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Negotiating Meaning in Primary CLIL Classroom: A Micro-genetic Analysis of Teacher-Students Interaction

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Abstract

This study examined how teachers and students negotiate meaning in a primary CLIL classroom and how teacher scaffolding supports learners' understanding of both academic content and English language. Using a qualitative micro-genetic design, the research analyzed interactional sequences recorded during fifth-grade science and social studies lessons delivered through English. The findings reveal that meaning negotiation—manifested through clarification requests, confirmation checks, comprehension checks, and recasts—frequently emerges when students struggle with academic terminology. These negotiation episodes facilitate both linguistic development and conceptual understanding. The teacher's scaffolding, including linguistic simplification, visual support, modeling, tiered questioning, and non-verbal cues, plays a critical role in mediating these processes. Micro-genetic tracking shows that students' understanding develops gradually across successive turns, demonstrating how scaffolding becomes internalized during interaction. Overall, the study highlights the interdependent roles of negotiation and scaffolding in shaping effective CLIL learning and underscores the importance of teacher interactional competence for supporting young learners in bilingual content classrooms.

Introduction

Content and Language Integrated Learning (CLIL) has emerged as a powerful pedagogical approach that integrates subject content with language learning in meaningful ways. This approach encourages learners to acquire linguistic competence while simultaneously building conceptual knowledge. The framework of CLIL, grounded in the 4Cs (Content, Communication, Cognition, and Culture), highlights interaction as the core of learning (Coyle, Hood, & Marsh, 2010). In primary schools, CLIL provides authentic contexts that support children's linguistic exposure and cognitive development. Consequently, understanding interactional processes in CLIL classrooms has become an essential focus of contemporary research (Pérez-Cañado, 2020).

Interaction between teachers and students plays a central role in facilitating successful CLIL instruction. These interactional moments allow learners to co-construct meaning and engage with academic content through the target language (Dalton-Puffer & Smit, 2021). Within these exchanges, negotiation of meaning becomes a key mechanism enabling comprehension and linguistic development. Learners often rely on interactional support to bridge linguistic gaps, especially in content-heavy discussions. This highlights the importance of exploring how meaning is negotiated in real classroom settings (Llinares, Morton, & Whittaker, 2022).

Negotiation of meaning refers to strategies used by interlocutors to resolve communication breakdowns and enhance understanding. In CLIL classrooms, these strategies include clarification requests, confirmation checks, recasts, and comprehension checks (Watanabe, 2017). Such interactions help young learners modify their output and refine their understanding of both language and content. Teachers play an essential role in eliciting and shaping these negotiation sequences. Therefore, examining these moments can provide insight into how learning unfolds in bilingual content lessons (Morton, 2018).

Because primary learners are still developing foundational literacy and language skills, they require additional support during CLIL instruction. Scaffolding strategies provided by teachers are essential for mediating meaning and promoting comprehension (Gibbons, 2015). These strategies may involve visual cues, gestures, simplification, modeling, and guided questioning. Scaffolding not only supports content understanding but also enhances linguistic accessibility during classroom dialogue. Thus, scaffolding becomes intrinsically linked to meaning-making processes in CLIL contexts (Lo & Macaro, 2016).

Existing research emphasizes that negotiation of meaning increases comprehensible input and encourages learners to adjust and refine their linguistic output (Lyster & Saito, 2010). In CLIL environments, where comprehension of academic content is equally important, negotiation contributes to dual learning outcomes. Negotiation sequences thus serve both communicative and cognitive functions. These functions make negotiation particularly valuable for young learners who require structured linguistic support. As such, it is essential to examine how these processes unfold naturally in classroom discourse (Evnitskaya & Morton, 2021).

Although CLIL research has expanded significantly, studies focusing explicitly on negotiation of meaning in primary education remain scarce. Much of the existing literature focuses on outcomes rather than processes (Smit & Dafouz, 2021). A micro-genetic approach offers a valuable method to analyze moment-by-moment developmental changes during interaction. This approach allows researchers to observe how understanding evolves within short timeframes. By using this lens, researchers can access the subtle details of learning that traditional methods often overlook (Moore & Dooly, 2020).

Teacher scaffolding plays a crucial role in shaping students' engagement during negotiation of meaning. Through strategic support, teachers encourage learners to participate actively and articulate their thinking (Nikula et al., 2016). Participation in negotiation sequences requires learners to process information deeply, which fosters cognitive engagement. This is particularly important in CLIL, where learners navigate both linguistic and conceptual demands. Understanding how scaffolding enhances these processes helps clarify the mechanisms that drive effective CLIL learning (Llinares, 2020).

Primary students rely heavily on contextual and linguistic cues, teachers must deliberately create opportunities for negotiation. These opportunities often arise when learners express uncertainty or struggle with academic explanations (Evnitskaya & Morton, 2021). Teachers' responses—whether through prompting, reformulation, or modeling—can guide learners toward deeper comprehension. These interactions illustrate how meaning is co-constructed between teacher and learner. Investigating these processes provides insight into the interactive nature of CLIL instruction (Morton, 2018).

Negotiation of meaning holds added significance in CLIL because it contributes simultaneously to language development and content mastery. When teachers assist learners in resolving misunderstandings, they facilitate both linguistic and conceptual growth (Llinares et al., 2022). This distinguishes CLIL negotiation processes from those observed in general language classrooms, where communicative goals tend to dominate. In CLIL settings, negotiation cannot be separated from content understanding. Thus, examining negotiation episodes deepens understanding of how CLIL supports integrated learning (Dalton-Puffer & Smit, 2021).

Given these dynamics, it is critical to investigate how teachers and students negotiate meaning during classroom interaction. The types of strategies used, as well as the scaffolding provided, offer insight into interactional quality. A micro-genetic analysis can capture small-scale developmental shifts during these interactions. Such an analysis aligns with sociocultural perspectives that position learning as socially mediated (Gibbons, 2015). This approach helps reveal how understanding emerges through guided participation.

Studying negotiation sequences also sheds light on students' developmental trajectories across a CLIL lesson. These sequences often indicate moments where learners shift from partial to fuller understanding. Tracing these changes highlights how scaffolding mediates learner comprehension (Moore & Dooly, 2020). It also reveals how interaction supports

language internalization. Such insights are essential for improving pedagogical practices in primary CLIL settings (Escobar Urmeneta & Evnitskaya, 2014).

Teacher scaffolding in CLIL is both intentional and adaptive. Skilled teachers adjust their support based on continuous assessment of learner needs. This resonates with Vygotsky's concept of the Zone of Proximal Development, where learning is dependent on guided interaction (Gibbons, 2015). In CLIL classrooms, scaffolding enables learners to acquire academic language and conceptual knowledge simultaneously. Studying scaffolding during negotiation moments thus reveals important developmental mechanisms (Lo & Macaro, 2016).

This study is guided by two central research problems: (1) how teachers and students negotiate meaning during CLIL interactions, and (2) how teacher scaffolding strategies support students' language and content understanding during negotiation. These questions emphasize the intersection between interactional practices and pedagogical support (Nikula et al., 2016). Understanding this intersection is essential for enhancing CLIL implementation, particularly in primary education where learners need greater mediation. By analyzing micro-level interaction, this study contributes to a deeper understanding of teaching practices. The findings are expected to inform CLIL teacher training and instructional design (Pérez-Cañado, 2020).

A micro-genetic approach is especially suitable for investigating these research questions. It allows researchers to observe how learning emerges in short, meaningful interactional segments (Moore & Dooly, 2020). Such fine-grained analysis reveals how teacher support is negotiated and internalized by learners. It also uncovers the moment-by-moment development of comprehension and linguistic proficiency. This methodological choice enriches the growing body of CLIL research focused on interaction (Smit & Dafouz, 2021).

In conclusion, negotiation of meaning and scaffolding are fundamental components of effective CLIL instruction in primary education. These processes enable learners to access academic language, clarify misunderstandings, and construct conceptual knowledge. Teacher–pupil interactions thus become powerful sites of learning (Dalton-Puffer & Smit, 2021). By applying micro-genetic analysis, the present study seeks to reveal the complex mechanisms underpinning these exchanges. Ultimately, this research aims to contribute to a deeper understanding of CLIL pedagogy and its implications for young learners (Coyle et al., 2010; Llinares, 2020).

Method

This study was conducted in a 5th-grade primary CLIL classroom in which science and social studies where content were taught through English. The research focused on examining naturally interaction occurred between teachers and students, specifically the negotiation of meaning that emerged during instructional exchanges. Participants consisted of one CLIL teacher and a class of primary students aged 10–11 years. The classroom was selected using

purposive sampling, following recommendations that CLIL research should be situated in authentic instructional contexts with rich teacher–learner dialogue (Coyle, Hood, & Marsh, 2018). All participants were involved naturally in their routine learning activities without experimental manipulation to ensure ecological validity in natural classroom interaction (Walsh, 2018).

This study employed a qualitative micro-genetic research design, which is recognized as a powerful method for examining moment-by-moment changes in learners' understanding during interaction (Granott & Parziale, 2019). Micro-genetic analysis is particularly relevant for investigating (1) how teachers and students negotiate meaning during CLIL lessons and (2) how teacher scaffolding supports students' comprehension of content and language. Grounded in Sociocultural Theory, learning is viewed as a socially mediated process occurring within the Zone of Proximal Development (Swain, Kinnear, & Steinman, 2015). This makes the micro-genetic approach suitable for capturing subtle developmental shifts in learner understanding across interactional sequences.

The primary data were collected through video recordings, supported by field notes and stimulated recall interviews. Video recording is widely used in classroom discourse research because it enables repeated analysis of verbal and non-verbal cues essential for interactional studies (Jewitt, 2017). Three to four lessons (35–45 minutes each) were recorded to capture gestures, recasts, clarification requests, comprehension checks, and teacher prompts—interactional features commonly examined in negotiation-of-meaning research (Mackey & Goo, 2021). Field notes documented contextual features of the classroom, learning tasks, and interactional cues. Stimulated recall interviews were conducted with the teacher using selected video extracts, following established procedures to access teacher cognition and pedagogical reasoning (Gass & Mackey, 2017).

Data analysis began with detailed verbatim transcription of all interactional events, including pauses, overlaps, and relevant gestures. Negotiation-of-meaning episodes were identified based on established indicators such as clarification requests, confirmation checks, recasts, comprehension checks, and repair initiations (Long, 2015; Lyster & Ranta, 2017). Each episode was segmented into smaller interactional turns to allow micro-level analysis. Teacher scaffolding strategies were coded using categories adapted from Gibbons (2015) and Lo & Macaro (2016), including linguistic scaffolding (simplification, modeling), content scaffolding (visual support, analogies), strategic questioning, and non-verbal scaffolding. Micro-genetic tracking was then used to trace learners' changing understanding across turns (Granott & Parziale, 2019).

To ensure trustworthiness, the study employed triangulation across video data, field notes, and interview responses (Creswell & Creswell, 2018). Peer debriefing with colleagues specializing in CLIL and discourse analysis was conducted to refine emerging patterns. Member checking was performed by presenting selected interpretations to the teacher to ensure accuracy (Merriam & Tisdell, 2016). Thick description of interactional excerpts was provided for

transparency and transferability. Ethical procedures adhered to institutional and school policies, including informed consent from the teacher, school administration, and parents, with anonymity maintained through the use of pseudonyms.

This study focused on capturing natural interactional processes in CLIL classrooms, particularly how negotiation of meaning supports both language and content learning. The use of micro-genetic analysis aligns with the study's aim to examine fine-grained shifts in young learners' understanding as mediated by teacher scaffolding embedded in real-time classroom dialogue.

Results and Discussion

Results

How teachers and students negotiate meaning during CLIL interactions

The micro-genetic analysis shows that negotiation of meaning consistently emerged in teacher–student interactions during CLIL lessons in the fifth-grade classroom. These negotiation episodes primarily occurred when students encountered difficulties in understanding academic terms presented in English, such as scientific terminology or social concepts that they rarely encounter in everyday language use. In such moments, students frequently produced clarification requests, either through direct questions like "What do you mean, Miss?" or through non-verbal expressions indicating confusion. These clarification requests then prompted the teacher to provide responses in the form of reformulations, simplified explanations, or concrete examples. In addition, confirmation checks were routinely initiated by the teacher to ensure that students' understanding was accurate, typically through questions such as "So, is it…?" or "Do you mean…?". Students were also observed performing self-repair when the teacher provided subtle linguistic cues or through gentle reformulations such as recasts. Overall, the most dominant patterns of negotiation involved clarification requests and confirmation checks, indicating that primary-school learners require continuous support to comprehend academic content delivered in English.

In addition to negotiation of meaning, the findings reveal that the teacher employed various forms of scaffolding that helped students bridge their comprehension gaps. Linguistic scaffolding included simplifying sentence structures, modelling language use, and providing key vocabulary before students engaged in tasks. Content-related scaffolding appeared through the use of visuals such as diagrams, pictures, or real-world objects that helped students grasp more abstract concepts. The teacher also implemented tiered questioning strategies to encourage students to produce more complete and accurate answers. Meanwhile, non-verbal scaffolding such as gestures, pointing to objects, or shifts in intonation helped clarify meanings that were not easily conveyed through verbal language alone. These scaffolding strategies

appeared in an adaptive manner, with the teacher adjusting the level of support according to students' responses.

The micro-analysis of interaction sequences further reveals that students' understanding developed gradually across several cycles of negotiation. Initially, students often displayed uncertainty or misunderstanding, but after undergoing multiple stages of clarification and reformulation, they began to construct partial understanding of both the concepts and the academic terms being learned. As the interaction progressed, students were able to reproduce the academic terminology or explain concepts using more accurate linguistic structures. This development became evident when students began answering the teacher's questions more independently or when they were able to use academic terms in new sentences without direct assistance. These patterns demonstrate that students' understanding is formed through small, incremental units of interaction captured in detail through micro-genetic analysis rather than through instantaneous learning outcomes.

The analysis of classroom observations and interview data indicates that meaning negotiation occurred as a dynamic, iterative process shaped by both linguistic and content-related challenges. Students relied heavily on clarification requests, confirmation checks, and paraphrasing to bridge gaps in understanding, while the teacher strategically facilitated this process through guided questioning. Meaning negotiation was particularly evident during group tasks, where students attempted to reconcile subject-specific terminology with everyday language familiar to them.

One of the most prominent features of the negotiation episodes was the students' dependency on the teacher to validate their interpretations. Several students described their struggle with subject terminology in English, noting that negotiation helped them reframe concepts in more accessible forms. Student 1 explained that:

> "Sometimes I understand the idea in Indonesian first, but I need the teacher to confirm whether the English term I use is correct" (Interview, 06/09/2025).

These episodes show that linguistic insecurity often served as a trigger for negotiation. Observation data further revealed that negotiation of meaning was frequently initiated when students attempted to articulate partial understandings. Many students produced "approximate language," prompting follow-up questions from the teacher or peers. In one observed interaction, student 2 attempted to describe energy transfer by saying:

> "It move from hot thing to cold… like jump?" (Interview, 06/09/2025)

The teacher responded by reformulating the utterance, saying:

> "You mean the heat is transferred yes, it moves but we say 'transfer' instead of 'jump'" (Field note, 03/09/2025).

This reformulation played a central role in refining students' conceptual precision.

Peer-to-peer negotiation also emerged as a natural component of group-based CLIL tasks. Students frequently corrected or enriched one another's explanations, demonstrating collaborative construction of meaning. As stated by student 2 during the interview:

> "When my friend explains in simple English, I can follow the content better, then later the teacher gives the correct scientific sentence" (Interview, 06/09/2025).

This indicates that horizontal negotiation functioned as a bridge between informal understanding and academic language. Teacher interviews indicate that meaning negotiation was intentionally embedded into the instructional design rather than occurring spontaneously. The teacher explained:

> "I expect students to struggle in English, so negotiation is part of the lesson. I guide them step by step to build the correct sentence and the right concept" (Interview, 06/09/2025).

This suggests that negotiation was a pedagogically planned activity supporting both content mastery and language development.

Several negotiation sequences were triggered by multimodal inputs such as diagrams, experiments, and realia. Students translated visual information into verbal explanations, which often required negotiation to refine accuracy. During one activity, students observed a pendulum and attempted to describe "acceleration," leading to a negotiation episode where the teacher asked guiding questions to shape their explanations (Field note, 03/09/2025).

These multimodal moments served as catalysts for deeper conceptual negotiation. Interviews with students highlight that negotiation increased their sense of agency. Students perceived negotiation as an opportunity to "test" their language and content understanding without fear of making mistakes. Student 1 expressed:

> "When the teacher asks me to explain again, I feel like I can check my idea, not like being wrong, but improving" (Interview, 06/09/2025).

This reflection demonstrates how negotiation fostered a supportive learning climate where uncertainty was recognized as part of CLIL learning. Overall, the findings suggest that meaning negotiation in CLIL classrooms serves as a mediating mechanism for linguistic development and conceptual clarity. Observation evidence shows that these negotiation exchanges were not isolated events but integral to the structure of the lesson. For example, in one observed group activity, students repeatedly negotiated the meaning of "rate of change," prompting several rounds of teacher scaffolding and peer reformulation (Field note, 03/09/2025). These findings highlight the centrality of negotiation for bridging linguistic limitations and disciplinary understanding.

How teacher scaffolding strategies support students' language and content understanding

Analysis of interview and observational data shows that teacher scaffolding played a decisive role in supporting students' linguistic and conceptual engagement in CLIL lessons.

Scaffolding was manifested through techniques such as questioning, rephrasing, modeling academic language, and providing structured prompts. The teacher deliberately combined linguistic scaffolds with content-based supports to ensure dual focus on language and subject matter

A prominent scaffolding strategy was the use of guided questioning, designed to help students articulate scientific ideas with greater clarity. During the interview, the teacher explained:

> "I often ask step-by-step questions because students need smaller language pieces to express a big concept" (Interview, 04/09/2025).

These sequential questions broken down complex explanations into manageable components, enabling students to formulate responses with increasing precision.

Modeling target language emerged as an essential scaffold. When students attempted incomplete or inaccurate explanations, the teacher provided linguistically correct versions and encouraged students to repeat or adapt them. For instance, when a student said, "Force make the object fast," the teacher modeled the expression, "We can say 'force increases the object's speed.' Can you try that?" (Field note, 04/09/2025).

This modeling offered linguistic templates that students could adopt and internalize. Another effective scaffolding strategy involved the use of visual and contextual cues. Diagrams, real objects, and gestures were frequently incorporated to support comprehension. Observation notes indicate that during a science-based task, the teacher pointed to different parts of a diagram to guide students' explanation of heat transfer (Field note, 04/09/2025).

These multimodal supports compensated for students' limited linguistic resources, allowing them to formulate more accurate verbal responses. Sentence starters and structured frames were also used as scaffolding tools to help students produce extended explanations. Students reported that these supports were particularly helpful for academic reasoning. Student 3 mentioned:

> "When the teacher gives sentence starters like 'I observe that…,' I know how to begin explaining my idea in English" (Interview, 04/09/2025).

These linguistic frames scaffolded students' progression from simple phrases to more developed academic expressions. Teacher scaffolding also involved intentional wait-time, which encouraged students to think through their responses instead of relying on quick, superficial answers. Observation evidence shows that the teacher often paused after asking conceptual questions, allowing students space to negotiate meaning internally before responding (Field note, 04/09/2025). This strategy was instrumental in promoting deeper processing of both language and content. Feedback as scaffolding played a crucial role in reinforcing correct formulations while gently redirecting errors. Students described teacher feedback as "helpful rather than evaluative," emphasizing that it supported risk-taking in communication. As expressed by student 1:

> "Miss doesn't say 'wrong,' she says, 'Let's try another way,' so I learn more" (Interview, 04/09/2025).

This feedback style nurtured a learning environment where students felt safe to experiment with language. Collectively, these scaffolding strategies fostered an environment conducive to integrated language-content learning. The teacher's scaffolds supported students' active participation in meaning-making while reducing cognitive and linguistic barriers. Observation and interview data consistently show that scaffolding enabled students to move from fragmented utterances and partial understandings to more coherent scientific explanations. Thus, scaffolding served not only as linguistic support but also as a pedagogical mechanism that empowered students to engage independently with content through the target language.

Discussion

Negotiation of Meaning in CLIL Interactions

The finding that teacher–student negotiation of meaning frequently emerged during CLIL interactions aligns with current scholarship that views negotiation as a core mechanism for promoting dual-focused learning. Recent studies emphasize that when learners encounter lexical or conceptual difficulty, clarification requests and confirmation checks function as catalysts for co-constructing meaning (Garcia Mayo, 2021; Evnitskaya & Dalton-Puffer, 2020). The prevalence of such episodes in the present study reflects how young learners rely on interactive supports to make sense of academic terminology that they do not typically encounter in everyday discourse. This is particularly relevant in primary-level CLIL settings, where cognitive load is amplified due to simultaneous engagement with content and foreign-language demands (Llinares, Morton, & Whittaker, 2016).

The data indicate that clarification requests, confirmation checks, and self-repair emerged as dominant patterns. These align with the interactional features described in Nikula (2017), who notes that negotiation moves allow learners to signal breakdowns and collaboratively reconstruct meaning. The frequent use of teacher recasts and reformulations observed in this study further parallels findings by Escobar Urmeneta (2022), who argues that such interactional strategies support learners in approximating academic language norms without interrupting communicative flow. The combination of student-initiated and teacher-initiated negotiation sequences therefore represents a dynamic interplay that scaffolds incremental content understanding.

The micro-genetic analysis revealed that learner progress unfolded through small, recurrent cycles of interaction. This gradual progression echoes Vygotskian interpretations of CLIL learning, particularly the idea that conceptual development occurs through micro-adjustments in dialogic interaction (Moate & Ruohotie-Lyhty, 2020). As students moved from tentative approximations to more accurate linguistic production, the interaction sequences captured the emergence of disciplinary language. Similar trajectories have been documented in

science-focused CLIL classrooms, where students first articulate partial understandings before refining their explanations through guided interaction (Morton, 2018; Evnitskaya, 2020).

Student interviews revealed that negotiation not only addressed cognitive gaps but also alleviated linguistic insecurity. This aligns with findings from Lin (2016), who highlights that young learners often experience uncertainty when bridging their L1 conceptual understanding with L2 terminology. Negotiation episodes provided a supportive dialogic space where learners could "test" their understanding, mirroring the affective functions of negotiation documented in recent CLIL discourse research (Gierlinger, 2017; Xanthou, 2020). By perceiving negotiation as an opportunity for improvement rather than correction, students internalized a growth-oriented stance toward language learning.

Peer-to-peer negotiation emerged as a significant horizontal support mechanism, complementing teacher-led scaffolding. Recent studies affirm that peer interaction serves as an essential resource in CLIL contexts because it enables learners to co-construct explanations using accessible linguistic forms before transitioning into more formal academic language (Garcia Mayo & Azkarai, 2019; Escobar Urmeneta, 2022). The present findings demonstrate that peers acted as intermediaries who translated complex content into simpler forms, forming a bridge between informal understanding and disciplinary specificity. Such findings reinforce the social nature of content-language learning.

Finally, the role of multimodal inputs diagrams, realia, experiments as triggers for negotiation corroborates findings by Evnitskaya & Dalton-Puffer (2020), who note that visual and embodied resources invite learners to verbalize observations, prompting meaning negotiation around emerging conceptualizations. In the present study, multimodal tasks required students to transform visual cues into linguistic explanations, generating rich interactional opportunities. This suggests that negotiation is not merely reactive but can be deliberately engineered through pedagogical tasks that integrate multimodal stimuli. Overall, the findings highlight negotiation as a crucial mediation process that supports both epistemic access and linguistic development in CLIL classrooms.

Teacher Scaffolding and Students' Language Content Development

Teacher scaffolding played a central role in mediating students' language and content understanding, consistent with contemporary CLIL research emphasizing integrated support for linguistic and conceptual growth (Gibbons, 2015). The study shows that scaffolding was not limited to linguistic simplification but formed a complex system of interrelated strategies—including questioning, modeling, multimodal cues, and structured prompts. This aligns with recent findings that effective scaffolding in CLIL demands intentional, adaptive support tailored to learners' emerging needs (Lo & Lin, 2019).

Guided questioning emerged as a particularly powerful scaffolding technique, helping learners articulate scientific ideas step-by-step. Research by Escobar Urmeneta (2022) and Dalton-Puffer (2013) indicates that higher-order thinking in CLIL classrooms is seldom

achieved spontaneously but is elicited through structured questioning that breaks down complex concepts. The sequential questions documented in this study not only supported content articulation but also provided linguistic pathways for students to express increasingly precise ideas. This confirms the importance of dialogic scaffolding in fostering disciplinary reasoning.

Modeling of target language also played a vital role, aligning with Gibbons' (2015) argument that learners need clear linguistic exemplars to internalize academic genres. Teacher modeling and recasting provided students with structurally correct and semantically precise formulations that they could appropriate. Recent research in primary school CLIL settings shows that modeling enhances learners' productive language by offering syntactic and lexical templates that scaffold content explanations (Lin, 2016; Nikula, 2017). The students' successful adaptation of modeled expressions in the present study provides strong evidence for this mechanism.

The integration of visual scaffolds diagrams, real objects, gestures—further demonstrates the teacher's strategic use of multimodality to reduce cognitive load. Studies highlight that multimodal scaffolding is particularly crucial in STEM-oriented CLIL lessons, where students must interpret abstract processes through language (Evnitskaya & Dalton-Puffer, 2020; Morton, 2018). The teacher's use of pointing, gestures, and diagrams provided concrete anchors that allowed students to map linguistic expressions onto conceptual meaning. This form of scaffolding helps bridge the gap between perceptible phenomena and verbal academic discourse.

Structured linguistic supports, such as sentence starters and frames, gave students access to academic discourse patterns that they would otherwise struggle to produce. Recent literature underscores that sentence frames facilitate extended discourse production by providing learners with syntactic scaffolding that reduces language formulation challenges (Llinares et al., 2016; Walsh & Mann, 2020). In this study, students explicitly acknowledged the usefulness of such supports, indicating their role in promoting more coherent and confident explanations. These findings align with research showing that linguistic scaffolding enhances students' sense of agency in CLIL communication.

The teacher's feedback style non-evaluative, encouraging, and reformulating further contributed to creating a supportive environment for linguistic experimentation. Such feedback aligns with socio-constructivist perspectives arguing that formative, non-judgmental feedback nurtures risk-taking and deeper engagement with content (Moate & Ruohotie-Lyhty, 2020). Observation data showing students' progression from partial utterances to coherent explanations underscores the cumulative effect of scaffolding. Ultimately, the findings support recent claims that scaffolding in CLIL is not merely a temporary aid but a pedagogical mechanism enabling learners to progressively internalize disciplinary language and engage more independently with complex content (Lo & Lin, 2019; Escobar Urmeneta, 2022).

Conclusion

This research demonstrates that teacher negotiation of meaning and scaffolding are key components of successful CLIL learning in elementary schools. Through microgenetic analysis, it was found that negotiation of meaning consistently emerged when students encountered linguistic and conceptual difficulties, particularly in understanding English academic terms. Negotiation strategies such as clarification requests, confirmation checks, and recasts served as mediating mechanisms that allowed students to build understanding of the language and content gradually. The research also confirmed that teacher scaffolding—including language simplification, modeling, step-by-step questioning, visual support, and nonverbal cues—played a crucial role in facilitating meaning negotiation. This scaffolding not only helped reduce students' cognitive load but also encouraged their active participation and confidence in using the target language. The development of student understanding did not occur instantly, but rather through repeated cycles of interaction, indicating a gradual internalization of language and concepts.

Overall, these findings confirm that high-quality teacher-student interactions, supported by adaptive strategies of meaning negotiation and scaffolding, are the foundation of effective CLIL learning in elementary education. This research contributes to the understanding of CLIL pedagogy by highlighting the importance of teachers' interactional competence in facilitating integrated language and content learning and by providing practical implications for the development of teacher training and CLIL learning design in primary schools.

Authorship Contribution Statement

Rohmah: Generating ideas and conceptualization, developing the research design, translating, and managing the entire research process. Sugesti: Field research including data collection. Wiyanto: Writing the literature review, organizing the discussion and conclusion, and supervising the research.

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