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Collaborative Analysis as a Pathway to Elementary CLIL Teachers' Talk and Learning

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ABSTRACT
In content and language integrated learning (CLIL) contexts, teacher talk provides learners with valuable input that enhances both language and content comprehension. This case study investigated the pedagogical functions of teacher talk produced by two Taiwanese elementary school English teachers in CLIL classrooms, as well as the impact of collaborative analysis on their professional development. Using thematic analysis of data derived from classroom observations, interviews, video recordings, and teaching materials, three key findings emerged. First, the pedagogical functions of "animating" and "explaining the language of learning" were found to be predominant in the teachers' talk. Second, both teachers found the selection of appropriate language for learning and the use of simplified language challenging. Finally, the teachers considered the collaborative analysis process valuable for critically examining their use of teacher talk. Based on the findings, the researcher put forward a professional development model centered on the collaborative analysis of teacher talk.
KEYWORDS: collaborative analysis, content language integrated learning (CLIL), language of learning, professional learning, teacher talk

Teacher talks in Content and Language Integrated Learning (CLIL), which has been recently implemented to teach academic content and English in elementary schools in Taiwan (Liao, 2020), can provide learners with a substantial amount of input on both English and content knowledge (García, 2017; Lázaro & Mayo, 2012; Martí & Portolés, 2019). Ellis (2015) defines teacher talk as "the special language that teachers use when addressing L2 learners in the classroom" (p. 145). Teacher talk can become comprehensible input for EFL (English as a foreign language) learners (Ito, 2019; Walsh, 2006). However, CLIL teachers tend to use long stretches of teacher talk in a lecture format in presenting the curricular and content knowledge through explaining, describing, or comparing (Dalton-Puffer, 2013; Liu, 2019). Moreover, in CLIL classrooms, teachers introduce the "language of learning" (Coyle et al., 2010), the language necessary for students to understand key concepts related to the subject, by repeating it or displaying it on the board. While previous research highlights the use of visual and audio support in teacher talk to aid comprehension (Escobar Urmeneta & Walsh, 2017; Lin & Lo, 2017; Roiha,

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2014), few studies have examined how teachers use these supports to fulfill the pedagogical functions of teacher talk.

Finding materials appropriate to learners' cognitive development and language proficiency has been challenging for CLIL teachers (Liao, 2020; Moate, 2011a). The scarcity of CLIL specific materials catering to learners' cognitive development and language proficiency often requires CLIL teachers to depend on their teacher talk in the delivery of content to their learners and interaction between teachers and learners, including using body language, offering simple sentence structures, giving synonyms, or providing the translation of difficult words (De Graaff et al., 2007; Evnitskaya, 2018, 2019; Leontjev et al., 2020; Moate, 2011b; Escobar Urmeneta & Walsh, 2017). For this reason, it is paramount that CLIL teachers should be aware of the language and the teacher talk that they use in class and their interaction with learners in order to make the content comprehensible and approachable for their students (De Graaff et al., 2007; Nikula, 2015).

Teacher collaboration should ensure quality and active learning for students, through curriculum development, lesson planning, assessment, and comprehensible teacher talk (Adamson et al., 2023; Alloway, 2013; Bauml, 2014; Zeng & Day, 2019). In line with this, the Ministry of Education in Taiwan (2018) stipulates that English teachers and subject teachers are to collaborate in implementing topic-, project-, and issue-based curricula. However, while some CLIL teachers in Taiwan engage in collaborative lesson planning, they seldom extend this collaboration to the analysis of teacher talk (Chien, 2024). This gap underscores the need for more studies that explore the collaborative analysis of teacher talk in CLIL, a critical area for improving teaching practices and student outcomes (e.g., Nikula, 2010).

Earlier research on teacher talk in CLIL contexts has explored various aspects, such as its types and functions, the use of translanguaging, and questioning strategies in English as a Foreign Language (EFL) settings. However, little attention has been given to the influence of professional development on teacher talk. Recognizing the importance of teacher talk in shaping how content is delivered in CLIL lessons, this study investigates how collaborative analysis between teachers who conducted the lessons and those who observed them impacts the pedagogical functions of teacher talk in CLIL classrooms taught by elementary school English teachers in Taiwan.

Literature Review

Teacher talk in CLIL can be characterized by four features. First, the target language or learners' first language (L1) used by teachers in CLIL lessons affects the interaction in the classroom (Acosta Corte, 2012; Lin & Lo, 2017; Nikula, 2010). Instructors' translanguaging can be used to clear up confusion, improve learners' comprehension, facilitate retention, and emphasize technical terms or concepts related to lesson content (Domalewska, 2017). CLIL teachers' translanguaging in four secondary courses in Austria was used mainly for behavior management, giving instructions, clarification sequences, or conceptual development (Gierlinger, 2015). Hence, CLIL teachers should have language competence in both English and the L1 so they can use both languages as an effective communication strategy in CLIL classrooms (Moore & Nikula, 2016; Morton & Jakonen, 2016; Pistorio, 2009).

Second, CLIL teachers with pedagogical content knowledge must employ appropriate teacher talk tailored to both the content area (Brooke, 2019; Coxhead, 2017; Dalton-Puffer et al., 2018; Nikula, 2015; Watanabe, 2013) and the learners' familiarity with the CLIL language and content (Coxhead, 2017). Finnish CLIL teachers in Nikula (2015) clearly oriented to subject-specific language such as "observing" or "writing down" for chemistry classes and "measuring" and "calculating" for physics lessons. Their learners repeated and recycled teachers' words during the hands-on tasks.

In addition to differences in subject-specific language use, Kang et al. (2010) compared and contrasted the teacher talk given by native English-speaking teachers (NESTs) and Korean teachers in CLIL mathematics and science lessons. Their analysis showed that Korean teachers provided more effective teacher talk for content delivery, offering input that was not only lexically diverse but also included more academic vocabulary and scaffolding strategies. This may be because Korean teachers were more attuned to their students' language proficiency and affective needs, allowing them to support comprehension more effectively than NESTs.

Third, due to learners' limited English proficiency levels, teacher–student interaction in CLIL lessons is often dominated by teacher talk that primarily involves initiating and monitoring discourse (Nightingale & Safont, 2019). This leads to a recitation-style pattern in classroom exchanges, with limited student participation (Nikula, 2002). Additionally, when language becomes the focus of instruction, teachers tend to emphasize its linguistic and semantic features over pragmatic use (Nikula, 2002). Supporting this, Baron et al. (2020), in their analysis of video-recorded CLIL lessons delivered by pre-primary teachers in Spain, found that teachers adopted a more pragmatically direct style of communication. This directness was interpreted as a strategy to scaffold understanding among very young learners with low L2 proficiency.

Fourth, in CLIL classrooms, teachers often employ a range of questioning strategies and dialogic inquiry to simultaneously support content learning and language development. These interactions frequently include incidental feedback, where language-related corrections or clarifications arise naturally during content-focused dialogue (Escobar Urmeneta & Walsh, 2017; Li & Zhang, 2022; Llinares & Pascual Peña, 2015; Nightingale & Safont, 2019; Valverde Caravaca, 2019). However, Llinares and Pascual Peña (2015), in their study of secondary history CLIL classes in Spain, found that most teacher questions primarily elicited factual information, regardless of the discourse genre being taught. This suggests that, despite the potential for dialogic inquiry in CLIL, teacher questioning may still lean heavily toward lower-order thinking prompts. Conversely, Nightingale and Safont (2019) examined the effect of professional development on CLIL teachers' questioning strategies. Before training, CLIL teachers in the study predominantly used display questions. However, following the intervention, two teachers in the experimental group began to ask higher-order questions that prompted students to evaluate and construct procedural knowledge. In contrast, teachers in the control group continued to focus mainly on factual recall related to conceptual knowledge. These findings suggest that targeted training can positively influence the cognitive demand of teacher questions in CLIL classrooms.

These studies collectively highlight how teacher talk in CLIL classrooms is not only central to scaffolding content and language learning but also varies in cognitive and interactional complexity. To further understand the broader pedagogical roles that teacher talk can play, Forman (2012) proposed a functional framework that categorizes teacher talk into six pedagogic functions: animating, translating, explaining, creating, prompting, and dialoguing (see Table 1). These functions reflect the diverse ways in which teacher discourse supports both classroom management and the co-construction of knowledge. This section focuses on animating and translating, which are particularly relevant in classrooms where learners have limited proficiency in the target language. For instance, when teachers read aloud textbook content to students, this is considered an act of animating. Similarly, when teachers translate words or phrases from the target language into the learners' native language (L1), they are performing the function of translating.

Table 1
Forman's (2012) Pedagogical Functions of Teacher Talk

type	definitions
animating	the teacher's oral rendering of written English, which represents for students – particularly in low-tech environments – an opportunity to hear how written L2 actually sounds
translating	occurs when the teacher translates words or phrases from L2 into L1
explaining	can occur in L1 or L2: principally when the teacher provides metalinguistic information concerning the grammar, meaning, usage or culture of the L2 – explaining what is; but also when s/he gives instructions in the classroom – explaining what to do
creating	teacher use of L2 for the purpose of meaning-based communication. It is connected to the notion of 'comprehensible input' which has retained widespread popularity amongst language teacher
prompting	medium-oriented, focusing on language itself
dialoging	message-oriented, concerned with the exchange of meaning

Building on the idea that teacher talk serves distinct pedagogical functions, several studies have explored how teachers can reflect on and improve their own language use in the classroom. One such notable contribution is Walsh's (2006) work, in which he developed three phases of collaborative analysis of teacher talk among eight EFL teachers in Ireland. These teachers first audio-recorded their classes to identify the relationship between their language use and pedagogic purpose. Next, these teachers analyzed their teacher talk based on the 13 interactional features of Walsh's (2006) Self-Evaluation of Teacher Talk (SETT). Finally, participants were interviewed to examine their classroom interaction in their teacher talk. Walsh (2006) concluded that the three phases of collaborative analysis enabled teachers to make a more detailed analysis of their use of language in relation to their pedagogical goals.

Previous studies on CLIL teacher talk have explored issues, such as translanguaging (e.g., Domalewska, 2017), types of teacher talk (e.g., Coxhead, 2017; Nikula, 2015), questioning strategies (e.g., Llinares & Pascual Peña, 2015; Valverde Caravaca, 2019), or function roles of teacher talk (e.g., pedagogical, affective, management)(e.g., Morton, 2012; Nasir et al., 2019). Limited studies have investigated the pedagogical functions of teacher talk (Walsh, 2006). Therefore, to address this gap in the literature, the present study examined CLIL teachers' collaborative analysis of the pedagogical roles and functions of teacher talk.

Methodology

This study employed a qualitative, exploratory case study design to investigate two elementary schools as individual cases during the 2019 academic year. Each school was treated as a distinct unit of analysis, with clear boundaries defined by its institutional context. As Merriam (2009) explains, a case study involves "an in-depth description and analysis of a bounded system" (p. 40), which aligns with the aim of this research to examine each school within its specific setting. The analysis of documents, videos, and observations examined the elementary school English

teachers' teacher talk through collaborative analysis as the unit of analysis. This case study addressed the following research questions. First, what were the pedagogical functions of teacher talk in these two CLIL lessons? Second, what challenges did these teachers face in delivering teacher talk while teaching their CLIL lessons? Third, what were the effects of collaborative analysis of teacher talk for their professional development?

Participants and Setting

A competition on CLIL lesson plans was organized by a municipal Bureau of Education in northwestern Taiwan. Two teachers' lesson plans were selected and recognized as exemplary by CLIL experts. These teachers were then invited to implement their lessons, and the researcher was invited to observe and provide commentary on their teaching practices. Purposeful sampling was adopted, as the study aimed to learn from exemplary practice. This study was approved by the Institutional Review Board of the authors' institution (No. 10903HT021). The researcher explained the purpose of the study to the participants, and informed consent was obtained prior to data collection.

As shown in Table 2, Anna and Sara (pseudonyms) were invited to take part in this study, and they agreed upon their involvement. Both teachers were in their early 50s, were native speakers of Mandarin Chinese, and had 25 years of English teaching experience. While Anna designed and taught a 40-minute lesson on timelines in mathematics to 28 third-graders, Sara taught a 40-minute lesson on landforms in Taiwan to 18 fifth-graders for a social science class. In each case, another 10 teachers observed their teaching and joined the post-observation conferences afterwards.

Table 2
Participants' Demography

schools	teachers	observers	topics in content areas
1	Anna	Abby, Emma, Jane, John, Kate, Lily, Luck, Mary, Ruby, Zoey	timelines in mathematics
2	Sara	Beth, Dave, Elsa, Gina, Jack, Leah, Lucy, Ruth, Tina, Vera	landforms in social science

Data Collection

The researcher explained the purpose of the study to the participants, and they subsequently signed consent forms indicating their willingness to participate. Data collection consisted of documents (lesson plans, self-evaluations of teacher talk), video recordings of the CLIL lessons, field notes on post-observation conferences, and interviews. All data sources were used to address the first research question concerning the pedagogical functions of teacher talk. Interviews specifically informed the second and third research questions, which focused on the challenges of delivering teacher talk and the effects of collaborative analysis on teacher talk as a form of professional learning. Additionally, observations were employed to answer the third research question.

Anna and Sara completed lesson plans on the topics and content areas and taught their lessons, as shown in Table 2. Each lesson lasted for forty minutes and was recorded for later analysis and transcriptions. During the post-observation conferences, ten observing teachers analyzed and discussed the lessons based on Forman's (2012) six pedagogical functions of teacher

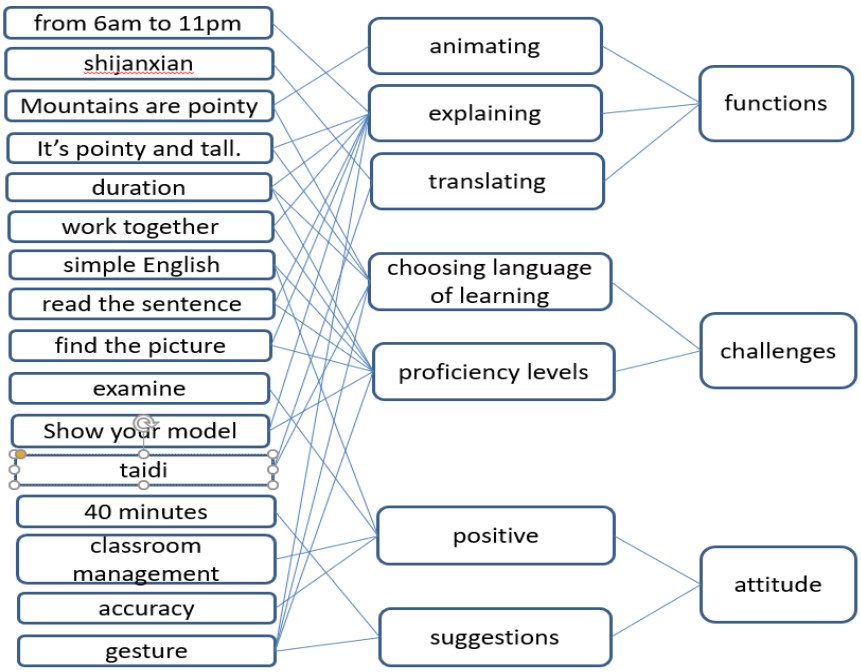
talk. The researcher conducted both observations and took field notes. Each observation lasted for forty minutes.

Two semi-structured focus group interviews were conducted in Mandarin Chinese, one at each participating school (see Table 2 for participant details). These focus groups allowed teachers to discuss specific issues related to teacher talk. The interview protocol, informed by similar empirical studies (e.g., Tulung, 2008), consisted of two parts. The first part included five questions related to teachers' design and attitudes toward teacher talk, such as "What were your purposes of teacher talk?" The second part included two questions focusing on participants' attitudes toward the collaborative analysis, such as "How did you feel about the collaborative analysis of the teacher talk?" Each focus group was conducted at the end of the post-observation conferences and lasted approximately two hours. All interviews were audio-recorded and transcribed for subsequent analysis.

Data Analysis

All the data were analyzed inductively and thematically in the following stages (Merriam, 2009). The data were first read holistically, and tentative codes (e.g., It's pointy and tall, duration, classroom management) were assigned to meaningful segments (see Figure 1). The coding process combined inductive and theory-informed approaches. Many codes emerged directly from the data, while others, particularly those related to teacher discourse functions, were informed by the framework of Forman et al. (2012). These initial codes were then grouped into emerging themes (e.g., explaining, choosing language of learning, positive), which were further organized into interpretive categories such as functions, challenges, and attitudes. Finally, broader patterns were identified in relation to the research questions.

Figure 1
Data Analysis



To enhance the validity and trustworthiness of the research, the data analysis was validated through member checking, peer reviews, and triangulation. First, triangulating data sources can also strengthen the credibility (Merriam, 2009), and data collected in this study included documents, observations, interviews, and videos.

Next, preliminary data analysis was shared with two teacher participants, Anna and Sara, for member checking. They reviewed the researcher's interpretations, confirmed their accuracy, and offered additional feedback. These two were selected due to their active involvement in the study and availability during the analysis phase. Moreover, the validity of the data analysis was further ensured through peer review, which involved discussions with two colleagues regarding the study's methodology, the consistency of the findings derived from the raw data, and the preliminary interpretations. Both peer review and member checking followed a structured protocol, beginning with an assessment of the logical coherence of the data analysis, followed by the evaluation of alternative interpretations, and concluding with a critique of the coding process and theme identification.

Results

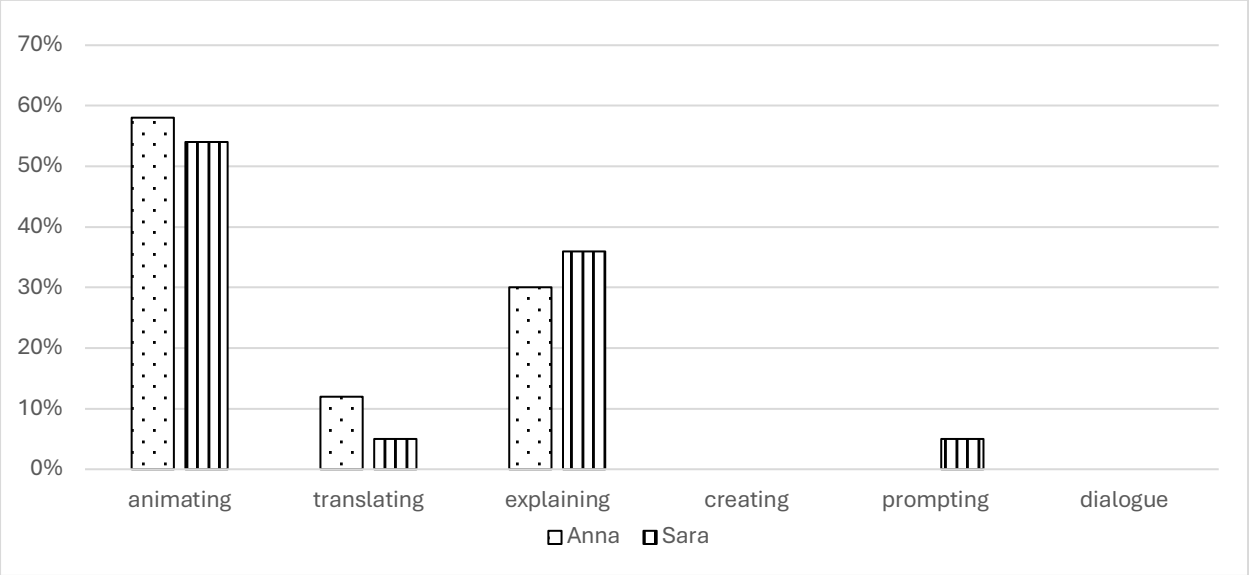
Based on the data analysis of documents, videos, interviews, and observation field notes, issues were discussed in terms of pedagogical functions of teacher talk, challenges on teacher talk faced by CLIL teachers, and teachers' attitude toward collaborative analysis on their teacher talk.

Pedagogical Functions of Teacher Talk

As revealed in Figure 2, the most salient pedagogical function of the teacher talk in these two CLIL classrooms was "animating," followed by "explaining." "Creating" and "dialogue" were not observed in these two classrooms. While "prompting" was infrequently observed in Sara's classroom and absent in Anna's classroom, "translating" and L1 was used to a limited extent in these two classrooms.

Figure 2

Pedagogical Functions of Teacher Talk



Excerpt 1 illustrates Anna's teacher talk on the language of learning the word "timeline." Anna thought that this was the first time for her students to have heard the word. She employed a teaching aid in the form of a "timeline" to illustrate the concept of a timeline.

Excerpt 1: Anna's Teacher Talk on Timeline (Video Anna 01)

Anna: Let's take a look at this one. (Walks to the desk). I will give each group a timeline. Do you know what a timeline is? Maybe it's your first time to hear the word timeline? (Holds a string as a timeline) from 6 am to 11 pm. In Chinese, we say "shijianxian." I will give you sticky notes like this. Go home. Go to bed. Have a lunch time. You can take it off and paste it on your timeline. Is it good to go to bed at 4 pm?

Students: No.

Anna: No. How about 10 pm?

Students: No.

During the interview, Anna evaluated her own teacher talk as follows:

> On my self-evaluation, "timeline" as the language of learning for my CLIL instruction, I only said the word for animating, used the teaching aid in the form of a "timeline" to explain the term, and used Mandarin Chinese "shijianxian" for timeline as "translating." I did not think I created the opportunities or dialogue for my students to use this term "timeline. (Anna interview 01)

Anna's choices of pedagogical functions of teacher talk "animating," "explaining," and "translating" on the language of learning were strongly influenced by her pedagogical content knowledge and her learners' target language competence. Anna thought that she made the language of learning salient by repeating or displaying.

Sara taught her lesson almost entirely in English and she said, "The content was easy. I taught the lesson in English." Sara said in the interview regarding her self-evaluation, "I used the pedagogical functions of teacher talk in terms of animating, explaining, and translating. I was not sure if I really used to prompt though." Sara assumed that CLIL instruction is supposed to be carried out almost entirely in the target language. Moreover, classroom interaction was typically dominated by her with her animating and explaining language of learning.

Excerpt 2 illustrates Sara's pedagogical function in animating based on her lesson plan as in Figure 3. She used the landform map to review the word "mountain." Sara said the word and sentences with actions, and her students repeated the words after her.

Excerpt 2: Sara's Animating (Video Sara 01)

Sara: Now let's read Taiwan's landforms map. Mountains are pointy.

Students: Mountains are pointy. (Makes a pointy action.)

Sara: Mountains are tall. (Makes a tall action.)

Students: Mountains are tall.

Figure 3
Sara's Lesson Plan

Procedure	Time	Resources	Teacher Talk
Presentation	3'	Book: Looking at Landforms	What do you see?
1. The teacher reads the book, such as			
. Mountains are tall.			Is it tall? Is it pointy?
. Mountains are pointy.			
2. The teacher asked questions such as			Have you ever climbed a mountain?
. What do you see?			
. Is it tall? Is it pointy?			
. Have you ever climbed a mountain?			Do you know any mountain in Taiwan?
. Do you know any mountain in Taiwan?			
. Right, that's Jade Mountain.			
3. Students try to answer as follows:			
"A Mountain."			
"Yes, it is."			
"Yes."			
"Yes, 玉山"			

Sara used explicit instruction on the language of learning, language needed for learners to access basic concepts relating to the subject topic, by giving explanations of language of learning with actions. Her use of pedagogical function of teacher talk "animating" was served to teach subject-specific language and deliver content knowledge, so her learners can echo and recycle the words.

As shown in Excerpt 3, when Sara first used the PowerPoint slide on mountains, she read aloud the rap "It's pointy and tall." She asked her students what "pointy" is, but her students did not know the answer. Sara used actions and gestures for explaining the word "pointy" first as well as "tall" and "short."

Excerpt 3: Sara's Explaining (Video Sara 02)
Sara: (Shows the PPT slide on mountain.) It's a mountain. It's pointy and tall. What is pointy?
Students: (no answer)
Sara: (Makes an action) It's pointy. What's tall?
Students: Gao
Sara: (Makes an action.) Tall. (Makes an action). Short.

Sara prepared her teacher talk in a way that it is not beyond her learners' proficiency levels. She had to use body language or simple sentence structures as ways to cater to learners when words might be too difficult for them.

Sara used teaching aids and Mandarin Chinese to explain what a basin is when her students did not know the meaning, as illustrated in Excerpt 4. Sara showed her students a real washbasin and told them its L1 name as "pen." So her students shouted out the Chinese phrase "pen di" for basin.

Excerpt 4: Sara's Translation (Video Sara 03)
Sara: (Shows the PPT slide on basin.) It's a basin. What's a basin?
Students: (no answer)
Sara: (Shows a washbasin.) It's a basin. Pen.

Students: Pen di.

Due to learners' limited command of the target language, Sara resorted to realia and the L1 to explain the language of learning. Such an interplay of actions, realia, and translation facilitated her learners' to understand the meaning of "basin," the language of learning of this lesson.

Sara prompted her students to do show-and-tell on their Lego model of a Taiwan landform, as exemplified in Excerpt 5. When Sara's students did not know how to use English for presenting, she guided them to say "This is…" Students from Group 1 were able to say "This is mountain" after her prompting.

Excerpt 5: Sara's Prompting (Video Sara 04)
Sara: Now Group 1, come and show your model.
Students: (Bring their Lego model.)
Sara: Say, "This is…"
Students: This is mountain.
Sara: Very good.
Sara: This is…
Students: This is mesa.

Challenges Teachers Faced in Teacher Talk

In this study, the teachers faced two major challenges in giving teacher talk in their CLIL lessons, as identified through responses to the interview question: 'What problems or challenges did you feel when you gave pedagogically-functioned teacher talk?' First, the teachers had to decide which language of learning for each content area should be taught in class and to use the language of learning accurately. The word "duration" and "from time A to time B" should be chosen for the language of learning for Anna's timeline lesson, but Anna said in the interview, "I did not teach the word 'duration' for the language of learning. I did not plan to teach the sentence patterns 'from A to B.' But in fact, it was accurate for learners to express themselves by saying, 'I watch TV from 8 to 9 rather than 'I watch TV at 8 and 9." Observer-teacher Jack said, "Language of learning for each content area may vary. I have to check which language of learning I should emphasize in my CLIL class." Sara said, "My lesson focused on Taiwan's major landforms and their characteristics. I struggled to use simple sentences and adjectives to describe the features of the five landforms, like calling mountains 'pointy' and 'tall' instead of referring to them as 'elevated portions of the Earth's surface.'"

Second, the teachers had to use the language at learners' English proficiency level for their teacher talk. Sara said, "When I designed my lesson plans, I did not include all teacher talk. When I taught in class, I realized that it was not easy to use simple English to explain the language of learning, concepts, and directions on completing the task." Anna struggled to use simple English to explain the timeline and duration, as mentioned earlier. She also said, "It was hard for me to explain the timeline, duration, and the concept of going from A to B."

Effects of Collaborative Analysis on Teacher Talk as Teachers' Professional Development

Participants regarded collaborative analysis of teacher talk, conducted during semi-structured focus group interviews, as an avenue for professional development. Collaborative analysis serves as the means for teachers to examine their own teacher talk. Observer-teacher Elsa said, "I can know which pedagogical functions of my teacher talk can be used for classroom management and which ones can be used for teaching the language of learning." Anna said, "The collaborative analysis led me to examine what pedagogical functions of teacher talk I employed

and the missing functions. Maybe I can try to integrate that kind of pedagogical functions into practice."

As shown in Excerpt 6, teachers such as Abby, Emma, John, and Kate were able to identify the pedagogical functions of Anna's teacher talk, particularly animating and translating. Kate identified "creating" as the missing pedagogical function of Anna's teacher talk, and Anna agreed with Kate and decided to try to integrate such a function into her future classroom practice.

> Excerpt 6: Anna's Post-Observation Conference (Anna observation 01)
> Abby: The first pedagogical function is animating. I think Anna's teacher talk was animating. I heard the term several times in the video.
> Emma: I agreed with Abby. Did Anna use L1 as translating? I did not find it in the video.
> John: Yes. Occasionally. I heard the Chinese translation from the video.
> Kate: I think so. I did not think her teacher talk functioned as creating. She did not give her students to use the term for oral presentation.
> Anna: I did not. Maybe I could try to include tasks for learners' oral production.

Participants made two suggestions on the collaborative analysis on teacher talk. First, limited time for collaborative analysis was the biggest problem. Dave said,

> "We only have limited time on collaborative analysis. I do not think that we can analyze the whole 40-minute video. Maybe we can first try to analyze only a small portion of the 40-minute lesson, such as warm-up or presentation."

Second, participants were not all familiar with certain pedagogical functions of teacher talk, such as "explaining" or "prompting" as illustrated in Excerpt 7. More explanations or examples should have been provided. Tina said, "The teacher trainer can introduce each pedagogical function of teacher talk with an example. So it will be clearer for me to analyze the teacher talk."

As displayed in Excerpt 7, Tina was not sure about the pedagogical function of "explaining." Jack, Leah, and Ruth tried to explain to Tina about this function. Sara herself said that she was explaining the activity.

> Excerpt 7: Sara's Post-Observation Conference (Sara observation 01)
> Tina: Sara said, "Read the sentence and find the picture. Match the picture to the sentence." Is it explaining or prompting? I am confused and not sure.
> Jack: I think it's explaining. When a teacher uses the language to introduce an activity, the language is used for explaining.
> Leah: I think so. The pedagogical function of teacher talk in explaining can be used to provide metalinguistic information concerning the grammar or meaning.
> Ruth: When teachers give instruction and explain to students what to do.
> Sara: Yes. I am explaining.
> Tina: I see.

Collaborative analysis of teacher talk and discussion, as shown in Excerpt 7 in this study provided CLIL teachers with opportunities to reflect on their talk in their classrooms. This helps them enhance their teacher talk and to plan and implement it more effectively in their lessons.

Discussion

This case study collected observation field notes, interviews, videos, and documents to analyze the pedagogical functions of the teacher talk delivered by two Taiwanese English teachers

in CLIL classes and the influence of collaborative analysis on their professional learning. Based on the research questions, data analysis, and overarching themes, three major issues were identified regarding teacher talk in CLIL lessons: implementation, design, and delivery of teacher talk, as well as collaborative analysis of teacher talk.

Implementations of Pedagogical Functions of Teacher Talk in CLIL Lessons

Regarding the first research question concerning the pedagogical function of teacher talk, the amount of the teacher talk on animating and explaining on the language of learning outnumbered other types of pedagogical functions. Such a finding is in accordance with empirical studies showing that a large proportion of teacher talk in CLIL lessons is used for lesson introduction, explanations, and facilitating learners' comprehension (Ito, 2019; Watanabe, 2013). CLIL teachers are required to demonstrate pedagogical content knowledge in contextualized language instruction of the language of learning in order to facilitate learners' awareness of and recycling of the language of learning in content areas (Ito, 2019; Morton, 2015). Pedagogical functions of teacher talk can instantiate their pedagogical content knowledge on CLIL in drawing their learners to engage in the content areas (Kang et al., 2010; Moate, 2011a). Such analysis can gain teachers' and researchers' attention on the quality and quantity of teacher talk to find out how teacher talk can effectively facilitate learners' learning of content areas and develop learners' better comprehension and use of subject-specific concepts and content in communication (Evnitskaya, 2018; Kang et al., 2010).

CLIL educators can guide learners, either implicitly or explicitly, to recognize the language of learning through techniques such as exemplification, definitions, or visualization, thereby utilizing the pedagogical function of explanation (Brooke, 2019; Pistorio, 2019). The visualization used by CLIL teachers, along with vocabulary explanations can serve as mediational means for developing learners' conceptual understanding and language learning (Leontjev & deBoer, 2020; Morton, 2015).

No teacher talk was given on the pedagogical functions of dialoguing and creating. Specifically, these two CLIL teachers did not guide their learners to engage in pushed output by actively producing both the language of learning and the associated content knowledge, which is closely related to the function of "creating." CLIL teachers are expected to stimulate learners' content processing and learning of oral and written input (De Graaff et al., 2007). To ensure learners comprehend the input, teachers can design hands-on tasks, such as pushed output productions, to actively check their understanding (De Graaff et al., 2007; Valverde Caravaca, 2019). Teachers and learners engage in negotiations and collaborate to accomplish goals (Nasir et al., 2019; Nikula, 2015). These hands-on tasks are meaning-oriented and content-driven, so they provide learners with opportunities to use and learn subject-specific language and knowledge (Nightingale & Safont, 2019; Nikula, 2015).

Designs and Delivery of Teacher Talk in CLIL Lessons

In response to the second research question, choosing the language of learning for the content areas and using simple teacher talk to explain and introduce it to their learners was regarded as challenging for these two CLIL teachers due to their learners' limited English proficiency. In general, CLIL teachers are required to have the competence to teach content areas in the target language, which differs from regular English language courses. Hence, CLIL teachers need subject knowledge (common content knowledge or specialized content knowledge) and language

(common language knowledge or specialized language knowledge) (Ito, 2019; Moate, 2011b; Morton, 2018). CLIL teachers' choice of teacher talk and language of learning are crucial to facilitate their learners' participation in classroom interactions or comprehension of the content being taught and learned (Nasir et al., 2019).

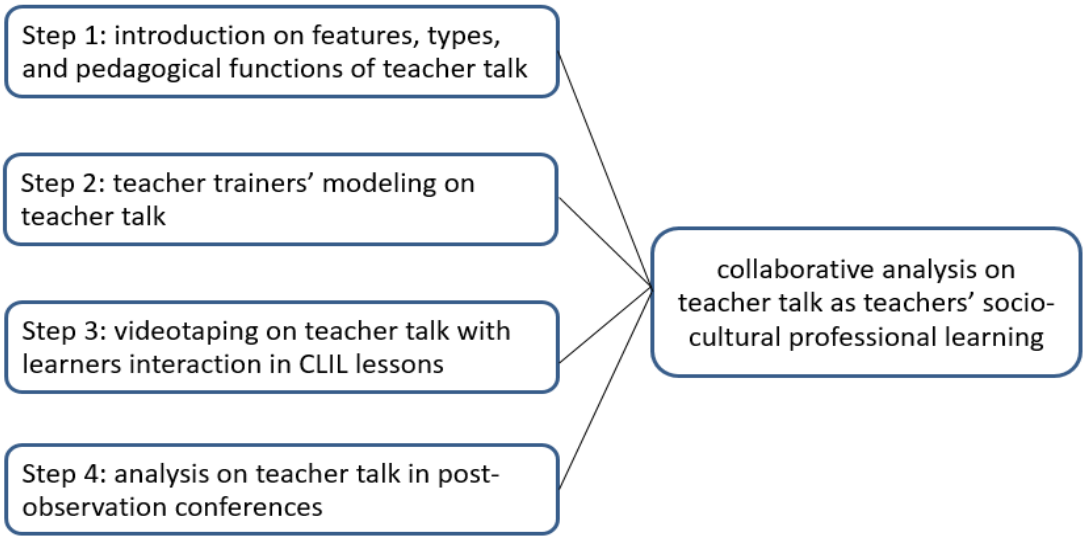
In this study, while CLIL teachers like Anna and Sara prepared their teacher talk to some extent, it is recommended that they carefully align it with their learners' target language proficiency levels to enhance effectiveness. This preparation involves adjusting the complexity of their language, selecting appropriate vocabulary and sentence patterns, and structuring their explanations to ensure that learners can both understand the content and engage with the language in a meaningful context, according to their level of language ability. Such teacher talk can be planned or used spontaneously to ensure it provides useful input for learners' acquisition and appropriate technical terms and concepts related to the lesson content and teaching objectives (Domalewska, 2017; Escobar Urmeneta & Walsh, 2017).

Collaborative Analysis on Teacher Talk as Professional Development

Regarding the third research question, participants regarded the collaborative analysis as useful in examining teacher talk. Teachers can be aware of the classroom discourse, monitor their teacher talk, and modify their talk and classroom practice in order to achieve their goals of CLIL instruction (Dalton-Puffer, 2007; Escobar Urmeneta, 2013).

Collaborative analysis of teacher talk benefits CLIL teachers such as Anna and Sara in this study. CLIL teachers benefit from working collaboratively on analyzing the pedagogical functions of their teacher talk. Collaborative analysis as a means of professional development is a more systematic and planned manner in raising teachers' awareness of designing and delivering CLIL lessons with teacher talk, so they can make the content and language of learning comprehensive and approachable to their learners (Nikula, 2015). In order to effectively integrate collaborative analysis into CLIL teachers' professional learning and to equip them with competence in teacher talk, a model was proposed based on Vygotsky's (1978) sociocultural theory, Johnson and Golombek's (2016) concept of mediation in teacher professional development, and relevant empirical studies (e.g., Moate, 2011b; Walsh, 2006), as illustrated in Figure 4. Central to sociocultural theory is the idea that language is fundamental to the learning process. In this context, teachers' interactions with peers during collaborative analysis, as well as their interactions with students in CLIL lessons, can be regarded as forms of talk. Such talk, grounded in social relationships, serves both as "a medium for teaching and learning" and as "one of the materials from which a child constructs meaning" (Edwards & Mercer, 1987, p. 20). Through social interaction and the use of artifacts, such as the collaborative analysis of teacher talk, teachers can learn to teach more effectively, internalize new knowledge, and refine their instructional strategies. This model therefore reflects how collaborative analysis acts as a mediating tool, linking social interaction with professional growth, as demonstrated in the findings of this study.

Figure 4
Collaborative Analysis on Teacher Talk as CLIL Teachers' Professional Learning



Collaborative analysis on teacher talk as part of CLIL teachers' sociocultural professional learning and development can be carried out in the following four steps. First, pedagogical functions of effective teacher talk should be introduced to CLIL teachers. Second, teacher trainers should model different types of teacher talk to CLIL teachers. Third, teacher talk should be videotaped for analysis. Finally, teachers can work in groups to analyze an assigned portion of videos during post-observation conferences. The use of recorded videos and evaluation of teacher talk are considered as useful professional development and learning tools for CLIL teachers. These tools can raise awareness of the pedagogical functions of teacher talk and teachers' interaction with their learners in their CLIL instruction (Escobar Urmeneta & Walsh, 2017).

Conclusion

This study analyzed the pedagogical functions of the teacher talk delivered by two Taiwanese English teachers in CLIL classes and the influence of collaborative analysis on their professional learning. This study produced the following three major findings. First, teacher talk of these two CLIL teachers was used mainly for animating and explaining the language of learning and class activities. Second, the biggest challenge on design and delivery of teacher talk was choosing the language of learning and using simple English. Third, participants regarded collaborative analysis as a useful professional development.

Based on the findings of this study, a professional development model on CLIL teacher talk is proposed and displayed in Figure 5. Such a model can shed light to guide language teacher trainers and education programs to enable CLIL teachers to collaboratively reflect on their classroom practice, particularly on teacher talk. This study also adds to the limited research that examines the pedagogical functions of teacher talk in CLIL lessons and calls for the need to encourage teachers to improve their quality of teacher talk.

Two major limitations require mention. First, it was a small-scale investigation of two CLIL teachers' teacher talk, so the findings might not be able to be generalized to all CLIL teachers in EFL (English as a foreign language) context. However, the triangulation of the data provided

detailed descriptions of these two teachers' pedagogical functions of teacher talk. It is recommended that future studies consider a large group of participants and post-observation conferences, so that the conclusions drawn from this study can be confirmed in other education contexts.

Second, this study explored the teacher talk in two content areas, mathematics and social science. Future research will benefit from collecting data from a wider range of CLIL subjects in the elementary school levels.

Author contribution

The corresponding author is the sole author of this manuscript and was responsible for data collection, data analysis, and preparation of the entire manuscript.

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Ethical Consideration

This study was approved by the Institutional Review Board of the authors' institution (No. 10903HT021). The researcher explained the purpose of the study to the participants, and informed consent was obtained prior to data collection.

Data Availability Statement

Data are available from the author upon reasonable request.

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Conflicts of interest

The authors declare no conflict of interest.

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