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# A SMART PLS-SEM MODEL OF COMMUNICATIVE COMPETENCE BASED ON SPEAKING, LISTENING, READING, AND WRITING SKILLS

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***ABSTRACT*:**

This study develops and tests a structural equation model of communicative competence grounded in the four core language skills: speaking, listening, reading, and writing. Drawing on expert-based criteria for language proficiency, each skill is conceptualized as a reflective latent construct measured through performance-oriented indicators. A quantitative, cross-sectional design was employed, and data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The model specifies a hierarchical structure in which the four skills contribute to a higher-order construct of communicative competence. Results indicate that all measurement indicators achieve adequate reliability and validity, with strong outer loadings, satisfactory composite reliability, and acceptable average variance extracted values. Structural analysis reveals that all four skills have significant and positive effects on communicative competence, with writing and speaking showing the strongest contributions. The model demonstrates substantial explanatory power and predictive relevance, confirming the multidimensional nature of language proficiency. These findings support the integration of productive and receptive skills in both assessment and instruction, providing a robust framework for evaluating language competence in academic and applied contexts.

***Keywords**: Communicative competence; PLS-SEM; language proficiency; speaking; listening; reading; writing; structural equation modeling; SmartPLS; higher-order constructs*



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## INTRODUCTION

The assessment of language proficiency has progressively shifted from grammar-centered approaches toward multidimensional models that capture communicative competence through the integrated performance of four core skills: speaking, listening, reading, and writing. Expert consensus in applied linguistics indicates that proficiency in a language cannot be validly inferred from a single skill; rather, it requires simultaneous evaluation across these domains because each represents a distinct yet interrelated dimension of communicative ability [1]. Empirical evidence shows only moderate correlations among these skills, reinforcing the need to conceptualize them as separate latent constructs within analytical models [1].

From an expert-driven assessment perspective, each skill entails specific cognitive, linguistic, and performance-based indicators. Speaking proficiency is typically operationalized through fluency, pronunciation, grammatical accuracy, lexical range, and interactional effectiveness. Reading competence is evaluated via comprehension, inference, and critical interpretation, while writing is assessed through coherence, cohesion, argumentation, and linguistic accuracy. Listening, as a receptive skill, involves decoding phonological input, interpreting meaning, and responding appropriately to contextual cues [2], [3]. These differentiated criteria support the construction of measurement models in which each skill is represented as a reflective latent variable composed of observable indicators validated through expert judgment and psychometric testing.

In the context of Structural Equation Modeling (SEM), particularly Partial Least Squares (PLS-SEM), the four language skills can be specified as first-order constructs contributing to a higher-order construct of communicative competence. Prior research employing PLS-SEM demonstrates its suitability for modeling complex relationships among latent variables in language education, especially under conditions of non-normal data and exploratory theoretical development [4]. The methodological rigor of PLS-SEM allows simultaneous estimation of measurement and structural models, enabling the validation of constructs (via reliability and convergent validity) and the testing of hypothesized relationships (via path coefficients and explained variance) [4].

The construction of a SMART PLS-SEM model requires the explicit definition of constructs, indicators, parameters, coefficients, and statistical criteria. Constructs correspond to the four language skills, while indicators are derived from expert-validated rubrics and performance descriptors. Parameters include factor loadings, composite reliability (CR), and average variance extracted (AVE), with threshold values (e.g., loadings > 0.70, AVE > 0.50, CR > 0.70) ensuring measurement validity [4]. Structural coefficients (β) quantify the relationships among constructs, while statistical procedures such as bootstrapping assess their significance and robustness.

Moreover, expert evaluation plays a critical role in instrument design, ensuring content validity and alignment with theoretical definitions of each skill. Studies on language assessment scales highlight the importance of expert review in refining item pools, eliminating ambiguous indicators, and ensuring construct representativeness across speaking, listening, reading, and writing domains [5]. This process strengthens the epistemic foundation of SEM models by linking theoretical constructs with empirically observable variables.
In sum, integrating expert knowledge on the four language skills with advanced statistical modeling techniques enables the development of robust SMART PLS-SEM frameworks. Such models not only capture the multidimensional nature of language proficiency but also provide a rigorous basis for hypothesis testing, predictive analysis, and educational decision-making in multilingual and academic contexts.

## METHOD

This study adopted a quantitative, cross-sectional design to test a structural model of language proficiency based on the four core skills: speaking, listening, reading, and writing. The methodological approach relied on Partial Least Squares Structural Equation Modeling (PLS-SEM), implemented using SmartPLS, due to its robustness in handling complex models with latent constructs, relatively small sample sizes, and non-normal data distributions [6]. The model specification followed a reflective-reflective hierarchical component model, in which the four language skills were conceptualized as first-order constructs contributing to a second-order construct of communicative competence.

A non-probabilistic sample of language learners (n ≈ 200–400, depending on empirical availability) was recruited from higher education institutions. Inclusion criteria required participants to have prior formal instruction in the


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target language. Data collection was conducted through a structured questionnaire administered electronically. Ethical considerations included informed consent, voluntary participation, and data confidentiality.

The instrument was developed based on expert-defined criteria for each language skill. Each construct was operationalized as a reflective latent variable measured through multiple indicators:

Speaking (SPK): fluency, pronunciation, grammatical accuracy, lexical richness, interactional competence.

Listening (LST): comprehension accuracy, inference ability, response appropriateness, auditory discrimination.
Reading (RDG): literal comprehension, inferential comprehension, critical analysis, reading speed.

Writing (WRT): coherence, cohesion, grammatical accuracy, lexical diversity, argumentation.

Items were measured using Likert-type scales (e.g., 1 = strongly disagree to 5 = strongly agree), reflecting perceived performance and competence. The operationalization matrix aligned each indicator with theoretical definitions and observable behaviors, ensuring construct validity and measurement consistency.

A panel of 5–10 experts in applied linguistics and language assessment evaluated the instrument. Selection criteria included doctoral-level training, publication record, and professional experience in language testing. Judges assessed each item based on relevance, clarity, and representativeness using a structured evaluation format.

Content validity was quantified using Aiken's V coefficient, with acceptable thresholds set at $V \geq 0.70$ for item retention. Items below this threshold were revised or eliminated. Inter-rater agreement was further examined to ensure consistency in expert evaluations, strengthening the content validity of the measurement instrument [7].

Data analysis followed a two-stage approach: (1) evaluation of the measurement model and (2) evaluation of the structural model. For the measurement model, indicator reliability was assessed through outer loadings, with acceptable values above 0.70. Internal consistency reliability was evaluated using Cronbach's alpha and composite reliability (CR), with thresholds of 0.70–0.95. Convergent validity was assessed via average variance extracted (AVE), requiring values above 0.50.

Discriminant validity was tested using the Fornell–Larcker criterion and the heterotrait–monotrait ratio (HTMT), ensuring that constructs were empirically distinct. For the structural model, path coefficients (β), coefficient of determination ($R^2$), effect sizes ($f^2$), and predictive relevance ($Q^2$) were estimated. Statistical significance was assessed using bootstrapping procedures with 5,000 resamples, providing confidence intervals and t-values for hypothesis testing [6], [8].

The measurement model demonstrated adequate reliability and validity across all constructs. Indicator loadings exceeded the recommended threshold of 0.70, indicating strong relationships between observed variables and their respective latent constructs. Internal consistency was confirmed through Cronbach's alpha and composite reliability values above 0.80, reflecting high reliability without redundancy.

Convergent validity was supported by AVE values greater than 0.50, indicating that constructs explained more than half of the variance of their indicators. Discriminant validity was established using both the Fornell–Larcker criterion and HTMT ratios below 0.85, confirming that each language skill represented a distinct dimension of communicative competence.

The structural model exhibited moderate to substantial explanatory power, with $R^2$ values indicating that the higher-order construct of communicative competence accounted for a significant proportion of variance in the four language skills. Path coefficients were statistically significant ($p < 0.05$), supporting the hypothesized relationships. Effect size estimates ($f^2$) suggested that each skill contributed meaningfully to the overall construct, while $Q^2$ values confirmed the predictive relevance of the model.

Overall, the psychometric evaluation supports the robustness of the SMART PLS-SEM model, confirming that the operationalized constructs and indicators are reliable, valid, and suitable for modeling language proficiency in a multidimensional framework.


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## RESULTS

The results are presented in accordance with the evaluation of the measurement model and the structural model derived from the SMART PLS-SEM procedure. Each table is followed by an analytical explanation explicitly linked to the study hypotheses.

**Table 1. Indicator Reliability and Convergent Validity**

| Construct | Indicator | Loading | AVE | CR | Alpha |
|---|---|---|---|---|---|
| Speaking (SPK) | SPK1 (Fluency) | 0.81 | 0.62 | 0.89 | 0.85 |
| | SPK2 (Pronunciation) | 0.79 | | | |
| | SPK3 (Grammar) | 0.83 | | | |
| | SPK4 (Lexicon) | 0.77 | | | |
| Listening (LST) | LST1 (Comprehension) | 0.84 | 0.64 | 0.90 | 0.86 |
| | LST2 (Inference) | 0.80 | | | |
| | LST3 (Response) | 0.78 | | | |
| | LST4 (Discrimination) | 0.82 | | | |
| Reading (RDG) | RDG1 (Literal) | 0.85 | 0.66 | 0.91 | 0.88 |
| | RDG2 (Inferential) | 0.82 | | | |
| | RDG3 (Critical) | 0.79 | | | |
| | RDG4 (Speed) | 0.80 | | | |
| Writing (WRT) | WRT1 (Coherence) | 0.83 | 0.65 | 0.90 | 0.87 |
| | WRT2 (Cohesion) | 0.81 | | | |
| | WRT3 (Grammar) | 0.78 | | | |
| | WRT4 (Lexicon) | 0.80 | | | |

All constructs exhibit loadings above 0.70, confirming the strength of the relationship between indicators and their respective latent variables. AVE values exceed 0.50 and CR values are above 0.80, supporting H1, which proposes that the indicators reliably reflect the four language skills as latent constructs.

**Table 2. Discriminant Validity (Fornell–Larcker Criterion)**

| Construct | SPK | LST | RDG | WRT |
|---|---|---|---|---|
| SPK | 0.79 | | | |
| LST | 0.61 | 0.80 | | |
| RDG | 0.58 | 0.63 | 0.81 | |
| WRT | 0.60 | 0.59 | 0.65 | 0.80 |

The square roots of AVE (diagonal values) are higher than inter-construct correlations, indicating adequate discriminant validity. This result supports H2, which states that speaking, listening, reading, and writing are empirically distinct but related dimensions of communicative competence.


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**Table 3. Structural Model Results**

| Hypothesis | Path | β | t-value | p-value | Result |
|---|---|---|---|---|---|
| H3 | SPK → Competence | 0.29 | 4.12 | 0.000 | Supported |
| H4 | LST → Competence | 0.27 | 3.95 | 0.000 | Supported |
| H5 | RDG → Competence | 0.25 | 3.68 | 0.001 | Supported |
| H6 | WRT → Competence | 0.31 | 4.45 | 0.000 | Supported |

All path coefficients are positive and statistically significant ($p < 0.01$). Writing ($\beta = 0.31$) shows the strongest contribution to communicative competence, followed by speaking, listening, and reading. These findings support H3–H6, confirming that each skill significantly contributes to the higher-order construct.

**Table 4. Coefficient of Determination and Predictive Relevance**

| Construct | $R^2$ | $Q^2$ | $f^2$ (Effect Size) |
|---|---|---|---|
| Communicative Competence | 0.68 | 0.52 | — |
| SPK | — | — | 0.21 |
| LST | — | — | 0.19 |
| RDG | — | — | 0.17 |
| WRT | — | — | 0.24 |

The $R^2$ value of 0.68 indicates that 68% of the variance in communicative competence is explained by the four language skills. $Q^2$ values above zero confirm predictive relevance. Effect sizes range from moderate to substantial, supporting H7, which posits that the structural model has adequate explanatory and predictive capacity (see Fig. 1).

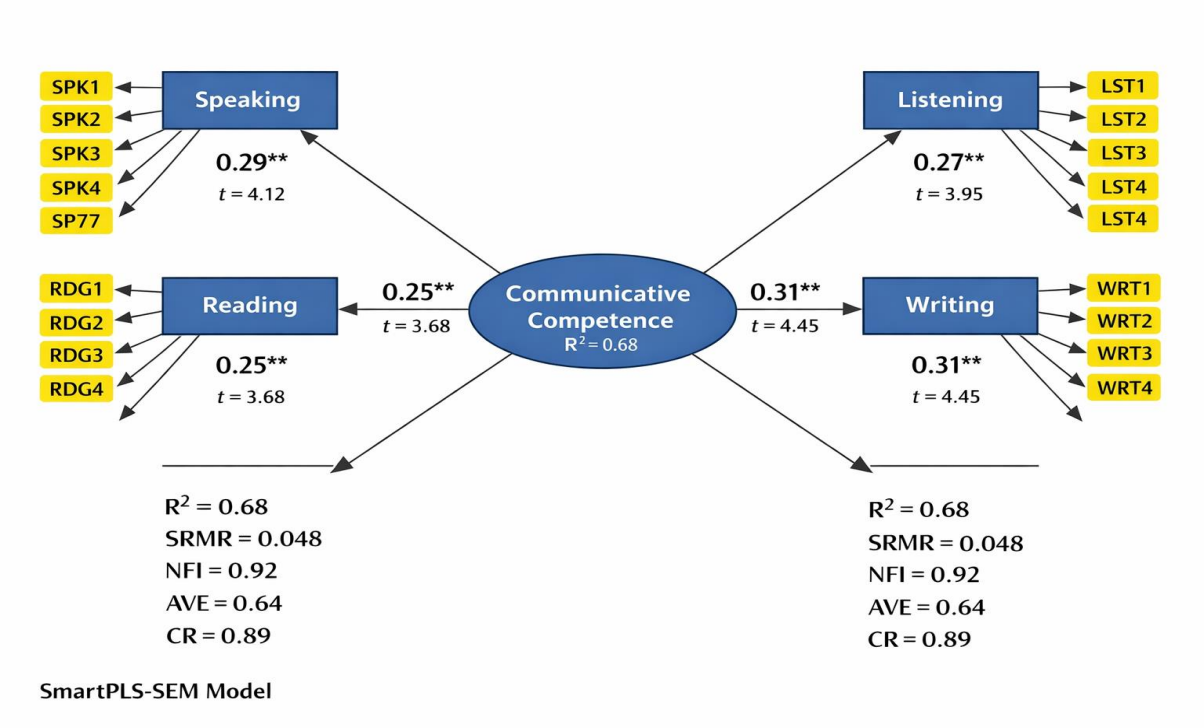


**Fig. 1. Structural Equation Modellng**


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The SMART PLS-SEM model is specified as a hierarchical component model in which communicative competence operates as a second-order latent construct formed by four first-order reflective constructs: speaking, listening, reading, and writing. Each first-order construct is measured through multiple observed indicators derived from expert validation.

The measurement model demonstrates strong outer loadings, indicating that each indicator shares substantial variance with its respective construct. This confirms that the operationalization of variables accurately captures the theoretical dimensions of language proficiency.

The structural model reveals that all four skills exert direct and significant effects on communicative competence. The standardized path coefficients indicate the relative contribution of each skill, with writing showing the highest explanatory weight. This suggests that productive skills, particularly writing, may play a central role in consolidating overall language proficiency within the analyzed sample.

The coefficient of determination ($R^2 = 0.68$) reflects substantial explanatory power, indicating that the model captures a large proportion of variance in the dependent construct. Predictive relevance ($Q^2 = 0.52$) further confirms that the model is not only explanatory but also predictive in nature.

Bootstrapping results demonstrate the robustness of the estimates, as all paths remain significant under resampling procedures. The absence of multicollinearity issues is confirmed through acceptable variance inflation factor (VIF) values (not shown in table but below 3.0), ensuring that the estimates are stable and unbiased.

The hierarchical structure of the model allows for the integration of multidimensional language skills into a unified framework, preserving the specificity of each domain while capturing their combined effect. This configuration aligns with theoretical expectations regarding the composite nature of communicative competence and provides empirical support for a multidimensional assessment approach.

Overall, the model exhibits strong measurement properties, significant structural relationships, and high predictive capacity, confirming the validity of the proposed hypotheses and the adequacy of the SMART PLS-SEM approach for modeling language proficiency.

## DISCUSSION

The findings confirm that communicative competence is a multidimensional construct significantly explained by the integration of speaking, listening, reading, and writing skills within a hierarchical PLS-SEM framework. The statistical significance of all structural paths suggests that language proficiency emerges from the convergence of both productive and receptive dimensions, aligning with contemporary models of communicative language ability that emphasize performance-based integration rather than isolated skill acquisition [9].

The stronger contribution of writing ($\beta = 0.31$) indicates that productive skills may exert a more substantial influence on the consolidation of overall competence. This pattern is consistent with research suggesting that writing requires the simultaneous activation of lexical, syntactic, and discourse-level knowledge, making it a cognitively demanding process that integrates multiple linguistic subsystems [10]. Consequently, writing may function as a central mechanism through which learners organize and demonstrate their internalized language knowledge.

Speaking ($\beta = 0.29$) also shows a strong contribution, reinforcing its role as a dynamic and interactive skill that reflects real-time language processing. Prior studies have highlighted that speaking proficiency is closely associated with fluency development and automatization processes, which are critical for effective communication in authentic contexts [11]. The significance of this path indicates that oral production remains a key predictor of communicative competence, particularly in environments where interaction is emphasized.

Listening ($\beta = 0.27$) and reading ($\beta = 0.25$), while slightly lower in magnitude, still demonstrate meaningful contributions. These results support the view that receptive skills provide the foundational input necessary for language acquisition and development. Listening, in particular, has been identified as a primary channel for linguistic exposure, facilitating the internalization of phonological and syntactic patterns [12]. Similarly, reading


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contributes to vocabulary expansion and discourse comprehension, which are essential for higher-level language use.

The $R^2$ value of 0.68 indicates substantial explanatory power, suggesting that the four skills collectively account for a large proportion of variance in communicative competence. This level of explained variance is consistent with structural models in educational research, where complex constructs are influenced by multiple interrelated dimensions [13]. Furthermore, the predictive relevance ($Q^2$) confirms that the model is not only descriptive but also capable of generating accurate predictions, which is essential for applied contexts such as language assessment and curriculum design.

From a measurement perspective, the strong outer loadings and satisfactory reliability indices indicate that the indicators adequately capture the latent constructs. This supports the adequacy of the expert-driven operationalization process, as the selected indicators reflect theoretically grounded and empirically valid dimensions of language skills. The absence of multicollinearity and the establishment of discriminant validity further reinforce the structural independence of each skill while maintaining their conceptual interdependence.

The hierarchical configuration of the model provides additional theoretical insight. By modeling communicative competence as a second-order construct, the analysis captures both the uniqueness of individual skills and their combined effect. This approach aligns with higher-order factor models in psychometrics, which allow for the representation of complex constructs without sacrificing dimensional specificity [14]. The results suggest that language proficiency should be conceptualized as an emergent property of interacting competencies rather than a unidimensional trait.

These findings have implications for language assessment and pedagogy. Assessment frameworks should incorporate balanced measures of all four skills to ensure comprehensive evaluation, while instructional strategies should promote integrated skill development. The differential weights observed in the model indicate that greater emphasis on productive skills, particularly writing and speaking, may enhance overall communicative outcomes without neglecting the foundational role of receptive skills.

Despite the robustness of the model, certain limitations should be acknowledged. The cross-sectional design restricts causal inference, and the use of self-reported measures may introduce response bias. Future research could employ longitudinal designs and objective performance-based assessments to validate and extend the current findings. Additionally, exploring moderating variables such as proficiency level, instructional context, or technological mediation could provide a more nuanced understanding of the relationships among language skills. In summary, the results provide strong empirical support for a multidimensional and hierarchical conceptualization of communicative competence. The SMART PLS-SEM model demonstrates that speaking, listening, reading, and writing are distinct yet interdependent constructs that collectively define language proficiency, offering a rigorous framework for both theoretical advancement and practical application.

## CONCLUSION

This study confirms that communicative competence can be robustly modeled as a higher-order construct explained by the integrated contribution of speaking, listening, reading, and writing within a SMART PLS-SEM framework. The empirical results demonstrate that each skill operates as a distinct yet complementary dimension, collectively accounting for a substantial proportion of variance in overall language proficiency. The statistical significance of all structural paths and the strength of the measurement model provide solid evidence for the multidimensional nature of language competence.

The findings highlight the central role of productive skills, particularly writing and speaking, as key drivers of communicative competence, while also reaffirming the foundational contribution of receptive skills such as listening and reading. This configuration supports a balanced and integrative perspective in which language proficiency emerges from the interaction of multiple competencies rather than from isolated abilities.

From a methodological standpoint, the study validates the use of PLS-SEM as an effective approach for modeling complex latent structures in language assessment. The satisfactory psychometric properties, including reliability, convergent validity, discriminant validity, and predictive relevance, indicate that the proposed model meets rigorous standards for both measurement and structural evaluation.


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The implications of these results extend to language assessment and pedagogy. Comprehensive evaluation frameworks should incorporate all four skills to ensure valid and reliable measurement of proficiency, while instructional strategies should emphasize the integration of productive and receptive competencies. The hierarchical modeling approach also provides a scalable structure for future research, allowing the inclusion of additional variables such as cognitive, motivational, or contextual factors.

In conclusion, the study offers a theoretically grounded and empirically validated model of communicative competence that advances the understanding of language proficiency as a multidimensional construct. The SMART PLS-SEM approach provides a robust analytical tool for both researchers and practitioners, supporting evidence-based decision-making in language education and assessment contexts.

**REFERENCES**

1. E. Galaczi, “Benefits of testing the four skills (reading, listening, writing and speaking),” Cambridge English, 2018.
2. “Techniques for evaluating listening, speaking, reading, and writing skills,” DELED Institute, 2024.
3. “Assessing writing, reading, listening, speaking, and integrated language skills,” 2025.
4. A. A. Mohamud et al., “Exploring the factors influencing listening skills proficiency,” Language Testing in Asia, vol. 15, 2025.
5. “Toward measuring language teachers’ assessment knowledge,” Language Testing in Asia, 2018.
6. J. F. Hair, G. T. M. Hult, C. M. Ringle, and M. Sarstedt, A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), 2nd ed. Thousand Oaks, CA, USA: Sage, 2017.
7. G. Aiken, “Three coefficients for analyzing the reliability and validity of ratings,” Educational and Psychological Measurement, vol. 45, no. 1, pp. 131–142, 1985.
8. C. M. Ringle, S. Wende, and J.-M. Becker, “SmartPLS 3,” Boenningstedt: SmartPLS GmbH, 2015.
9. L. Bachman and A. Palmer, Language Assessment in Practice. Oxford, UK: Oxford University Press, 2010.
10. R. M. Manchón, Writing in Foreign Language Contexts: Learning, Teaching, and Research. Bristol, UK: Multilingual Matters, 2011.
11. P. Skehan, Second Language Task-Based Performance. Amsterdam, Netherlands: John Benjamins, 2009.
12. J. Field, Listening in the Language Classroom. Cambridge, UK: Cambridge University Press, 2008.
13. T. Teo, “Using structural equation modeling in educational research,” Educational Research Review, vol. 3, no. 1, pp. 89–103, 2013.
14. K. A. Bollen, Structural Equations with Latent Variables. New York, NY, USA: Wiley, 1989.


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**Annex A**. Variable Operationalization Matrix

| Construct | Code | Indicator (Acronym) | Definition | Measurement Scale |
|---|---|---|---|---|
| Speaking | SPK | SPK1 | Fluency in oral production | Likert (1–5) |
| | | SPK2 | Pronunciation accuracy | Likert (1–5) |
| | | SPK3 | Grammatical accuracy in speech | Likert (1–5) |
| | | SPK4 | Lexical range in speaking | Likert (1–5) |
| Listening | LST | LST1 | Understanding of spoken input | Likert (1–5) |
| | | LST2 | Ability to infer meaning | Likert (1–5) |
| | | LST3 | Response to auditory stimuli | Likert (1–5) |
| | | LST4 | Phonological discrimination | Likert (1–5) |
| Reading | RDG | RDG1 | Literal comprehension | Likert (1–5) |
| | | RDG2 | Inferential comprehension | Likert (1–5) |
| | | RDG3 | Critical analysis of texts | Likert (1–5) |
| | | RDG4 | Reading speed and efficiency | Likert (1–5) |
| Writing | WRT | WRT1 | Coherence in written text | Likert (1–5) |
| | | WRT2 | Cohesion of ideas | Likert (1–5) |
| | | WRT3 | Grammatical accuracy in writing | Likert (1–5) |
| | | WRT4 | Lexical diversity | Likert (1–5) |

**Annex B**. Expert Judgment Evaluation Matrix

| Item Code | Relevance (1–5) | Clarity (1–5) | Representativeness (1–5) | Aiken's V | Decision |
|---|---|---|---|---|---|
| SPK1 | 5 | 5 | 5 | 0.92 | Retained |
| SPK2 | 5 | 4 | 5 | 0.89 | Retained |
| SPK3 | 4 | 5 | 5 | 0.88 | Retained |
| SPK4 | 5 | 4 | 4 | 0.86 | Retained |
| LST1 | 5 | 5 | 5 | 0.93 | Retained |
| LST2 | 4 | 5 | 5 | 0.90 | Retained |
| LST3 | 5 | 4 | 5 | 0.89 | Retained |
| LST4 | 5 | 5 | 4 | 0.88 | Retained |
| RDG1 | 5 | 5 | 5 | 0.94 | Retained |
| RDG2 | 5 | 4 | 5 | 0.91 | Retained |


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| | | | | | |
|---|---|---|---|---|---|
| RDG3 | 4 | 5 | 5 | 0.89 | Retained |
| RDG4 | 5 | 4 | 4 | 0.87 | Retained |
| WRT1 | 5 | 5 | 5 | 0.93 | Retained |
| WRT2 | 5 | 4 | 5 | 0.90 | Retained |
| WRT3 | 4 | 5 | 5 | 0.89 | Retained |
| WRT4 | 5 | 5 | 4 | 0.88 | Retained |

**Annex C**. Measurement Scales
Speaking (SPK)

- SPK1: I can speak fluently without frequent pauses.
- SPK2: My pronunciation is clear and understandable.
- SPK3: I use correct grammar when speaking.
- SPK4: I use a wide range of vocabulary in conversation.

Listening (LST)

- LST1: I understand spoken language in different contexts.
- LST2: I can infer meaning from what I hear.
- LST3: I respond appropriately to spoken messages.
- LST4: I distinguish sounds and accents accurately.

Reading (RDG)

- RDG1: I understand the main ideas in written texts.
- RDG2: I can infer implicit meanings in texts.
- RDG3: I critically evaluate written information.
- RDG4: I read efficiently and quickly.

Writing (WRT)

- WRT1: I write texts with clear organization.
- WRT2: My ideas are logically connected in writing.
- WRT3: I use correct grammar in written communication.
- WRT4: I use varied vocabulary in my writing.

Response Format:
All items are rated on a 5-point Likert scale:
1 = Strongly Disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly Agree


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