

A Critical Review of Barriers to Technology Integration Faced by Teachers in First Language Teaching at Secondary Schools in Sri Lanka

OPEN ACCESS

Volume: 13

Special Issue: 3

Month: March

Year: 2026

P-ISSN: 2321-788X

E-ISSN: 2582-0397

Citation:

Paunanthie, A., and A.Tholappan. "A Critical Review of Barriers to Technology Integration Faced by Teachers in First Language Teaching at Secondary Schools in Sri Lanka." *Shanlax Interantional Journal of Arts, Science and Humanities*, vol. 13, no. S3, 2026, pp. 120–28.

DOI:

<https://doi.org/10.34293/sijash.v13iS3-Mar.10497>

A. Paunanthie

Research Scholar

*Department of Education, Bharathidasan University
Tiruchirappalli, Tamil Nadu, India*

Dr. A.Tholappan

Professor

*Department of Education, Bharathidasan University
Tiruchirappalli, Tamil Nadu, India*

Abstract

The use of technology in first language (Sinhala and Tamil) instruction in Sri Lanka has unique problems which educational studies and policies have never addressed. In this critical assessment, the problems faced by the teachers are analyzed with the help of the first-order and second-order barriers approach created by Ertmer (1999). The research employed the multi-source method of secondary data. It is a methodology that involves academic journals, reports, and accounts of professional practitioners. The barriers to technology integration were found in this paper. In this vein, poor infrastructural development, incompetence of linguistically related high-end software, inflexibility of curriculum and the entrenched pedagogical ideals are greatly limiting the participation of the teachers in integrating technology in the first language teaching. Areas of discrepancy include Sinhala and Tamil Unicode rendering problems, the digital divide and subject-specific professional growth. The review has offered a categorical structure of distinguishing resource-induced restrictions against teacher-induced restrictions and gives advice to legislators, schools, and professionals. The possibility of technological change to amplify inequalities and marginalise the lingual history of Sri Lanka will exist unless these language-related issues are appropriately identified.

Keywords: Technology Integration, First Language Teaching, Secondary Education, Sri Lanka

Introduction Background

The application of ICT education in schools has also improved over the last 20 years following the state policy guidelines and global developmental objectives. The Sri Lankan government came up with the idea of the supposed Smart Schools. This notion aims at the digital

transformation by using a row of policy measures. It enhanced the ICT education by setting up schools with technology infrastructures and advancing digital illiteracy (Asian Development Bank, 2017). Sri Lanka has also invested in ICT infrastructure, including the computer labs in the schools, and internet access in the schools. There are however major investments in schools within the urban sector as compared to the rural sector (Palagolla & Wickramarachchi, 2019). ICT is now a compulsory course in Grade 6 and the Ministry of Education has developed elaborate policy frameworks to assist teachers adopt technology in every subject (Vidanagama & Karunathilake, 2021).

Problem Statement

The challenges that face teachers in the First Language (Sinhala and Tamil) teachers differ with those of the STEM teachers despite the national regulations. Research has shown that the challenges that language teachers encounter include the problem of digital literacy, pedagogical alignment, and linguistically appropriate material (Nawastheen et al., 2023). The technicality of the Sinhala and Tamil scripts is cumbersome to their complex circular forms, compound characters and marks of diacritic. These problems are not outstanding when it comes to teaching the English language (Ekanayake, 2023). The technology has to supplement the culturally sensitive first language instruction (Tseng et al., 2022). The digital ecosystem of Sinhala and Tamil is underdeveloped with little language processing tools and culturally-related digital content (Ponniiah et al., 2023).

Research Aim

This critical review has tried to determine, examine and classify the systemic and psychological impediments to effective technology implementation in the First Language teachers in Sri Lankan secondary schools. This review involved the use of the framework by Ertmer (1999, first-order barriers and second-order barriers) in its application. The external factors include resource availability and infrastructure which are the first-order barriers. And, second-order barriers, are internal ones including beliefs of teacher, attitudes and pedagogical orientations.

Significance

The research will also make a contribution to the education field and especially educational modernisation and preserving culture. Speaking the First-language helps to spread cultural knowledge and linguistic self-identification. The language learning of the students is going to be strengthened by the application of efficient technology in the learning process. This will also make sure that the first language, Sinhala and Tamil will be adjusted to the digitalized world.

Literature Review

Theoretical Framework

In this review, the simple method of dividing barriers into two categories by Peggy Ertmer (1999) is taken. First-order barriers refer to external issues that do not involve teachers, including the absence of technical support, time to plan, and access to computers and computer software. An example of second-order barriers is teachers with strongly held attitudes concerning teaching and learning, established classroom practices and their unwillingness to change pedagogy. Ertmer (1999) states that the second-order barriers require that teachers change their philosophical views, whereas the first-order barriers can be resolved through institutional investments. Later research, including Hew and Brush (2007), has elaborated upon this idea by providing a list of barriers to K-12 contexts in a systematic manner, indicating the relevance of the dichotomy of Ertmer.

Technology Integration in South Asian Native Language Teaching

South Asia has several similarities. The book by Pradhan and Gupta (2025) explores politics, education, and technology of South Asian languages regarding the South Asian countries of Pakistan, Sri Lanka, Bangladesh, Nepal, and India. This book takes care of language marginalisation in school policy and the preservation of language through the utilisation of technology. Chapter 10 shows that it is not possible to use mobile applications to teach the challenging indigenous languages such as Malayalam. Computer-Assisted Language Learning in the Global South (McCallum and Tafazoli, 2025) explores the problems of language teachers in developing countries of different cultures.

The Sri Lankan Gap: Identifying the Missing Link

The sphere of First Language practitioners is characterized by a clear lack of research, despite the fact that the academic community may be becoming increasingly interested in the issue. Nawastheen et al. (2023) reported that out of the limited number of empirical studies on the preparedness of Tamil-medium teachers in Sri Lanka, there was a significant lack of technological competence and pedagogical self-confidence. Similarly, Ponniah et al. (2023) examined the competency and access of information and communication technology (ICT) by primary school teachers of Tamil and discovered that there were shortcomings in both. The absence is, however, research that methodically uses the framework proposed by Ertmer in distinguishing between first-order (linguistically inappropriate software and flaky infrastructure) and second-order (pedagogical beliefs and professional identity issues) challenges that Sinhalese and Tamil teachers encounter.

Methodology

Research Design: Justification for Multi-Source Document Analysis

The data collection on this study was done by document analysis methodology. The data and information used as identified documents including journals, magazines, reports, policy papers are systematically analyzed to find out the impediments to technology integration among teachers, teaching first language in secondary schools in Sri Lanka. Through examination of documents like journals, magazines, reports, policy papers etc., pertinent information was obtained to identify the triangulation of various views of academic research, policy discourse and practitioner communities.

There were three complementary categories that were used to obtain data. To begin with, literature of peer-reviewed journals like recent studies on the ICT perspectives of teachers in Tamil medium (Dilakshan and Nawastheen, 2025) surveyed 125 teachers and discovered that smartphones were most commonly (92.8) used, and less frequently smartboards (56.8). A systematic approach was used in most of the studies on technical leadership (Nawastheen, 2025). Moreover, the reports and the action plan prepared by Asian Development Bank (2017) and UNESCO (2023) gave policy perspectives. Lastly, the views of the practitioners were documented in professional journals and conferences, such as the CARN Conference 2025, where presentations were given on participatory teacher training (Jayasinghe, 2025).

The READ Approach

The process of document analysis was operationalised based on the READ framework (DalGLISH et al., 2021). Inclusion criteria were set by the Ready phase. According to the criteria, there were three major themes on which documents were incorporated. They include: technology integration in Sri Lankan education, secondary schooling/education, and the First language teaching (Sinhalese/Tamil). The Analyse phase used thematic analysis as it related to Ertmer framework. The Distil step synthesised the findings of sources, and this created the categorical structure to be found below.

Authenticity and Credibility

Triangulation by scholars validated practitioner views. The impediments recognized by the teachers regarding inadequate infrastructure (Suhaib Razith et al., 2019) were confirmed in survey studies of quantitative urban-rural differences (Dilakshan and Nawastheen, 2025). There was convergence in study teams between multiple independent studies (Rafeena & Suhaib Razith, 2022), which supported the concerns of Tamil teachers.

Findings and Discussion

One of the most common theoretical frameworks applicable to analyse the technological integration issues is the first-order and second-order barriers, as suggested by Ertmer (1999). The first-order barriers as illustrated in the figure 1 are external factors like ineffective access to technology, ineffective technical support, and failure to prepare time to teach technology-based lessons on part of the teachers (Ertmer, 1999). Second-order barriers on the other hand are related to internal teacher factors including pedagogical beliefs, negative attitude to technology, and resistance to technology changes (Ertmer, 1999). The significance of this framework has been reiterated in subsequent studies and these studies have indicated that both structural factors and teacher level factors are also involved in contributing towards the achievement of successful ICT integration in the classroom (Hew and Brush, 2007; Inan and Lowther, 2010).

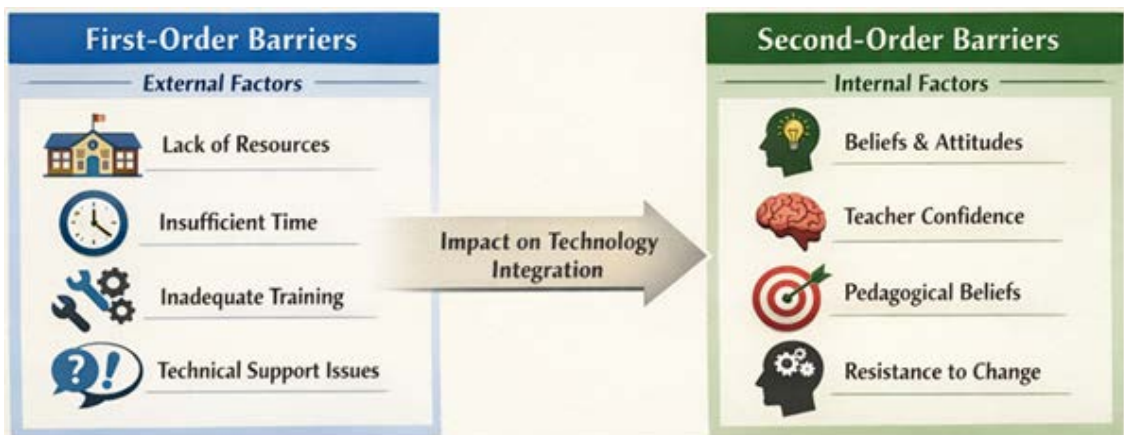


Figure 1. Ertmer’s First- and Second-Order Barriers to Technology Integration

First-Order Barriers

a. Infrastructure and Access and the Urban-Rural Digital Divide

Through the analysis, it has indicated that, there are still technological inequalities between urban and rural secondary schools in terms of technological infrastructure. The 2021 computer literacy statistics indicate that urban ownership of desktops and laptops in Sri Lanka is lesser than 38.3% out of less than one in five households, with rural being 20.7% and the estate sector third in the list with 4.1% (Department of Census and Statistics 2021). Such deficit is further extended to schools based on which there is a reported smartphone pre-eminence of ICT usage by teachers working at Tamil medium schools: 92.8%, followed by laptop: 61.6% and smartboards: 56.8% with a pathetic usage of interactive whiteboards: 22.4% and tablets: 38.4% (Dilakshan and Nawastheen, 2025). These findings are also supported by research conducted on the integration of AI tool in Kandy district where 53.3% of teachers say they lack infrastructure as a significant barrier (Srikanth, 2025).

b. Linguistic Software Limitations: Unicode Challenges

First Language teachers also encounter special technical problems with the lack of support of Sinhalese and Tamil scripts. As is evidently shown in technical support forums, Unicode rendering issues with Sinhala typing continue to persist with updates on the system undermining input methods. These all systemic challenges with documentation have an implicit acknowledgement in the creation of a special Help Centre in Sinhalese and Tamil Unicode in the year 2019 (Help Centre for Sinhalese and Tamils Unicode, 2022). The effects of language barriers on the integration of technology are proven by recent research in 40 percent of teachers who have attempted to do so (Sriganth, 2025).

c. Curriculum Rigidity: Systemic Constraints

One of the first-order barriers, which restricted the technology integration, was found to be the inflexibility of the current school curriculum. In Sri Lanka, secondary education is said to be results focused structures, and by placing emphasis on contents and less on pedagogical innovation (The Morning, 2025). Literary material and exam requirements are the feature of Sinhalese and Tamil syllabuses. Notably, the current curricular cannot sustain exploratory digital pedagogy. These limitations are compounded by this assessment system, yet, teachers possess the digital ability, and the emphasis of the examination-oriented system on hand-written answers discourages the development of digital writing skills.

Second-Order Barriers (Teacher-Based)

a. Pedagogical Beliefs: Language Teaching as “Tradition”

The pedagogical beliefs are imposing second-order impediments. The fact that people are seeing language instruction as a traditional activity that needs to be mediated with the help of little technology is a manifestation of a culturally constructed meaning of what constitutes genuine language pedagogy. The belief system is socially reproduced within teacher education programme and within institutional cultures, language teaching is presented as a humanistic practice relating to technical orientations. This perspective is connected to the humanistic perspective stating that high school language teaching is a potent means of fostering spirituality in students, meaning, purpose, and interconnectedness in the world is more important than the religious indoctrination, which they rightly regard as a highly individual and reflective approach. As a result, instructors teaching the first language in the secondary classrooms receive technology as a possible threat to the genuine interaction with the texts as opposed to improvement (NCAS, 2024).

b. Digital Literacy and Confidence: The Training Deficit

In the study by Dilakshan and Nawastheen (2025), a contradictory relationship between the ICT awareness ($M=3.88$) and the ICT interest ($M=3.86$) was observed. And, it provides poor self-evaluated skills ($M=3.73$) and knowledge ($M=3.77$) among teachers in Tamil medium. This observation underscores the fact that teacher education has acquired positive attitude. Nonetheless, educators are not prepared in practical competences. The other study that was conducted by Sriganth (2025) on the integration of AI tools revealed that most of the respondents feel that a key hurdle the technology integration faces is inadequate training. Moreover, another important obstacle is that 65.3 percent are not very confident about the use of the digital tools (Sriganth, 2025).

c. The “Prestige Gap”: Differential Professional Development

Differentiation of professional development opportunities is one of the most malicious barriers. The training programmes in ICT are disproportionately focused on STEM teachers and English

teachers and Sinhales and Tamils teachers are trained in general training which is not focused on the subject matter. This bias is being brought out implicitly by conference programmes with little to no representation of First Language contexts (University of Colombo, 2022). Ceylon Teachers Union (CTU) struggle against the existing problem of teacher shortage. In this regard, the general secretary of the CTU boldened that it has 42,000 vacancies that have specialized demand in mathematics, science, and IT (Daily Mirror, 2025). It unspokenly demotes the humanities subjects.

Triangulation: Policy Versus Reality



Figure 2. Gap between National Policy and Classroom Realities

As Figure 2 demonstrates, triangulation reveals profound disparities between the policy discourse and realities. The policy commitment of ICT in education in Sri Lanka was recorded by Asian Development Bank (2017). Nonetheless, when contrasted with practitioner accounts, one will see a different image. Household survey results indicate a contradiction between the policy claim of the fair allocation of infrastructures with households owning 4.1% of computers in the estate sectors (Department of Census and Statistics, 2021). The government allegations regarding teacher readiness are refuted by the results which indicate that 60 percent of them name the absence of training as the key impediment (Sriganth, 2025). The technological vision of smooth language learning that is technologically enhanced collides with technical reality (as reported in Unicode help centre) (Help Centre for Sinhala and Tamil Unicode, 2022).

Recommendations and Conclusion

Implications

Ways of overcoming second-order obstacles are best achieved through grassroots-level efforts. One of the ways through which digital confidence can be facilitated is by developing Communities of Practice among First Language Teachers. Action research evidence on the use of virtual teacher communities shows that such networks are capable of delivering useful professional development (Dissanayake et al., 2025). These communities would share resources created by them locally and resolve technical problems peculiar to Sinhalese and Tamil teachers.

Policy Recommendations

One, persistent software restriction in language necessitates instant investment in localisation. One of the opportunities offered by the government initiative to create a National Education

Management Information System backed by the Sri Lanka Air Force (2025) is the possibility to incorporate the local language functionality. A system that is beneficial to over 4.2 million students must place preferences to Sinhala and Tamil language interfaces along with administrative operations.

Second, professional development requires restructuring in the form of subject-specific ICT workshops among the practitioners of the First Language. Existing models that reproduce the prestige gap should be substituted by training based on the recognition of different pedagogical traditions of Sinhalese and Tamil teaching. The idea of the government to provide smartboards to approximately 2,500 schools (Xinhua, 2025; People's Daily Online, 2026) has to be supported with similar investments in the subject-related training.

Third, the urban rural digital divide needs to be taken care of by the national policy to connect all secondary schools to the Internet by 2026 (Xinhua, 2025) so that the rural schools using Tamil and Sinhalese could be proportionately invested in.

Conclusion

The critical review has identified in a systematic way the barriers that the First Language teachers encounter in the framework of Ertmer, distinguishing the first-order barriers, which are a lack of infrastructure, limitation of linguistic software and inflexibility of the curriculum and second-order barriers, which include the opinions that are related to the language teacher beliefs as well as the systemic de-prioritisation of language teachers. Since Sri Lanka enters the very ambitious prospects of digital transformation, the findings provide a figure of caution since the integration of technology cannot be done without offering infrastructure. It entails simultaneous investments in linguistic localisation, specialised professional developmental and professional communities that are not disrespectful of the peculiarities of Sinhala and Tamil teaching. In the absence of deliberate attention to these impediments, the dangers are that the technological change process will only raise inequality and marginalise the languages that are the expressions of the rich cultural heritage of Sri Lanka.

References

1. Asian Development Bank. (2017). Innovative strategies for accelerated human resources development in South Asia: Information and communication technology for education—Special focus on Bangladesh, Nepal, and Sri Lanka. <https://doi.org/10.22617/TCS179080>
2. Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27–40. <https://doi.org/10.3316/QRJ0902027>
3. Dalglish, S. L., Khalid, H., & McMahan, S. A. (2021). Document analysis in health policy research: The READ approach. *Health Policy and Planning*, 35(10), 1424–1431. <https://doi.org/10.1093/heapol/czaa064>
4. Department of Census and Statistics. (2021). Computer literacy statistics 2021. Sri Lanka.
5. Dilakshan, R. S., & Nawastheen, F. M. (2025). Teachers' perspectives on ICT integration in classroom teaching and learning: A study of Tamil medium teachers in Sri Lanka. *Asian Journal of Education and Social Studies*, 51(12), 361–375. <https://doi.org/10.9734/ajess/2025/v51i122697>
6. Dissanayake, S., Jansz, M., & Schreiber, B. (2025). Virtual teacher communities in Sri Lanka: Difficulties and possibilities. In U. Pradhan & M. Gupta (Eds.), *Language education, politics and technology in South Asia*. Routledge.
7. Ekanayake, N. (2023). Design and implementation of a cloud-based application for Sinhala and Tamil manuscript recognition [Unpublished master's dissertation]. Informatics Institute of Technology. <http://dlib.iit.ac.lk/xmlui/handle/123456789/1699>

8. Ertmer, P. A. (1999). Addressing first- and second-order barriers to change: Strategies for technology integration. *Educational Technology Research and Development*, 47(4), 47–61. <https://doi.org/10.1007/BF02299597>
9. Fareed Mohamed, N. (2025). How school principals navigate leadership challenges in integrating technology into the teaching-learning process. *International Journal of Contextual Science Education*, 3(4), 129–139. <https://doi.org/10.29303/ijcse.v3i4.1283>
10. GEM Report UNESCO. (2023). Global education monitoring report 2023: Technology in education: A tool on whose terms? <https://doi.org/10.54676/UZQV8501>
11. Help Centre for Sinhala and Tamil Unicode. (2022). Help centre for Sinhala and Tamil Unicode. <https://helpcentre.lk>
12. Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development*, 55(3), 223–252. <https://doi.org/10.1007/s11423-006-9022-5>
13. Inan, F. A., & Lowther, D. L. (2010). Laptops in the K-12 classrooms: Exploring factors impacting instructional use. *Computers & Education*, 55(3), 937–944. <https://doi.org/10.1016/j.compedu.2010.04.004>
14. Jayasinghe, M. (2025). Bridging the digital divide: Supporting Sri Lankan English language teachers [Conference presentation]. CARN Conference 2025.
15. Kern, F. G., & Mustasilta, K. (2023). Beyond replication: Secondary qualitative data analysis in political science. *Comparative Political Studies*, 56(8), 1224–1256. <https://doi.org/10.1177/00104140221139388>
16. McCallum, L., & Tafazoli, D. (Eds.). (2025). *Computer-assisted language learning in the Global South: Exploring challenges and opportunities for students and teachers*. Routledge. <https://doi.org/10.4324/9781003495956>
17. Nawastheen, F. M., Kingston Palthamburaj, S., Shifaaan, S., & Tamilmullai Thannimalai. (2023). A study on the readiness and attitudes of Sri Lankan Tamil medium teachers towards the use of ICT in teaching and learning. *International Journal of Advanced and Applied Sciences*, 10(6), 54–62. <https://doi.org/10.21833/ijaas.2023.06.007>
18. Palagolla, W. W. N. C. K., & Wickramarachchi, A. P. R. (2019). Effective integration of ICT to facilitate the secondary education in Sri Lanka (Version 1). arXiv. <https://doi.org/10.48550/ARXIV.1901.00181>
19. Paunanthie, A., & Tholappan, A. (2020). Fostering spirituality for the secondary level students through language teaching. In M. Mirunalini, L. Tripathi, & Pandey (Eds.), *Mind, self, and spirit: Advances in transpersonal and spiritual psychology* (1st ed., pp. 141–148). Scribe and Scroll Publishing. <https://doi.org/10.25215/1257011561.18>
20. People’s Daily Online. (2026, January 15). China, Sri Lanka unveils general education digital transformation project. <https://en.people.cn/n3/2026/0115/c90000-20414859.html>
21. Ponniah, K., Tamilmullai Thannimalai, Sathiamoorthy, B., & Thirunavukkarasu, S. (2023). An investigation of ICT skills among Tamil language teachers in primary schools and the adequacy of ICT facilities: A quantitative study. *International Journal of Advanced and Applied Sciences*, 10(7), 33–41. <https://doi.org/10.21833/ijaas.2023.07.005>
22. Pradhan, U., & Gupta, M. (2025). *Language education, politics and technology in South Asia: Shaping inclusive societies, identities, and futures* (1st ed.). Routledge. <https://doi.org/10.4324/9781003491347>
23. Rafeena, H. M., & Suhaib Razith, S. M. M. (2022). Latest technologies in language teaching and constraints of using it in Tamil language. South Eastern University of Sri Lanka.

24. Ranawana, R. (2025, October 1). Localisation key to unlocking Sri Lanka's AI potential. Daily FT. <https://www.ft.lk/it-telecom-tech/Localisation-key-to-unlocking-Sri-Lanka-s-AI-potential--Dr--Ranawana/50-782426>
25. Sriganth, R. (2025). Assessing the competencies of secondary school teachers on AI tools for teaching: A study in Kandy District, Sri Lanka. Proceedings of the International Research Conference of the Open University of Sri Lanka (IRC-OUSL 2025). <https://ours.ou.ac.lk/wp-content/uploads/2026/01/ID-208-ASSESSING-The-Competencies-Of-Secondary-School-Teachers-On-Ai-Tools-For-Teaching-A-Study-In-Kandy-District-Sri-Lanka.pdf>
26. Suhaib Razith, S. M. M., Mansoor, C. M. M., & Rafeena, H. M. (2019). Investigating the possibilities and challenges on computer integrated teaching. South Eastern University of Sri Lanka.
27. Tseng, J.-J., Chai, C. S., Tan, L., & Park, M. (2022). A critical review of research on technological pedagogical and content knowledge (TPACK) in language teaching. *Computer Assisted Language Learning*, 35(4), 948–971. <https://doi.org/10.1080/09588221.2020.1868531>
28. Xinhua. (2025, July 9). Sri Lanka to connect all secondary schools to Internet by 2026. <https://english.news.cn/asiapacific/20250709/8b09ff47bb344c4d84dfae01bdce4948/c.html>