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Anandhi Santhosh
Assistant Professor of
Mathematics, Anbil
Dharmalingam Agricultural
College and Research
Institute, Tamil Nadu
Agricultural University,
Tiruchirappalli, India

K Thangaraj
Professor of English, Tamil
Nadu Agricultural University,
Coimbatore, India

Is digital language laboratory intervention bridging the communication gap of students from regional-medium schools? A case study

Anandhi Santhosh¹, K Thangaraj²

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ABSTRACT

Effective communication in English is a decisive factor in academic and professional success for students, especially those from regional-medium schooling backgrounds. This paper integrates the findings of two correlated diagnostic-intervention studies conducted at the Agricultural College and Research Institute and the Horticultural College and Research Institute for Women, Tiruchirappalli, both of which are constituent colleges of Tamil Nadu Agricultural University, Coimbatore. It examines the impact of a structured six-month software-assisted remedial intervention on 65 first-year undergraduate students, most of whom were first-generation graduates from rural backgrounds. The intervention was administered after a diagnostic study of the students' oral and written expressive skills. The speaking competence of the learners was assessed across five dimensions: pronunciation and accent, fluency, vocabulary, syntax and grammar, and confidence, whereas writing competence across content knowledge, vocabulary, grammar, sentence structure, and mechanics of writing. Both skill sets were rated on a four-point scale (Needs Improvement, Fair, Good, and Excellent) before and after the intervention, and paired t-tests were used to test statistical significance. Both tests indicated highly significant gains ($p < 0.001$): the proportion of students in the "Needs Improvement" classification fell sharply across all oral and written measures, and most students moved into the "Fair" and "Good" bands. However, none reached "Excellent" in either domain. This paper underscores the need for sustained, long-term practice to move students from intermediate to advanced proficiency.

Keywords: Digital Language Laboratory, Oral Skills, Writing Skills, Expressive Skills, Regional-Medium Students, Paired t-Test

1. Introduction

Language proficiency, which comprises the ability to communicate with clarity and accuracy, is vital for the academic progress and career readiness of students in higher education. Graduates in agricultural and allied sciences are mandated to articulate clear, well-organised technical ideas and research outputs to policymakers and industry stakeholders, and to prepare reports, proposals, and extension materials. These competencies in speaking and writing rely on both overlapping micro-skills, such as phonemes, morphemes, spelling, syntax, and word choice, and macro-skills, including fluency, discourse, coherence, and audience awareness. However, these skills are often insufficiently developed in students educated through a regional medium of instruction rather than English.

Most high-scoring students from regional-medium schools join government professional institutes with a good grasp of their subjects. However, they lack exposure to English, leading to low self-esteem and restricted participation in class discussions, interviews, and group discussions, which naturally limits their professional growth. To bridge this gap, students need consistent, structured remedial support rather than isolated or short-term training programs. Effectively utilising the resources in the Digital Language Laboratories (DLLs) is the best technology-enabled solution to solve the problem.

A language laboratory is a technology-supported setting equipped with software for structured training in listening, speaking, reading, and writing, allowing students to practise independently, repeat exercises without fear of committing mistakes and embarrassment in front of peers, and receive immediate, individualised feedback. Such environments are particularly well-suited to first-generation and rural students, who often lack an English-speaking environment at home and may otherwise be reluctant to practise in front of others.

Recognising this need, a Digital Language Laboratory was established at the Agricultural College and Research Institute of Tiruchirappalli, a constituent college of TNAU, Coimbatore. Two complementary diagnostic intervention studies were subsequently undertaken to evaluate its effectiveness: one examining oral communication skills (pronunciation and accent, fluency, vocabulary, syntax and grammar, and confidence) and a second examining writing skills (content knowledge, vocabulary, grammar, sentence structure, and mechanics of writing) among 65 first-year agriculture and horticulture students from the same institutions. Both studies followed the same broad design, a diagnostic pre-evaluation, a six-month structured DLL inter

Corresponding Author:

K Thangaraj
Professor of English, Tamil
Nadu Agricultural
University, Coimbatore,
India

vention, and a post-evaluation, and both used a paired *t*-test to establish the statistical significance of any improvement. This paper brings the two studies together to present a unified picture of how a single Digital Language Laboratory intervention affected both the oral and the written expressive skills of regional-medium entrants to agricultural higher education, and to draw combined implications for language remediation programmes in similar institutional settings. Both the oral and writing diagnostic-intervention studies drawn here have already been published separately and the present paper undertakes a new, combined analysis of the two published datasets, integrating them into a single joint statistical treatment (including the combined composite score and its paired *t*-test) that was not part of either original publication.

2. Materials and methods

2.1 Study setting

Both segment studies were conducted at the Digital Language Laboratory established at the Agricultural College and Research Institute, Tiruchirappalli, for the students of agriculture and horticulture. The DLL is equipped with a teacher console networked with students' computer workstations, headsets, and a curated set of licensed software with pre-loaded learning materials, with which students can practise listening, speaking, reading, and writing tasks at their own pace, outside regular class hours, with periodic guidance of the teacher and feedback.

2.2 Participants and sampling

The participants in this study were 65 first-year undergraduate students (45 boys and 19 girls) in agriculture and horticulture who had completed their schooling through a regional (Tamil) medium of instruction, a population identified by faculty as showing a consistent gap in English proficiency relative to English-medium entrants. The majority of them were from rural backgrounds and were first-generation college graduates in their families, factors that were recorded and considered relevant to their limited prior exposure to spoken and written English outside the classroom. Both sets of students were selected from the same year of admission and participated in the same six-month remedial programme conducted in the language laboratory. As a result, the two datasets illustrate companion measurements of the same intervention rather than two independent tests. No students were excluded after completing the diagnostic test, and all those who took part in the pre-evaluation were followed to the post-evaluation. This ensured that the pre- and post-test data fully matched for each participant, making the dataset suitable for paired-samples analysis.

2.3 Background survey instrument

A primary data sheet was prepared using a Google Form to collect the detailed information on the students' region, the educational qualifications of both parents, whether they were first-generation graduates, their higher secondary examination marks, familiarity with academic journals and magazines, frequency of library visits, reading habits related to newspapers and magazines, frequency of listening to English news broadcasts, and previous use of online or mobile resources for independent language learning. These background variables were not assumed as covariates in the statistical investigation of the pre- and post-evaluation scores. Instead, they were used to present a comprehensive understanding of the learning environment of students. Overall, the survey revealed that the cohort had limited opportunities for informal exposure to English outside the classroom, supporting the need for a structured, language laboratory-based remedial activity rather than relying on incidental language exposure.

2.4 Assessment framework and rating scale

The performance of the students was evaluated based on their oral and written work, with reference to the standard distinction between micro-skills and macro-skills in language production. Micro-skills refer to the smaller building blocks of language — phonemes, morphemes, words, collocations, and phrasal units in speech, and spell-

ing, syntax, and word usage in writing. Macro-skills are large-scale, integrative aspects of performance — fluency, discourse, register, pitch, and tone in speech, and purpose and audience awareness, cohesion, and coherence in writing. This distinction guided the selection of the five rated dimensions in each domain: Pronunciation and Accent, Fluency, Vocabulary, Syntax and Grammar, and Confidence for oral skills; and Content Knowledge, Vocabulary, Grammar, Sentence Structure, and Mechanics of Writing for written skills.

The assessment was developed with reference to a well-established distinction in language testing between holistic and analytical scoring. Holistic scoring evaluates students' overall performance and yields a single score, whereas analytical scoring assesses the communicative competence of individual components: fluency, pronunciation, grammar, vocabulary, and organisation. Though this method requires more time and careful scoring, it offers more detailed feedback, which is valuable for diagnosis and targeted teaching.

Since the primary objective of this study was to identify specific language difficulties and monitor improvement after remedial instruction, an analytical, criterion-referenced rubric was used to assess both oral and written performance. Each of the five assessment dimensions was scored independently using a five-point scale. To make the results easier to interpret, the raw scores were later grouped into four descriptive proficiency levels: *Needs Improvement*, *Fair*, *Good*, and *Excellent*. These categories allowed changes in students' performance to be clearly compared before and after the intervention.

For the writing assessment, the evaluation was also guided by the widely recognised POWER framework—*Prewriting*, *Organising*, *Writing*, *Evaluating*, and *Revising*. This framework informed both the design of the writing tasks and the assessment criteria, particularly in evaluating the quality of content, organisation, vocabulary, and accuracy in students' written work.

2.5 Diagnostic pre-evaluation procedure

Prior to the pre-evaluation, a diagnostic test was administered to all participants before initialising the intervention at the language laboratory, using the above-mentioned analytical rubrics. For oral skills, each student undertook a structured speaking assessment that included short, spontaneous responses and guided speech tasks, which were rated live or from audio recordings by trained evaluators across the five oral dimensions.

Writing skills were assessed for each student through a series of short writing tasks, including short-answer comprehension questions, descriptive writing based on the given picture or situation, and paragraph writing on a specific topic. These tasks were designed to assess both lower-level writing skills, such as grammar and vocabulary, and higher-level skills, such as organisation and coherence. The students' responses were evaluated by applying the same analytical rubric, with scores assigned separately for each of the five writing dimensions.

The pre-evaluation served to establish a baseline against which students' post-intervention performance could be compared using a paired-samples analysis. In addition, it helps to identify specific components of language difficulties in students, allowing the Digital Language Laboratory intervention to be structured to the needs of individual students.

2.6 The digital language laboratory intervention

Following the diagnostic test, all selected students underwent a structured, software-assisted training programme in the DLL over a period of six months, conducted during the off-class hours twice or thrice a week. The instructor periodically monitored the guided learning. To improve students' speaking skills, sessions focused on six core competencies: the use of stress and intonation in speaking, speech rate, basic grammar, vocabulary, sentence structure, and pronunciation and accent. Some of the practice tasks in the language laboratory included listening-and-repeating drills, listening comprehension with question-and-answer, listening-and-paraphrasing exercises, group narrative activities, the "Chinese whisper" game, and other collaborative speaking activities. Students also practised with elementary and intermediate-

level listening materials modelled on the TOEFL and IELTS examinations, and were regularly exposed to recordings of native English speakers to support accent familiarisation. Table 1 summarises the software used to support each oral-skill area.

S. No.	Skill Assessed	Software Used
1	Vocabulary	English in Mind 2 & 3
2	Pronunciation	Business Vocabulary in Use; Learn to Speak English – Lessons & Workshops
3	Word Stress & Sentence Stress	English in Mind
4	Grammar	Cambridge English Pronunciation – Elementary, Intermediate, and Advanced
5	Fluency	Speech Rate Meter

To improve students' writing skills, laboratory sessions were designed to include automated grammar- and vocabulary-checking tools, vocabulary enrichment games, grammar drills, and interactive modules that support individualised learning tracks with immediate feedback. Structured writing tasks included grammar practice exercises, vocabulary-building activities, short-story writing, picture description, narrating personal experiences, sentence-construction and jumbled-sentence drills, paragraph writing, and essay writing, covering both IELTS/TOEFL-style examination preparation and free-composition tasks. Table 2 shows the software supported for each writing-skill area.

Table 1. Software used to support the oral-skills intervention.

S. No.	Skill Assessed	Software Used
1.	Vocabulary	Cambridge English in Mind 2 & 3; Business Vocabulary in Use – Intermediate; Cambridge Vocabulary in Use
2.	Content Knowledge	Cambridge English in Mind – Module 1; Learn to Speak English – Lessons & Workshops
3.	Grammar	Active Grammar Level 2; Interchange 3
4.	Sentence Structure	Cambridge Complete IELTS – Bands 6.5–7.5; English in Mind
5.	Mechanics of Writing	Active Grammar Level 2; Cambridge Complete IELTS – Bands 6.5–7.5; Face2Face – Intermediate

Table 2. Software used to support the writing-skills intervention.

In addition to regular practice in the language laboratory, a Google Group was created for the writing-skills cohort to monitor students' progress. Weekly, bi-weekly, and monthly written assignments were set through this platform, and performance on these assignments informed customised remedial instruction targeted at each student's strengths and weaknesses during subsequent laboratory sessions.

2.7 Post-evaluation procedure

After a six-month intervention in the language laboratory, a post-evaluation was conducted to assess oral and written skills, using the same assessment instruments used in the pre-evaluation test. It ensured consistency and comparability between the two measurement points. As with the pre-evaluation, oral performance was rated on live or

recorded speaking tasks, and writing performance was rated on a comparable set of writing tasks, both scored using the same analytical rubric across the five respective dimensions.

2.8 Data collection and statistical analysis

In both segments, the null hypothesis (H_0) stated that there would be no significant difference between the mean pre-evaluation and mean post-evaluation scores. In contrast, the alternative hypothesis (H_1) suggested that the intervention in the language laboratory would produce a significant improvement in scores. For each domain, the analysis reported the sample size, the content, mean, and standard deviation of pre- and post-evaluation scores; the mean paired difference, its standard deviation and standard error; the 95% confidence interval for the mean difference; and the resulting t -value and p -value, evaluated against the conventional significance threshold of $\alpha = 0.05$. In parallel with the inferential test, descriptive frequency distributions were computed for each of the five dimensions in each domain, expressed as the percentage of students falling into each of the four proficiency bands before and after the intervention, in order to identify which specific dimensions showed the greatest movement and to supplement the aggregate significance test with a dimension-level diagnostic picture.

2.9 Design limitations

Both studies are limited by the lack of a control group, which prevents a clear conclusion about cause and effect. Since participants were only evaluated before and after the language laboratory intervention, external factors could have influenced the results. These include natural maturity over six months, daily college English exposure, and test familiarity. This limitation is discussed further in the conclusion, which outlines stronger research designs for future studies.

2.10 Dataset origins and secondary analysis

This study utilizes secondary data derived from two distinct oral-skills and writing-skills datasets, which were published in full by Thangaraj and Anandhi¹⁴ and Thangaraj and Santhosh¹⁵. No new primary data were gathered. The core contribution of this paper rests on a novel secondary analysis that synthesizes these independent composite scores into a singular, student-specific Combined (Oral + Writing) index. This unified index undergoes three new statistical evaluations missing from the original works: a paired t -test, chi-square analysis, and correlation-sensitivity analysis.

3. Results and discussion

Students were rated on a 4-point ordinal scale viz., Needs improvement, Fair, Good and Excellent across five writing sub-skills and five oral sub-skills, both before and after an English lab intervention. This report summarises the distribution of ratings and tests whether the observed shifts are statistically significant, and whether writing skills improved by a different amount than oral skills.

3.1 Oral skills: pre- and post-evaluation

During the pre-evaluation of this study, most of the students fell into the category of "Needs Improvement" across all five oral-skill dimensions, remarkably in Syntax and Grammar with 69%. It is worth mentioning that no student has reached the "Good" or "Excellent" levels. Following the six-month intervention in the language laboratory, the proportionate rate of need improvement fell sharply in every element, 6% in Pronunciation and Accent with 12% reaching "Good", 19% in Fluency, 17% in Vocabulary, 14% in Syntax and Grammar, and to 0% in Confidence, where 31% of students reached the "Good" level. Table 3 summarises the comparative distribution.

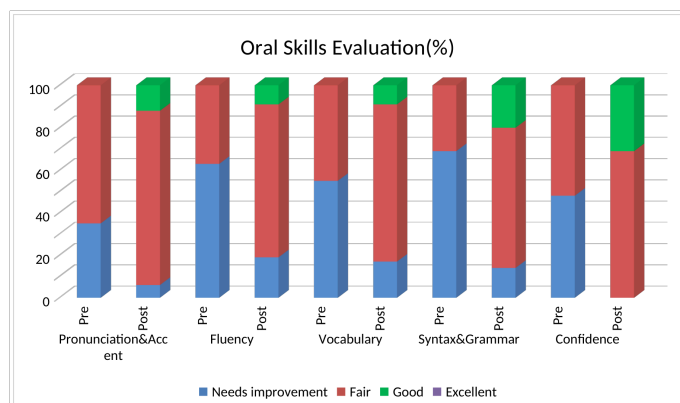


Figure 1. Comparative pre- and post-evaluation distribution of oral-skill proficiency levels

Table 3. Comparative pre- and post-evaluation distribution of oral-skill proficiency levels (excellent = 0% throughout).

Oral Skill Dimension	Needs Improvement (Pre → Post)	Fair (Pre → Post)	Good (Pre → Post)
Pronunciation & Accent	35% → 6%	65% → 82%	0% → 12%
Fluency	63% → 19%	37% → 72%	0% → 9%
Vocabulary	55% → 17%	45% → 74%	0% → 9%
Syntax & Grammar	69% → 14%	31% → 66%	0% → 20%
Confidence	48% → 0%	52% → 69%	0% → 31%

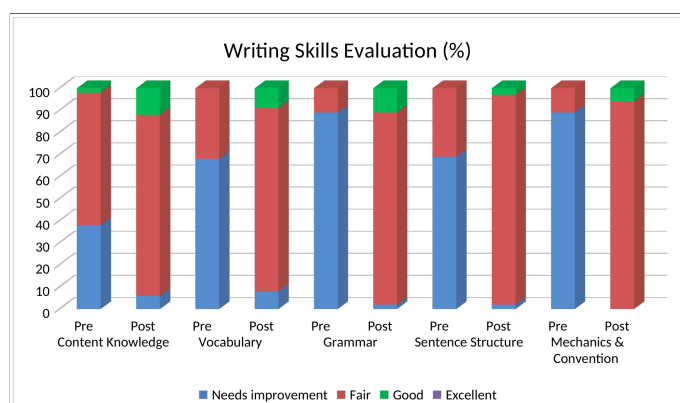


Figure 2. Comparative pre- and post-evaluation distribution of writing skill proficiency level

Overall, the intervention has resulted in an average 68.2% drop in the proportion of students classified as "Needs Improvement" across all five writing dimensions, with the complete elimination of the "Needs Improvement" category in Content Knowledge and Mechanics and Convention. Combined "Fair" and "Good" proficiency increased from an average of 31.4% to 97% across dimensions

Table 4. Comparative pre and post-evaluation distribution of writing-skill proficiency levels.

Writing Dimension	Needs Improvement (Pre → Post)	Fair (Pre → Post)	Good (Pre → Post)
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Content Knowledge	38% → 0%	60% → 85%	2% → 15%
Vocabulary	68% → 8%	32% → 83%	0% → 9%
Grammar	89% → 2%	11% → 87%	0% → 11%
Sentence Structure	69% → 2%	31% → 95%	0% → 3%
Mechanics & Convention	89% → 0%	11% → 94%	0% → 6%

3.3 Statistical analysis of results

A paired *t*-test was conducted separately for the oral-skills dataset and the writing-skills dataset to determine whether the Digital Language Laboratory intervention produced a statistically significant improvement in each domain. In both cases, the null hypothesis (H_0) stated that there would be no significant difference between the mean pre-evaluation and mean post-evaluation composite scores, while the alternative hypothesis (H_1) proposed that the intervention would produce a significant improvement.

Also a chi-square test of homogeneity was conducted to examine whether the distribution of student performance ratings differed significantly between the pre-intervention and post-intervention assessments for each of the ten writing and oral sub-skill categories.

3.3.1 Descriptive statistics of pre- and post-evaluation scores

Table 5 presents the descriptive statistics — sample size, range, mean, standard deviation, and standard error of the mean for the composite pre- and post-evaluation scores in both domains.

Table 5. Descriptive statistics of composite pre- and post-evaluation scores for oral and writing skills.

Domain	Sample	N	Min	Max	Mean	SD	SE Mean
Oral Skills	Pre-evaluation	65	5	10	7.292	1.487	0.184
Oral Skills	Post-evaluation	65	7	14	10.262	1.716	0.213
Writing Skills	Pre-evaluation	65	5	10	6.492	1.276	0.158
Writing Skills	Post-evaluation	65	9	14	10.338	1.050	0.130

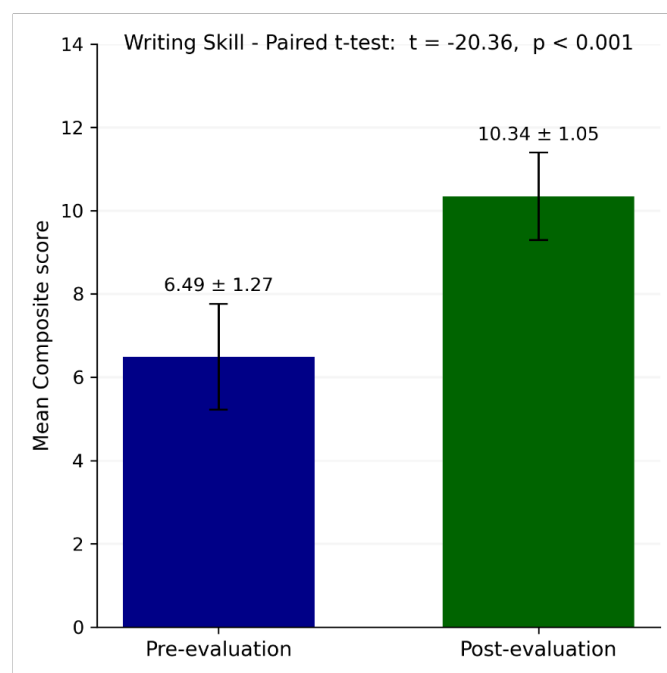
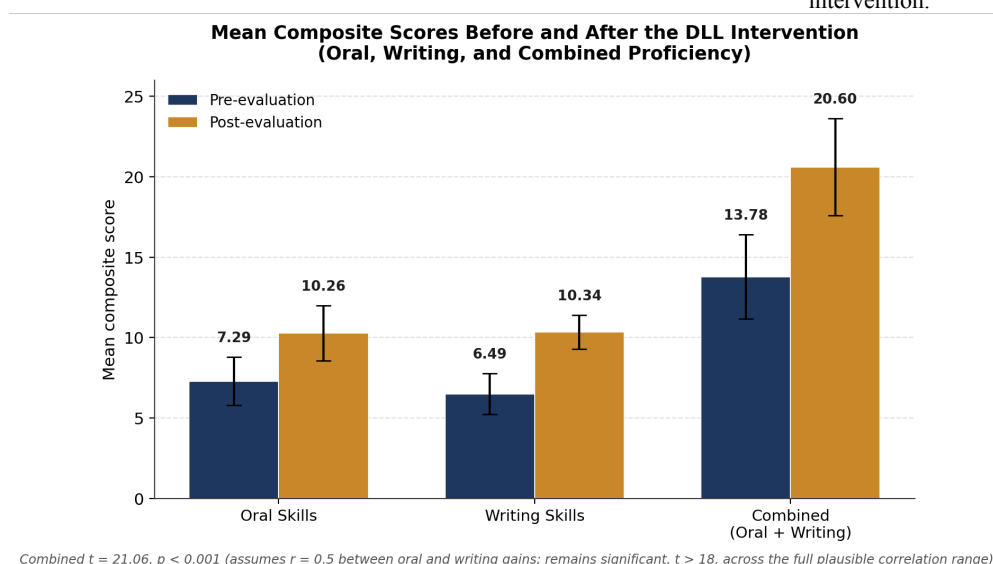
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$$SD^2(\text{combined gain}) = SD^2(\text{oral gain}) + SD^2(\text{writing gain}) + 2r \cdot SD(\text{oral gain}) \cdot SD(\text{writing gain})$$

Table 8. Sensitivity of the combined paired *t*-test to the assumed correlation between oral and writing gains (*df* = 64).

Assumed <i>r</i> (oral–writing gain)	SD of Combined Gain	SE	Combined <i>t</i> (<i>df</i> = 64)	Cohen's <i>d</i>
0.0 (independent)	2.130	0.264	25.80	3.20
0.3	2.428	0.301	22.63	2.81
0.5 (moderate, assumed)	2.609	0.324	21.06	2.61
0.7	2.777	0.344	19.79	2.45
1.0 (perfectly correlated)	3.012	0.374	18.24	2.26

Even at the most conservative end of this range, a perfect correlation between oral and writing gains with $r = 1.0$, which maximises the dispersion of the combined score and therefore minimises the *t*-value. The combined result remains far beyond the threshold for statistical significance ($t = 18.24$, critical $t \approx 2.0$ at $df = 64$, $\alpha = 0.05$, $p < 0.001$). Taking $r = 0.5$ as a plausible mid-range estimate, given the partially shared skill content of the two intervention tracks, the combined analysis yields $t = 21.06$, $p < 0.001$, with a combined effect size of Cohen's $d = 2.61$ — an effect conventionally described as very large ($d > 0.8$). The conclusion that the DLL intervention produced a statistically significant, large-magnitude improvement in overall (oral + writing) English proficiency is therefore robust to the choice of correlation assumption, and is, if anything, more strongly supported than either single-domain result taken alone.

**Figure 4.** Mean composite writing-skills score before and after the intervention.**Figure 5.** Mean composite scores before and after the DLL intervention for oral, writing, and combined (oral + writing) proficiency, with ± 1 SD error bars.

3.4 Significance of pre-post shift by category using chi squared test

A chi-square test of homogeneity was conducted to examine whether the distribution of student performance ratings differed significantly between the pre and post-intervention assessments for each of the ten

writing and oral sub-skill categories. This test evaluates whether the proportion of students across performance levels shifted meaningfully following the English lab intervention, rather than remaining consistent with pre-intervention patterns. For each of the ten sub-skill categories, the test was computed on the underlying 2×4 contingency table of student counts (pre-intervention vs. post-intervention) across

the four proficiency bands reported in Tables 3 and 4; the "Pre mean" and "Post mean" columns in Table 9 below report the corresponding average four-point rating for that category at each time point, for ease

of interpretation alongside the χ^2 and p -values, rather than the counts on which the test itself was run.

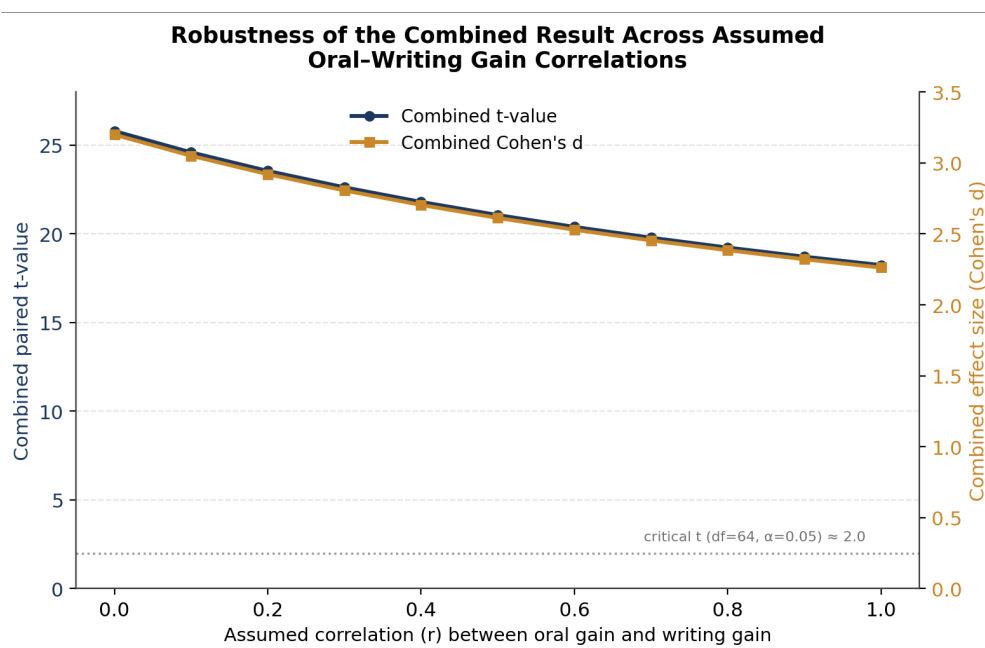


Figure 6. Combined paired t -value and Cohen's d as a function of the assumed correlation between individual students' oral and writing gains

Table 9. Comparison of homogeneity between the pre- and post-intervention distributions using Chi squared test

Category	Pre mean	Post mean	Mean Difference Δ	χ^2	p -value
Content knowledge (W)	1.63	2.06	+0.43	22.78	< .001
Vocabulary (W)	1.32	2.02	+0.69	51.56	< .001
Grammar (W)	1.11	2.09	+0.98	101.13	< .001
Sentence structure (W)	1.31	2.02	+0.71	65.60	< .001
Mechanics & conventions (W)	1.11	2.06	+0.95	104.88	< .001
Pronunciation & accent (O)	1.65	2.06	+0.42	22.64	< .001
Fluency (O)	1.37	1.91	+0.54	29.32	< .001
Vocabulary (O)	1.45	1.92	+0.48	23.99	< .001
Syntax & grammar (O)	1.31	2.06	+0.75	45.40	< .001
Confidence (O)	1.52	2.31	+0.78	52.53	< .001

Results indicated a statistically significant improvement in student performance across all ten categories, all with p -values below 0.001, suggesting that the observed shift toward higher performance levels following the intervention is highly unlikely to have occurred by chance. Writing sub-skills demonstrated particularly strong shifts in Grammar and Mechanics & Conventions, which recorded the highest chi-square values of 101.13 and 104.88 respectively. Oral sub-skills showed the largest shifts in Confidence and Syntax & Grammar, with chi-square values of 52.53 and 45.40. Given the sample size of 65 students, a small number of categories contained expected cell counts below 5, which may slightly reduce the precision of the chi-square approximation in those cases. This pattern is consistent with the paired-samples t -tests reported in Section 3.3.2, which showed t equal to 20.36 ($p < .001$) for writing and t equal to -16.07 ($p < .001$) for oral, supporting the robustness of these findings.

Both studies show a consistent pattern that the regional-medium students entered the Digital Language Laboratory programme with substantial deficits in both oral and written English, with Syntax and Grammar/Fluency the weakest oral dimensions and Grammar/Mechanics and Convention the weakest writing dimensions, a convergence suggesting that grammatical accuracy is the single largest barrier facing this student population, in both spoken and written modes. In both areas, the intervention has created large, statis-

tically significant gains (oral: $t = -16.07$; writing: $t = -20.36$; both $p < 0.001$), and in both domains the gains carried the great majority of students from "Needs Improvement" into the "Fair" band, with a smaller but meaningful shift into "Good."

It is worth emphasising that none of the students reached the "Excellent" level in both categories, indicating that the intervention is effective in moving students from the basic to the intermediate level, but not to the proficient level. These attributes indicate that language learning is a continuous, long-term process that requires continuous, structured practice beyond the restricted time-bound process.

The consistency of the software used across both interventions, namely, vocabulary, pronunciation, and grammar modules shared between the oral and written, further suggests that an integrated Digital Language Laboratory curriculum addressing these skills concurrently, rather than as separate tracks, may be both efficient and pedagogically coherent, since micro-skills such as vocabulary and grammar underlie both speaking and writing performance.

4. Conclusion

This study demonstrates that systematic training in the Language Laboratory led to advances in the expressive skills of students from regional-medium schools whose mother tongue is not English. The majority of students moved from "needs improvement" to the "Fair"

and "Good" proficiency bands. Paired t-tests confirmed these gains as highly significant ($p < 0.001$) in both domains.

At the same time, the absence of any student reaching the "Excellent" level in either oral or written skills indicates that the intervention, while effective in resolving foundational deficiencies, brought students only to an intermediate stage of proficiency. This suggests that continued, longer-duration engagement with the language laboratory extending beyond six months and reinforced by regular practice and real-world application will be necessary to advance students from intermediate to advanced proficiency in both speaking and writing.

The findings reinforce the wider adoption of technology-enabled, self-paced language laboratories as a scalable remedial strategy for everyone, especially regional-medium entrants. Future research would benefit from the inclusion of a control group to strengthen causal inference, tracking long-term retention of gains after the intervention ends, and further integration of oral and written skill training within a single, unified DLL curriculum.

Disclaimer: This work was carried out in collaboration between both authors. Author KT trained students in digital language laboratory. Author AS performed evaluation and statistical analysis. Both authors read and approved the final manuscript.

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References

1. Attali Y, Burstein J. Automated essay scoring with e-rater® V.2. *J Technol Learn Assess*. 2006;4(3).
2. Barr J, Seyfeddinipur M. The role of fillers in listener attributions for speaker disfluency. *Lang Cogn Process*. 2010;25(4):441–455.
3. Brown HD. *Language assessment: Principles and classroom practices*. Pearson Education; 2004.
4. Chapelle CA, Douglas D. *Assessing language through computer technology*. Cambridge University Press; 2006.
5. Cottrell S. *The study skills handbook*. Macmillan International; 2019.
6. Dörnyei Z. *Motivational strategies in the language classroom*. Cambridge University Press; 2001.
7. Hyland K. *Second language writing*. Cambridge University Press; 2003.
8. Koomen M, Zoanetti N. Strategic planning tools for large-scale technology-based assessments. *Assess Educ Princ Policy Pract*. 2018;25(2):200–223.
9. Luoma S. *Assessing speaking*. Cambridge University Press; 2004.
10. Nagaraj G. *English language teaching: Approaches, methods, and techniques*. Orient BlackSwan; 2010.
11. Padmapriya PV. Effectiveness of language laboratory in improving the communicative skills of engineering students. *Int J Engl Lang Teach*. 2014;1(1):1–6.
12. Ramesh P, Krishnan R. Role of language laboratories in enhancing writing skills of ESL learners. *J Engl Lang Lit*. 2017;4(2):312–316.
13. Richards JC, Rodgers TS. *Approaches and methods in language teaching*. 3rd ed. Cambridge University Press; 2014.
14. Thangaraj K, Anandhi S. An impact study on the oral proficiency of students from Tamil medium schools tutored in digital language laboratory. *Int J Soc Sci*. 2024.
15. Thangaraj K, Santhosh A. Effectiveness of Digital Language Laboratory intervention on writing skills of undergraduate students from regional-medium schools. *Asian J Agric Ext Econ Sociol*. 2025;43(12):287–301.
16. Warschauer M. The changing global economy and the future of English teaching. *TESOL Q*. 2000;34(3):511–535.
17. Weigle SC. *Assessing writing*. Cambridge University Press; 2002.

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