

# A Subjective Teachers' Report on Classroom Listening Environments Using a Tamil Translated Version of The Listening Inventory for Education-Revised (L. I. F. E. - R.)

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**Abstract:** ***Purpose:** The Listening Inventory of Education - Revised (L. I. F. E. - R.) is a self-reporting tool that enables children in third grade and up, as well as their teachers, to evaluate how well they hear in various social, academic, and classroom settings. Teachers may better comprehend the special requirements of each student if they are aware of problems with individual listening. Additionally, they can monitor how the kids hear in class and how they perceive the acoustic environment. **Method:** The translation and validation of the L. I. F. E. - R. into Tamil is the aim of this study. The original L. I. F. E. - R in English was translated into Tamil using six phases, including forward and backward translations, content validation, and questionnaire validation, in which randomly selected, 68 teachers took part. 34 of the 68 teachers worked with kids who had hearing loss, while the other 34 worked with kids who had normal hearing. The participants were given questionnaires to complete, and this method of gathering data was used. The information gathered was subjected to statistical analysis. In this study, a comprehensible Tamil translation of the questionnaire was made. By giving the questionnaire to a small pilot population of average students and teachers, who read and analysed the questions, the validity of the questionnaire's contents was investigated. The version with content validation was used in numerous regular schools and schools for hearing-impaired students. With the help of Cronbach's Alpha, the consistency of the questionnaire was assessed, and the results showed that it is quite a reliable tool. **Conclusions:** The translated listening inventories for education in Tamil have shown to be a helpful tool to comprehend students' listening experiences in the classroom. However, done in a small population with time limitations, a larger population to generalize the results further would be appropriate.*

**Keywords:** Classroom Listening, Hearing Issue, Typically Developing, L. I. F. E. - R, Teacher report

## 1. Introduction

Hearing is one of the five senses that is heavily utilised in Indian education. In the past, spoken exchanges have been the primary method of information delivery in education. People learn by paying close attention to noises and identifying their origins or channels in order to spot patterns. So, for learning, both sound quality and listening skills are essential.

Primary and secondary schools typically have classroom noise levels of 72 dBA LAeq or more, which are above the level of conversational speaking (Shield and Dockrell, 2008). Valid and trustworthy classroom listening tests are required to assess the functional impact of hearing issues due to the importance of classroom listening skills for children's learning and the fact that classrooms can be challenging listening environments even for kids with normal hearing (Dockrell and Shield, 2004). Standardized clinical trials are less effective at monitoring progress in listening conditions than questionnaires that provide data on perceived performance in ordinary contexts (Crandell et al., 2005; Smaldino and Flexer, 2012).

Although there are other distractions and sources of noise in

the classroom, other students' conversations are the predominant source (Shield and Dockrell, 2004). It has long been recognised that, when subjected to activity limitations, children with hearing impairments fare academically worse than peers with average hearing (Monfort and Sánchez, 2002).

Studies conducted in a variety of educational settings have shown that tasks requiring language, such as reading and word problems in mathematics, are particularly difficult to complete in a noisy environment. These tasks also require a high cognitive workload, such as attention, problem solving, and memory. For many children, particularly those with hearing issues or learning disabilities, poor classroom acoustics can create a hostile learning environment (Bradlow et al., 2003).

There is evidence that teachers have greater throat problems than those in other occupations. (Gotaas and Starr, 1993). They regularly speak over background noise in rowdy courses, which makes the situation worse. (Teachers were more likely than other professionals to miss work and experience vocal strain at a rate of 32 percent higher; 80% of teachers reported experiencing these problems; 86 percent claimed that classroom loudness was a problem for them.)

Volume 13 Issue 2, February 2024

Fully Refereed | Open Access | Double Blind Peer Reviewed Journal

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While several methods for analysing a classroom's physical acoustics, such as signal - to - noise ratio and reverberation, exist, there are few behavioural instruments and questionnaires for checking the quality of the classroom listening environment, including the Teacher Evaluation of Auditory/Oral Performance of Children (TEACH) (Ching and Hill, 2005), the Teacher Evaluation of Auditory Performance (TEAP) (Purdy et al., 2002), the Listening Inventory (TLI) (Geffner and Ross – Swain, 2006), and the Screening Identification for Targeting Educational Risk (SIFTER) (Anderson, 1989). Teachers are required to rate their pupils on their listening behaviour (TEACH, TEAP) or overall performance (TLI, SIFTER) in class using these surveys.

However, only one questionnaire, The Listening Inventories for Education (LIFE), uses both teacher and student self - report to analyse all the specific listening problems in the classroom. To meet the need for behavioural verification methods, the Listening Inventories for Education (LIFE) were developed in 1998. (Anderson and Smaldino, 1999).

The current study aims to translate, gather reliability and validity information for the L. I. F. E. - R. Tamil questionnaire from children who are typically developing and children who have hearing issues as well as their teachers. The study's objectives include translating the L. I. F. E. - R questionnaire into Tamil, assessing its validity and reliability, and using it with teachers handling students with normal hearing and hearing impairments.

Distraction, classroom noise, and a natural deficiency of listening skills are all issues that students who attend school must deal with, which makes learning challenging. This study would be useful in identifying the circumstances of the listening environment in the classroom because there are no evaluation tools in Tamil that focus on the classroom environment for students in schools. Hence, this study would be focusing on translating and validation of the L. I. F. E. - R questionnaire to the Tamil language, for easier implementation in schools in Tamil Nadu.

## 2. Literature Survey

### *Noise and affects in hearing and voice*

Jamieson et al. (2004) investigated the ability of 40 young school - aged children (ages five to eight) to understand speech (monosyllables, spondees, trochees, and trisyllables) when listening in a background of noise comparable to that seen in real - life classrooms. When the noise was at levels encountered in many classrooms, all children had some trouble recognising speech (i. e., 65 dBA). Kindergarten and grade 1 students, on the other hand, had far greater difficulties than older children at an intermediate level ( - 6 dB SNR).

In quiet conditions, all of the children performed well, with results that were equivalent to or somewhat better than those reported in prior research, suggesting that the task was age - appropriate and well - understood. These findings show that the youngest students in the school system, whose classrooms are also among the noisiest, are the most vulnerable to the impacts of noise.

The association between classroom acoustics and teachers' well - being was examined by Karjalainen et al. (2020). Investigations were also conducted on the potential effects of their age, experience, teaching grade, and class size on the relationship. The terms stress, burnout, self - efficacy, and self - reported voice health are used to describe well - being in this study. Twenty - three primary school teachers provided responses to well - being surveys. The variables clarity of voice (C50), ventilation system noise (VSN), and reverberation time were used to measure the acoustical qualities in each teacher's classroom.

A variety of non - parametric correlations was conducted in order to ascertain the connection between classroom acoustics and instructors' well - being. Voice symptoms were shown to be connected with both teaching grade and VSN, and there was a substantial bivariate association at first between burnout and VSN. The results show that voice symptoms worsen with increased VSN in classrooms and that a higher degree of burnout is linked to higher levels of VSN. Compared to teachers in higher classes, those in lower grades reported experiencing more voice issues.

Durup et al. (2015) measured teachers' voices in various classroom types in an attempt to gain a better understanding of the impact of classroom acoustic design on their voice parameters. By measuring speech parameters (such as fundamental frequency, phonation time, and average voice sound pressure level) directly from the skin vibrations in the neck, an Ambulatory Phonation Monitor (APM) has been able to remove the influence of external noise sources.

To enable the investigation of correlations between the speech data and acoustic characteristics, such as unoccupied ambient noise levels and reverberation times, each of the participating rooms underwent unique acoustical benchmarking. The analysis of the collected data reveals a favorable relationship between teachers' voice levels and the internal ambient noise levels in classrooms. Consequently, the teacher's speaking level rises with the internal ambient level, possibly raising the chance of voice concerns.

### *The listening inventories for education: original and revised*

The Hearing Performance Inventory for Children (HPIC), developed by Giolas et al. in 1997, was used as the foundation for the Listening Inventories for Education (LIFE), which Anderson & Smaldino (1999) updated and added new companion scales to provide a more complete picture of a student's listening situation in a classroom.

The Listening Inventory for Education - Revised (LIFE - R) (2011), includes student and teacher evaluations, can be found on the Supporting Success for Children with Hearing Loss website: <https://www.successforkidswithhearingloss.com>.

The LIFE - R Teacher Appraisal (Listening Inventory for Education - Revised) consists of two sheets that can be used separately or together. The 15 replies are averaged and evaluated in the same way as the findings of the first Teacher Appraisal.

Teachers' Checklist for Self - Advocacy and Instructional Access: With the help of this new evaluation, the professional for the deaf and hard of hearing may highlight important skills that the student ought to possess in the classroom and add self - advocacy goals in the child's IEP. The instructor replies to eight inquiries about different types of self - advocacy.

### *Similar works in other languages*

The study "Translation and cultural adaptation of Student Listening Inventory for Education – Revised questionnaire to European Portuguese" by Quadros et al., (2014) aims to adapt the L. I. F. E. - R questionnaire to European Portuguese culture by translating and culturally modifying it. Convenience sampling was used to identify children who were at least eight years old chronologically.

The European Portuguese version's content validity and language equivalence to the original version were both confirmed. The assessment instrument was evaluated by a review committee, which regularly discovered light and considerable coefficients of agreement as well as a total percentage of concurrence above 50%. The validity of the instrument tool used in this investigation was not tested repeatedly in a range of samples.

Afsah et al. (2021) in their study, attempted to verify an Arabic questionnaire for listening skills to understand the listening abilities of Egyptian Arabic - speaking children who were hearing impaired. The Arabic questionnaire for school - based listening skills was created by adapting elements from an English questionnaire (the LIFE - R).

The questionnaire was given to 70 Arabic - speaking Egyptian children 7 to 12 years old, with 30 of them having normal hearing, 30 utilizing hearing aids, and 10 of the children using cochlear implants. Children with normal hearing had the best results, with no significant differences in observations between children who used cochlear implants and those who used hearing aids.

The most significant determinants of the listening skills of deaf Egyptian children appeared to be the severity of hearing loss and the amount of time spent receiving language therapy. The modified Arabic questionnaire was discovered to be a valid and trustworthy functional assessment tool that can be used to assess and track the listening abilities of Arabic - speaking deaf students in a classroom setting.

## **3. Method**

### **3.1 Participants**

The subjects required for this study were recruited voluntarily from a number of Tamil - speaking schools in the Tamil - speaking states of Tamil Nadu and Puducherry, as well as from the Union Territory of Puducherry.

#### **3.1.1 Inclusion criteria**

- Teachers handling students with typical development from 13 - 17 years working at mainstream schools
- Teachers handling students with hearing difficulties from 13 - 17 years working at schools for inclusive education

and for the hearing impaired

#### **3.1.2 Exclusion criteria**

- Teachers handling students with typical development younger than 13 years and older than 17 years of age.
- Teachers handling students with hearing difficulties from inclusive schools and schools for the hearing impaired in the age group younger than 13 years and older than 17 years.

### **3.2 Research design**

With the aid of the Tamil L. I. F. E. - R teacher questionnaires, data were gathered over the course of four months, from March 2022 to June 2022, using a cross - sectional, descriptive methodology.

### **3.3 Translation to the Tamil Language and validation of the questionnaires**

Sousa and Rojjanasrirat (2010) offered clear and user - friendly instructions for the translation, adaption, and validation of instruments or scales for cross - cultural health care research, which is used in this study's methodology.

Karen Anderson (1999), the author of the original questionnaire, was requested permission to translate the L. I. F. E. - R Questionnaire into Tamil, and two people with a strong grasp of English and Tamil carried out the translation process separately. A committee approach was used to clarify any ambiguities and produce the preliminary initial translated version (PI - TL). Two translators (B - TL1 and B - TL2) back - translated the PI - TL into English, resulting in two back - translated versions with different backgrounds. Comparison was done between the two versions for wording, sentence structure, meaning and applicability of the directions, the questions and the answer format. A multidisciplinary committee consisting of the researcher, an audiologist, a speech language pathologist, translators skilled in English and Tamil languages, and translators from the previous translation processes was formed to debate the relevance and proximity to the original questionnaire. If there are still ambiguities and disagreements, only sentences that lose their literal meaning are re - translated and back translated.

### **3.4 Administration and scoring of the L. I. F. E. - R. Questionnaires**

The LIFE - R includes both a teacher and a student evaluation. The teacher assessment consists of two parts: the teacher LIFE - R and self - advancement abilities. To identify the difficulties with a student, instructors must score 15 questions on a 5 - point Likert scale in the teacher LIFE - R. A score between 15 (always difficult) and 75 is possible (no challenges with listening). On the self - advocacy questionnaire, teachers are expected to rank the frequency and situations in which students employ self - advancement strategies in the classroom. Eight situations must be scored on a 5 - point Likert - type scale for this portion.

The questionnaire was administered to teachers in the form of fill out sheets. The teachers were given explanations on

the questions and how to rate using the rating scales. Data was collected in the form of responses to questions and ratings given by the student and teacher populations in the L. I. F. E. - R. translated questionnaires. Data collection was conducted by distributing questionnaires to the teachers and students in schools for the typically developing and for the hearing impaired and they were asked to read and fill in answers by picking multiple options in multiple choice questions and by rating their experiences in 5 - point rating scales retrospectively.

The study examined the intelligibility of instructions, items, and answer format for 3 children with hearing challenges, 2 children with typical hearing, and 5 teachers with Tamil as their mother tongue. 68 participants volunteered to participate, divided into 34 teachers working in mainstream schools and 34 teachers working in schools for the hearing - impaired child.

**3.5 Statistical analysis**

The data was entered into Microsoft Excel sheets after being quantified by giving the numbers nominal values. The IBM SPSS Statistics version 23 software was used for the analysis. The Cronbach's alpha coefficient was used to

assess the questionnaires' internal consistency and reliability.

**4. Results**

*Translation and content validation*

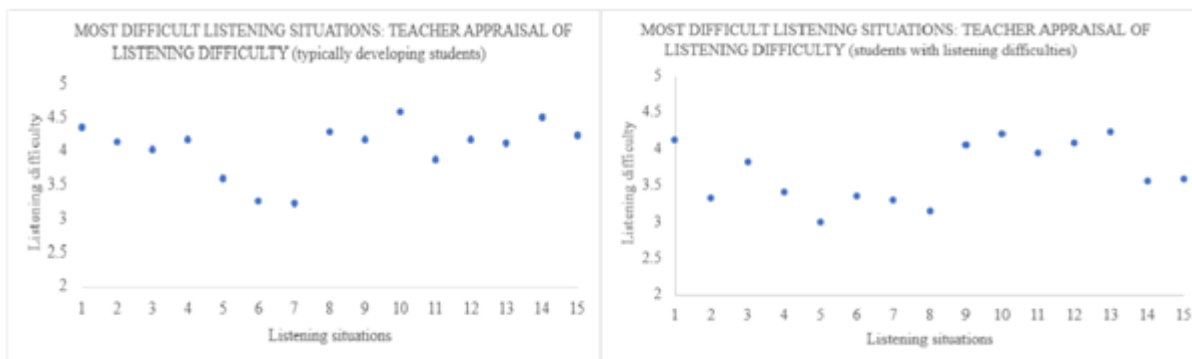
The L. I. F. E. - R. Questionnaires were translated into the Tamil language successfully and with good content validity. The students and teachers involved in the content validation had no problems with interpreting the questions and were able to understand the rating scales with some explanations. Since the Tamil questions include the same number of scoring items as the original L. I. F. E. - R. Questionnaires, the original scoring of the questionnaires may be kept.

*Descriptive statistics*

*Demographic data*

Participants involved in this study include 68 teachers, out of which 34 teachers were working in mainstream private secondary and senior secondary schools and 34 teachers were working in schools for the hearing - impaired child.

*Teacher Appraisal of Listening Difficulty*



**Figure I:** Most difficult listening situations for students as rated by their teachers in mainstream schools and schools for the hearing impaired

(Ref. Figure I) The teachers reported a general decline in performance of students with listening difficulties, with reduced attention spans and participation, greater requirement of reorientation for activities in both student groups. Teachers handling students with hearing difficulties also reported a greater decline in capacity to pay attention to and comply with verbal instructions when the teacher is pacing around the classroom among students, reduced focus and attention to instructions and greater hesitation before following directions provided to a larger group of students compared to reports from teachers handling typically developing children.

**Table I:** Mean and standard deviation values of classroom listening score averages

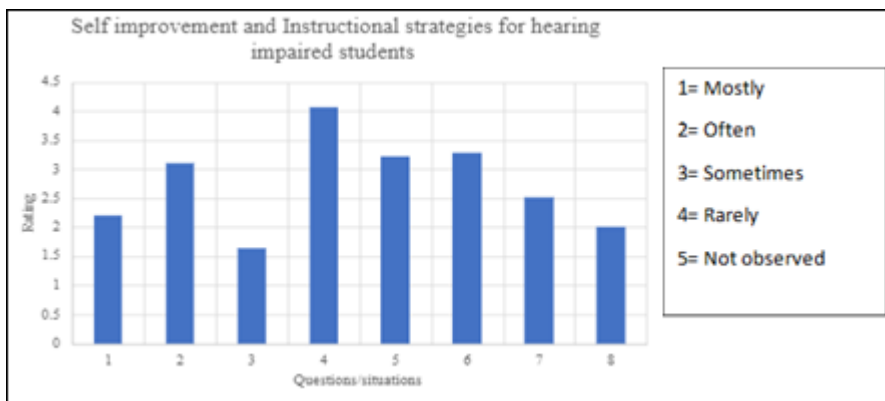
		No of Samples	Average	Std Dev
Teachers	Normal	34	59.4	3.5
	HD	34	55.1	5.8

\*HD= Teachers handling students with hearing difficulties

Teachers on average rated listening experiences of students to be occasionally facing difficulties in their listening environments, according to the classroom listening scores, for both mainstream schools and schools for the hearing impaired. (Ref. Table I)

*Self - Advocacy and Instructional Access*

*Schools for the hearing impaired*

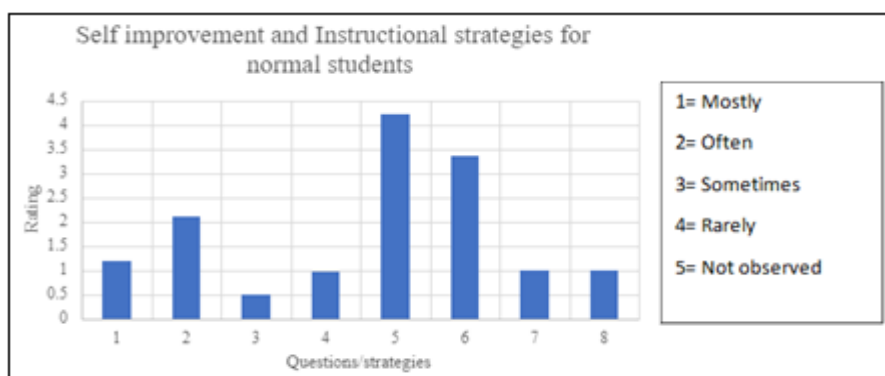


**Figure II:** Ratings of teachers working at schools for students with hearing difficulties, for questions 1 through 8 of the self - advocacy and instructional access rating scale.

The teachers reported an average rating of 70.12 percent; higher averages for questions 4, 5, 6, and 2 show that most students take responsibility for their hearing aids and cochlear implants; frequently, students found it simple to follow directions given in large groups; frequently, students self - advocate for their listening requirements in context to media and announcements; and frequently, students used strategic seating for better listening during classes. The

student may use several methods during collaborative learning, such as positioning oneself for optimal auditory and visual access, asking their friends for repetition, having the group sit in a circle, moving to a less loud area of the classroom, and other strategies (Ref. Figure II).

**Mainstream schools**



**Figure III:** Ratings of teachers working at mainstream schools, for questions 1 through 8 of the self - advocacy and instructional access rating scale

The teachers rated a 44.79% score in average, there is a larger average in question 5 and 6, indicating students mostly found it easy to understand directions provided in large groups and often students self - advocate for their listening requirements in connection to media and announcements. Sometimes students utilized strategic seating for better listening during classes (Ref. Figure III).

**Consistency and reliability measures**

According to Ahdika, (2017), the level of reliability of the questionnaire can be determined using Cronbach's alpha scores. The L. I. F. E. - R. Teacher questionnaire was identified to be quite reliable, with Cronbach's Alpha value of 0.59. (Ref. Table II)

**Table II:** Levels of reliability based on Cronbach’s alpha scores

Cronbach's Alpha Score	Level of Reliability
0.0 - 0.20	Less Reliable
>0.20 - 0.40	Rather Reliable
>0.40 - 0.60	Quite Reliable
>0.60 - 0.80	Reliable
>0.80 - 1.00	Very Reliable

**5. Discussion**

In this study, an attempt was made to translate the Listening Inventory For Education - Revised (L. I. F. E. - R.) questionnaire into comprehensible Tamil. The questionnaires were distributed to teachers from mainstream and schools for the hearing impaired, and they were asked to complete them.

According to the classroom listening ratings for both mainstream schools and schools for the hearing impaired, teachers generally assessed students' listening experiences as occasionally experiencing challenges in their listening environments.

The teachers rated a 70.12% score in average, larger averages in questions 2, 4, 5 and 6 indicate that most students take responsibility for their listening devices (i. e., hearing aids and cochlear implants), often students found it easy to listen to directions provided in large groups, often students self - advocate for their listening requirements in connection to media and announcements and often students utilized strategic seating for better listening during classes.

Similarly, according to Krijger et al. (2020), five out of 8 self - advocacy strategies (Q2, Q4, Q5, Q7, Q8) were “often” or in “most opportunities” observed by the teacher in the CI group. On the contrary, Krijger et al., (2020) found teachers had answered that participants with a CI “rarely” self - advocate for their needs in relation to multimedia (median score: 2, IQ range = 2–7).

## 6. Summary and Conclusion

The Listening Inventory For Education - Revised: Tamil questionnaires yielded valuable information regarding the listening environment in classrooms in both perspectives of individual students and their teachers. Self - advocacy measures were also assessed to be appropriate among students and teachers. With this information, teachers can implement acoustic treatment, hearing assistive devices or self - advocacy strategies to accommodate the listening needs of their students in the classroom for effective learning in mainstream schools and schools for the hearing impaired.

## 7. Limitations and future directions

The duration and timing of the study aligning with annual exams and summer vacations for students in both types of schools was a major reason for a smaller sample size considered in this study. Further implementation in larger and more representative Tamil populations can shed a better light on the outcomes expected from the questionnaires.

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