil Nadu, India- A Story of Inequitable Distribution. *JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH*. <https://doi.org/10.7860/jcdr/2023/62769.18217>.
- 13) Siddiqi, A. (2022). A Study of Students Perception about Virtual Learning: An Evidence from Punjab, Pakistan. *Journal of Education and Social Studies*.
<https://doi.org/10.52223/jess.20223105>.
- 14) Oliver, K., Kellogg, S., Townsend, L., & Brady, K. (2010). Needs of elementary and middle school teachers developing online courses for a virtual school. *Distance Education*, 31, 55 - 75. <https://doi.org/10.1080/01587911003725022>.
- 15) Nagamani, D., & Muthuswamy, P. (2013). Teacher's Professional Use of Information and Communication Technology in Secondary Schools in Tamil Nadu, India. *International Education Studies*, 6, 64-73. <https://doi.org/10.5539/IES.V6N12P64>.
- 16) Jasmin, E. (2017). OPINION TOWARDS AN E-CONTENT IN TEACHING TAMIL LANGUAGE LEARNING TO 9th STANDARD ENGLISH MEDIUM STUDENTS. *International Education and Research Journal*, 3.
- 17) Nachimuthu, K., & Revathi, A. (2019). Need of Virtual Reality to Enrich Teacher Education. *Shanlax International Journal of Arts, Science and Humanities*.
<https://doi.org/10.34293/SIJASH.V6I4.368>.
- 18) Girija, T., & Srinivasan, B. (2017). Assessing the Readiness to Adopt E-Learning among Industrial Training Institute Students in Tamil Nadu. *IOSR Journal of Business and Management*, 19, 55-62. <https://doi.org/10.9790/487X-1901015562>.
- 19) Singh, A. (2021). Virtual Schooling: Issues And Challenges During Pandemic. , 12, 4831-4838. <https://doi.org/10.17762/TURCOMAT.V12I3.1987>.
- 20) Khlaisang, J., & Songkram, N. (2017). Designing a Virtual Learning Environment System for Teaching Twenty-First Century Skills to Higher Education Students in ASEAN. *Technology, Knowledge and Learning*, 24, 41 - 63.
<https://doi.org/10.1007/s10758-017-9310-7>.
- 21) Singh, M. (2022). PERCEPTION OF CLASS 7 ESL LEARNERS TOWARDS VIRTUAL LEARNING ENVIRONMENT. *International Journal of Advanced Research*.
<https://doi.org/10.21474/ijar01/14188>.
- 22) Manegre, M., & Sabiri, K. (2020). Online language learning using virtual classrooms: an analysis of teacher perceptions. *Computer Assisted Language Learning*, 35, 973 - 988.
<https://doi.org/10.1080/09588221.2020.1770290>.
- 23) Raja, M., & Priya, G. (2021). An Analysis of Virtual Reality Usage through a Descriptive Research Analysis on School Students' Experiences: A Study from India. *International Journal of Early Childhood Special Education*. <https://doi.org/10.9756/int-jecse/v13i2.211142>.
- 24) Jasmin, E. (2017). A STUDY OF EFFECT OF AN E-CONTENT IN TEACHING TAMIL LANGUAGE LEARNING TO 9th STANDARD ENGLISH MEDIUM STUDENTS. *International Education and Research Journal*, 3.
- 25) DiPietro, M. (2010). Virtual School Pedagogy: The Instructional Practices of K-12 Virtual School Teachers. *Journal of Educational Computing Research*, 42, 327 - 354.
<https://doi.org/10.2190/EC.42.3.e>.

- 26) Barbour, M., & Reeves, T. (2009). The reality of virtual schools: A review of the literature. *Comput. Educ.*, 52, 402-416. <https://doi.org/10.1016/j.compedu.2008.09.009>.
- 27) Davis, N., Roblyer, M., Charania, A., Ferdig, R., Harms, C., Compton, L., & Cho, M. (2007). Illustrating the "virtual" in virtual schooling: Challenges and strategies for creating real tools to prepare virtual teachers. *Internet High. Educ.*, 10, 27-39. <https://doi.org/10.1016/J.IHEDUC.2006.11.001>.
- 28) Lawrence, A., & Preethi, V. (2021). Learners' attitude towards ODL during COVID-19 crisis with special reference to Tamil Nadu Open University. *Turkish Journal of Computer and Mathematics Education*, 12, 1564-1573. <https://doi.org/10.17762/TURCOMAT.V12I7.3016>.
- 29) Singh, R., & Sikka, P. (2022). Virtual Learning. *Virtual Learning: Insights and Perspectives*. <https://doi.org/10.4324/9781003336600>.
- 30) Padmini, S., & Ramani, P. (2023). Assessing the Efficacy of E-learning Resources in Facilitating Course Teaching in Cuddalore District of Tamil Nadu, India. *Asian Journal of Education and Social Studies*. <https://doi.org/10.9734/ajess/2023/v49i31149>.
- 31) Shanmugam, K., & Balakrishnan, B. (2019). Motivation in Information Communication and Technology-Based Science Learning in Tamil Schools. *Jurnal Pendidikan IPA Indonesia*. <https://doi.org/10.15294/JPII.V8I1.16564>.
- 32) Hamutoğlu, N., Gemikonakli, O., Duman, I., Kirksekiz, A., & Kiyici, M. (2020). Evaluating student's experiences using a virtual learning environment: satisfaction and preferences. *Educational Technology Research and Development*, 68, 437-462. <https://doi.org/10.1007/S11423-019-09705-Z>.
- 33) Al-Qahtani, M. (2020). Teachers' and Students' Perceptions of Virtual Classes and the Effectiveness of Virtual Classes in Enhancing Communication Skills. *Social Science Research Network*. <https://doi.org/10.2139/ssrn.3512530>.
- 34) Jena, R. (2016). Investigating the interrelation between attitudes, learning readiness, and learning styles under virtual learning environment: a study among Indian students. *Behaviour & Information Technology*, 35, 946 - 957. <https://doi.org/10.1080/0144929X.2016.1212930>.
- 35) Peng, H., Lin, Y., & Wu, T. (2019). The Effects of Virtual Learning Environment on High School Students' English Learning Performance and Attitude. , 815-824. https://doi.org/10.1007/978-3-030-35343-8_85.
- 36) Song, S. (2023). Application of VR Technology in Middle School Students' English Speaking. *Journal of Education, Humanities and Social Sciences*. <https://doi.org/10.54097/ehss.v9i.6408>.
- 37) Lee, J., Hong, N., & Ling, N. (2001). An analysis of students' preparation for the virtual learning environment. *Internet High. Educ.*, 4, 231-242. [https://doi.org/10.1016/S1096-7516\(01\)00063-X](https://doi.org/10.1016/S1096-7516(01)00063-X).
- 38) Díaz, J. (2020). Virtual World as a Complement to Hybrid and Mobile Learning. *Int. J. Emerg. Technol. Learn.*, 15, 267-274. <https://doi.org/10.3991/ijet.v15i22.14393>.
- 39) Tasneem, N. (2023). Challenges of Online English Language Teaching and Learning at Secondary Schools in Bangladesh. *EDULANGUE*. <https://doi.org/10.20414/edulangue.v5i2.5931>.
- 40) Jain, S. (2020). THE INFLUENCE OF VIRTUAL LEARNING IN INDIA. , 54-55. <https://doi.org/10.36713/EPRA5121>.
- 41) Oliver, K., Osborne, J., & Brady, K. (2009). What are secondary students' expectations of teachers in virtual school environments? *Distance Education*, 30, 23 - 45. <https://doi.org/10.1080/01587910902845923>.
- 42) Johannesen, M. (2013). The role of virtual learning environments in a primary school context: An analysis of inscription of assessment practices. *Br. J. Educ. Technol.*, 44, 302-313. <https://doi.org/10.1111/j.1467-8535.2012.01296.x>.
- 43) Cavanaugh, C. (2004). Development and Management of Virtual Schools: Issues and Trends. , 2003, 274-276. <https://doi.org/10.4018/978-1-59140-154-4>.

- 44) Vishwakarma, A. (2017). Mobile Virtual Class. *Imperial journal of interdisciplinary research*, 3.
- 45) Barker, J., & Gossman, P. (2013). The Learning Impact of a Virtual Learning Environment: Students' views. *Teacher Education Advancement Network Journal*, 5.
- 46) Pandirajaa et al., P. (2022). Blended learning: A study on Tamil primary schools. *International Journal of ADVANCED AND APPLIED SCIENCES*.
<https://doi.org/10.21833/ijaas.2022.03.020>.
- 47) Manikutty, A. (2014). Digital Blue: A New Paradigm to Solve the Illiteracy Problem in India by the Year 2020. *Sustainability & Economics eJournal*. <https://doi.org/10.2139/ssrn.2466876>.
- 48) Al-Qahtani, M. (2020). Teachers' and Students' Perceptions of Virtual Classes and the Effectiveness of Virtual Classes in Enhancing Communication Skills. *Social Science Research Network*. <https://doi.org/10.2139/ssrn.3512530>.
- 49) Hansson, T. (2005). English as a Second Language on a Virtual Platform—Tradition and Innovation in a New Medium. *Computer Assisted Language Learning*, 18, 63 - 79.
<https://doi.org/10.1080/09588220500132332>.
- 50) Lee, J., Hong, N., & Ling, N. (2001). An analysis of students' preparation for the virtual learning environment. *Internet High. Educ.*, 4, 231-242. [https://doi.org/10.1016/S1096-7516\(01\)00063-X](https://doi.org/10.1016/S1096-7516(01)00063-X).
- 51) Hamutoğlu, N., Gemikonakli, O., Duman, I., Kirksekiz, A., & Kiyici, M. (2020). Evaluating student's experiences using a virtual learning environment: satisfaction and preferences. *Educational Technology Research and Development*, 68, 437-462. <https://doi.org/10.1007/S11423-019-09705-Z>.
- 52) Singh, R., & Sikka, P. (2022). Virtual Learning. *Virtual Learning: Insights and Perspectives*. <https://doi.org/10.4324/9781003336600>.
- 53) Davis, N., Roblyer, M., Charania, A., Ferdig, R., Harms, C., Compton, L., & Cho, M. (2007). Illustrating the "virtual" in virtual schooling: Challenges and strategies for creating real tools to prepare virtual teachers. *Internet High. Educ.*, 10, 27-39. <https://doi.org/10.1016/J.IHEDUC.2006.11.001>.
- 54) Barker, J., & Gossman, P. (2013). The Learning Impact of a Virtual Learning Environment: Students' views. *Teacher Education Advancement Network Journal*, 5.
- 55) Zulfa, P. (2023). Students' Perceptions on Virtual Discussion of Learning English for Specific Purposes. *International Journal of Education, Language, and Religion*. <https://doi.org/10.35308/ijelr.v5i1.6545>.
- 56) Akbari, J., Tabrizi, H., & Chalak, A. (2021). EFFECTIVENESS OF VIRTUAL VS. NON-VIRTUAL TEACHING IN IMPROVING READING COMPREHENSION OF IRANIAN UNDERGRADUATE EFL STUDENTS. *Turkish Online Journal of Distance Education*. <https://doi.org/10.17718/TOJDE.907585>.
- 57) Ponniah, K., Jose, F., Kassymova, G., Saravanakumar, A., & Sasireha, P. (2023). The impact of hybrid learning in educating Tamil educator and learner relationship. *International Journal of ADVANCED AND APPLIED SCIENCES*. <https://doi.org/10.21833/ijaas.2023.04.012>.
- 58) Johannesen, M. (2013). The role of virtual learning environments in a primary school context: An analysis of inscription of assessment practices. *Br. J. Educ. Technol.*, 44, 302-313. <https://doi.org/10.1111/j.1467-8535.2012.01296.x>.
- 59) Liu, X., & Zhang, J. (2012). Foreign Language Learning through Virtual Communities. *Energy Procedia*, 17, 737-740.
<https://doi.org/10.1016/J.EGYPRO.2012.02.165>.
- 60) Srivani, V., Hariharasudan, A., Nawaz, N., & Ratajczak, S. (2022). Impact of Education 4.0 among engineering students for learning English language. *PLoS ONE*, 17. <https://doi.org/10.1371/journal.pone.0261717>.
- 61) Zheng, D., Young, M., Brewer, R., & Wagner, M. (2009). Attitude and Self-Efficacy Change: English Language Learning in Virtual Worlds. *the CALICO Journal*, 27, 205-231. <https://doi.org/10.11139/CJ.27.1.205-231>.
- 62) Oliver, K., Osborne, J., & Brady, K. (2009). What are secondary students' expectations of teachers in virtual school environments? *Distance Education*, 30, 23 - 45.

- <https://doi.org/10.1080/01587910902845923>.
- 63) Young, S. (2003). Integrating ICT into second language education in a vocational high school. *J. Comput. Assist. Learn.*, 19, 447-461. <https://doi.org/10.1046/j.0266-4909.2003.00049.x>.
- 64) Richardson, J., LaFrance, J., & Beck, D. (2015). Challenges of Virtual School Leadership. *American Journal of Distance Education*, 29, 18 - 29. <https://doi.org/10.1080/08923647.2015.992647>.
- 65) Jagadeeswari, M., Manikandababu, C., Balaji, R., & Kumar, A. (2021). Virtual Learning Assistance for Students. *2021 Third International Conference on Inventive Research in Computing Applications (ICIRCA)*, 968-975. <https://doi.org/10.1109/ICIRCA51532.2021.9544790>.



Questionnaire 1

Title: Significance of Virtual Learning of Languages: An Overview of Tamil (Mother Tongue) and English (Second Language) Learning at the Middle School Level in Tamil Nadu

1. Name of the participant:
2. Age of the participant:
3. Gender: Male / Female / Other
4. Grade/Standard in Middle School:
5. Do you currently attend virtual language learning classes? Yes / No
6. Do you own a gadget used for attending online classes? Yes / No
7. If yes, what type of gadget do you use? (Choose all that apply)
 - a. Mobile Phone b. Computer c. Tablet
8. If not, do you share a gadget with someone else to attend online classes? Yes / No
9. Do you think you would benefit from having your own gadget for online learning? Yes / No
10. Which language are you learning virtually? (Choose all that apply)
 - a. Tamil (Mother Tongue) b. English (Second Language)
11. How often do you attend virtual Tamil and English language learning classes?
 - a. Daily b. Few times a week c. Once a week d. Rarely e. Never
12. How do you access virtual Tamil and English language learning classes? (Choose all that apply)
 - a. Smartphone b. Tablet c. Computer/Laptop d. Television e. Other (please specify)
13. Do you have reliable internet access for attending virtual classes? Yes / No
14. What type of classes do you attend? (Choose all that apply)
 - a. Live Only b. Live and Recorded c. Recorded Only d. Television Only e. Not Applicable
15. How regularly do you attend these classes?
 - a. Regularly b. Irregularly c. Not Applicable
16. How would you rate your overall experience with virtual Tamil and English language learning?
 - a. Excellent b. good c. Fair d. Poor e. Very Poor
17. What do you find most challenging about virtual Tamil and English language learning? (Open-ended question)
18. Do you prefer virtual Tamil and English language learning over traditional classroom learning?

Yes / No / Sometimes
19. Have you faced any technical difficulties while attending virtual Tamil and English language learning classes? Yes / No
20. Do you feel that virtual Tamil and English language learning helps you improve your language skills effectively? Yes / No / Not sure
21. Would you recommend virtual Tamil and English language learning to your friends?

Yes / No / Maybe
22. How satisfied are you with the support provided by your teachers during virtual Tamil and English language learning classes?
 - a. Very Satisfied b. Satisfied c. Neutral d. Dissatisfied e. Very Dissatisfied
23. What improvements would you like to see in virtual Tamil and English language learning classes? (Open-ended question)
24. Do you feel adequately prepared for language assessments through virtual learning?

Yes / No / Somewhat