

A Phenomenological Study on Meaning-Making and Coping among Grade 12 STEM Students with Limited Vocabulary at a Senior High School in Bataan

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Abstract

This study examined the lived experiences, coping strategies, and meaning-making of Grade 12 STEM students with self-perceived limited English vocabulary at Limay Senior High School and used these experiences as the basis for context-responsive vocabulary support. The study was anchored in Moustakas' Transcendental Phenomenology, Lazarus and Folkman's Transactional Model of Stress and Coping, and Park's Meaning-Making Model. Using a transcendental phenomenological research design, ten Grade 12 STEM students were selected through purposive criterion sampling. Data were generated through semi-structured in-depth interviews and non-participatory classroom observations and analyzed using Moustakas' modified Stevick-Colaizzi-Keen method. Findings showed that limited English vocabulary affected students' comprehension of academic and technical terms, spoken and written expression, classroom participation, confidence, and selected social interactions. Difficulties intensified during formal, technical, public, and time-pressured situations. Participants coped through translation, Tagalog or Taglish, contextual clues, peer and teacher assistance, digital resources, reading, independent practice, and acceptance of corrections. They interpreted vocabulary limitations as weakness, pressure, challenge, preparation, or opportunities for improvement. The study concluded that vocabulary limitation was a context-dependent learning concern influenced by academic demands, relationships, emotional safety, and available support. It recommended coordinated vocabulary support across learning areas through the proposed BRIDGE-STEM Context-Responsive Vocabulary Support Framework, while future studies should evaluate its effectiveness in other educational contexts. The study primarily supports SDG 4, Quality Education, by promoting more inclusive and equitable access to STEM learning. Its sustainability impact is educational, institutional, and socio-economic through language-responsive instruction, coordinated learner support, and improved preparation for higher education and future professional communication.

Keywords: Academic Vocabulary, Coping Strategies, English Vocabulary, Grade 12 STEM Students, Meaning-Making, Phenomenology, STEM Education, Vocabulary Support

1. Introduction

Vocabulary is essential to comprehension, communication, and academic participation. Students with limited English vocabulary may struggle to understand texts, express ideas, and engage in classroom activities (Quines, 2023; Leung et al., 2024). These difficulties are more pronounced in STEM education because learners must understand technical English while mastering complex disciplinary concepts (Brooks et al., 2021; Alharbi, 2021). This study examines how Grade 12 STEM students at Limay Senior High School experience, interpret, and cope

with self-perceived limited English vocabulary and uses these lived experiences as a basis for context-responsive vocabulary support.

Vocabulary knowledge strongly influences comprehension, writing, and participation in English-medium education (Verhoeven et al., 2021; Zano, 2022; Wei et al., 2024). Limited vocabulary restricts academic performance (Aldayel et al., 2026; Babayigit & Trenkic, 2025; Edunesia, 2024), particularly in STEM subjects where specialized terminology requires deliberate support (Lin & Lei, 2021; Biseko, 2023; Teng, 2024). Technical vocabulary also increases cognitive demands (Othman, 2024; Suryani, 2020). Students must process unfamiliar words while understanding complex concepts (Sweller et al., 2021), which may encourage superficial comprehension (Othman, 2024). Vocabulary gaps may also accumulate as academic tasks become more difficult (Biseko, 2024; Zhang and Lu, 2022). Reading difficulties involving information retrieval, inference, and contextual understanding further reflect these limitations (Rudas, 2024), especially in resource-constrained environments (Hossain, 2024; Jahan, 2025). Philippine studies similarly associate vocabulary difficulties with reduced academic performance among senior high school and STEM students (Galang, 2022; Roma & Erellana, 2024; Rogayan et al., 2021). These difficulties may limit participation in laboratory discussions, written activities, and collaborative work (Rogayan et al., 2021; Maco and Maco, 2024).

Vocabulary limitation extends beyond linguistic difficulty and may involve anxiety, cognitive burden, identity concerns, and reduced confidence (Genelza, 2022; Galang, 2022; Rogayan et al., 2021). Learners may interpret vocabulary gaps as personal or academic inadequacy (Nguyen, 2025; Laroza-Velasco, 2024), while fear of negative evaluation may result in avoidance of oral participation (Tapado, 2025; Velasco & Abel, 2023; Pabro-Maquidato, 2021). Such anxiety can reduce opportunities for vocabulary development (Masrurroh et al., 2025; Bayabel & Tahir, 2023). Vocabulary limitations also affect social participation. Learners may experience communication anxiety (Tambunan et al., 2024; Daflizar, 2024) and resort to silence or code-switching (Lavadia et al., 2025; Nguyen, 2025; Othman, 2024). Digital environments may provide additional vocabulary exposure (Sivagananam & Yunus, 2020; Edunesia, 2024), although unequal connectivity can limit access (Gholami and Salahshour, 2025). Vocabulary difficulty may therefore contribute to social and professional anxiety (Nguyen, 2025; Babayigit & Trenkic, 2025; Aldayel et al., 2026). Learners respond through peer support, translation, code-switching, contextual guessing, digital tools, and self-regulation (Manuel, 2022; Nguyen & Nguyen, 2025; Lee, 2025; Xu, 2022). Peer assistance can provide linguistic and emotional support (Bayabel and Tahir, 2023; Chen & Wu, 2025; Ramachandran, 2025), while translation and code-switching help sustain communication (Nguyen and Nguyen, 2025; Sholikhah and Isnaini, 2024; Yang and Zhao, 2023). Contextual guessing can support retention when combined with metacognitive strategies (Alahmari and Alrabai, 2024), while digital learning provides additional vocabulary support (Lee, 2025; Khlasiang and Sukavatee, 2023; Sun and Li, 2025). Self-regulation can strengthen motivation and persistence (Bai and Wang, 2023; Li and Wang, 2024; Manuel, 2022). Resilience likewise helps learners sustain performance despite language difficulties (Zhang, 2024; Lin, 2022). Meaning-based coping can help students reinterpret vocabulary limitations as challenges that encourage persistence and engagement (Lu et al., 2024; Peng, 2023). Emotional resilience also influences responses to vocabulary anxiety (Qi et al. (2025)), while meaning-making remains central to understanding lived experience (Moustakas, 1994). Thus, coping and meaning-making operate as interconnected processes (Peng, 2023; Zhang, 2024; Lu et al., 2024).

Globally, language barriers may restrict equitable participation in education, directly relating to SDG 4 and its emphasis on inclusive and quality education (UNESCO, 2021; UNDP, 2022). Within ASEAN, vocabulary limitations are associated with reduced confidence and participation, while peer support and collaboration are common coping responses (Bacus & Trasmil, 2025; Umam, 2025; Sereyrath, 2022). Regional priorities also emphasize resilience, mental health, and equitable learning opportunities (ASEAN Secretariat, 2021). ASEAN studies further demonstrate relationships among vocabulary difficulty, coping, and identity. Nguyen and Nguyen (2025) documented anxiety, technology-supported coping, and identity reconstruction; Umam (2025) identified resilience and identity negotiation; Sholikhah and Isnaini (2024) highlighted code-switching as both coping and meaning-making; and Bayabel and Tahir (2023) emphasized collaborative learning. In the Philippines, educational policies and reforms emphasize equitable and learner-centered education. National concerns about foundational learning also reinforce the importance of addressing vocabulary barriers. Studies report vocabulary-related academic difficulties (Galang, 2022; Roma & Erellana, 2024; Rogayan et al., 2021), as well as the role of coping, resilience, and institutional support (Maco & Maco, 2024; Reyes, 2025; Donguines et al., 2021; Ocampo et al., 2024; Jugan et al., 2023). Philippine qualitative studies further identify self-regulation, collaboration, adaptability, and resilience among STEM learners (Canayong and Mabansag, 2021; Palcullo, 2022; Delute, Dela Peña, and colleagues, 2023). The applicability of phenomenological inquiry is supported by Pabro-Maquidato (2021), Antonio et al. (2024), and Tadia et al. (2024). Vocabulary-related experiences have also been linked with identity, belonging, anxiety, and code-switching (Laroza-Velasco, 2024; Candilas et al., 2023; Velasco and Abel, 2023; Donguines et al., 2021; Reyes, 2025). In Bataan, Grade 12 STEM learners at Limay Senior High School encounter technical English in Chemistry, Physics, and Research subjects. These concerns are consistent with broader reading difficulties among Filipino learners (PISA, 2022). Vocabulary limitation therefore represents both an academic and psychosocial concern (Laroza-Velasco, 2024; Verhoeven & Perfetti, 2021).

The study integrates Moustakas' (1994) Transcendental Phenomenology, Lazarus and Folkman's (1984) Transactional Model of Stress and Coping, and Park's (2010, 2021) Meaning-Making Model. Phenomenology emphasizes lived experience and recognizes participants' perceptions as valid sources of knowledge (van Manen, 2023; Dodgson, 2023). Intentionality explains how experiences are directed toward particular academic, social, or identity concerns (Moustakas, 1994; Isik, 2025). Epoché and bracketing require the researcher to manage prior assumptions while remaining attentive to participants' accounts (Moustakas, 1994; Williams, 2021; Pabro-Maquidato, 2021). Textural and structural descriptions are then synthesized into a composite essence (Meihami & Rashidi, 2022), while individual perspectives are treated as authentic representations of lived experience (de Boer & Zeiler, 2024; Isik, 2025; van Manen, 2023). Phenomenological studies have also demonstrated the relevance of emotional regulation, identity, coping, and meaning-making (Meihami and Rashidi, 2022; Park, 2021; Peng, 2023). Lazarus and Folkman's (1984) model explains how students appraise vocabulary difficulties and employ coping responses, while Park's (2010, 2021) model explains how they interpret and reframe these experiences. Supporting studies further emphasize self-regulation, resilience, and meaning-based coping (Bai and Wang, 2023; Zhang, 2024; Lin, 2022; Lu et al., 2024; Qi et al. (2025); Moustakas' (1994)).

Most Philippine studies on vocabulary use quantitative or descriptive-correlational approaches that examine proficiency and academic outcomes (Galang, 2022; Roma & Erellana, 2024). Although these studies establish the effects of vocabulary limitation, they provide limited understanding of how STEM learners personally experience and interpret these difficulties. The problem is significant because STEM education requires precise technical comprehension, while provincial learners may also experience limited access to English-rich resources (Rogayan et al., 2021; Othman, 2024). Existing research also tends to examine coping (Manuel, 2022; Maco & Maco, 2024; Reyes, 2025) and meaning-making (Laroza-Velasco, 2024; Peng, 2023) separately rather than as reciprocal processes. No phenomenological study was identified in Bataan that examines how Grade 12 STEM students experience, cope with, and make meaning of self-perceived limited English vocabulary as an integrated lived phenomenon. The literature supports the educational importance of this inquiry (Rogayan et al., 2021; Othman, 2024; Manuel, 2022), while studies on coping (Bayabel & Tahir, 2023; Lee, 2025; Zhang, 2024) and meaning-making (Peng, 2023; Park, 2021; Nguyen & Nguyen, 2025) support its conceptual focus. Moustakas' (1994) transcendental phenomenology is likewise supported by related Philippine studies (Pabro-Maquidato, 2021; Laroza-Velasco, 2024; Tadia et al., 2024).

The study primarily aligns with SDG 4, Quality Education, which promotes inclusive and equitable learning (UNESCO, 2021). Vocabulary limitations may restrict students' access to academic content and meaningful classroom participation (UNDP, 2022). Addressing the lived experiences of STEM learners can therefore contribute to more responsive vocabulary support and more inclusive participation in STEM education.

The study contributes mainly to educational, institutional, and socio-economic sustainability. Understanding vocabulary-related experiences may help teachers develop language-responsive instruction, assist schools in designing appropriate learner support, and provide evidence for curriculum and educational policy decisions. By improving access to STEM learning and supporting students' preparation for higher education, the study may also contribute to more equitable academic and future professional opportunities.

2. Material and methods

2.1 Research Design

The study employed Moustakas' (1994) transcendental phenomenology, which focuses on describing the essence of lived experiences through epoché and the suspension of researcher assumptions (Dodgson, 2023; Creswell & Poth, 2018). This design was appropriate because the study examined the experiences, coping, and meaning-making of Grade 12 STEM students with self-perceived limited English vocabulary (Moustakas, 1994; Meihami & Rashidi, 2022). Its use in related Philippine studies further supports its contextual appropriateness, including Pabro-Maquidato (2021), Laroza-Velasco (2024), and Tadia et al. (2024). The study followed the descriptive tradition of Moustakas' (1994) transcendental phenomenology by examining what and how participants experienced vocabulary limitations (Moerer-Urdahl & Creswell, 2004), while also recognizing interpretative elements in examining the meanings attached to these experiences, as demonstrated by Meihami and Rashidi (2022) and Nguyen and Nguyen (2025). This orientation was consistent with Lazarus and Folkman's (1984) coping theory and Park's (2010, 2021) meaning-making model. The philosophical foundations included intentionality, epoché, phenomenological reduction, noema and noesis, and the lifeworld. Intentionality focused attention on the meanings, emotions, demands, and relationships surrounding vocabulary limitation (Moustakas, 1994; van Manen, 2023). Epoché required the researcher to bracket professional assumptions through continuous reflexivity (Pabro-Maquidato, 2021; Dodgson, 2023; Moustakas, 1994), while phenomenological reduction maintained focus on participants' accounts rather than prior assumptions (Creswell & Poth, 2018; Meihami & Rashidi, 2022). Noema and noesis distinguished what was experienced from how it was experienced (Moustakas,

1994), while attention to the lifeworld grounded the inquiry in participants' everyday school experiences (van Manen, 2023; Dodgson, 2023; Creswell & Poth, 2018).

2.2 Locale of the Study

The study was conducted at Limay Senior High School, a public institution in Limay, Bataan, Philippines. The school offers Academic and Technical-Vocational-Livelihood tracks, including STEM, where learners regularly engage with English-medium textbooks, scientific articles, laboratory reports, and oral presentations. The locale was selected because vocabulary limitations were identified as a recurring concern among STEM learners and because its context provided relevant experiences for examining language difficulties within technical and academic instruction.

2.3 Respondents of the Study

The co-participants were ten (10) Grade 12 STEM students enrolled at Limay Senior High School during the academic year 2026–2027 who self-identified as having limited English vocabulary. Eligible participants had experienced vocabulary-related difficulties affecting academic or selected social participation and voluntarily agreed to participate with the required consent or assent. Participants with advanced English proficiency indicators, those unable or unwilling to participate in extended interviews, those with documented learning disabilities that could confound the phenomenon, and those enrolled in intensive English remediation programs were excluded. Diversity in sex, academic performance, and home language was considered to enrich the range of lived experiences rather than for statistical comparison.

2.4 Sample and Sampling Procedure

Purposive criterion sampling was used to select ten (10) participants who had directly experienced the phenomenon and could provide detailed accounts of it (Moustakas, 1994; Creswell & Poth, 2018; Rahimi & Khatooni, 2024). The sample size was guided by experiential saturation, or the point at which additional participants were unlikely to provide substantially new experiential themes (Fusch & Ness, 2015). The number was also consistent with related Philippine phenomenological studies (Pabro-Maquidato, 2021; Laroza-Velasco, 2024) and Rahimi and Khatooni's (2024) guidance for transcendental phenomenological research.

2.5 Research Instrument

Data were generated primarily through semi-structured in-depth interviews supported by non-participatory classroom observations. Semi-structured interviews allowed participants to describe their experiences in their own words and enabled probing of the textural and structural dimensions required in phenomenological analysis (Moustakas, 1994; Creswell & Poth, 2018). Classroom observations provided contextual information on language-related hesitation, peer interaction, responses to technical vocabulary, and observable coping behaviors without assessing vocabulary proficiency (Stalmeijer et al., 2023; Creswell & Poth, 2018). Open-ended interview questions were aligned with the research questions and focused on participants' situations, conditions, relationships, responses, coping, and meanings associated with vocabulary limitations. Structured field notes were used to document classroom observations.

2.6 Data Gathering Procedure

Each co-participant participated in two interview sessions lasting approximately 20 – 30 minutes. The first elicited detailed accounts of experiences with limited English vocabulary in academic and selected social contexts. The second was used for member checking, during which participants reviewed and clarified the researcher's textural and structural descriptions (Creswell & Poth, 2023; Moustakas, 1994). Classroom observations supplemented the interviews by situating participants' narratives within their actual academic environments. Throughout data generation, the researcher practiced reflexivity and bracketing as articulated by Moustakas (1994), continuously examining personal assumptions and maintaining openness to participants' accounts (Creswell & Poth, 2018). Responses provided in Tagalog/Filipino were translated into English using back-translation or peer validation to preserve meaning. Interviews and observation sessions were audio-recorded with consent to preserve the richness of participants' accounts (Moustakas, 1994). Interviews were transcribed verbatim, including pauses, false starts, emotional expressions, and code-switching (Candilas et al., 2023; Moustakas, 1994). Transcripts remained in the participants' chosen language before Filipino or Tagalog passages were translated into English with attention to semantic equivalence (Squires, 2021). Back-translation by a bilingual peer reviewer was used to verify accuracy and cultural fidelity (Squires, 2021; Temple & Young, 2004). Participants were also allowed to clarify, add, or remove portions of their transcripts during member checking.

2.7 Data Analysis Techniques

Data were analyzed using Moustakas' (1994) modified Stevick–Colaizzi–Keen method. The researcher first practiced epoché and immersed herself in the transcripts through repeated reading, supported by participants' brief reflection on recent vocabulary-related experiences (van Manen, 2023). Significant statements were then identified through horizontalization, with each initially given equal value before repetitive or irrelevant statements were removed. Relevant statements were clustered into invariant meaning units and themes. Individual textural

descriptions were developed to describe what each participant experienced, followed by structural descriptions explaining how the experiences occurred within particular conditions, relationships, and contexts. These were integrated into individual textural-structural descriptions and subsequently synthesized across participants to derive the composite essence of navigating limited English vocabulary as a Grade 12 STEM learner. Themes and the composite essence were also used as the basis for developing context-responsive vocabulary support recommendations.

2.8 Ethical Considerations

The study followed the ethical requirements of the University Research Ethics Board and the qualitative research principles of Creswell and Poth (2018), as well as the Data Privacy Act of 2012 (RA 10173). Because most participants were minors, written parental or guardian consent and student assent were secured in Filipino and English. Participation was voluntary, and participants could withdraw, refuse questions, or request removal of recorded information without penalty. Pseudonyms or participant codes were used to protect identity. Digital files were password-protected, physical records were securely stored, and research data were retained for five years before secure destruction. Interviews were conducted in private and comfortable settings because discussions of vocabulary limitations could evoke embarrassment, frustration, shame, or anxiety. Interviews could be paused or terminated when distress occurred, with referral to the school guidance counselor when necessary.

2.9 Trustworthiness and Rigor

Trustworthiness was established using Lincoln and Guba's (1985) criteria of credibility, transferability, dependability, and confirmability, supplemented by authenticity (Creswell & Poth, 2018). Credibility was supported through member checking, triangulation of interview and observational data, prolonged engagement, and peer debriefing. Transferability was strengthened through detailed descriptions of participants, setting, and contextual conditions. Dependability was maintained through an audit trail documenting the progression from transcripts to horizons, meaning units, themes, and the composite essence. Confirmability was supported through reflexive journaling, systematic bracketing, and grounding interpretations in participants' accounts. Authenticity was maintained by representing both common and contrasting experiences rather than reducing participants' perspectives to a single uniform account.

3. Results and Discussion

3.1 Experiences of Limited English Vocabulary

3.1.1 Difficulty Understanding Academic and Technical Vocabulary

The participants experienced difficulty understanding unfamiliar words in lessons, examinations, reading materials, EAPP, Practical Research, and other STEM-related activities. Unfamiliar terms sometimes prevented them from understanding questions, completing tasks, following discussions, or contributing fully to group work. Some needed repetition, translation, clarification, or assistance from classmates before they could respond. These findings show that vocabulary limitations can interfere with access to academic content. Rogayan et al. (2021) similarly reported English-related difficulties among Filipino senior high school STEM learners, including problems with unfamiliar vocabulary, grammar, and scientific concepts. Liswaniso and Pretorius (2025) also found a significant relationship between vocabulary knowledge and reading comprehension, while Perez and Perez (2024) identified gaps in vocabulary knowledge and weak confidence among senior high school students. The present findings describe these difficulties through students' self-perceived lived experiences rather than standardized vocabulary measures.

3.1.2 Difficulty Expressing Ideas in Spoken and Written English

Several participants reported having ideas but struggling to translate or organize them into complete English sentences. Oral recitation was particularly difficult because it required immediate responses, while some participants found writing more manageable. Others experienced difficulty with both essay writing and speaking because they relied on Tagalog, basic English, or translation before expressing their ideas. English-only requirements and formal conversations with teachers intensified these challenges. Through Moustakas' (1994) transcendental phenomenology, these experiences demonstrate that vocabulary limitation was shaped by both what students experienced and the circumstances in which it occurred. Tapado's (2025) findings similarly identified sentence-construction concerns, stuttering, communication apprehension, and anxiety during oral activities. Aricheta et al. (2024) further found that fear of negative evaluation contributed to public-speaking anxiety, while preparation helped learners manage it. Cuamag et al. (2024) likewise documented audience, personal, and situational anxiety among Filipino senior high school students during oral activities.

3.1.3 Emotional and Social Effects of Vocabulary Limitation

Vocabulary difficulty was accompanied by shyness, nervousness, self-doubt, pressure, fear of errors, and concern about judgment. Some participants compared themselves with more fluent classmates, felt academically inferior, or became silent when unsure of their English. Others remained more comfortable with friends than teachers, indicating that confidence changed depending on the social relationship and level of formality. These findings

indicate that vocabulary limitation was not solely linguistic but also emotional and relational. Aldubaikhi (2023) found that confidence-building, guidance, reduced competition, and teacher concern were associated with lower foreign-language anxiety. Mai et al. (2024) similarly showed that participation was influenced by linguistic, cognitive, emotional, instructional, and social factors. Nguyen (2025) linked limited vocabulary, low confidence, fear of negative evaluation, and classroom conditions with speaking anxiety. Abel and Velasco (2024) likewise identified nervousness, self-doubt, social pressure, and fear of others' reactions among public senior high school learners.

3.2 Conditions, Relationships, and Coping Responses

3.2.1 Academic and Linguistic Conditions

The difficulty became stronger during oral recitation, examinations, technical reading, essay and research writing, English-only activities, and situations requiring immediate responses. Formal interaction with teachers and unfamiliar or advanced terminology also increased pressure. In contrast, tasks allowing preparation, familiar language, clarification, or slower responses were generally easier to manage. The findings demonstrate that vocabulary limitation was context-dependent rather than equally severe across all tasks. Tai (2022) found that multilingual and multimodal classroom practices helped secondary learners access subject-specific knowledge, supporting the value of flexible language resources. Sari et al. (2025) likewise found that peer interaction created a lower-anxiety environment for spoken English. These findings support the importance of adjusting language support according to task demands and communication conditions.

3.2.2 Supportive and Pressuring Relationships

Teachers and classmates influenced how participants experienced vocabulary limitations. Strict expectations, public questioning, peer comparison, and fear of ridicule increased hesitation and reduced confidence. Conversely, patient teachers, respectful correction, peer assistance, response time, and acceptance of Tagalog or Taglish encouraged continued participation. Some participants also benefited from family members who provided opportunities to practice English. Relationships therefore functioned as either sources of pressure or support. Bacus and Cañete (2025) reported that social support was related to the management of language anxiety and could strengthen confidence. Patra et al. (2022) found that teacher feedback reduced academic anxiety and improved attitudes toward English learning. Deniega and Neri (2024) further found that translanguaging supported comprehension, communication, confidence, participation, and collaboration, although they also noted possible concerns related to overdependence on the first language.

3.2.3 Coping and Vocabulary-Learning Strategies

Participants responded by asking for meanings, requesting repetition or translation, using context clues, consulting classmates and teachers, searching through Google, reading, watching English-language media, practicing independently, and accepting corrections. Some used Tagalog or Taglish as temporary bridges to English. Others relied on basic English or partial contributions to remain involved, although silence and temporary withdrawal occurred when anxiety became strong. These responses show that coping involved linguistic, interpersonal, digital, and self-directed strategies. Ocampo (2023) found that translanguaging was related to reading comprehension and recommended combined use of English and the home language. Shehadeh (2024) found positive engagement with smartphone-based vocabulary learning, supporting participants' use of digital resources. Ölmez and Can Aran (2025) reported improved writing performance and motivation through digital storytelling, although anxiety did not necessarily decrease. Teacher guidance remained important, particularly when independent tools were insufficient.

3.3 Meanings Attached to Limited English Vocabulary

3.3.1 Vocabulary Limitation as Weakness and Challenge

Participants attached different meanings to their vocabulary limitations. Some primarily viewed them as weaknesses associated with low confidence, academic inadequacy, or inability to meet STEM expectations. Others considered them challenges that encouraged practice, help-seeking, correction, and improvement. Several simultaneously experienced pressure and motivation, showing that negative and positive meanings could coexist. Within Moustakas' (1994) framework, these meanings emerged from recurring experiences rather than being imposed beforehand. Tao et al. (2026) found relationships among learner identity, speaking proficiency, autonomous learning, anxiety, belonging, and future expectations. This supports the present finding that vocabulary limitations acquired meaning through confidence, classroom identity, relationships, and learners' expectations for themselves.

3.3.2 Vocabulary Limitation as Motivation and Future Preparation

Some participants connected vocabulary improvement with college, research defense, employment, and future professional communication. Difficult experiences could motivate additional study, practice, correction, or greater willingness to communicate. Others remained concerned that limited vocabulary might affect future professional readiness, particularly because they associated STEM-related careers with strong English communication. These findings show that vocabulary difficulty extended beyond immediate classroom performance. Rahma et al. (2025)

reported that technical vocational students viewed English-speaking ability as relevant to career readiness, while Risanti et al. (2025) found that students associated English with future careers and professional preparation. Pabro-Maquidato (2021) similarly documented fear of negative feedback alongside coping through reading, writing, dictionary use, and openness to correction.

3.4 Composite Essence of the Lived Experience

The composite essence centered on a gap between what students understood or wanted to communicate and what they could confidently express in English. Unfamiliar vocabulary slowed comprehension, restricted spoken and written expression, reduced participation, and exposed students to possible judgment. Formal, technical, public, and time-pressured situations intensified the experience, while patient guidance, peer assistance, respectful correction, and familiar-language support made it more manageable. Across participants, weakness, pressure, challenge, persistence, and possible growth coexisted. Through Moustakas' (1994) transcendental phenomenological framework, the composite essence integrates the shared textural and structural dimensions of the participants' experiences while retaining differences across individuals. Namsaeng and Thuratham (2025) found that speaking anxiety could occur regardless of performance level and that vocabulary knowledge, formal speaking demands, and anxiety interacted in complex ways. This supports the finding that students' experiences resulted from the interaction of vocabulary difficulty, academic conditions, social exposure, and self-confidence rather than vocabulary knowledge alone.

3.5 Context-Responsive Vocabulary Support

3.5.1 Academic Vocabulary Access and English Expression

The findings supported vocabulary preview, clarification language, guided digital resources, research and EAPP vocabulary support, clearer assessment language, sentence guides, oral rehearsal, and planned movement from Filipino or Taglish toward English. These inputs address unfamiliar technical terms and help students who understand concepts but experience difficulty organizing and expressing them in English. Within Moustakas' (1994) phenomenological approach, these proposed inputs were derived from participants' lived experiences and coping practices rather than predetermined assumptions. Montante (2025) reported improvements in vocabulary knowledge, comprehension, writing, engagement, and retention through explicit teaching, peer instruction, repeated exposure, contextual activities, writing, and technology. However, the proposed inputs in the present study remain recommendations and have not yet been tested as interventions.

3.5.2 Safe Relationships and Personalized Vocabulary Growth

The findings emphasized respectful correction, peer assistance, sufficient response time, low-pressure practice, teacher patience, and opportunities to ask questions without ridicule. Personalized approaches such as vocabulary records, self-study resources, digital tools, reading, media exposure, and teacher consultation were also proposed because participants differed in their preferred coping strategies. These findings indicate that language support should address both vocabulary development and emotional safety. Supportive interaction may encourage students to continue participating despite errors, while flexible strategies allow different learners to use resources appropriate to their needs. The framework therefore avoids treating limited vocabulary as a uniform experience requiring a single intervention.

3.5.3 STEM Academic and Career Readiness

The findings also supported vocabulary activities connected with college, research communication, workplace English, and professional communication. Students may practice explaining STEM concepts, presenting research findings, responding to questions, and using technical vocabulary in authentic academic and career-related situations. This component reflects participants' concerns about the future significance of English vocabulary. The proposed system therefore connects present vocabulary development with higher education, research defense, employment, and professional communication. The broader framework integrates academic vocabulary access, expression and participation, supportive relationships, personalized growth, and STEM academic and career readiness through coordinated teacher collaboration, learner feedback, monitoring, and flexible implementation.

3.6 Theoretical, Practical, and Policy Implications

3.6.1 Theoretical Implications

The findings show that limited vocabulary was experienced differently depending on the academic task, required language, audience, relationships, and available support. Meaning-making was also central because participants interpreted the same type of difficulty as weakness, challenge, preparation, or opportunity for improvement. Coping included translation, Tagalog or Taglish, help-seeking, digital resources, independent practice, correction, participation, silence, and temporary avoidance. These results support a contextual understanding of vocabulary limitation rather than treating it solely as an individual deficit. The experience developed through the interaction of linguistic demands, emotional responses, academic identity, relationships, coping strategies, and future goals.

3.6.2 Practical Implications

The findings suggest that vocabulary support should be integrated into STEM, EAPP, Practical Research, mathematics, science, and other learning areas. Teachers may introduce essential technical terms, provide clearer explanations, allow preparation time, use sentence guides, support appropriate use of Filipino or Taglish, provide respectful correction, and offer varied ways for students to participate. These practices recognize that difficulty expressing an answer does not necessarily indicate absence of knowledge. Flexible vocabulary support, emotionally safe interaction, digital tools, peer assistance, and guided independent learning may help learners organize meaning, maintain participation, and gradually strengthen communication.

3.6.3 Policy Implications

At the school level, vocabulary development may be treated as a shared responsibility across subject areas. Coordinated planning, common clarification practices, assessment-language review, respectful communication policies, teacher development, and regular monitoring were identified as possible institutional responses. Implementation should remain flexible and responsive because the proposed support inputs have not yet been tested as an intervention. Overall, the findings support a shift from viewing limited English vocabulary solely as an individual weakness toward understanding it as a context-dependent learning concern influenced by instruction, relationships, emotional safety, and academic demands. Coordinated and supportive school practices may help Grade 12 STEM students remain engaged while developing greater comprehension, expression, confidence, participation, and readiness for future academic and professional communication.

4. Conclusion & Recommendations

The study concluded that self-perceived limited English vocabulary among Grade 12 STEM students was a context-dependent challenge affecting comprehension, expression, participation, confidence, and selected academic and social interactions. The difficulty intensified during formal, technical, public, and immediate English communication but became more manageable through teacher guidance, peer support, clarification, familiar-language use, digital resources, and independent practice. Participants viewed their vocabulary limitations as weakness, pressure, challenge, preparation, or an opportunity for improvement, while the shared essence of their experience reflected their continuing effort to remain academically and socially engaged despite difficulties expressing themselves confidently in English.

Limay Senior High School may implement coordinated vocabulary support across English, EAPP, Practical Research, mathematics, science, and other relevant learning areas. Teachers may introduce essential academic and technical terms, provide sufficient response time, use sentence guides and rehearsal, allow Filipino or Taglish as temporary support, encourage respectful correction, and provide flexible opportunities for participation. Students may also use personal vocabulary records, digital resources, peer assistance, teacher consultation, reading, and regular practice. The proposed BRIDGE-STEM Context-Responsive Vocabulary Support Framework may serve as a guide for these initiatives, while future studies may evaluate its effectiveness and examine similar experiences across other strands, schools, grade levels, and educational settings.

The study was limited to ten Grade 12 STEM students from Limay Senior High School who were purposively selected based primarily on their self-perceived limited English vocabulary. Consequently, the findings reflect the lived experiences of this specific group and context and are not intended for broad statistical generalization. Moreover, the proposed BRIDGE-STEM Context-Responsive Vocabulary Support Framework was developed from qualitative findings and has not yet been tested as an intervention; therefore, its effectiveness requires further implementation, evaluation, and refinement.

5. Compliance with ethical standards

The study was conducted in accordance with the ethical requirements of the University Research Ethics Board and the Data Privacy Act of 2012 (RA 10173). Participation was voluntary, with written parental or guardian consent and student assent secured for minors. Participant confidentiality was protected through pseudonyms or codes, secure data storage, and restricted access to research records. Participants were informed of their right to withdraw, decline to answer questions, or request the removal of recorded information without penalty, while appropriate safeguards were observed during interviews to protect their privacy, dignity, and well-being.

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