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TECHNOLOGICAL, PEDAGOGICAL, CONTENT KNOWLEDGE OF TEACHERS AND THE METALINGUISTIC ABILITY OF LEARNERS

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ABSTRACT

. This study determined the relationship between teachers' Technological, Pedagogical, and Content Knowledge (TPACK) and learners' metalinguistic ability in the San Fernando District. Employing a descriptive-correlational design, data were gathered from 30 teachers using a standardized self-reported TPACK survey and from 150 learners using a researcher-made metalinguistic ability test measuring phonological, morphological, orthographic, and syntactic awareness. Descriptive statistics (mean, standard deviation) were computed to profile teacher competencies and learner performance, while Spearman's rho was used to test correlations between variables. Results revealed that teachers demonstrated Advanced levels of TPACK across all domains, with Pedagogical Knowledge (M=4.36) as the strongest and Technological Knowledge (M=3.83) as the lowest. Learners exhibited High Proficiency in phonological awareness (M=8.66) and morphological awareness (M=7.52), but Moderate to Low Proficiency in orthographic (M=5.01) and syntactic awareness (M=2.01). Correlation analysis showed very weak to negligible relationships between all TPACK domains and metalinguistic ability components (ρ ranging from -0.405 to 0.213), indicating no significant association between teachers' self-reported competencies and learners' language awareness outcomes. The BRIDGE pedagogical framework was proposed to address this implementation gap through diagnostic assessment, explicit teaching, strategic intervention, classroom observation, and monitoring and evaluation.

Keywords: *TPACK, metalinguistic ability, phonological awareness, syntactic awareness, pedagogical framework,*

INTRODUCTION

The Technological, Pedagogical, and Content Knowledge (TPACK) of teachers and the metalinguistic ability of learners are two foundational pillars that collectively shape instructional quality and literacy development in the elementary classroom.

The Teacher as the pivotal agent of instructional delivery and the learner as the ultimate receiver of its effects, this study investigates the critical intersection between teachers' professional competency and students' foundational literacy skills in the context of 21st-century education. The central focus is the relationship between teachers' Technological, Pedagogical, and Content Knowledge (TPACK) and their pupils' metalinguistic abilities. In an era where effective teaching requires the dynamic integration of technology with sound pedagogy and deep content mastery, this study examines whether and how this integration supports the development of learners' capacity to consciously analyze and manipulate language structures, a skill set proven essential for advanced literacy and academic success. The research is conducted in schools in San Fernando District, specifically involving selected teachers and pupils as the respondents. It addresses a significant gap by moving beyond theoretical TPACK and perceived self-efficacy to explore its practical enactment and correlation with specific, measurable learner outcomes in metalinguistics.

The 21st-century education landscape is undeniably shaped by rapid technological integration and evolving pedagogical demands. However, for the Philippine education system, this global context is overshadowed by a more immediate and severe foundational crisis. Recent national assessments and international benchmarks have painted a stark picture of this reality.

In the 2022 Programme for International Student Assessment (PISA), the Philippines ranked among the lowest of 81 participating countries in reading comprehension, with over 75% of 15-year-old students failing to reach the minimum proficiency level (OECD, 2023). Echoing this, the Second Congressional Commission on Education (EDCOM 2) has flagged a "proficiency collapse" in early grades, noting that a staggering 91% of 10-year-old children in the country are in "learning poverty," unable to read and understand a simple age-appropriate text (World Bank, 2022, as cited in EDCOM II, 2023), meanwhile looking at the Beginning of School Year 2025-2026 assessment using the Philippine Informal Reading Inventory, as the standard reading assessment in Deped, the number of learners assessed were 2, 214. There were 264 or 12% were independent Reader in English and 400 or 18% Independent Reader in Filipino. With such a vast majority of learners struggling to meet minimum reading standards, the development of metalinguistic ability, the meta-cognitive skill essential for reading comprehension and academic success, has ceased to be a mere educational goal and has become an urgent national priority. This challenge directly implicates the Department of Education's mandate for 21st-century learning, which places teachers at the forefront of this battle, requiring them to master the complex interplay of technology, pedagogy, and content knowledge (TPACK) to reverse these alarming trends.

This national crisis takes on its most tangible form in the local classrooms of the San Fernando District, where teachers are not just implementers of policy but frontline agents of reform, tasked with bridging the gap between national directives and the stark realities of their learners' diverse needs. Ultimately, pupils depend on their teachers' ability to diagnose and address critical gaps in metalinguistic awareness, making the classroom the decisive arena where professional competency directly shapes foundational literacy and, consequently, the nation's educational future. Teachers, as the leading figures in the teaching and learning process, are not only expected to have mastery of the subject matter but also to employ varied, innovative strategies that make learning meaningful and relevant to the diverse needs of learners. They are no longer confined to delivering the content using the traditional lecture method. The traditional role of teachers as the transmitter of knowledge has changed into that of facilitators of learning, requiring a more dynamic and interactive interplay between the expertise on the subject matter taught, the pedagogical approaches and strategies, and the use of technological tools. Understanding the Technological, Pedagogical, and Content Knowledge (TPACK) of teachers is relevant in the teaching-learning process. It highlights the effectiveness of teaching, which not only depends on the subject matter knowledge (content knowledge) or the teaching strategies (pedagogical Knowledge), but also on the integration of technology (technological knowledge), which creates a relevant and engaging learning and learner-centered environment. Understanding TPACK empowers teachers to effectively blend technology with pedagogy and content, ensuring quality education, preparing learners for future challenges, and supporting lifelong learning. According to Mishra and Koehler's (2006) framework on Technological, Pedagogical, and Content Knowledge (TPACK) provides a holistic lens for examining how teachers combine these three domains in their professional practice. The study emerged as a vital model for understanding how teachers can effectively and efficiently integrate technology into the content and pedagogy in their daily teaching practice, and allows teachers to design instructions that are adaptive, innovative, and responsive to the contemporary learning contexts.

Tantamount to these advances and developments is the recognition of the learners' metalinguistic ability as one of the key factors in attaining deeper learning outcomes. It equips teachers to create learning experiences by designing instructions where technology supports language reflection, pedagogy encourages critical analysis of linguistic structures, and content knowledge ensures accuracy and depth. Through this integration, learners develop the capacity to analyze, manipulate, and reflect on language, which strengthens both their communicative competence and higher-order thinking skills. Metalinguistic ability refers to the learner's capacity to consciously reflect on and analyze language as an object of thought, rather than using it solely as a means of communication. It encompasses awareness of phonological structures, syntactic patterns, semantic distinctions, and the arbitrary relationship between linguistic symbols and meaning (Jacobson and McDavid, 2025). The metalinguistic abilities, such as phonological awareness, orthographic, morphological awareness, and syntactic awareness, have a significant positive impact on an individual's ability to perform in learning a new language. In the context of Hofer et al. (2025), on multilingual partial immersion education at the primary school level, explored how children's metalinguistic

awareness, their ability to reflect on and analyze language, supports their acquisition of an additional language. The study emphasizes the importance of developing learners' metalinguistic ability or skills early in their education, as it directly contributes to better outcomes in multilingual learning environments. This delivers a valuable implication for Technological Knowledge (TK) that when teachers integrate technology-driven tools such as automated writing feedback, translation software, or interactive grammar applications, they can create conditions that encourage learners to notice, reflect, and analyze language, thereby fostering metalinguistic growth. In the study of Saricoban et. Al (2019) evaluated the technological pedagogical content knowledge (TPACK) of pre-service English as a Foreign Language (EFL) teachers. The authors investigated how teacher candidates integrate technology, pedagogy, and content knowledge in preparing to teach English. The findings suggest that while participants demonstrated competence in content and pedagogical knowledge, their technological integration skills required further development. This article is relevant for teacher education programs as it highlights the need for systematic training in technology-enhanced language instruction. This study implies a significant and useful role in research focusing on teacher preparation, TPACK, and the improvement of language teacher education curricula. The increasing demand for 21st-century education emphasized the vital role of teachers' competencies in integrating technology, pedagogy, and content knowledge (TPACK) to enhance pupils' learning outcomes. Teachers are expected not only to master subject content and effective pedagogy but also to manifest skills in utilizing the technology to facilitate interactive and meaningful instruction. However, despite the increasing emphasis on technological integration, many teachers still struggle to balance these domains, especially in resource-limited contexts. At the same time, learners are expected to develop higher-order skills, such as metalinguistic ability, which enables them to think about, analyze, and manipulate language structures. The question of how teachers' TPACK influences learners' metalinguistic growth remains underexplored, especially in the context of Philippine settings in basic education

While the TPACK framework provides a robust theoretical standard for 21st-century teaching, its translation into practice within the San Fernando District reveals a complex gap shaped by multiple intersecting factors. The journey from professional standards to actual classroom practice is influenced by teacher preparation, the realities of the learning environment, the nature of professional development delivery, and the intricate demands of foundational literacy instruction.

Yet despite the recognized importance of both teachers' TPACK and learners' metalinguistic ability for literacy development, no study in the Philippine basic education context and specifically within the San Fernando District has directly examined the relationship between these two. Existing TPACK research has largely focused on teachers' self-reported assessment or how well training worked, teachers' self-efficacy, attitudes toward technology, or the effectiveness of training programs and stopping at the level of teacher output without connecting them to actual learner outcomes. Meanwhile, studies on metalinguistic ability have overlooked how a teacher's combined skills in technology, teaching methods, and subject matter affect learners and influences that development. As a result, there is a critical missing piece; we simply do not know whether, and to what extent, teachers' TPACK competencies relate to learners' ability to

consciously think about and manipulate language. This missing link leaves professional development and instructional support without a solid foundation in evidence about what truly helps build foundational literacy.

Moreover, this study recognizes several limitations that may influence its outcomes. The research is limited to a specific number of teachers and learners within a defined community, which may not adequately represent the larger population of educators and students. The assessment of teachers' technological, pedagogical, and content knowledge (TPACK) relies mainly on self-reported instruments, which may be prone to exaggeration or understatement. Likewise, the measurement of learners' metalinguistic ability is dependent on available assessment tools that may not fully capture the multifaceted nature of language awareness. Time constraints confine the investigation to a single academic period, limiting the opportunity to observe long-term effects of teachers' TPACK on learners' linguistic growth. Moreover, external factors such as learners' prior knowledge, home support, motivation, and unequal access to technology may influence results but remain beyond the researcher's control. Finally, the presence of limited technological resources in certain schools may hinder the full integration of TPACK, thereby affecting its potential impact on learners' metalinguistic development.

This study aimed to address the identified gap by investigating the connection between teachers' competencies in integrating technology, pedagogy, and content knowledge and learners' metalinguistic development. The goal is not just to evaluate teacher performance, but likewise to generate insights that can inform more targeted, context-sensitive, and linguistically-informed professional development for the San Fernando District. By understanding where the gaps lie within the broader educational system, stakeholders can work collaboratively to propose a pedagogical framework that bridges the implementation gap and genuinely supports teachers in their vital role as facilitators of foundational literacy. The finding may provide evidence for the improvement of training for teachers, curriculum design, and coming up with learner-centered instruction in the digital age.

Addressing this research gap holds significant implications for various stakeholders.

***Department of Education (DepEd) Officials and Policymakers*.** The findings will provide evidence-based data to guide policy formulation and the allocation of resources. Understanding the connection between TPACK and learner outcomes can help DepEd design more effective professional development programs that are not merely focused on technology operation, but on the strategic integration of technology to address specific linguistic bottlenecks in literacy.

School Administrators and Instructional Leaders. For principals and curriculum supervisors, the results will offer a clearer picture of the professional support teachers need. The study can inform the development of school-based interventions, learning communities, and instructional coaching models that target the intersection of technology, pedagogy, and foundational literacy instruction.

Teachers. This study will help teachers recognize the tangible impact of their TPACK competencies on their students' metalinguistic growth. It will provide a rationale for reflecting on their own practice and seeking professional development that bridges the gap between technology integration and language instruction.

Future Researchers. This study will serve as a foundational work for future research exploring the TPACK-metalinguistic ability nexus. It will provide a methodological framework and empirical baseline that can be extended, replicated, or refined in other contexts, contributing to a more robust body of knowledge on teacher competency and literacy development.

Research Objectives

The study sought to determine the relationship between teachers' Technological, Pedagogical, and Content Knowledge (TPACK) and learners' metalinguistic ability.

Specifically, the study aimed to achieve the following objectives:

1. Describe the level of TPACK of teachers and the metalinguistic ability of pupils.
2. Correlate the TPACK of the teachers and the metalinguistic ability of learners
3. Propose a pedagogical framework that bridges the implementation gap between teachers' TPACK and pupils' metalinguistic ability.

METHODOLOGY

Research Design

The study employed a descriptive-correlational design. The descriptive method was used to determine the technological, pedagogical, and content knowledge (TPACK) of teachers, as well as the metalinguistic ability of the learners. This approach is appropriate as it allows the researcher to systematically document and characterize existing conditions without manipulation or intervention. In the context of this study, the descriptive component provides a comprehensive profile of teachers' self-assessed TPACK competencies and learners demonstrated metalinguistic awareness within the natural classroom setting of San Fernando District. The correlational method was used to test the link between teacher competency (TPACK) and learner outcomes (metalinguistic ability). A correlational survey design allows for the systematic collection of data from a representative sample of teachers and learners using validated instruments, then applies Spearman's rho as the inferential statistics to determine whether and to what extent variations in teachers' technological, pedagogical, and content knowledge predict differences in learners' phonological, morphological, orthographic, and syntactic awareness. This component is justified by the study's aim to explore the association between these two variables without implying causation.

This quantitative approach with a correlational survey design to objectively measure teachers' TPACK and learners' metalinguistic ability and to statistically test the relationship between them. This approach is ideally suited to address the current literacy situation of the Philippines, tagged as "proficiency collapse". It allows the study to generate empirical, generalizable evidence on whether the interrelationship between teacher competency and pupil linguistic awareness can serve as a cognitive scaffold to reverse the crisis.

Methods and Procedure

Data was gathered using two instruments: a standardized Self-reported TPACK survey questionnaire for teachers and a researcher-made metalinguistic ability test for learners. The self-reported TPACK survey measures teachers' knowledge across technological, pedagogical, and content domains, while the metalinguistic test assesses learners' awareness of phonological, morphological, orthographic, and syntactic aspects. Based on the findings from these instruments, a pedagogical framework was proposed to bridge the implementation gap between teachers' TPACK and pupils' metalinguistic ability, integrating targeted technological-pedagogical strategies that explicitly develop learners' awareness of language form across phonological, morphological, orthographic, and syntactic levels.

Research Instrument

The data were gathered utilizing the two primary instruments: an adapted self-Report TPACK questionnaire and a researcher-made metalinguistic ability test. Both instruments underwent rigorous validation and readability testing to ensure their appropriateness and alignment with the research objectives. The TPACK of teachers was measured using an adapted version of the Technological Pedagogical Content Knowledge (TPACK) survey originally developed and validated by Schmidt and colleagues (2009) at Iowa State University. The original instrument was designed to assess preservice teachers' self-reported knowledge across the seven domains of the TPACK framework: Technology Knowledge (TK), Content Knowledge (CK), Pedagogy Knowledge (PK), Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical Content Knowledge (TPCK). Schmidt et al. (2009) established the validity and reliability of the instrument through a pilot study involving 124 preservice teachers, employing Cronbach's alpha statistics for each knowledge domain and factor analysis to confirm the instrument's internal structure.

On the other hand, the metalinguistic ability of learners was assessed using a researcher-made instrument developed by the author during her Master's degree coursework, designed to measure the four key components of metalinguistic ability: phonological awareness, morphological awareness, orthographic awareness, and syntactic awareness. Before actual use, the instrument underwent content and face validation, wherein Master Teachers from the district reviewed the questionnaires and administered the test to selected pupils who were not part of the actual sample. Items on

phonological awareness may be too easy for the intermediate pupils because it is a skill learned in the primary grades; however, the items on orthographic and syntactic awareness may be too difficult for the learner respondents, especially for those considered slow learners or categorized as frustration learners, which could affect the result. On the other hand, the controlled classroom setting in which the test was administered, where teacher-advisers conducted the oral test individually under structured conditions, may have influenced natural pupil performance. The formal, one-on-one environment can heighten test anxiety, causing learners to perform below their typical ability compared to more relaxed, familiar classroom interactions. Rater variability across different teacher-advisers, despite standardized instructions, may introduce inconsistencies in pacing, prompting, or scoring. These limitations are recognized and should be considered when interpreting the findings of this study.

The Data collection followed a systematic procedure: first, the researcher secured permission from the Dean of the Graduate School to allow the researcher to conduct the study at the selected schools in San Fernando District. Upon approval, the researcher secured a permit to conduct the study from the Public Schools District Supervisor and the Head of Schools and sought informed consent from the participants. The TPACK survey was administered to teacher-respondents, while learners took the metalinguistic test in a controlled classroom setting. The researcher ensured uniform test administration to maintain data reliability. The researcher personally distributed the questionnaire to the teacher-advisers to conduct the individual oral test to the pupils and retrieve them individually right after the respondents were through answering. Then the researcher tallied, tabulated raw data, encoded, verified, and analyzed the data gathered. The data was explained and interpreted using descriptive analysis concerning their level of significance and correlational analysis to establish a significant relationship between the teachers' self-reported TPACK and the metalinguistic ability of learners.

Respondents Profile

The unit of study for this research consists of two main groups of respondents: the teachers and the learners. The selection of respondents for this study was guided by a set of specific criteria to ensure the validity of the data and the logical pairing between the independent and dependent variables. The teacher-respondents were selected based on the following inclusion criteria: they must be currently employed as permanent teachers handling either English or Filipino subjects in the selected elementary schools within the San Fernando District; they must be actively teaching in Grades 4, 5, or 6 to ensure they are instructing learners at a developmental stage where metalinguistic skills are more formally assessed; and they must have a direct and consistent class schedule with the learner-respondents, serving either as a subject teacher or teacher-adviser. Additionally, only those who voluntarily signed the informed consent form and completed the TPACK survey were included in the final sample. Teachers who were on extended leave during the data collection period, those handling only non-language subjects, or those who submitted incomplete survey responses were excluded from the study. The 30 teacher-respondents were the focus for assessing Technological, Pedagogical, and Content Knowledge (TPACK) through a standardized questionnaire.

On the other hand, the learner-respondents represented the unit of study for measuring metalinguistic ability, which was examined through a researcher-made test covering phonological, morphological, orthographic, and syntactic aspects. They were the pupils officially enrolled in Grades 4, 5, or 6 for the current academic year and who belong to a section or class directly handled by one of the 30 teacher-respondents for English or Filipino subjects. This specific condition was essential to establish the direct link between the teachers' TPACK and the learners' metalinguistic ability. From each teacher's class, five learners were selected to participate, ensuring a balanced total sample size of 150 students. Furthermore, only learners with signed parental consent forms and who personally provided their assent were allowed to take the researcher-made metalinguistic ability test. Learners were excluded if they were not directly taught by the teacher-respondents, if they had incomplete or missing consent forms, or if they were absent on the day of test administration without an opportunity for a make-up schedule. These carefully defined criteria ensured that the respondents accurately represented the target population and that the data gathered would meaningfully address the research objectives.

The inclusion of both teachers and learners is important because the study aims to determine whether the level of teachers' TPACK has a significant relationship with the metalinguistic ability of the learners they directly teach. This pairing ensures a logical and contextual linkage between the independent and dependent variables of the study.

Data Analysis Technique

This study employed the Descriptive–Correlational Statistical design to analyze the data gathered using Spearman's rho coefficient to see the relationship between teachers' TPACK and pupils' metalinguistic ability. Descriptive statistics, such as the mean, and frequency distribution, were used to present and summarize the level of teachers' Technological, Pedagogical, and Content Knowledge (TPACK) as well as the level of learners' metalinguistic ability in terms of phonological, morphological, orthographical, and syntactic aspects. These measures provide a comprehensive description of the respondents' performance and the variability of scores across the groups.

Descriptive statistics, including mean and standard deviation, were used to summarize the level of teachers' Technological, Pedagogical, and Content Knowledge (TPACK) across the three domains (TK, PK, CK) as conceptualized by Mishra and Koehler (2006). These measures provide a profile of teacher competencies, indicating which knowledge areas are strongest and which may require further development. Likewise, descriptive statistics were computed for learners' metalinguistic ability across the four domains derived from Gombert's (1992) framework: phonological, morphological, orthographic, and syntactic awareness. Frequency distributions were also generated to present the categorization of respondents based on their scores, allowing for a clear visualization of how teachers and learners are distributed across proficiency levels.

The correlational component of the design was applied to determine the significant relationship between teachers' TPACK and the metalinguistic ability of learners. For this

purpose, Spearman's rank-order correlation coefficient (Spearman's rho) was computed. This non-parametric test was selected because the data were measured on ordinal scales and were not assumed to be normally distributed. The use of Spearman's rho is appropriate for examining whether the theoretical relationship posited by the TPACK and metalinguistic frameworks, that teacher competencies in integrating technology, pedagogy, and content may influence learners' development of conscious language awareness, holds true in the context of the San Fernando District.

The choice of a descriptive–correlational method is appropriate for this study because it does not only describe the existing conditions of the two variables but also examines their relationship without manipulating any of them, which aligns with the purpose of the research, which seeks to explore whether the teachers' level of TPACK has a significant relationship with the learners' metalinguistic ability. The data gathered in this study were treated with both descriptive and inferential statistical methods appropriate to the research objectives. To describe the levels of teachers' Technological, Pedagogical, and Content Knowledge (TPACK) and the metalinguistic ability of learners, descriptive statistics such as mean and standard deviation was computed. These provide a clear picture of the general performance and variability of the two groups of respondents.

Scope and Delimitation

This study focused on determining the relationship between the Technological, Pedagogical, and Content Knowledge (TPACK) of 30 teachers and the metalinguistic ability of 150 learners across six participating schools in San Fernando District, with five teachers selected from each school and five pupil-respondents per teacher. Specifically, the study was conducted during the Academic Year 2025-2026.

The teacher-respondents were assessed on their level of TPACK using standardized self-report survey instruments adapted from established TPACK frameworks, measuring their technological knowledge (TK), pedagogical knowledge (PK), content knowledge (CK), and the integration of these domains. The learner-respondents' metalinguistic ability was measured through a researcher-constructed language performance assessment designed to assess four key dimensions: phonological awareness, morphological awareness, orthographic awareness, and syntactic awareness. The study aimed to describe the levels of both variables and determine the significance and direction of the correlation between teachers' TPACK and learners' metalinguistic ability.

This study was confined to six schools in San Fernando District, selected through purposive sampling to represent varying geographic locations and resource contexts within the municipality. From each school, five permanent teachers serving as class advisers for English or Filipino subjects participated, along with 25 learners under their advisory classes, yielding a total of 30 teachers and 150 learners. This 1:5 teacher–learner ratio was chosen to allow a balanced examination of the relationship between TPACK and metalinguistic ability within manageable school-level clusters. However, the

selection process particularly the fixed number of teachers and learners per school introduces a limitation. Any weak or non-significant results should be interpreted with caution, as they may be influenced by the specific composition of participants rather than the absence of a true relationship. Moreover, the assessment of teachers' TPACK relied solely on self-report surveys, which may not fully reflect their actual classroom practices because no direct observations were conducted. Similarly, the measurement of learners' metalinguistic ability was limited to a specific language assessment administered in a controlled classroom setting, which may not capture the full range of their language awareness in naturalistic learning contexts. Collectively, these sampling and measurement constraints delimit the generalizability of the findings and underscore the need for cautious interpretation.

San Fernando District was selected because it reflects the resource-constrained settings common in public schools. The six participating schools are located away from the town proper, and technological resources are limited to teachers' personal laptops and a television in each classroom. This context provides an authentic lens for examining TPACK not in an ideal, well-resourced environment, but in the actual conditions where many teachers work. Understanding how teachers integrate technology, pedagogy, and content with such limited tools is essential for generating relevant, practical insights that can inform professional development and support strategies for schools facing similar constraints across the country.

RESULTS

1. Level of Teachers' TPACK

The teachers in the San Fernando District demonstrated an overall Advanced level of TPACK across all three core domains, reflecting strong self-perceived competence in technological, pedagogical, and content knowledge.

Technological Knowledge (TK) yielded a composite mean of 3.83 (SD = 0.66), interpreted as Advanced. Teachers exhibited proactive engagement with emerging technologies and confidence in functional technical skills, though exploratory and breadth-oriented technology use was comparatively less pronounced.

Pedagogical Knowledge (PK) emerged as the strongest domain, with a composite mean of 4.36 (SD = 0.47), interpreted as Advanced. Teachers displayed very high confidence in assessment, adaptive instruction, and classroom management, with consistently low standard deviations indicating uniform pedagogical competence across the respondent group.

Content Knowledge (CK) obtained a composite mean of 4.06 (SD = 0.65), interpreted as Advanced, reflecting strong subject-matter confidence, particularly in literacy. Teachers demonstrated consistent content expertise across indicators, providing a solid foundation for instructional design.

Overall TPACK, teachers possess strong, well-developed competencies across the TPACK domains, with pedagogical knowledge being the most pronounced strength and technological knowledge showing functional competence with limited exploratory engagement. This profile positions teachers favorably for integrating technology into instruction, though the translation of this knowledge into classroom practice that directly supports learners' metalinguistic development remains a critical consideration.

Level of Learners' Metalinguistic Ability

The learners in the San Fernando District demonstrated a varied profile of metalinguistic ability across the four domains assessed, with foundational skills showing relative strength while higher-order skills revealed significant gaps.

Phonological Awareness emerged as the strongest domain, with a composite mean of 8.66 (SD = 1.10), interpreted as High Proficiency. Learners performed well in initial sound, middle sound, segmenting, and syllable tasks, indicating solid foundational skills for decoding and early literacy. However, rhyming (M = 5.73, SD = 3.35) showed notably lower performance with high variability, suggesting uneven development in holistic sound pattern recognition.

Morphological Awareness reflected moderate proficiency, with an overall mean of 7.52 (SD = 1.98). Learners performed better on suffix knowledge (M = 8.28) than on prefix knowledge (M = 6.77), indicating emerging but not yet robust understanding of word structure. The large standard deviations point to substantial individual differences in morphological analysis skills.

Orthographic Awareness was comparatively weaker, with a mean of 5.01 (SD = 4.29) on pseudo words, interpreted as Moderate Proficiency. The low mean and high variability indicate difficulty in applying spelling patterns and grapheme-phoneme correspondences to unfamiliar words, revealing a critical gap between sound-based skills and orthographic mapping.

Syntactic Awareness was the most challenging domain, with a composite mean of 2.01 (SD = 0.41), interpreted as Moderate Proficiency. Learners struggled most with sentence combining (M = 0.73) and sentence correction (M = 1.27), indicating limited ability to actively manipulate sentence structures and evaluate grammatical relationships.

Overall Metalinguistic Ability, learners demonstrate a developmental imbalance: strengths lie in foundational phonological skills essential for decoding, while higher-order skills involving word structure (morphology), spelling patterns (orthography), and sentence-level grammar (syntax) remain underdeveloped. This pattern suggests that while learners have acquired basic sound-based literacy skills, they require more explicit and targeted instruction to develop the reflective, manipulative control of language necessary for advanced reading, writing, and comprehension.

Research Objective No. 2

Correlate the TPACK of the teachers and the metalinguistic ability of learners

Absence of Direct Correlation with Learner Outcomes: No statistically significant correlations were found between any TPACK domain (or overall TPACK) and learners' metalinguistic ability components are generally very weak to weak. Most correlation coefficients are close to zero, indicating minimal association between the variables. Although slight positive relationships were observed in syntactic awareness, the overall results suggest that teachers' TPACK indicators do not strongly predict learners' metalinguistic ability in this study

Research Objective No. 3

Propose a pedagogical framework that bridges the implementation gap between teachers' TPACK and pupils' metalinguistic ability

DISCUSSION

Technological knowledge

The findings demonstrate that teachers possess strong pedagogical foundations and well-integrated technological competencies, with pedagogy emerging as the most robust domain and technology-related knowledge showing consistently positive, though slightly more varied, perceptions. The overall high TPACK scores imply readiness for effective technology integration in teaching, while the relatively lower TK indicators point to potential areas for professional development focused on expanding technological exploration and diversification. The findings implied that teachers possess a satisfactory level of Technological Knowledge (TK), as reflected by the overall Agree rating. This suggests that teachers are generally capable of using technology to support their professional tasks and classroom responsibilities. Their strong performance in keeping up with important new technologies implies an awareness of current digital trends and a willingness to adapt to technological changes, which is essential in contemporary teaching contexts. The relatively high means for the ability to solve technical problems independently and to learn technology easily further suggest that teachers demonstrate functional autonomy in managing technological tools. This level of competence reduces reliance on technical support and enables teachers to integrate technology more confidently into instructional practices. However, the comparatively lower ratings for exploratory behaviors such as frequently experimenting with technology and having knowledge of a wide range of technological tools indicate that teachers' technological engagement may be more practical than innovative. While they are proficient in using familiar technologies, they may be less inclined to explore new or diverse digital tools beyond those required for immediate instructional needs. They just rely on what they are familiar with and used to. Overall, these results suggest that although teachers have established foundational technological skills, there remains an opportunity to strengthen

their exploratory and creative use of technology. Encouraging hands-on experimentation and exposure to a broader range of educational technologies may further enhance their Technological Knowledge and support more innovative technology integration in the classroom. In this sense, they did not limit their technological knowledge, which may lead them to a much wider perspective and adapt better instructional styles.

Pedagogical Knowledge

The Pedagogical Knowledge (PK) of teachers serves as the essential operational backbone of effective teaching, transforming theoretical understanding into tangible student learning. The very high confidence in assessing performance and adapting instruction indicates a teaching corps that is diagnostically skilled and reflexively flexible, capable of reading classroom dynamics and shifting strategies in real time to meet learners' needs. This level of pedagogical fluency is critical because it means instructional decisions are data-informed and purposeful, ensuring that time in the classroom is used efficiently and that interventions are timely and appropriate. The strong competence in classroom organization further establishes a predictable and managed environment where such differentiated instruction can actually take place, as orderly routines create the necessary space for academic engagement and complex pedagogical moves. The homogeneity of these high responses across the group is equally significant, as it points to a systemic or cultural success in teacher training and professional development within this context. It suggests that foundational pedagogical principles such as the importance of formative assessment and responsive teaching have been effectively institutionalized and are consistently applied. This collective strength provides a substantial advantage for any school-wide initiative, as there exists a common language and skill set upon which to build. For instance, efforts to integrate new technologies or deepen content-specific teaching strategies can leverage this strong pedagogical base, ensuring that innovations are implemented through already-effective instructional frameworks rather than having to establish classroom management and basic pedagogical competence from scratch. That’s why it is still very important to conduct regular monitoring of teachers, particularly the classroom observations, not to judge the teacher on how they teach, but to give them technical assistance to improve teaching.

Under the pedagogical knowledge**,** “assessing student performance in a classroom” had the highest mean of 4.50, which falls under “expert”. It is a fundamental competency that transforms teaching from a one-way delivery of information into a responsive and dynamic dialogue for learning. It serves as the critical feedback mechanism that allows a teacher to move beyond assumptions and accurately diagnose what students truly understand, where misconceptions lie, and whether instructional goals are being met. This ongoing, formative assessment informs crucial decisions about pacing, differentiation, and the need for re-teaching, ensuring that instruction is tailored to the learners' actual needs rather than a predetermined script. Ultimately, this skill is what enables a teacher to close the gap between what was taught and what was learned, making the educational process intentional, evidence-based, and focused on genuine student growth rather than mere coverage of content.

Content knowledge

Based on the result presented in the Content Knowledge (CK), it can be inferred that the teachers possess a strong and confident foundation in their literacy-specific Content Knowledge. This is evidenced by the high overall mean score in the Content Knowledge domain, which reflects a self-assessed "Advanced" level of competence, with particular strength in literacy. The highest-rated indicators show teachers not only feel they have sufficient knowledge about literacy but also actively employ various strategies to deepen that understanding. This solid core of subject-matter expertise and pedagogical confidence suggests the faculty is well-positioned for meaningful technology integration. With a secure grasp of their core content and teaching methods, they are more likely to adopt technology as a purposeful tool to enhance student learning in literacy rather than using it in a superficial or disconnected way. Consequently, this strong foundation in Content Knowledge acts as a significant enabling asset, indicating that professional development efforts might be most effectively focused on bridging this existing expertise with technological tools and integrative pedagogical strategies, rather than on building basic content knowledge itself. The high agreement ratings (M ~4.1) on knowledge and strategy use in literacy indicate strength in core pedagogy, which implies that the teachers are not just familiar with the subject matter, but are also pedagogically confident. They believe they can teach literacy effectively using various methods. This core confidence is a crucial prerequisite for innovation. Teachers with strong CK are less likely to use technology as a superficial add-on. Instead, they can leverage technology to enhance, transform, or deepen the literacy learning they are already confident in facilitating. For example, they might use digital storytelling platforms, online collaborative annotation tools, or adaptive reading apps with clear pedagogical intent. Since Content Knowledge is not a barrier, professional development efforts can be strategically focused on other crucial domains for tech integration, such as Technological Pedagogical Content Knowledge (TPACK) which will help teachers apply their strong literacy knowledge to select and use specific technologies effectively, Technological Knowledge (TK) by building skills with the specific hardware, software, and digital tools available to them. and develop **c**onfidence in other Subjects like Investigating if the high CK is specific to literacy or if it extends to other domains (e.g., math, science). The fact that the two highest-rated indicators are directly related, having knowledge and actively using strategies to deepen that knowledge, suggests a culture or mindset of continuous learning and application among the teachers. This proactive stance is favorable for adopting new practices like technology integration.

Overall TPACK

The overall TPACK domain yielded a high mean of 4.20 (SD = 0.484), interpreted as Advanced, indicating that teachers perceive themselves as highly capable of integrating content, pedagogy, and technology in instruction. This finding aligns with Chai et al. (2019), who affirmed that TPACK represents the intersection where meaningful technology integration occurs, and with Gorospe and Ocdenaria (2025), who reported similarly high TPACK levels among Filipino teachers, suggesting a growing confidence in integrative competencies possibly shaped by sustained professional development initiatives. However, this self-reported strength must be interpreted with caution, as

Schmid et al. (2020) demonstrated that teachers' self-assessed TPACK can be discrepant from their observed performance or students' actual experiences. The relatively low standard deviation (0.484) reflects a strong consensus among teachers in San Fernando District, which may be causally linked to systemic professional development investments such as DepEd's Digital Rise Program (DepEd, 2022) and a shared school culture that consistently reinforces technology integration practices. While the advanced TPACK score suggests teachers possess the foundational knowledge for transformative instruction, Scherer et al. (2021) emphasized that it is actual instructional practices and the specific design of learning tasks that directly influence student learning gains not merely self-reported competence. This distinction is particularly significant for the present study, as Arya et al. (2022) found that technology-supported tools promote metalinguistic awareness only when activities are carefully scaffolded to direct student attention to language forms and functions, implying that high TPACK confidence does not guarantee teachers are designing the precise, form-focused activities necessary for developing learners' metalinguistic ability.

It can be inferred that, based on their self-reported assessment of TPACK, the participating teacher respondents have successfully developed a functional level of TPACK, perceiving themselves as capable of designing and teaching lessons that meaningfully link technology with core pedagogical and content goals. The strong collective score shows that professional development or prior experience has been effective in fostering this integrative mindset. The result in literacy integration may reflect the challenge of identifying technologies that go beyond basic presentation or word processing to fundamentally enhance the processes of reading, writing, analysis, and communication in transformative ways.

Phonological Awareness

In the context of phonological awareness, learners demonstrated relatively strong performance in tasks involving sound manipulation at the phoneme and syllable level. High mean scores were observed for Initial Sound (M = 9.74, SD = 0.92), Middle Sound (M = 9.34, SD = 1.49), Segmenting (M = 9.21, SD = 1.70), and Syllables (M = 9.30, SD = 1.45), indicating that most learners can accurately identify, isolate, and segment sounds within words. The comparatively lower standard deviations for initial sound tasks suggest more consistent mastery among learners, whereas higher variability in segmenting and middle sound tasks points to differences in proficiency. In contrast, performance on Rhymes (M = 5.73, SD = 3.35) was notably lower and more dispersed, indicating that rhyme recognition and production may be more challenging and unevenly developed among learners. This pattern aligns with the developmental trajectory described by the National Institute of Child Health and Human Development (2023) and Law et al. (2023), who affirmed that discrete phonemic skills such as initial sound identification and segmentation are foundational and typically mastered earlier than more holistic abilities like rhyming. The high variability observed in rhyming performance further echoes Yeung et al. (2022), who documented that performance on rhyming tasks shows significant individual differences among young learners and often serves as a key predictor of reading difficulties. Moreover, while the composite phonemic awareness mean (M = 8.66,

SD = 1.10) suggests adequate foundational skills, Uchida and Hoshino (2024) caution that such overall scores can mask significant disparities in specific subskills, pointing to the need for targeted instructional interventions rather than assuming general phonemic mastery. These results suggest that, at the sound level, learners are better equipped for decoding and early literacy tasks, yet the pronounced difficulty with rhyming highlights a critical area requiring instructional attention.

The results which was expressed through mean scores and standard deviations for each indicator, offer a clear picture of learners' strengths and difficulties in specific language skills. Rather than providing a general measure of reading ability, this breakdown highlights particular linguistic processes such as phoneme identification, word structure analysis, spelling conventions, and sentence construction that are already well developed, as well as those that remain challenging for the learners. This level of analysis is essential, as it enables educators and researchers to identify specific areas that require focused instructional support and intervention to enhance learners' overall language comprehension and written expression. The Metalinguistic ability and reading performance are key determinants in assessing the learning competence of the learners. Metalinguistic ability corresponds to pupils' awareness on the spoken language and written symbols. It determines pupils' knowledge on identifying connections and distinctions among each symbols and understanding how symbols are combined until words are formed and interpreted. The metalinguistic abilities, such as phonological awareness, orthographic, morphological, and syntactic awareness, have a significant positive impact on an individual's ability to perform in learning a new language. The data reveal a clear and significant disparity within the learners' phonological awareness, a core sub-domain of metalinguistic abilities. While pupils demonstrate very high proficiency in discrete phonemic skills, the initial sound, and segmenting, they show only moderate proficiency with high variability in rhyming**.** This pattern indicates a specific, addressable weakness in their broader phonological foundation;

Morphological Awareness

The observed difference in performance between suffix knowledge (M = 8.28) and prefix knowledge (M = 6.77) may be attributed to the fact that instructional emphasis in early literacy often prioritizes suffixes, particularly inflections such as -ed, -ing, and -s, which appear more frequently in early reading materials and are explicitly taught in foundational literacy programs. And also the positional salience plays a role; suffixes occur at word endings, which learners may process more easily than prefixes due to the natural left-to-right decoding pattern in reading. Likewise, considering the frequency of exposure in both oral and written language may favor suffixes, as English learners encounter suffixed words more regularly than prefixed words in everyday texts and classroom discourse. The cognitive load involved in processing prefixes may be higher, as they often require learners to simultaneously attend to the root word and the meaning change introduced at the beginning, which can be more demanding for developing readers. The larger standard deviations in both prefix (SD = 2.48) and overall morphological awareness (SD = 1.98) further suggest that learners' exposure to and

mastery of morphological concepts vary considerably, pointing to the need for more systematic and explicit instruction in word structure, particularly for prefixes.

The pedagogical implication of this disparity is profound. It suggests that while instruction in morphological awareness is beneficial, a more detailed approach is necessary. Teachers might initially leverage students' relative strength with suffixes to build confidence and demonstrate how morphemes construct meaning and grammar. However, the moderate proficiency in prefixes indicates a clear area for targeted intervention. Explicit instruction should focus on the semantic and phonological variations associated with common prefixes (e.g., *un-, re-, dis-, in-*), perhaps through structured word families and etymology-based activities. It must be noted that morphological instruction must move beyond simple recognition to include manipulation and analysis of word parts in varied contexts, which is especially crucial for prefixes, where meaning can be more abstract and less predictable. The figures presented in the morphological awareness of the pupils are more than a simple ranking of skills; they reveal a window into the cognitive-linguistic processes of learners. The higher proficiency with suffixes likely reflects their grammatical salience and consistency, while the challenge posed by prefixes calls for deliberate instructional strategies.

Orthographic Awareness

The findings on orthographic awareness, particularly the low mean performance on pseudo words (M = 5.01, SD = 4.29) and the high variability among learners, can be interpreted through Vygotsky's (1978) Sociocultural Theory, specifically the concept of scaffolding within the Zone of Proximal Development (ZPD). According to Vygotsky, cognitive development occurs when learners engage in tasks they cannot yet master independently but can accomplish with guided support from a more knowledgeable other, in this case, the teacher. The difficulty learners demonstrated in applying spelling patterns and grapheme–phoneme correspondences to unfamiliar nonwords suggests that orthographic awareness remains a skill within their ZPD that has not yet been fully internalized. The wide variability in performance (SD = 4.29) further indicates that while some learners may have received adequate scaffolding to develop this skill, many others have not yet benefited from sufficient guided instruction or meaningful interaction that would enable them to move from assisted performance to independent mastery. From a sociocultural lens, orthographic awareness is not acquired in isolation but develops through socially mediated activities where teachers intentionally model, question, and provide feedback as learners engage with written language. The moderate proficiency observed suggests that the scaffolding provided may have been insufficient or inconsistent in helping learners consolidate the ability to visualize and apply orthographic patterns independently. Therefore, strengthening instructional scaffolding through explicit modeling of sound–letter patterns, guided practice with pseudo-words, and structured feedback within the ZPD could support learners in moving this foundational skill from a level of moderate proficiency to one of mastery, ultimately enhancing their reading development as emphasized in the theoretical framework.

The moderate orthographic knowledge suggests pupils are still building the crucial bridge in their brains between sounds and written patterns. Early reading relies heavily on "sounding out" words (phonology). However, to become fluent, readers must quickly recognize common letter strings and spelling patterns by sight (orthography). This result indicates that while pupils are moving beyond basic phonics, they have not yet automated the sight recognition of word patterns, which slows down their reading speed and uses up mental energy needed for comprehension. The data reveal that Orthographic Awareness is the most critical and underdeveloped domain in this learner cohort, presenting a significant bottleneck to literacy advancement. With a low composite score and exceptionally high variability in performance on pseudo-word tasks indicate a fragile and inconsistent ability to apply knowledge of spelling patterns. This is not merely a "moderate" challenge; it is the primary vulnerability in the learners' metalinguistic profile. Strong phonological skills, as seen in previous data, are necessary but insufficient for fluency. Without robust orthographic awareness, learners cannot efficiently transition from sounding out to recognizing words instantly, which directly impairs reading fluency, spelling, and, ultimately, comprehension.

Syntactic Awareness

The findings on syntactic awareness, characterized by low mean scores across indicators particularly in sentence correction (M = 1.27) and combining sentences (M = 0.73) reveal learners' limited ability to consciously manipulate grammatical structures. This can be interpreted through Gombert's (1992) theory of metalinguistic awareness, which distinguishes between *epilinguistic* (implicit, intuitive) control and *metalinguistic* (explicit, reflective) control. According to Gombert, true metalinguistic development involves the emergence of a reflective attitude toward language, where learners move beyond simply recognizing when a sentence "sounds right" to being able to identify, explain, and correct errors intentionally. The low performance in sentence correction and combining sentences suggests that learners in this study have not yet reached the metalinguistic stage for syntax; rather, they may still be operating at the epilinguistic level, where grammatical judgments remain intuitive and unarticulated. The relatively higher scores in Identifying Correct Word Order (M = 2.83) and Detecting Grammar Error (M = 2.56) support this, as error detection typically precedes error correction in the developmental trajectory, consistent with Gombert's assertion that reflective manipulation emerges later and requires more advanced cognitive control.

From the lens of Vygotsky's (1978) Sociocultural Theory, these findings highlight a critical gap in scaffolding within the Zone of Proximal Development (ZPD). Syntactic awareness, particularly the ability to combine sentences and correct errors, represents a higher-order cognitive skill that learners cannot yet perform independently but could accomplish with guided support. The low performance indicates that such scaffolding may have been insufficient or not strategically targeted within learners' ZPD. Vygotsky emphasized that cognitive development occurs through social interaction where a more knowledgeable other in this case, the teacher provides structured support, gradually withdrawing assistance as learners internalize the skill. The notably low scores in sentence combining (M = 0.73), a task that requires explicit instruction in how to connect ideas using conjunctions and relative clauses, suggest that learners may not have

received adequate modeling, guided practice, or feedback on this specific skill. Moreover, the relatively smaller variability in this domain (SD = 0.41) compared to orthographic awareness may indicate that syntactic difficulty is widespread rather than isolated to a few learners, pointing to a systemic need for more intentional, dialogic instruction that engages learners in metalinguistic talk where teachers use questioning, modeling, and reflective dialogue to scaffold learners' conscious understanding of sentence structure. Aligning with the theoretical framework, these findings underscore that without deliberate scaffolding within the ZPD, learners cannot progress from implicit grammatical knowledge to the explicit, reflective control that Gombert identifies as essential for advanced literacy and reading comprehension.

Overall Metalinguistic Ability of Learners

Viewed through the combined lens of Gombert's (1992) metalinguistic development and Vygotsky's (1978) Sociocultural Theory, the overall metalinguistic profile (M = 73.40, SD = 9.53) reveals a developmental imbalance: learners have achieved epilinguistic (implicit) control in phonological and phonemic domains, yet they have not fully transitioned to the explicit, reflective metalinguistic stage in orthographic and syntactic dimensions. According to Gombert, true metalinguistic competence, the capacity to consciously analyze and manipulate language, emerges gradually and is not uniform across linguistic levels. The stronger performance in phonological awareness suggests that learners have internalized foundational sound-based skills, likely because these were scaffolded earlier and more consistently within their Zone of Proximal Development (ZPD). In contrast, the weaker orthographic and syntactic skills remain within the ZPD, indicating that the necessary social interaction, explicit modeling, and guided practice have not yet been sufficiently provided. Vygotsky's framework explains this as a gap in instructional scaffolding: teachers may have effectively supported early phonological development but have not yet extended that support to the higher-level language structures. Together, these theories underscore that overall metalinguistic competence is not merely the sum of isolated skills but the product of targeted, socially mediated instruction across all language dimensions, a process that requires teachers to strategically scaffold each domain within the learners' ZPD.

The pattern of strengths and weaknesses observed in learners' metalinguistic ability carries significant implications for understanding their developmental path and the nature of instructional support they require. The strength in phonological and phonemic awareness confirms that learners have successfully acquired the foundational skill of breaking words into their constituent sounds, a skill that is typically the earliest to develop and the most heavily emphasized in primary literacy instruction. This foundation enables decoding, allowing learners to sound out unfamiliar words and establish the initial mapping between oral language and print. However, the characterization of morphological awareness as "emerging" suggests that learners are only beginning to recognize that words are composed of meaningful units, roots, prefixes, suffixes, and that these units carry consistent meaning across words. They may identify affixes in isolation but lack the automaticity to use morphological knowledge strategically during reading or writing. This emerging skill indicates that learners are at a transitional phase: they have moved beyond simple phonemic decoding but have not yet consolidated the ability to use

morphology to infer word meaning, expand vocabulary, or spell derivational forms accurately.

The concurrent weaknesses in orthographic and syntactic awareness reveal a more critical developmental gap. Orthographic weakness implies that learners struggle to internalize and automatize the conventional spelling patterns and letter sequences that characterize written English. Even if they can decode phonetically, they may not reliably recognize or produce the correct orthographic forms of words, leading to inconsistent spelling and slowed reading fluency. Without automatic orthographic knowledge, learners expend cognitive effort on word recognition that should be reserved for comprehension. Syntactic weakness compounds this difficulty: learners lack the conscious awareness of sentence structure needed to parse complex sentences, correct grammatical errors, or combine simple ideas into sophisticated, cohesive statements. They may understand sentences intuitively but cannot manipulate or evaluate them reflectively, a skill essential for revising writing, interpreting complex texts, and understanding how authors use sentence structure to convey nuance. Together, these weaknesses signify a critical bottleneck in learners' literacy development. They have acquired the foundational skill of breaking words apart (phonological awareness) but lack the higher-order skills of organizing words into conventional spellings (orthographic knowledge) and structuring words into meaningful, complex sentences (syntactic awareness). This creates a developmental disconnect: learners can decode simple texts but struggle to read fluently, spell accurately, write with syntactic variety, or comprehend sentences that extend beyond basic structures. In essence, they possess the "word-breaking" tool but have not yet developed the "word-organizing" and "meaning-structuring" tools necessary for advanced literacy.

From a theoretical standpoint, this pattern reflects Gombert's (1992) distinction between epilinguistic and metalinguistic control. Learners have achieved epilinguistic (implicit) control at the phonological level, they can manipulate sounds without necessarily reflecting on those operations but have not yet reached the metalinguistic (explicit) stage in orthography and syntax. They may recognize when a word "looks wrong" or a sentence "sounds off," but they cannot articulate why or independently correct the error. This gap between implicit knowledge and explicit control is precisely where instructional scaffolding within the Zone of Proximal Development (ZPD) must intervene, as Vygotsky (1978) emphasized. Ultimately, this profile suggests that learners are at risk of plateauing in their literacy development. Without targeted instruction that explicitly teaches orthographic patterns (e.g., word sorting, structured word inquiry) and syntactic manipulation (e.g., sentence combining, error detection and correction), the gap between foundational and advanced skills will widen. Learners may continue to decode adequately but will struggle to meet the demands of academic texts, written expression, and disciplinary literacy in higher grade levels. The findings underscore that effective literacy instruction must be balanced extending beyond phonology to systematically develop the orthographic, morphological, and syntactic dimensions that collectively underpin fluent reading and sophisticated writing.

Research Objective 2

The correlation analysis reveals that the relationships between teachers' self-reported TPACK and learners' metalinguistic ability across all dimensions: phonemic, morphemic, orthographic, syntactic, and overall are uniformly very weak to weak, with coefficients ranging from -0.405 to 0.213. Most correlations cluster near zero, indicating that variations in teachers' technological, pedagogical, and content knowledge do not meaningfully associate with variations in learners' metalinguistic skills. Notably, even the integrative TPACK domains (PCK, TCK, TPK) showed negligible to weak correlations across all learner outcomes, with the highest observed coefficient ($\rho = 0.213$) falling within the weak positive range for PCK and syntactic awareness. This persistent pattern of weak correlations points to a fundamental disconnects between teachers' self-perceived competence and its translation into measurable learner gains. Several factors may explain why self-reported TPACK does not translate into student learning outcomes. First, self-report measures capture perceived competence, not enacted practice. As Schmid et al. (2020) demonstrated, teachers' self-assessed TPACK can be discrepant from their observed classroom performance. A teacher may rate herself highly on survey items indicating confidence in selecting technologies for instruction, yet actual classroom application may lack the depth, frequency, or precision needed to influence student learning. Second, knowledge alone does not guarantee effective instructional practice. Scherer et al. (2021) emphasized that while TPACK is necessary for technology integration, it is the actual instructional practices and the specific design of learning tasks that directly shape student learning gains. Teachers may possess the knowledge but fail to deploy it in ways that target the specific cognitive demands of metalinguistic development, such as explicit scaffolding of orthographic patterns or guided practice in sentence combining. Third, the Zone of Proximal Development (ZPD) requires intentional scaffolding. From Vygotsky's perspective, teacher knowledge becomes educationally meaningful only when it is translated into guided interaction that meets learners at their level of need. The weak correlations suggest that despite teachers' self-reported competence, the necessary scaffolding within learners' ZPD, particularly in the higher-order domains of orthography and syntax may not have occurred with sufficient frequency, consistency, or quality and fourth, metalinguistic development requires explicit, reflective instruction that moves beyond implicit exposure. Gombert's theory distinguishes between epilinguistic (implicit) and metalinguistic (explicit) control. Teachers may be providing activities that engage learners at the epilinguistic level like reading aloud, basic phonics drills, without deliberately fostering the explicit reflection required for learners to consciously analyze word structure, spelling patterns, and sentence grammar. This gap between instruction and the cognitive demand of metalinguistic tasks may explain why teacher knowledge does not correlate with learner outcomes.

Taken together, the weak correlations underscore that self-reported teacher knowledge is a necessary but insufficient condition for developing learners' metalinguistic ability. Without the intentional translation of knowledge into targeted, scaffolded instructional practice specifically designed to move learners from implicit understanding

to explicit control, even advanced TPACK will not reliably produce measurable gains in metalinguistic competence.

As the result revealed, this suggests that, within this study context, simply possessing or integrating technological, pedagogical, and content knowledge does not automatically translate into improved learner outcomes in metalinguistics, highlighting a potential gap between teacher competency in theory and its effective application in classroom practice to directly foster these specific language awareness skills. The coherent and well-integrated TPACK construct analysis among teachers utilized a statistical method to measure how closely two factors are related, specifically focusing on teachers' technology-enhanced teaching knowledge (TPACK) and students' metalinguistic ability, their understanding of how language works. The statistical analysis found no meaningful connection between any area of the teachers' self-assessed TPACK, whether it was their technology skills, teaching methods, or the blend of both and the students' metalinguistic ability. The correlation numbers were so close to zero that they effectively indicate no relationship; the very slight negative correlation with overall TPACK is negligible and likely due to random chance. In essence, simply possessing strong, well-integrated teaching knowledge, as reported by the teachers themselves, was not enough to directly predict or explain differences in how well students performed on tests of language analysis. This finding highlights a vital gap between teacher knowledge and student learning outcomes. It suggests that what teachers *know*, their TPACK, and what students demonstrate, their metalinguistic ability, are mediated by other critical factors not captured in this correlation. The teachers' knowledge may not have been effectively translated into classroom practices that develop this specific skill, or other elements, such as the quality of instructional implementation, the curriculum materials used, the frequency of metalinguistic tasks, or even the way knowledge was measured, might play a more decisive role. Therefore, the study concludes that at this aggregated level, high teacher TPACK alone does not guarantee higher student metalinguistic performance, pointing to the complex journey from professional knowledge to tangible student results. Finally, how we measure these things matters a lot. In this study, the teachers were asked to rate their own knowledge (self-report), which can sometimes be different from what they actually do in the classroom daily. Also, a student's ability to analyze language is influenced by many things beyond one teacher, like their reading habits at home or previous learning. So, the lack of a direct link in the data presented doesn't necessarily mean TPACK is unimportant. It more likely shows that the connection is indirect and complex, influenced by how the knowledge is put into action and many other factors in a pupil’s life. The researcher suggests that conducting future research that observes exactly what teachers do in class might show a clearer link.

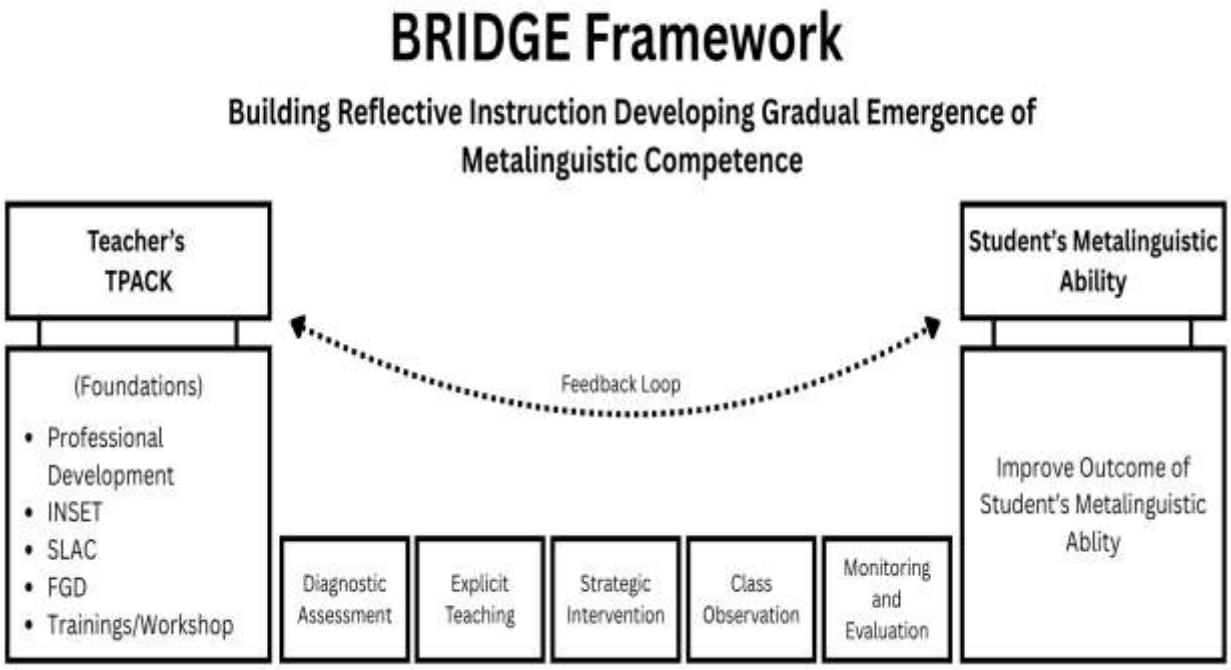
Research Objective 3

Proposed Pedagogical Framework

Presents the illustration of the BRIDGE Framework, a pedagogical framework designed to bridge the gap between teachers' TPACK and pupils' metalinguistic ability. The framework is structured as a pathway where the first component focuses on

Teachers' TPACK Foundations, improved through professional development, INSET, SLAC, FGD, trainings and workshops. This serves as the starting point that flows into Component 2, a sequential instructional process consisting of Diagnostic assessment, Explicit Teaching, Strategic Intervention, Classroom Observation, and Monitoring and Evaluation, ultimately leading to Component 3, targeting the Improved Outcomes of Students' Metalinguistic Ability

The dotted arrow in Figure 5 represents the feedback loop connecting learners' Metalinguistic Ability back to the Teacher's TPACK. The feedback loop operates in two directions: teachers' TPACK influences student outcomes, while student results can also serve as the basis for adjustments that teachers need to make, enabling them to refine their practice based on demonstrated student needs. This recursive process ensures that the BRIDGE Framework is adaptive, positioning teachers to implement Target Interventions with greater precision and effectiveness over time



In summary, the Process is a structured pathway: *TPACK Foundation → Diagnostic Assessment → Explicit Teaching → Strategic Intervention → Classroom Observation → Monitoring and Evaluation → Improved Metalinguistic Ability*, with continuous feedback from outcomes back to teacher knowledge and practice.
The framework extends TPACK theory into a student-outcome-driven instructional pathway, provides a step-by-step protocol for developing metalinguistic awareness across phonological, orthographic, morphological, and syntactic domains, and introduces a recursive feedback mechanism that makes pedagogical frameworks adaptive and evidence-informed, addressing a critical gap in literacy intervention research and practice

Conclusions

Research Objective 1

Technological Knowledge (TK)

Teachers demonstrated Advanced technological knowledge, characterized by confidence in functional skills and proactive engagement with emerging technologies. However, exploratory and breadth-oriented technology use was comparatively less pronounced, and variability in technical problem-solving suggests uneven proficiency among some teachers.

Pedagogical Knowledge (PK)

Pedagogical Knowledge emerged as the strongest domain, with teachers exhibiting uniformly high confidence in assessment, adaptive instruction, and classroom management. The homogeneity of responses indicates a cohesive professional culture and shared training experiences.

Content Knowledge (CK)

Teachers demonstrated Advanced content knowledge, particularly in literacy, with consistent confidence across indicators. This solid foundation in subject matter provides a strong basis for designing instruction that targets language development

Overall TPACK

Teachers possess strong, well-developed competencies across the three TPACK domains, with pedagogical knowledge being the most pronounced strength. However, the findings reveal a critical gap: high self-perceived competence does not automatically translate into instructional practices that directly support learners' metalinguistic development, as evidenced by the weak correlations between TPACK and learner outcomes.

Phonological Awareness

Phonological awareness was the strongest domain, with learners demonstrating solid proficiency in initial sound, middle sound, segmenting, and syllable tasks. However, performance in rhyming was notably lower and highly variable, indicating uneven development in holistic sound pattern recognition.

Morphological Awareness

Morphological awareness reflected moderate proficiency, with learners performing better on suffix knowledge than prefix knowledge. The large standard deviations indicate substantial individual differences in word structure analysis skills.

Orthographic Awareness

Orthographic awareness was comparatively weaker, with low mean scores and high variability in pseudo-word tasks. Learners demonstrated difficulty applying spelling patterns and grapheme–phoneme correspondences to unfamiliar words, revealing a critical gap between sound-based skills and orthographic mapping.

Syntactic Awareness

Syntactic awareness was the most challenging domain, with very low performance in sentence combining and sentence correction. Learners demonstrated limited ability to actively manipulate sentence structures, evaluate grammatical relationships, or correct ungrammatical sentences.

Overall Metalinguistic Ability

Learners demonstrate a developmental imbalance: strengths lie in foundational phonological skills essential for decoding, while higher-order skills involving word structure (morphology), spelling patterns (orthography), and sentence-level grammar (syntax) remain underdeveloped. This pattern suggests that while learners have acquired basic sound-based literacy skills, they lack the reflective, manipulative control of language necessary for advanced reading, writing, and comprehension.

Research Objective No. 2

Correlate the TPACK of the teachers and the metalinguistic ability of learners

The lack of significant correlation with learner metalinguistic ability leads to a critical conclusion: Teacher self-reported knowledge (TPACK) does not automatically translate into measurable student outcomes in the specific domain of metalinguistics**.** This disconnect suggests that factors beyond teacher confidence and knowledge, such as the specific instructional practices employed, the alignment of those practices with metalinguistic subskills, the quality of implementation, or contextual classroom variables, may act as more direct mediators of learner achievement.

Research Objective No. 3

Propose a pedagogical framework that bridges the implementation gap between teachers' TPACK and learners’ metalinguistic ability.

To bridge the identified gap between teachers’ self-reported TPACK and learners’ actual metalinguistic ability, the BRIDGE Framework was developed as a practical and recursive pedagogical model. It starts by strengthening teachers’ foundational TPACK through sustained professional development activities such as INSET, SLAC, and collaborative workshops. From there, a structured five-step target intervention pathway is

implemented: diagnostic assessment to identify specific learner needs, explicit teaching to make language structures visible, strategic intervention to provide differentiated support, classroom observation to verify instructional fidelity, and monitoring and evaluation to continuously refine practice. A feedback loop ensures that learner outcomes inform subsequent teacher actions, making the framework adaptive and evidence-driven. Ultimately, the BRIDGE Framework transforms teacher knowledge into actionable classroom strategies that directly develop learners' phonological, morphological, orthographic, and syntactic awareness, thereby addressing the implementation gap and improving literacy outcomes in elementary education

Recommendations

Research Objective 1

Technological Knowledge

Professional development should shift from basic skills training to fostering exploratory and innovative technology use. Schools may establish technology exploration sessions or sandbox activities where teachers can freely experiment with diverse digital tools. Peer mentoring programs can also support teachers who face challenges in technical troubleshooting, promoting more equitable technology competence across the group.

Pedagogical Knowledge

This strong pedagogical foundation should be leveraged as a platform for integrating technology and content more deeply. Teachers may serve as peer models or lead school-based learning action cells (SLAC) focused on pedagogical innovation. Professional development should continue to reinforce these strengths while exploring how pedagogical practices can be intentionally directed toward developing learners' metalinguistic skills

Content Knowledge

Content knowledge should be further strengthened through sustained professional development that deepens understanding of literacy instruction, particularly in areas of morphology, orthography, and syntax—domains where learners demonstrated weaknesses. Collaborative lesson study and curriculum mapping can help teachers align content expertise with instructional practices that explicitly target metalinguistic skills.

Overall TPACK

Professional development must move beyond enhancing individual knowledge domains toward explicitly developing teachers' capacity to translate TPACK into classroom practice that targets metalinguistic skills. Instructional coaching, classroom observation with feedback, and structured reflection on teaching episodes can help bridge the gap between knowledge and enactment. Schools should prioritize job-embedded

professional learning that focuses on the intentional design of lessons addressing phonological, morphological, orthographic, and syntactic awareness.

Phonological Awareness

Instruction should continue to reinforce foundational phonemic skills while providing targeted intervention for rhyming, which remains a challenge for many learners. Teachers may incorporate explicit rhyming activities, wordplay, and songs into daily literacy routines. Differentiated instruction should address the varied proficiency levels observed, particularly for learners who struggle with holistic sound patterns

Morphological Awareness

Explicit instruction in morphology should be strengthened, with particular emphasis on prefixes, which learners found more challenging. Teachers may integrate word study routines such as word sorts, root word analysis, and morphological mapping into literacy instruction. Consistent, systematic teaching of common prefixes, suffixes, and root words can help learners build automaticity in recognizing and using morphemes to decode and comprehend unfamiliar words

Orthographic Awareness

Explicit instruction in orthographic patterns and spelling conventions should be prioritized. Structured word inquiry, word sorting, and patterned spelling lists can help learners internalize the conventional spelling patterns of English. Teachers should provide systematic, explicit instruction that moves beyond phonics to develop learners' ability to visualize and recall correct orthographic forms, particularly for nonwords and unfamiliar words.

Syntactic Awareness

Explicit syntactic instruction must be prioritized, particularly focusing on sentence combining and error correction. Teachers may incorporate daily sentence combining exercises, guided practice in identifying and correcting grammatical errors, and structured opportunities for learners to expand simple sentences into complex structures. Dialogic teaching strategies that engage learners in metalinguistic talk discussing why sentences work or do not work grammatically, can help move learners from implicit understanding to explicit, reflective control of syntax.

Overall Metalinguistic Ability

A balanced, comprehensive literacy program is essential—one that extends beyond phonics to explicitly address morphological, orthographic, and syntactic dimensions. Instructional planning should intentionally scaffold learners across all metalinguistic domains, ensuring that foundational skills are built upon with higher-order language awareness. Teachers should receive professional development on evidence-

based strategies for teaching morphology, orthography, and syntax, and should be supported in integrating these across the literacy curriculum. Early identification of learners struggling in specific domains, followed by targeted intervention, can help prevent the widening of gaps as learners progress to higher grade levels

Research Objective 2

To bridge the gap between teachers' self-reported TPACK and learners' metalinguistic development, school heads, instructional coordinators, and master teachers across the San Fernando District shall shift the focus from knowledge to enacted practice by conducting quarterly classroom observations and lesson plan analyses to evaluate how teachers apply TPACK to address specific learner gaps, such as prefix knowledge for morphological aspect and sentence combining for syntactic aspect. School heads shall facilitate monthly School-Based Learning Action Cells (SLAC) and bi-monthly Focus Group Discussions (FGDs) where all teachers collaboratively design and come-up with an innovative output or instructional materials with, implement, and refine technology-integrated lessons targeting these skill gaps. All activities shall be documented, monitored, and evaluated using the Performance Monitoring and Coaching Form (PMCF), with school heads providing quarterly formative feedback and summative evaluation at year's end.

To strengthen instructional quality, school heads, instructional coordinators, and master teachers shall collaboratively develop context-sensitive TPACK observation rubrics, piloted district-wide, to evaluate the quality of technology integration in literacy instruction specifically how teachers scaffold orthographic mapping and syntactic manipulation. Teachers shall implement explicit, systematic instruction across all metalinguistic domains, with particular emphasis on morphology, orthography, and syntax, supported by school heads, instructional coaches, and literacy coordinators using developed lesson exemplars and assessment tools beginning at the start of the school year.

Finally, school heads and district supervisors shall strengthen instructional leadership by conducting at least two classroom observations per teacher per quarter, providing feedback within one week, and ensuring all professional development aligns with identified learner skill gaps. Quarterly district-level reviews shall track teacher progress and pupil outcomes, holding the system accountable for translating knowledge into effective classroom practice.

Research Objective 3

The BRIDGE Framework was developed to address the persistent implementation gap between teachers' TPACK and pupils' metalinguistic ability (phonological, orthographic, morphological, and syntactic awareness). Existing professional development treats TPACK in isolation, and classroom instruction rarely translates diagnostic insights into targeted, sequential interventions, creating a disconnect where teacher knowledge does not systematically lead to the development of learners'

conscious language awareness. Consequently, this implementation gap results in fragmented teaching practices and uneven literacy outcomes. The framework, therefore, provides a coherent, recursive, and actionable model that bridges this gap by starting from teacher knowledge foundations and ending with measurable improvements in pupils' metalinguistic ability.

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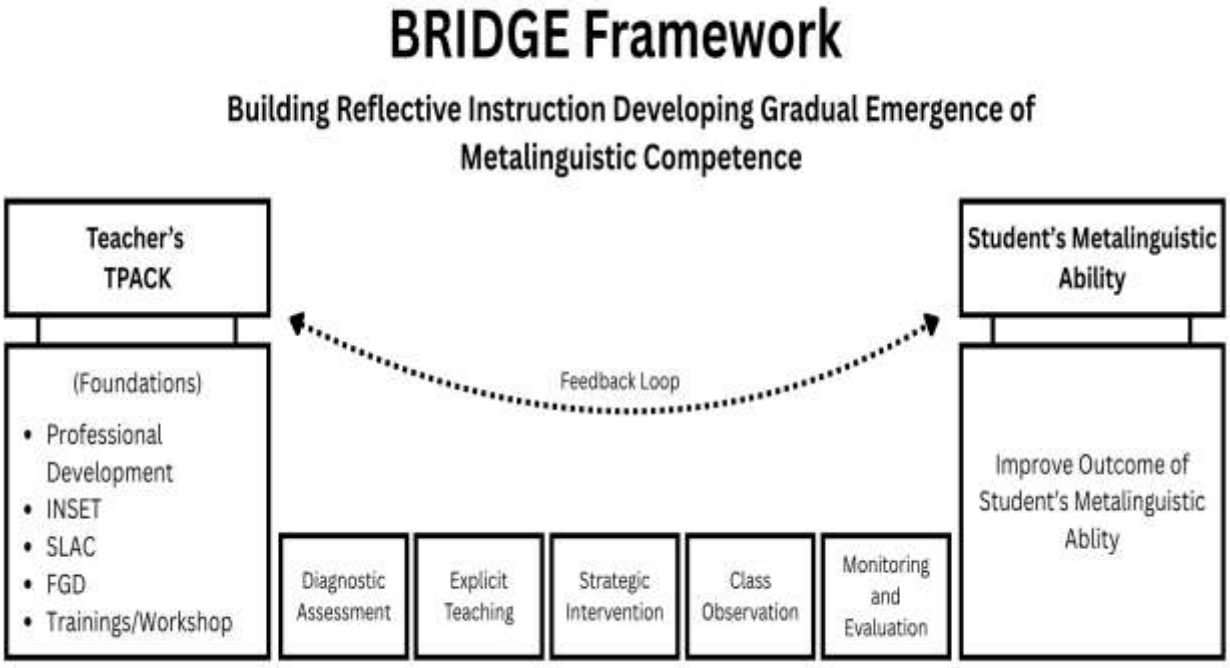

Compliance with Ethical Standards

Informed consent was obtained from all participants. Respondents were adequately informed and oriented with the purpose and the process of the study. The researcher ensured the protection of the identity of all the respondents and explained that all responses would be taken with confidentiality. This commitment to privacy was established to uphold ethical standards and foster trust between the researcher and the respondents. In accordance with the Data Privacy Act, all identifiable information, including the pupil's name, was removed from the data entries during the interpretation of result phase. All data will be kept until the thesis is completed and then permanently deleted or shredded. Likewise, the researcher further explains that their participation will be voluntary, and they will be given a choice to participate or not participate. They were also reminded that they have the right to clarify things that might occur during the conduct of the study.

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REFERENCES

Chai, C. S., Jong, M. S. Y., & Yan, Z. (2019). A review of the technological pedagogical content knowledge framework: New themes, trends, and challenges for integrating technology in education. Journal of Educational Technology Development and Exchange, 12(2), 1–14. https://doi.org/10.18785/jetde.1202.01

EDCOM II. (2023). Miseducation: The failing system of Philippine education. Second Congressional Commission on Education

Gombert, J. E. (1992). Metalinguistic development. University of Chicago Press.

Hofer, B., Jessner, U., & Traxl, C. (2025). Metalinguistic awareness in primary schoolers in multilingual partial immersion education. Frontiers in Language Sciences, 4, 1547151. https://doi.org/10.3389/flang.2025.1547151

Jacobson, L., & McDavid, M. (2025, May 19). Champion metalinguistic awareness in every classroom: 6 reasons why [Blog post]. 10 Publications.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. Teachers College Record, 108(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

OECD. (2023). PISA 2022 results (Volume I): The state of learning and equity in education. OECD Publishing. https://doi.org/10.1787/53f23881-engine

Sarıçoban, A., Tosuncuoğlu, İ., & Kırmızı, Ö. (2019). A technological pedagogical content knowledge (TPACK) assessment of pre-service EFL teachers learning to teach English as a foreign language. Journal of Language and Linguistic Studies, 15(3), 1122–1138. https://doi.org/10.17263/jlls.631552

Scherer, R., Howard, S. K., Tondeur, J., & Siddiq, F. (2021). Profiling teachers' readiness for online teaching and learning in higher education: Who's ready? Computers in Human Behavior, 118, 106675. https://doi.org/10.1016/j.chb.2020.106675

Schmid, M., Brianza, E., & Petko, D. (2020). Developing a short assessment instrument for Technological Pedagogical Content Knowledge (TPACK.xs) and comparing results of an international study. Computers & Education, 157, 103967. https://doi.org/10.1016/j.compedu.2020.103967

.World Bank. (2022). Filipino children falling behind in early learning. World Bank Group. (As cited in EDCOM II, 2023)

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