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"LANGUAGE LABS IMPROVE SANSKRIT LANGUAGE LEARNING THROUGH SPEAKING AND LISTENING SKILLS."

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ABSTRACT
Language enables individuals to express their thoughts and emotions, and it serves as a fundamental medium of communication for social integration. Every society possesses its own distinct language, which individuals begin acquiring from birth; therefore, learning a language is essential for self-expression. Promoting language development requires both formal and informal approaches. Schools, as formal institutions, provide multilingual classrooms where language learning fosters mutual connection, deepens understanding, and facilitates the exchange of discoveries and traditions. It enhances students' maturity. Students learn a language systematically under the guidance of proficient teachers. Teachers' proficiency in the language helps students develop language skills, and teachers are role models for students' language skill development. Teaching methods and approaches serve as motivational tools for students. Language skills are based on four main pillars: L for listening, S for speaking, R for reading, and W for writing. The Sanskrit language is the primary root of refined language abilities. Language laboratories are modern, practical tools for language skill development. Four pillars are essential for language skills, including memorizing Sanskrit sutras, practicing Sanskrit shlokas, and achieving correct pronunciation and fluency of speech. A 10-point scale is used to evaluate each dimension.

KEYWORDS: Communication, Language Learning, language skill, Speaking, Listening.

INTRODUCTION

Language is the main vehicle (tool) of thought (**Aida Walqui, 2008) [1].** Language is the primary medium for expressing and understanding human thoughts. It manifests the ideas arising in the mind in the form of words; without it, the exchange of ideas becomes difficult. It organizes the processes of thinking, understanding, and reasoning. Nelson Brooks, who coined the term "audio-lingual," intended it merely to refer to the "sound" form of language, as opposed to its "written" form. He sought to explain this in terms of the two natural forms of language: first, the auditory and spoken aspect; and second, the oral usage of spoken language. According to Nelson Brooks, the original meaning of the term "audio-lingual" denoted an approach based on the auditory and oral forms of language; however, it subsequently evolved into the "Audio-Lingual Teaching Method," which placed greater emphasis on repetition, drills, pattern practice, and habit formation (**James R. Nord 1980) [2].**

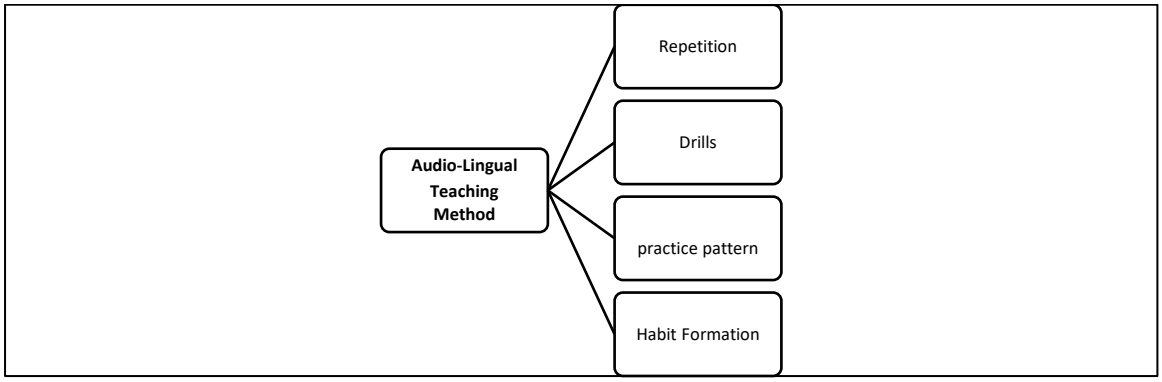

Figure 1: Core Techniques of the Audio-Lingual Method

Logically, the structure of a 'sign' consists of three components: a meaningful word, the object it denotes, and the 'mind' that establishes the relationship between them. In contrast, a 'symbol' comprises four elements: a

meaningful word, the intended object, the mental concept of that object, and the 'mind' that relates these components. Only humans possess the capacity for symbolization through language **(Nelson H. Brooks 1964) [3].** Psychologically, language fulfills two primary functions: the communication of thought (interpersonal language) and the organization of thought (intrapersonal language or thinking in language). Interpersonal language is further divided into receptive and expressive domains **(James R. Nord 1974) [4].** For humans, language is the principal medium for expressing thought, enabling the articulation of ideas, emotions, and behaviors within society. Traditional education systems have employed various language-learning strategies, including oral instruction, lectures, recitation, explanation, debate, and discussion

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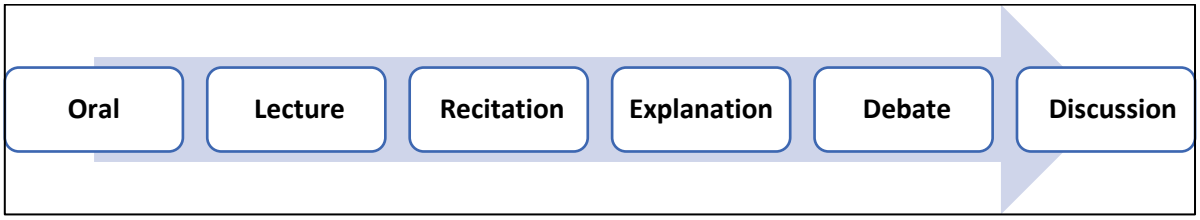

Figure 2: Traditional Patterns of Language

Rajasekar T. (2019) researched the topic "Enhancing Speaking Skills through Collaborative Learning." For this study, a sample of 180 college students was selected. The primary focus of the study was the pronunciation, vocabulary, and grammar of undergraduate students. Employing an experimental research design, the study's findings were derived by comparing the overall speaking proficiency of an experimental group (trained using collaborative learning techniques) against that of a control group (who received standard instruction). Consequently, the students' speaking skills improved significantly following the collaborative learning sessions. Initially, the students made numerous speaking errors; however, after implementing collaborative learning methods, the frequency of these errors decreased substantially. The study concludes that 'collaborative learning techniques' are highly beneficial for undergraduate students seeking to enhance their English-speaking skills **(RAJASEKAR T, 2019) [5].**

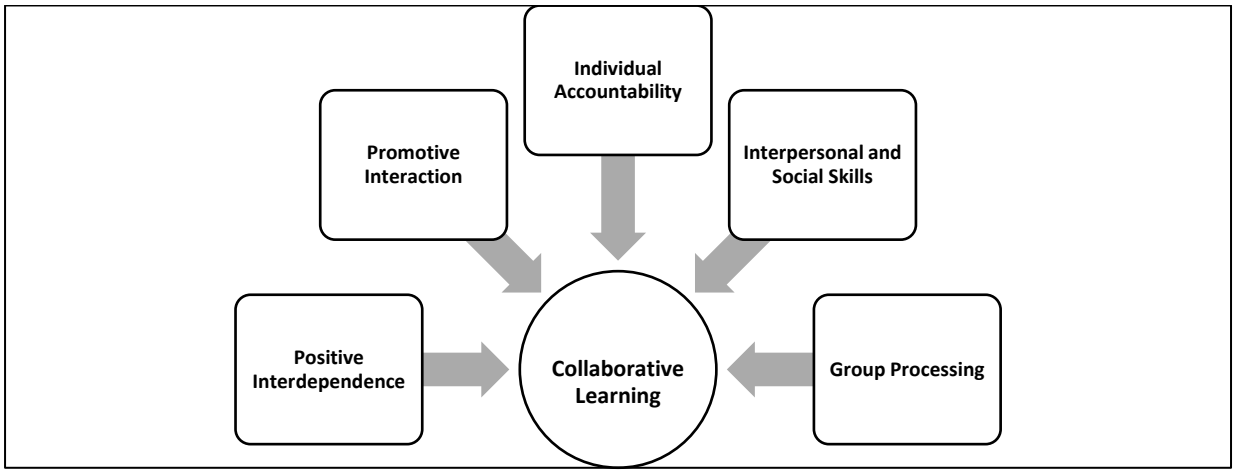

Figure 3: Key components of successful cooperative learning (Gillies, R. M., 2016) [6].

In a 2022 study by Nimisha Mukala, 1,200 students were selected, comprising 650 from the 9th grade and 550 from the 10th grade. Based on this study, researchers concluded the attitudes of boys and girls attending secondary schools toward learning English as part of their school curriculum. Specifically, this study examined the attitudes of 9th and 10th-grade students in secondary schools toward the study of English within their academic curriculum. The government, private institutions, and regional administrative bodies operated these secondary schools. Furthermore, the study included secondary schools situated in both urban and rural areas **(Nimisha Mukala, 2022) [7].**

A review of research on technology-based language learning and 21st-century skills. This review focuses specifically on 21st-century skills. For this study, 34 articles published over 12 years, commencing in 2011, were selected and reviewed. The primary emphasis of these studies was on language skills, such as speaking and writing, as well as 21st-century skills, such as communication and collaboration. In these studies, researchers reported that technology-based language learning activities provided learners with positive learning experiences and enhanced their motivation, engagement, and self-confidence. However, learners also encountered certain challenges during these activities, which are likewise discussed herein **(Rustam Shadiev & Zun Wang, 2022) [8].**

This study evaluated the effectiveness of activity-based Sanskrit teaching for 9th-grade students. A total of 72 students studying Sanskrit in secondary schools were randomly selected. The results indicate that factors such as

gender, region, and varying levels of academic achievement influence these outcomes. Improvements were observed in students' communication skills and academic achievement in Sanskrit **(Prabhat M. Kasra, 2023) [9].** Titled "Challenges of Sanskrit Teaching in Modern Education Systems in the Context of Social Perspectives," this research paper examines the challenges encountered in teaching Sanskrit within modern educational frameworks, against the backdrop of prevailing social attitudes. This article suggests that it is indeed possible to address the challenges facing Sanskrit teaching and integrate it as an impactful component of modern education; this requires implementing innovative teaching strategies and leveraging the curricular framework of the updated National Education Policy (NEP) 2020. **[10]**

Education, too, has not remained untouched by the transformations occurring within human civilization; alongside the shifting contemporary landscape, the fundamental nature of education has also evolved significantly. Human emotions and sensibilities are articulated within the linguistic framework developed in an individual through societal customs. In the modern era, technology is the backbone of educational institutions. Different types of laboratories are significantly facilitating the educational system. A developed work culture and ideology are important for modern institutions because a nation's future is always shaped in educational institutions. Future generations will become the collective voice of the nation, so the developed language skills of a nation's people play an important role in the overall development of society and the country. In the language learning process, language laboratories are essential for developing effective communication skills. With the help of audiovisual aids, multilingual students can cultivate proficiency in multiple languages. These laboratories enable students to develop linguistic skills. Practice and exercise in real-world contexts. Language laboratories provide data on improvement by recording their conversations before and after. Feedback mechanisms and practice tools help the students to evaluate their own performance. Vocabulary is a critical aspect of that language. The existence of language is based on vocabulary. However, to attain complete mastery over a language, merely possessing a strong command of its grammar and vocabulary is not sufficient; For a speaker, it is equally imperative to understand *how* to articulate their thoughts, *how* to effectively utilize appropriate gestures and body language, *how* to develop speech fluency, and *how* to overcome the nervousness associated with interpersonal communication all of which are skills that can be effectively honed only within the environment of a language laboratory. Ultimately, this laboratory helps refine students' conversational skills, enabling them to communicate with fluency and confidence **(Qais Butti Al-Otaibi, 2023)**. In his research article, "The Importance of Using Language Laboratories in Teaching English as a Second Language" **(Qais Butti Al-Otaibi, 2023) [11], he notes that** since their inception, language laboratories have been an integral part of the language-learning process. Typically, language laboratories rely heavily on audiovisual resources in their course materials to facilitate learning English. In the context of second language acquisition, this approach is the most beneficial for international students compared with other methods. We can incorporate even more technological innovations into this process, and we are taking every possible step to ensure it remains equally beneficial to both teachers and students. Although this accelerates the pace of learning, what ultimately matters most is the actual extent of the students' learning. Producing sounds using the vocal organs is merely one facet of learning a second language, albeit undoubtedly a very significant one. Intonation patterns within sentences, such as tone, pitch, and fluctuations between high- and low-mid registers, are likewise of paramount importance; these elements can be effectively mastered with the aid of language laboratories and audiovisual materials, thereby proving immensely beneficial for students.

(Mohammad Faraz and Bilal Taslim, 2025) Within the Faculty of Arts, under the aegis of the 'Linguistics Laboratory,' numerous language laboratories are located across various cities, with the primary objective of developing listening and speaking skills **(Mohammad Faraz & Bilal Taslim, 2025) [12].** A shared goal across all language laboratories is to enhance the four fundamental linguistic skills: speaking, reading, writing, and listening **[13].** Access to these laboratories provides us with the perpetual opportunity to make repeated attempts, rectify our errors, and boost our self-confidence. Students acquire these skills within the laboratory by listening to and practicing conversations involving native speakers. In a language laboratory, listening skills can be refined through audio recordings. These recordings assist students in comprehending the nuances of the listening process, specifically intonation, pronunciation, and the practical usage of spoken language. An individual's native accent can invariably be discerned in their manner of speaking. What constitutes the correct form of speech? What constitutes the appropriate style of pronunciation? How can speaking skills be effectively cultivated within a language laboratory? Here, it becomes possible to record and analyze the comparative effects of various accents and speaking styles. This laboratory is a dedicated environment for developing both listening and speaking skills **[14].** Students can engage in independent practice here and identify their own errors by listening to their personal recordings. The facility utilizes equipment such as computers, projectors, and headsets, which render the learning process significantly more interactive and engaging. The objective of a language laboratory is to accelerate language acquisition through practical, laboratory-based learning experiences. The language laboratory is the center of language teaching **[15].** Language learning experiences become more effective with the use of technology and software.

Main objective of the study: The main objective of conducting this research is as follows:

1. Effectiveness of the language laboratories in improving listening skills.
2. Reduction of errors in listening skills.
3. Improvement of speaking skills.
4. Reduction of errors in speaking skills.

Hypothesis for testing – To understand the importance of the language laboratory in developing speaking and listening abilities for the promotion of language, the following hypothesis has been developed:

1 H_1- "Language laboratory-based instruction improves students' listening skills in learning the Sanskrit language."

H_0- "Language laboratory-based instruction has no significant effect on students' listening skills."

2 H_1- "Language laboratory-based practice reduces errors related to students' listening skills."

H_0- "Language laboratory-based practice does not result in any significant reduction in errors related to listening skills."

3 H_1- "Language laboratory-based instruction improves students' speaking skills in learning the Sanskrit language."

H_0- "Language laboratory-based instruction has no significant effect on students' speaking skills."

4 H_1- "Language laboratory-based practice reduces errors related to students' speaking skills."

H_0- "Language laboratory-based practice does not result in any significant reduction in errors related to speaking skills."

METHOD

To complete this research, the researcher employed a 'quasi-experimental' research methodology—falling within the scope of experimental research—which specifically adopted a 'trial-and-error' approach. A single group of students was evaluated within a language laboratory setting. Various techniques were utilized in this process, including testing procedures. Observational methods, statistical analysis, and comparative analysis were employed to assess the students' performance. Fifteen students aged 12–13, from non-Sanskrit backgrounds, participated in this study. Four specific dimensions of the students' linguistic skills were tested, and data were collected accordingly. The following elements were taken into consideration for data collection: first, *Sūktis* (Sanskrit proverbs or aphorisms); second, *Ślokāṃśas* (fragments or parts of verses); and third, *Kaṭhina Śabdoccāraṇa* (the pronunciation of words deemed difficult).

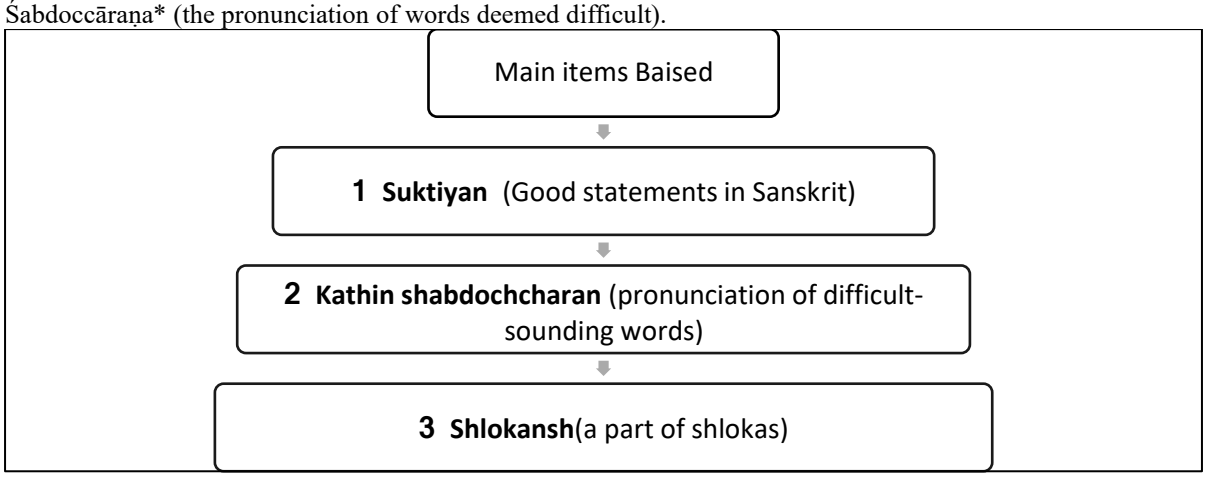

Figure 4: Main items indexed

Development of language skills in the language laboratory: As teaching methodologies evolve, the 'Language Laboratory' has emerged as a vital tool for fostering linguistic skills and encouraging language development. Various types of language laboratories include: standard language laboratories, multimedia language laboratories, language laboratories combined with media centers, multimedia language learning centers, software-based language labs, digital language laboratories, and portable language laboratories. A language laboratory can also be mobile or wireless. In a language laboratory, learners can work in various groups or at their own pace and engage in tasks suited to different proficiency levels; furthermore, regardless of class size, they can speak simultaneously without distracting one another **(Abdullo Mardonov, 2023) [16].**

This aids students in learning and comprehending a language, as well as in enhancing their communication skills. It assists students in refining their pronunciation, grammar, and listening comprehension in the target language by using various laboratory tools, including audiovisual materials, microphones, headphones, and software. It facilitates the practical application of language in a realistic context for speaking practice. Students can easily follow the teacher's voice and pronunciation, which positively influences their own pronunciation. This practice is easy listening and speaking that enhances personal progress and motivates the learner. Use the language by following the teacher's guidance and practicing it, focusing on good enunciation and articulation. Regular, steady learning is essential to developing your language skills. All the skills are interconnected. Adjacent to listening are speaking, reading, and writing. Regular practice of this skill enhances it and reinforces vocabulary by expanding its possibilities. According to Robert Lado, 'Language laboratory is the center of language teaching in which a controlled environment is provided for the students to listen, speak, and write **[17].** As a result, the students develop the four main abilities of language learning, i.e., listening, speaking, reading, and writing, through the language laboratory **[18].**

➢ **Development of listening skills in students through the language laboratory:** The language laboratory features high-quality audio equipment that enables students to hear the teacher's instructions and pronunciation clearly. This will improve learners' listening skills, enabling them to better comprehend the language's various pronunciations and cultural nuances. Having consistent ears to hear around the sounds is the first physiological stage of listening. Comprehension of facts and interpretation of difficult sounds or sentences depend on learners' physiological, psychological, mental, and emotional states. Mind and heart must work together to convey a theme. This is making sense of what is heard and understanding the words to keep things in mind. Developing understanding of the language, tone, emotion, and gesture of the speaker or analysis of learning received and deciding upon the wing right/ wrong or useful/useless, and later response, think with the mind, stimulate with the heart, answer with the mind, and ask with the mind. Robert Lado "Language laboratory is the center of language teaching in which students are provided a controlled environment for listening, speaking, reading and writing" **[19].** Improving communication skills using various techniques and special resources, such as gramophone, tape recorder, cinema, television, and video material used in the language laboratory, in which they understand various aspects of the language and can increase their communication ability **[20].** Its purpose is to empower students and make them self-reliant in language.

1. Clear and adaptive audio technology is used in language laboratories, which helps students to hear sounds clearly according to their hearing ability.
2. Deaf users tend to get more knowledge of language from what they look at on the visual display (the screen, picture card, animation, etc) rather than what they listen to.
3. Speech-to-text technology simplifies the process of assisting students with hearing disabilities.
4. Language labs offer lip-reading practice to students with hearing impairments.
5. In the language labs, the students can opt for individual headset/microphones/sound filters based on individual requirements.
6. Phonetic exercises were applied to distinguish the sounds from each other.
7. Development of self-confidence.
8. Opportunity to learn the sounds and the specific sounds fluency. Speed. Rhythm in speech can be evaluated.

➢ **How the language lab can facilitate correcting speech defects:** – To assess proficiency in pronunciation, it is essential first to understand what constitutes a "pronunciation error." If a person is unable to pronounce words correctly during conversation, it indicates a deficiency in their pronunciation skills; fortunately, these errors can be corrected with the help of a 'language laboratory.' In this globalized era, technology plays a significant role in linguistic transformation. According to the All-India Council for Teacher Education, a 'Language Lab' is of immense importance for students in both technical and non-technical institutions. **(Bhise, M.V., Kadam, P.A., Lad, A.S., 2023) [21]**. This facilitates effective communication. Speaking fluency is primarily developed through practice, reading aloud, and the repeated use of the language. Vocabulary serves as the backbone of effective language use; it lends immense clarity to speech. Possessing an extensive vocabulary allows an individual to select words with precision, ensuring that their message is conveyed with absolute clarity. It enables one to articulate ideas in a rich and varied manner, empowering them to speak confidently in any given situation. Grammar defines formal language. Language labs play a crucial role in providing a comfortable environment for language learning. To foster global competencies, colleges are establishing digital language labs to help students develop and enhance their communication skills **(Mahajan, R., & Sharma, R., 2017) [22].** Language laboratories are ideal spaces where any learner can learn independently at their own pace through a variety of technology-based exercises **(Ramganesh, E., & S. Janaki, S., 2017) [23].** Labs provide students with the opportunity to hone their linguistic proficiency—specifically the four skills of LSRW: listening, speaking, reading, and writing. Today's modern language laboratories play a fundamental role in language learning for the 'cell phone generation **(Krishna, D., 2021) [24].** This laboratory serves as an ideal and effective medium for rectifying pronunciation defects in language. Here, the pronunciation of words is practiced.**[25]** Communication skills are a key component of employability skills **(Bute, A., 2022) [26].**

1. General rules and regulations of language learning may be adopted.
2. Pronunciation defects can be removed easily.
3. Sound qualities of the words may be completely clear.
5. Following the correct instructions of the teachers, students can correct their pronunciation. This provides them with a deeper understanding of different linguistic styles or modes, which proves highly beneficial in refining their pronunciation **[27].**
6. In the Resource Center, students learn how to utilize 'Pause Control,' a feature that aids in improving their pronunciation.
7. Given the facility to practice within the laboratory and the flexibility to choose their own convenient timings, students gain increased opportunities to enhance their pronunciation.
8- Make the student develop his ability to communicate in the language by practicing with the teacher, in oral dialogues, dramatizations, oral exercises, conversation in the language laboratory, etc.
9- The language laboratory also helps improve the listening skills that will reveal the students' problems with pronunciation.
10 Linguistic skills can be enhanced through repeated practice and the aid of computer software. This can make pronunciation clearer, more effective, and more precise, benefiting both the learners and the instructor.

Sampling and research process: In this study, 15 examinees from the Haridwar district, none of whom had a background in Sanskrit, were selected as subjects, and Sanskrit was adopted as the medium of experimentation. To evaluate their proficiency in Sanskrit, the 'Language Laboratory' at the Uttarakhand Sanskrit University in Haridwar was used. To assess the students' listening and speaking abilities, materials and questions were prepared based on *Sanskrit Suktiyan* (proverbs), *Shlokansh* (excerpts from verses), and *Kathin Shabdochcharan* (pronunciation of difficult words). To fulfill the objectives of the evaluation, four specific parameters were adopted: for listening skills—word recognition, comprehension, sound identification, and rhythm and pauses; and for speaking skills—word accuracy, meaningfulness, pronunciation and phonetics, and rhythm and pauses. For each parameter, ten marks were allotted. Time was given from 10 to 15 minutes. The procedure was repeated at 5-day intervals. All the students were provided with their own equipment. Four dimensions were tested. The first dimension was word recognition, the second was meaning comprehension, the third was sound recognition, and the fourth was identification of rhythm and pause. Teachers and students were provided with a language laboratory.

1 **Administration of the Listening Skills Test:** The students were informed that their "listening skills" were being evaluated, and they were played a series of Sanskrit sutras, excerpts from shlokas, and challenging vocabulary words in a group setting. Students participating in the examination were instructed to listen carefully to each audio clip and mark the correct option on their answer sheets. During the examination, they were also asked to pay special attention to the pronunciation, rhythm, pace, and pauses of each word. The evaluation will be based on four main parameters: word recognition, meaning comprehension, voice recognition, and recognition of rhythm and pauses. The entire examination will take approximately 5 to 10 minutes.

- **The first dimension,** "Word Recognition," includes questions designed to assess skills such as distinguishing between words that sound alike, word recall, auditory sequencing, attention span, error detection, phonetic discrimination, recognition of complex words, pattern recognition, and understanding the relationships between words and their meanings.
- **The second dimension,** "Meaning Comprehension," encompasses assessment questions related to semantic knowledge, identifying the main idea, selecting words based on context, verifying meaning, logical understanding, identifying key concepts, grasping practical implications, and expressing meaning in one's own words.
- **The third dimension,** "Sound Recognition," included questions related to word perception, sound discrimination, voice recognition, complex sound recognition, phonetic nuances, pronunciation discrimination, sound sequencing, attention span, pattern recognition, and error detection.
- **The fourth Dimension:** "Recognition of Rhythm and Pauses." Within this dimension, questions on pauses, rhythm, pace, vocal modulation (intonation), incorrect punctuation, meter/prosody, pause duration (long versus short), reading fluency, and emphasis/stress are included.

2 **Administration of the Speaking Skills Test:** Prior to commencing the speaking skills test, students listened to audio recordings of aphorisms, verse fragments, and difficult Sanskrit words. First, students were asked to listen carefully to an audio recording, paying special attention to correct pronunciation, rhythm, pauses, and intonation. Subsequently, the teacher asked them to repeat those same difficult words, excerpts of verses, and verses, and evaluated them based on four parameters: accuracy of words, comprehension of meaning, clarity of speech with correct pronunciation, and speaking pace and pauses. Each child was allotted 5–6 minutes for this task.

- **The first dimension,** "Word Accuracy," includes questions related to word repetition, precise reading, pronunciation of difficult words, conjunct consonants, short and long vowels, visarga and anusvara (diacritical marks), word order, error correction, reading of *Sandhi* (joined) words, and the accurate recitation of aphorisms. The objective of this dimension was to assess the students' accuracy regarding difficult sounds, clear pronunciation of conjunct characters, vowel precision, accuracy in specific phonetic sounds, reading in the correct sequence, error-correction capabilities, and overall reading accuracy.
- **The second dimension**, “Meaningfulness,” included questions concerning word meanings, underlying sentiments, explaining meanings in one's own words, situation-based inquiries, expressive reading, question-and-answer sessions, sentence completion, providing examples, identifying emotions, and interpretation. The objective of this dimension was to test the students' comprehension of word meanings, ability to grasp the central theme, capacity for independent expression, practical understanding, ability to speak with appropriate emotion, competence in providing meaning-based answers, semantic recall, practical application, recognition of sentiments, and the ability to articulate detailed meanings.
- **The third dimension**, “Pronunciation and Sound,” included questions regarding word repetition, difficult words, conjunct consonants, short and long vowels, *visarga*, *anusvara*, distinguishing between similar-sounding words, phonetic clarity, *sandhi* words, recitation of aphorisms, stress (emphasis), and vocal flow. The objective of this dimension was to assess the students' clarity regarding difficult sounds, accuracy in conjunct characters, vowel precision, pronunciation of *visarga*, accuracy in nasal sounds, ability to distinguish between sounds, clear articulation, pronunciation of *sandhi* words, overall pronunciation accuracy, stress placement, and fluency.
- **The fourth dimension,** “Rhythm and Pause,” utilized questions regarding reading with sentence rhythm, reading with appropriate pauses, correcting incorrect pauses, reading speed, intonation (rising and falling pitch), duration of pauses (short and long), fluency, meter/cadence, stress (emphasis), and a combination of rhythmic and pausing elements. The objective of this dimension was to assess students' ability to speak sentences with the correct rhythm, their competence in pausing at appropriate junctures, their capacity to identify and rectify incorrect pauses, their proficiency in reading at slow, moderate, and rapid speeds, their aptitude for speaking with an

understanding of vocal modulation, their recognition of various types of punctuation marks, their ability to read continuously and fluently, their adherence to Sanskrit meters and rhythms during recitation, their capacity to place appropriate stress on words, and their overall ability to integrate rhythm, pauses, pace, and tone in a coordinated manner.

Table 1: Dimension Table

Skills	Listening Skills				Speaking Skills			
	Dimensions				Dimensions			
	Word Recognition	Comprehension	Sound Recognition	Rhythm & Pause Recognition	Word Accuracy	Meaningfulness	Sound / Pronunciation	Rhythm & Pauses
Marking	10	10	10	10	10	10	10	10

Statistical Method- The following statistical methods were used for the analysis of the collected data in the present study—

$$\text{Total Average Marks} = \frac{\text{Total Marks Obtained by All Students}}{\text{Number of Students}}$$

$$\text{Total Percentage} = \frac{\text{Average Marks Obtained}}{\text{Maximum Marks}} \times 100$$

$$\text{Error Percentage} = \frac{(\text{Maximum Marks} - \text{Marks Obtained})}{\text{Maximum Marks}} \times 100$$

Data analysis and explanation- During the experiment, participants exhibited characteristics such as intermittent speech, hesitation, speech errors, mispronunciation, incorrect emphasis, limited vocabulary, unclear grammar, lack of fluency, difficulty speaking, lack of confidence, errors in sentence construction, fluctuations in speech rate, poor memory, and confusion regarding sounds. However, to improve performance, activities like role-play exercises, repeated listening and practice, phonetics exercises, pronunciation lab, reading aloud, dialogue exercises, conversation exercises, repetition techniques, guided speaking, pattern exercises, audio correction, repeated speaking cycles, listening tests, word exercises, etc. were implemented for five consecutive days. In the present research, statistical analysis has been conducted by displaying tables and charts, which are as follows:

Table 02: Listening Skills Assessment Day 01 to Day 05

Day	Word Recognition	Comprehension	Sound Recognition	Rhythm & Pause Recognition	Total Marks	Average Total Marks	Average %	Total Error Marks	Error %
Day–1	35	27	35	43	140	9.33	23.33%	460	76.67%
Day–2	39	40	51	65	195	13	32.50%	405	67.50%
Day–3	56	52	70	87	265	17.67	44.18%	335	55.83%
Day–4	83	69	84	104	340	22.67	56.68%	260	43.33%
Day–5	99	99	106	115	419	27.93	69.83%	181	30.17%

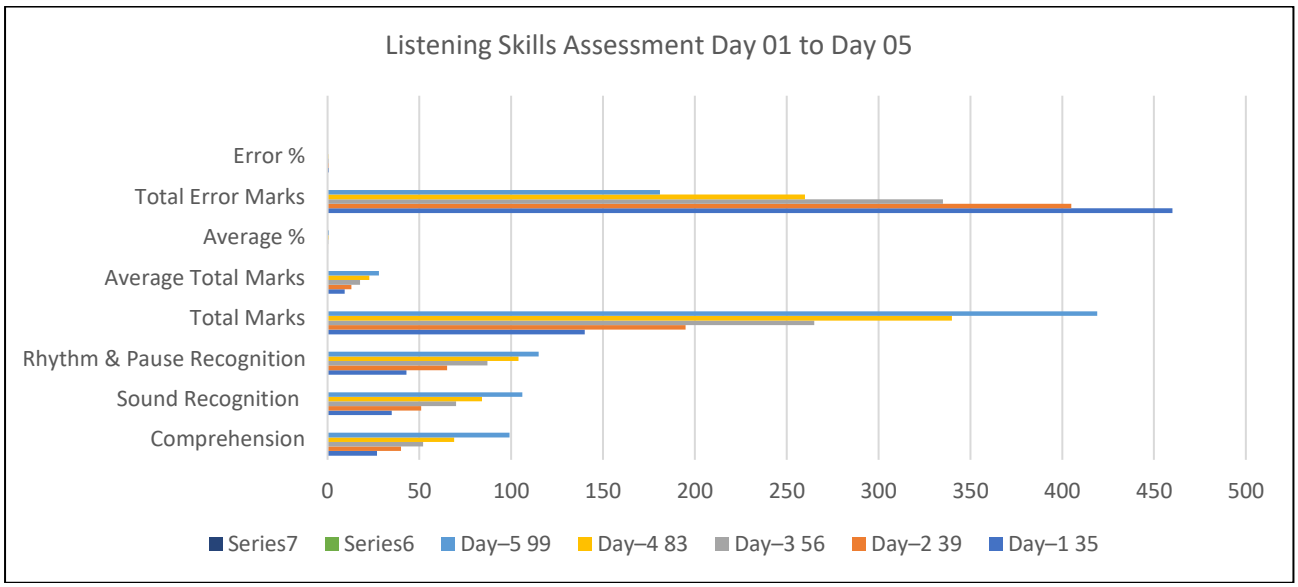

Figure 05: Listening Skills Assessment Day 01 to Day 05

The objective of the five-day language assessment conducted in the language laboratory was defined as follows: "To study the effectiveness of the language laboratory in improving students' listening skills (auditory ability)." To fulfill this objective, a 'Null Hypothesis' (H_0) and an 'Alternative Hypothesis' (H_1) were formulated. The results indicate that, through language laboratory-based listening exercises, there was a continuous and significant improvement in the students' listening proficiency in Sanskrit. An examination of the Data Table reveals that the average scores increased from the first day to the fifth day of the listening skills assessment; specifically, scores for word recognition rose from 35 to 99, for comprehension from 27 to 99, for sound recognition from 35 to 106, and for rhythm and pause recognition from 43 to 115. Similarly, the total average score increased from 140 on the first day to 419 on the fifth day. Correspondingly, the average percentage score rose from 23.33% to 69.83%, reflecting an approximately threefold improvement in the students' performance. On the other hand, an Error Analysis reveals that although the total number of errors was high on the first day of the listening skills assessment, it progressively decreased by the fifth day. The average number of errors dropped from 460 (76.67%) on the first day to 181 (30.17%) on the fifth day, indicating a substantial reduction over the five days and underscoring the language laboratory's effectiveness in enhancing listening skills. Therefore, based on the results obtained, the 'Null Hypothesis' (H_0), which posits that "language laboratory-based instruction has no significant impact on students' listening skills," is rejected. Conversely, the 'alternative hypothesis' (H_1), which posits that "language laboratory-based instruction improves students' listening skills in the process of learning the Sanskrit language," is accepted. This confirms that language laboratory-based instruction is a highly effective teaching method for enhancing students' listening skills.

Table 03: Listening skills error reduction table

Dimension	Day–1 Error %	Day–5 Error %	Reduction
Word Recognition	76.67%	34%	42.67%
Meaning Comprehension	82%	34%	48%
Sound Recognition	76.67%	29.33%	47.34%
Rhythm and Pauses	71.33%	23.33%	48%

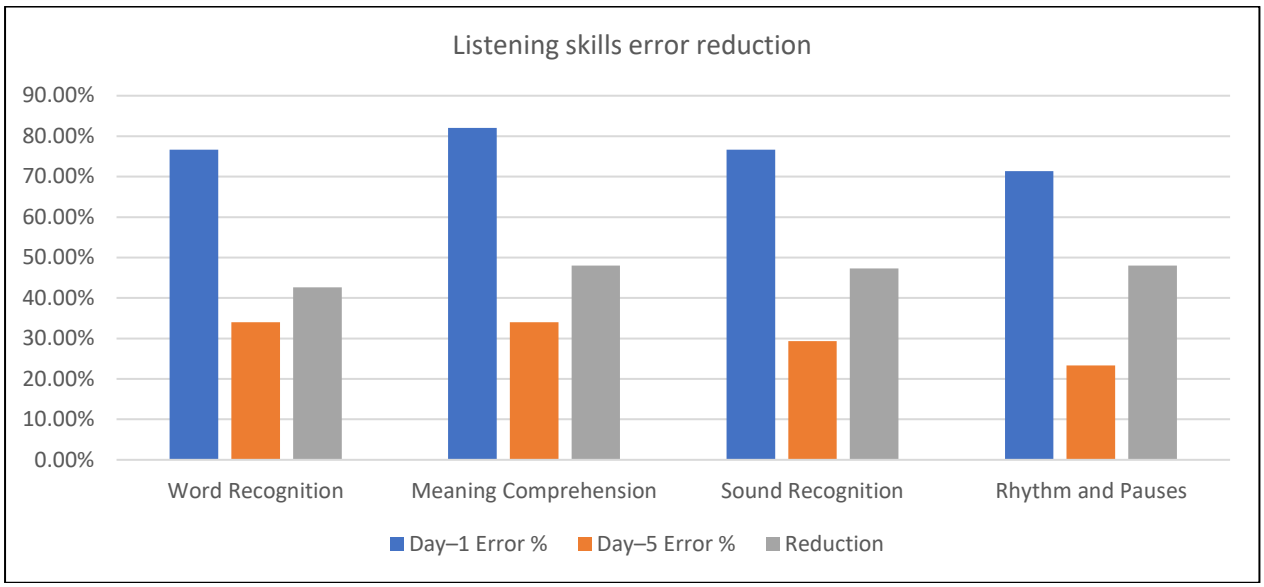

Figure 06: Listening skills error reduction

The secondary objective of the five-day language test conducted in the language laboratory was defined as follows: "To study the reduction of errors in students' listening skills through language laboratory-based practice." To achieve this objective, a 'Null Hypothesis' (H_0) and an 'Alternative Hypothesis' (H_1) were formulated. An analysis of the errors observed on the first and fifth days across various auditory dimensions revealed significant improvements: errors decreased by 42.67% in 'Word Recognition,' 48% in 'Meaning Comprehension,' 47.34% in 'Sound Recognition,' and 48% in 'Rhythm and Pause Recognition.' The consistent decline in the percentage of errors across all dimensions confirms that language laboratory-based practice plays a pivotal role in mitigating listening-related difficulties and in strengthening learners' comprehension and auditory processing skills. Based on these findings, the Null Hypothesis (H_0), which posits that "language laboratory-based practice does not bring about any significant reduction in errors related to listening skills," is rejected. Conversely, the Alternative Hypothesis (H_1), which posits that "language laboratory-based practice reduces errors related to students' listening skills," is accepted. This clearly demonstrates that a language laboratory can be used effectively to minimize listening-skill errors in Sanskrit learning.

Table 04: Speaking Skills Assessment Day 01 to Day 05

Days	Word Accuracy	Meaningfulness	Pronunciation & Sound	Rhythm & Pauses	Total Marks	Average Total Marks	Average %	Word Accuracy Errors	Meaningfulness Errors	Pronunciation Errors	Rhythm & Pause Errors
Day1	24	15	24	27	90	6.0	15.0	126	135	126	123
Day2	34	34	39	54	161	10.73	26.82	116	116	111	96
Day3	45	45	58	76	224	14.93	37.32	105	105	92	74
Day4	69	57	77	100	303	20.2	50.5	81	93	73	50
Day5	103	77	96	113	389	25.93	64.82	47	73	54	37

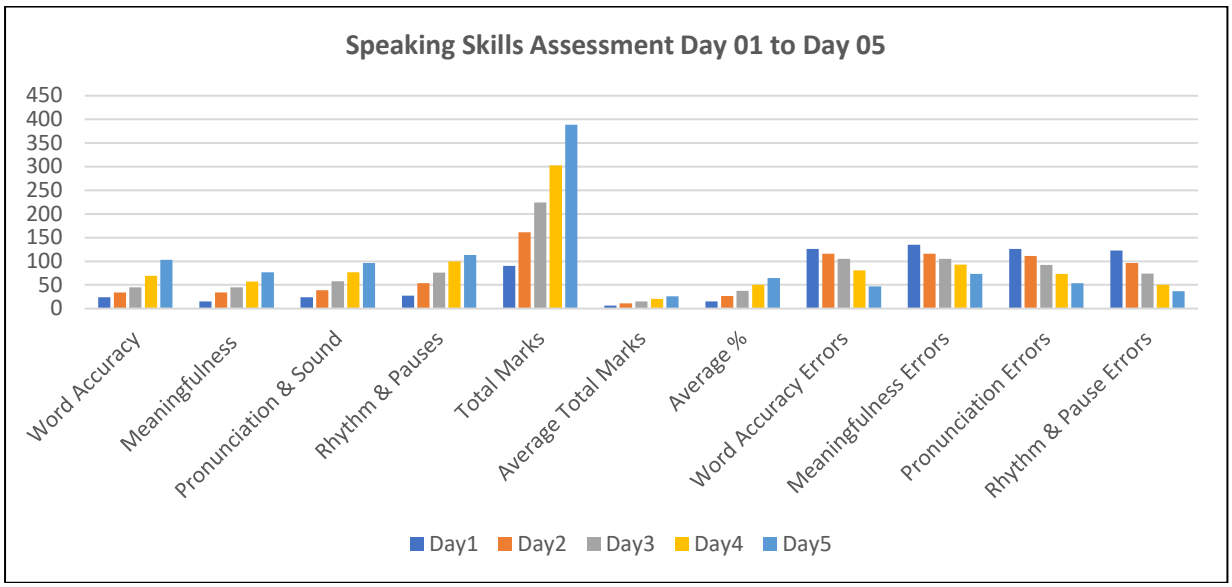

Figure 07: Speaking Skills Assessment Day 01 to Day 05

The objective of the five-day language assessment conducted in the language laboratory was defined as follows: "To study the progress made in students' speaking skills through language laboratory-based instruction." To fulfill this objective, a null hypothesis (H_0) and an alternative hypothesis (H_1) were formulated. The results of the assessment indicate that the five-day language laboratory-based instructional intervention demonstrated a clearly significant improvement in the students' Sanskrit speaking skills from the first day to the fifth day. Regarding the dimensions of speaking proficiency: scores for 'Word Accuracy' increased from a total of 24 on the first day to 103 on the fifth day; scores for 'Coherence' rose from 15 to 77; scores for 'Pronunciation and Articulation' increased from 24 to 96; and scores for 'Rhythm and Pauses' rose from 27 to 113. Furthermore, errors related to speaking skills, specifically in 'Word Accuracy,' decreased from 126 to 47; errors in 'Coherence' dropped from 135 to 73; errors in 'Pronunciation' fell from 126 to 54; and errors in 'Rhythm and Pauses' declined from 123 to 37. This consistent reduction in errors, coupled with the corresponding increase in performance scores, confirms that language laboratory-based instruction effectively enhances fluency, accuracy, pronunciation, and rhythmic delivery in spoken Sanskrit. Therefore, these findings support the hypothesis that "language laboratory-based instruction improves Sanskrit language learning." Conversely, the null hypothesis (H_0) that "language laboratory-based instruction has no significant effect on students' speaking skills" is rejected.

Table 05: Speaking skills error reduction table

Dimensions	Day-1 error	Day-5 error	Reduction
word correctness	126	47	-79
Meaning	135	73	-62
pronunciation and sound	126	54	-72
rhythm and pause	123	37	-86
Total Error Points	510	211	299
Error Percentage	85%	35.17%	49.83

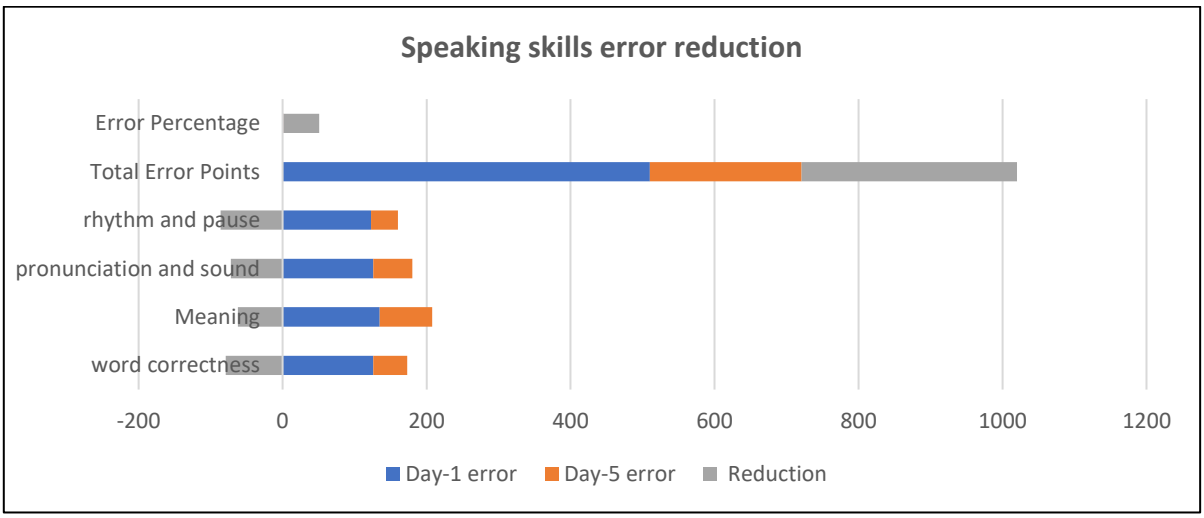

Figure 08: Speaking skills error reduction

The objective of the five-day language assessment conducted in the language laboratory was defined as follows: "To study the reduction in errors occurring in students' speaking skills through language laboratory-based practice." To fulfill this objective, a null hypothesis (H_0) and an alternative hypothesis (H_1) were formulated. A study of the table reveals that between the first and fifth days, a reduction in errors was observed across various dimensions: 79 points in verbal accuracy, 62 points in the semantic dimension, 72 points in the pronunciation and intonation dimension, and 86 points in the rhythm and pauses dimension. The total number of errors, which stood at 510 (85%) on the first day, decreased to 211 (35.17%) by the fifth day; this reduction of 299 points signifies a 49.83% improvement in speaking skills. Based on these findings, the null hypothesis (H_0), which states that "language laboratory-based practice does not lead to any significant reduction in speaking skill errors," is rejected. Conversely, the alternative hypothesis (H_1), which states that "language laboratory-based practice reduces errors related to students' speaking skills," is accepted. It can be concluded that, through continuous practice in the language laboratory, the learners have developed enhanced control over aspects such as pronunciation, accuracy, meaning-making, and prosodic features (specifically rhythm and pauses).

Finding: The results of a five-day, language-laboratory-based experiment revealed that, initially, students were confused by words with similar sounds such as conjunct consonants, short and long vowels, and complex Sanskrit terms. They had difficulty grasping the underlying meanings of aphorisms and *shlokas*and recognizing the patterns inherent in pauses, pace, and intonation (the rise and fall of the voice). Students hesitated while pronouncing words; they took considerable time to formulate their responses accurately and to articulate them verbally. However, by the final day of the experiment, the majority of students had begun to recognize word order, distinguish between similar sounds, identify appropriate pauses, maintain a suitable pace, and discern patterns in intonation. The continuous five-day language practice undertaken by the students in the laboratory resulted in a significant reduction in error rates in sound recognition, pronunciation, and the correct use of pauses. This study clearly demonstrated that a language laboratory-based teaching methodology is highly effective for Sanskrit language development. Consequently, there was a continuous improvement in students' abilities regarding word recognition, comprehension, sound recognition, pronunciation accuracy, and rhythm and intonation. Furthermore, errors decreased, while confidence increased.

The Utility of a Laboratory for the Sanskrit language:

1. Language laboratory software can be utilized to facilitate language comprehension and teach correct pronunciation. Language laboratory software is an audio-visual tool designed for learning any language **[28].**
2. In the language laboratory, language teachers can foster the ability to converse in Sanskrit through simple and effective dialogue.
3. Students' listening skills can be effectively developed in the language laboratory through the use of practice tapes.
4. By utilizing recording techniques in the language laboratory, teachers can sustain students' continuous motivation toward language learning, thereby enabling them to achieve proficiency characterized by both clarity and accuracy in both listening and speaking skills.
5. The language laboratory facilitates the resolution of students' linguistic difficulties and ensures the correct pronunciation of new vocabulary.
6. The language learning process becomes significantly more effective in the language laboratory when students receive specific feedback regarding errors observed in their listening and speaking skills.
7. To stimulate students' curiosity regarding language learning, the language laboratory can be integrated into the curriculum through innovative and creative methodologies, thereby facilitating the teaching of the language in a more comprehensive, engaging, and effective manner.
8. A language laboratory enables teachers to utilize engaging communication materials and resources, thereby simplifying the language learning process for students. It can be easily integrated into the curriculum, and language teachers can adapt the instructional materials to suit their specific requirements and curricular needs **[29].**
9. Within a laboratory environment, individual attention can be devoted to each student. This allows teachers to correct students' errors immediately and guide them in refining their skills.
10. Teachers can effectively utilize the teaching-learning materials and equipment available in the language laboratory to achieve the educational objectives associated with language instruction **[30].**
11. To facilitate the learning process, the teacher should adopt a 'language-centered approach.' The ultimate goal of language-centered learning is to communicate messages effectively; however, its short-term objective is to master linguistic elements. Its methods include practicing pronunciation, using substitution tables and exercises, learning vocabulary through 'word cards,' intensive reading, translation, memorizing dialogues, receiving feedback on writing, inferring meaning from context, and using dictionaries, among others (**I.S.P. Nation, Jonathan Newton 2008) [31].**

CONCLUSION

The language laboratory can be useful for language learners. This results in more efficient, more successful, and more enriching language teaching. Students will learn to use the language and demonstrate confidence in themselves, their communication, and their abilities. The ability to listen, the ability to speak, and the motivation

to master the language as perfectly as possible with a global vision. The student must set up language laboratories at institutions to enhance vocabulary during language learning.

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