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A CORPUS ANALYSIS OF TEACHER-LED ENGLISH QUESTIONS IN TAIWAN SECONDARY CLIL CLASSROOMS

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ABSTRACT

Teacher-led questions are paramount when teachers seek to impart knowledge and ensure students understand the subject. They help teachers to guide meaningful interactions, make their students more active and influence their thinking, reasoning and participation. Surprisingly, however, there has been little research on analysing teacher questioning in Content and Language Integrated Learning (CLIL) classrooms in Asian EFL contexts at the secondary level. Therefore, our study aimed to analyse the frequency and types of questions used by CLIL teachers in Taiwanese classrooms, believing that this would help us understand teacher-student interaction and scaffold our teaching, students' learning and content learning. A corpus of 1,405 minutes from 39 CLIL lessons was collected and analysed. The results show that teachers use display, referential and confirmation checks in CLIL classrooms, raising doubts about achieving intended pedagogical goals and challenging learners' cognitive development. Teacher gender, learner level and course duration also significantly influence the questions used in the classroom. The pedagogical implications of the research are to raise CLIL teachers' awareness of the importance of questioning, translanguaging, L1/L2 translation and multimodalities to support better interactive discourse in CLIL classrooms and to provide adequate professional development for CLIL practitioners on classroom questioning skills to facilitate interaction, participation and deeper learning.

Key words: teacher-led questions, CLIL, bilingual education, professional development (PD), Chinese-speaking context

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INTRODUCTION

Teacher-led questions are essential for teaching and student comprehension. Questions from teachers help assess students' thinking and reasoning and affect classroom involvement. They can also help teachers facilitate meaningful relationships (Doiz & Lasagabaster, 2023). They can assist them in engaging students and influencing their thinking, reasoning, and engagement (Chin, 2007). They support scaffolding so teachers and students can co-construct knowledge for improved learning. These factors will promote deep learning by influencing students' thinking and reasoning (Coyle & Meyer, 2021). Few studies have examined the effects of asking students questions in secondary CLIL classes (Lasagabaster, 2023). CLIL settings where English is learnt as a foreign language (EFL) require teachers and students to engage in classroom discourse in an L2 they are unfamiliar with, which puts more pressure and re-adaptation on them than in L1-dominated instruction scenarios because they must re-co-construct conceptual knowledge in a language they don't know. In L1- or L2-dominated classrooms, teacher-led questions enhance students' subject understanding. Researchers should examine how changes in instructional language impact pedagogical objectives and classroom practices (Sánchez-García, 2020).

Teachers' English competence and comfort with using English to teach topics, indeed, may affect question-and-answer discussions. The two basic sorts of this discourse are authoritative and dialogic. Authoritative discourse is when the teacher transmits knowledge and expects single words from students. Asking questions leads to predefined, lower-order cognitive responses. The teacher corrects incorrect responses and says the correct ones. Thus, teachers are expected to utilise both authoritative and dialogic discourse since they have benefits. However, in contrast, constructivist dialogic discourse enables students to explore and discuss, boosting higher-order cognitive skills. Dialogical interaction involves many student responses, and the teacher stays neutral to avoid evaluation. When a pupil answers, the teacher elaborates. High levels of teacher dialogue improve academic performance (Lasagabaster, 2023).

Yet, teachers' questioning types in rapidly-growing CLIL contexts like Taiwan are still rarely documented. Hence, our study examined the frequency and type of CLIL teachers' questions in Taiwan, a CLIL emerging setting, to better understand teacher-student interaction and scaffold our teaching, learners' learning, and content learning because they influence students' thinking and reasoning and encourage participation, which leads to quality teaching. To be specific, we would like to answer the following two questions:

1. What are the common teacher-led question types (TLQC) in Taiwan secondary CLIL lessons?
2. Are there any significant variances in TLQC under the variables of teachers' gender, students' grade level, teaching subject, course duration, and subject type?

LITERATURE REVIEW

Assessing Students with Teacher-Led Questions in CLIL Classes

CLIL should consider learners' equal growth in its 4Cs pedagogy (content, communication (language), cognition, and culture) and assess language and content equally as a dual-target method (Massler et al., 2014). Teachers' questions in a CLIL classroom can be viewed as formative assessment. Content assessment is necessary since most CLIL models prioritise content (Lo, 2022). Assessing content achievement in a foreign language can be difficult for target language input, output, and cognition. Assessment of cognitive demands should match learners' age-related capacities and not beyond their worldview (Huang, 2021). Teacher-led questions in CLIL classrooms (TLQC) can help students develop a sense of self and otherness, social inclusion, peer recognition, community belonging, sensitivity to criticism, and interdependence. CLIL teachers must provide a psychologically safe environment and familiar oral tasks, consider learners' interests or preferences, prepare them for success and progress, and provide positive experiences and friendly feedback to help them maintain enthusiasm, creativity, and motivation for deeper learning. Accordingly, TLQC should be adaptable to accommodate all

levels; learners' responses should be evaluated cautiously, and different measures should be employed to obtain the whole picture of learners' performance (Huang, 2021). Thus, CLIL teachers should acknowledge the inextricable link between language and content and the importance of language in classroom performance (Lo, 2022).

Shaw (2012) and Shaw and Iman (2013) examined how biology, geography, and history topics impose language demands on students and what L2 proficiency they need to answer questions. Their findings suggest that learners' poor performance is mostly due to content understanding, whereas L2 proficiency can help them approach exercises and questions better. This shows how language design and scaffolding help students convey their ideas (Lo, 2022). Students must openly meet linguistic demands to respond to instructions and implicitly express their ideas to perform well (Shaw, 2012). Thus, studying TLQC design and how it affects learners' replies is crucial.

A large-scale study by Lo (2022) and Lo and Fung (2020) examined linguistic and cognitive demands in Hong Kong CLIL courses. They used Bloom's taxonomy (Bloom, 1956) to create a 3 x 3 framework (recall, application, and analysis in cognitive skills; vocabulary, sentence, and text in linguistic dimensions) (Lo & Lin, 2014) to investigate CLIL written questions' linguistic and cognitive demands. They collected data from junior (science) and senior (biology) secondary CLIL textbooks and biology entrance exams. The better the pupils' grades, the more questions required analytical and higher-order thinking and textual responses. The cognitive, receptive, and productive language demands of different queries varied greatly as the demands moved from lower to higher levels. Increasing cognitive demand decreases pupils' overall performance, while increasing linguistic demand decreases their performance. CLIL written and spoken exercises present cognitive and linguistic challenges for learners of all levels and subjects. These obstacles rise as students go to higher grades and public exams, which require more language and cognition than classroom tests (Lo, 2022). Thus, CLIL teachers should scaffold language and cognitive skills to enable students to answer various questions (Lo & Lin, 2014).

Lo's (2022) and Lo and Fung's (2020) research illuminated the complexity and interplay of linguistic and cognitive demands in CLIL

assessment research. Still, most of their research focuses on summative and formative assessments, especially CLIL practitioners' verbal questions in CLIL classrooms (TLQC) and their embedded cognitive discourse functions (CDFs) (Dalton-Puffer, 2013, 2016). Oral questions in CLIL courses are believed to encourage L2 and content knowledge interaction and co-construction more than written ones. TLQCs, like CDFs, can measure CLIL students' academic language competency (Morton, 2020).

Verbal communication in CLIL classrooms is easy to spot. Participants' (teachers and students) verbalisations make learning content "intersubjectively accessible and represent knowledge objects through processes and epistemological stances" (Dalton-Puffer, 2016: 29). If teachers balance language and literacy development in CLIL education, verbal communication can help students demonstrate, communicate, and manipulate their content knowledge using academic language functions (Dalton-Puffer, 2013) and make formative CLIL assessment more focused and transparent (Morton, 2020). Our strong theoretical foundation helps us analyse verbal difficulties in CLIL classrooms in our research.

Questions Linking Classroom Discourse and Teaching

Proper questioning can enhance classroom communication and assist teachers reach learning goals (Sánchez-García, 2020). If CLIL teachers understand how classroom talk can promote learners' cognitive and linguistic development and use classroom verbal questions effectively, they not only fulfil the functions of questions but also teach students to think, achieving pedagogical goals. Sánchez-García (2018, 2020) examines the correlation between instructor questioning methods, educational aims, and cognitive demands in Spanish and English lectures. The analysis of 16 lectures by the same two university teachers in Spanish and English found no direct correlation between interaction and questions; eliciting questions were infrequent and teachers' questions were mostly unanswered. Teachers' teaching and discursive approaches and students' traits affected questions. Bilingual and monolingual courses have different questions according to student variety. She concludes

that teachers' use of questions should be better used for pedagogical reasons and that teachers must be aware of how questions affect their teaching and students' learning.

Using Sánchez-García's (2020) question taxonomy, Doiz and Lasagabaster (2023) examined teachers' questions in a university EMI environment. Their study found that teachers used instructional or content question types more often than regulative questions, focusing on classroom content rather than procedural or off-task issues. They also tried different questions to urge students to elaborate and stimulate critical thinking and meaningful discussion. In L2, students need more time to react, so training courses should strengthen teachers' interactional abilities and encourage them to wait longer for student responses. Personalised language and methodological training should also be explored because teacher questioning approaches differ significantly (Doiz & Lasagabaster, 2023).

Another study examined if CDFs help EMI history students learn skills (Doiz & Lasagabaster, 2021). The results demonstrate that EMI professors deploy complicated discourse functions to shape classroom communication. This strategy achieves communication aims and grows students' historical literacy. They (Doiz & Lasagabaster, 2021) also admit that teachers must alter CDFs and question types when disciplines shift since two prior research projects focused primarily on history, emphasising the significance of studying classroom discourse in other topics. This led to cross-discipline-related question-type research (Lasagabaster & Doiz, 2022). Across the three disciplines, lecturers asked confirmation check, display, referential, and self-answered questions in order from high to low, resulting in less learner participation. Their study, which agrees with Hu and Duan's (2019), found that teachers in Spain and China ask factual questions about lower-order thinking skills but underestimate argumentation and problem-solving questions. Teachers should offer more difficult questions to engage pupils and test their cognition.

Chang (2012), Dafouz and Sánchez-García (2013), and Lo (2014) have studied the types of questions asked by different disciplines in EMI classrooms at collegiate and secondary levels. The first two research projects found more parallels than variances in questioning across disciplines. In soft sciences, teachers' queries and students'

answers were longer than in hard sciences. Unfortunately, the corpus of classes they studied is relatively small, making comparing disciplines (subjects) and other variables challenging. Yet, in an interesting study by Pun and Macaro (2019), late EMI schools in Hong Kong, where EMI was implemented after years of Chinese Medium Instruction (CMI) with less exposure to English and more use of L1 in the classroom, have more interactive learning and use high-order questions, while early EMI schools with years of English exposure have low-order questions and monologic class interaction. If teachers want to ask cognitively challenging questions and develop higher-order thinking in EMI classrooms, instructional language flexibility is important.

In contrast to content-based CLIL mode, i.e., EMI (English Medium Instruction) situations, only some equivalent studies were done in language-driven CLIL classrooms, likely because soft CLIL classrooms allow both L1 and L2 but hard CLIL (EMI) contexts only allow English (L2). According to Llinares and Pascual Peña (2015), teachers in CLIL history classrooms often use factual inquiries, which typically elicit shorter and simpler responses than other categories. They recommend that CLIL teachers build linguistic awareness of different subject genres and then urge students to participate orally in genres according to their academic and linguistic levels. Valverde Caravaca (2019) found that most classroom interactions in Spanish CLIL programmes only involved responding to display questions with lower-order cognitive skills, so they tested question types to improve learners' higher-order thinking and learning outcomes. They found that CLIL teachers could accommodate students' low- and high-order thinking after training on effective questioning. Likewise, in another European context, Menegale (2008) claims that most Italian CLIL lessons were teacher-led and teacher-directed, with repetitious, planned questions. After teaching CLIL teachers to elicit oral output, they could ask more diverse questions to encourage CLIL learning, boost student participation, and improve learning outcomes. They also advocate for a longer reaction time since CLIL learners face 'double hurdles' while answering in an unfamiliar language. Thus, Perez Canado et al. (2021) recommended a significant CLIL initiative to diversify CLIL practices in European countries. CLIL learners' CDFs

and mixed abilities must be considered while teachers design questions to assess them from many directions.

Currently, most research on CLIL question types focuses on European or Asian ESL (English as a second language) contexts where CLIL has been carried out for decades, with no studies using Sánchez-García's (2020) or other expanded corpus frameworks in Chinese-speaking CLIL secondary classrooms where English is still learnt as a foreign language and CLIL education is still in its infancy stage (Yang, 2023). Our research aims to fill the gap in the literature on TLQC in Asian CLIL settings by answering what questions CLIL secondary teachers use and whether gender, grade level, subject, course duration, and subject type are significant in emerging Asian EFL CLIL contexts.

RESEARCH METHODOLOGY

Research Context

Taiwan's 2030 bilingual policy has rapidly led schools in Taiwan to implement bilingual education at various levels, and the CLIL approach has been experimentally promoted at the secondary level. As a result, government-initiated projects to follow CLIL education can easily be found posted by central or local education authorities. University professors have then been appointed to supervise the teaching performance of CLIL teachers. Typically, the supervision or guidance involves three phases: co-preparation, observation and discussion of the designated CLIL teaching in the school. Classroom observation usually plays an important role in evaluating the teaching effectiveness and efficiency of CLIL practices, which provides university professors with an opportunity to understand how CLIL teacher preparation is properly considered, how the CLIL approach is contextually implemented, and how bilingual education is carried out in Taiwanese classrooms.

These classroom observations or demonstration lessons were videotaped. These experimental CLIL implementations came from a MOE-sponsored bilingual project in some subject areas. The CLIL classroom observations and supervision were carried out by a team

led by a university professor and his colleagues, who supervised 117 primary and secondary schools across the island. They proposed a FERTILE model (i.e., flexibility, environment, role modelling, time, instructional strategies, learning needs analysis and differentiated instruction, and stakeholder involvement) to implement bilingual education in Taiwan (Lin, et al., 2023). As CLIL is being promoted at an early stage but is expanding in Taiwan (Yang, 2023), the domains and subjects used for CLIL education are still limited, mainly in the domains of art, technology, health and physical education, and integrative activities, termed as operation-based lessons. These 'non-testing domains or operation-based lessons' are not tested in formal assessments and are therefore more suitable for CLIL teaching experiments than the 'testing domains or lecture-based lessons' such as Chinese language, English language, mathematics, sociology or science.

Typically, when a school joins the bilingual project, the support team would spend time and effort working with the school's teachers to train the teachers, prepare the CLIL teaching materials, review the lesson plans, observe the actual or demonstration teaching, review the performance and provide feedback for future improvement. Although effective questioning by CLIL teachers is usually a critical topic in many CLIL training programmes, little is known about the types of questions CLIL practitioners ask to promote learners' deeper thinking in the classroom.

Corpus and Analysis

At the time of research (i.e., 2023)[1], we collected all publicly accessible 39 videos of CLIL lessons from 39 secondary school teachers without any deletions, all uploaded by the supervising team of the secondary school CLIL project led by one professor in Taiwan (Lin, 2025) and freely available on YouTube for watching and downloading. Based on Taiwan MOE requirements, these CLIL lessons were collected from four major non-testing domains, including Performance Arts, Science and Technology, Integrative Activities, and Health and PE. Since all these CLIL lessons were implemented and monitored by the previous MOE project and the

supervising team, the procedures of observation, video recording, teaching, video editing and finally uploading followed the same patterns. While recording, the camera always faced the teachers, so teacher-led questions were precisely recorded to ensure clear quality and accurate transcription. In addition, teacher-led questions were not the primary emphasis of the supervising team in this MOE project (CIRN, 2023), so we can assume that the teachers did not pretend to ask questions, and thus, the questions asked would happen more naturally. All the above measures were taken to ensure internal consistency, replicability, and transparency of the data (Sui, et al., 2022), thus mitigating potential observer effects and selection bias when the data source mainly came from YouTube.

The total length of the videos is 1,405 minutes. Each video was transcribed into English using AI software (Taption). This software allows us to watch the video and its transcripts simultaneously to assess and correct the transcribed texts accordingly. We then exported all the transcripts into Word files for further question identification within the texts. The researcher and the research assistant worked together to search for and highlight all questions in the transcripts by locating the question mark generated by Taption. Usually, the questions beginning with wh- (where, when, how, what, etc.), auxiliary verbs (such as do, does, did) or be verbs (such as are, is, were) are easily identified by the software. Once the questions were identified, according to the time lapses on each transcript marked in the margins, the research team rewatched the videos to reconfirm the noted questions and to manually locate the questions without the previous keywords (e.g., tag questions), most of which were asked for confirmation with a rising intonation, such as 'You like art, don't you?' or 'You mean it's ...., right?' All questions were clearly marked.

We then used Sánchez-García's (2016, 2018, 2020) framework of questions validated and used in EMI classrooms to categorise the types of questions asked by teachers in the CLIL classrooms. In bilingual education, EMI can be seen as a strong version of CLIL (i.e., hard CLIL), with the difference that it is implemented at different levels of education, namely at tertiary level for the former and mainly at primary and secondary level for the latter (Kao, 2022). The types of questions include two main categories: instructional questions

related to content and regulatory questions related to classroom management, and the subcategories of each are shown in Figure 1. This question taxonomy is supposed to contain a complete combination of frequent discourse features in bilingual classrooms (Dafouz & Sánchez-García, 2013; Sánchez-García, 2016).

Figure 1

Classification of Questions in CLIL Classroom (Sánchez-García, 2016, 2020)

Instructional questions	
Display	Those to which the answer is known by the teacher
Referential	Those to which the answer is not known by the teacher
Repetition	Those seeking for the repetition of the last word, idea, utterance, etc.
Language	Those seeking for assistance as regards language matters
Confirmation checks	Those which aim at ensuring the audience's understanding of the topic/lecture
Retrospective	Those which make the audience go back in time to revise something
Self-answered	Those which are immediately answered by the teacher, preventing other participants from providing any responses
Rhetorical	Those to which no answer is expected
Indirect	Those which are embedded in the discourse and are not uttered to get a response, but to exemplify some situation
Regulative questions	
Procedural	Those which refer to the development of the lesson and do not focus on the content/language, but on the lecture itself or a particular activity
Off-task	Those which make reference to a topic that departs from the main subject

First, the trained research assistant coded the question types on all the transcripts using a designed form to record the frequency and examples of texts. Then, one of the researchers followed the same procedure for coding 20% of the data. Any disagreements or confusion were discussed, and a consensus was reached among the research team. The inter-coder reliability is 92%. Next, all the data (frequencies and variables) were imported into the statistical software EXCEL and SPSS. In addition to the descriptive analysis, whether the participants' demographical variables, such as gender, grades they taught, nature of subjects, and class duration, may have impacts on the types of questions posed by CLIL teachers but rarely explored by the previous works, the t-test or analysis of variance (ANOVA) was carried out. A multiple regression analysis was also carried out to determine the structure of the relationships between question types and these variables. The results will be discussed in the following sections.

RESULTS AND DISCUSSION

Types of Questions Asked in English by Secondary CLIL Teachers

Table 1 presents the descriptive statistics on gender, year level, type of subject and duration of teaching of these 39 secondary school teachers. Of these teachers, 74.4% were female and 25.6% were male. Most of these courses, about 54%, were offered to students in grade 7, 28.2% were provided to students in grade 8, and almost 18% were offered to students in grade 9. Concerning the nature of the courses, 84.6% were classified as operation-based (mainly involving physical movements) and 15.4% as lecture-based (mainly involving teacher talk). The duration of these lessons was classified into three groups; the label 'short' means that the lesson lasted less than 20 minutes and six out of 39 lessons (15.4%) were in this group. 51.3% of the classes were longer than 40 minutes and were labelled as the 'long' group. The other 13 classes, about 33.3%, were conducted for 20-40 minutes and were designated as 'medium'.

Table 1

The Demographical Variables of Participants (N=39)

Variable		N	%
Gender	female	29	74.4
	male	10	25.6
Grade Level	Grade 7	21	53.8
	Grade 8	11	28.2
	Grade 9	7	17.9
Nature of Subject	Operation-based	33	84.6
	Lecture-based	6	15.4
Class Duration	Short (<20 min.)	6	15.4
	Medium (20-40 min.)	13	33.3
	Long (>40 min.)	20	51.3

The frequency and types of questions asked by CLIL teachers are shown in Table 2. It shows that the total number of questions posed was 939 and the type of question posed was 'display' with a total of 392 times (41.75%) (e.g,. *Where is the mercury? Please tell me, what is the cause of molecular degeneration? Do you remember who built this building? How many laps should we do? What is the name of a national university in Taiwan? Who can tell me what hand sewing is? If you have a chance to shoot but someone scores, what will you say?*), the second most common type of question is 'Referential' with 254 times (27.05%) (e.g., *If you were to run past me and pass by, what would you do? Have you ever played a game by day? The next question is: What can you do to prevent cataracts? OK, group one, what is your question about monsters? How do you know you're in Turkey? We are fighting with your sister and what about your family? What did you learn in today's scout class?*), and the third most common question is 'confirmation check' with 114 times (12.14%) (e.g., *Do you want to know what this name is or why these two areas are put together? You can tell where the empty area is, right? And now we are going to do two laps in three minutes, okay?*) The frequency of 'Rhetorical', 'Procedural', 'Retrospective', 'Language', 'Indirect' and 'Self-answered' questions ranges from 15 to 43 times and is below 10%. However, the 'repetitive' question was used only two times and none of the teachers used the 'off-task' type of question.

Apparently, due to the arrangement and nature of classroom observations, teachers might feel uncomfortable or intruded upon, and they had also set their timetable to control the progress of the lesson, so these regulative questions relating to timekeeping, classroom rules (off-task question) or the development of the lesson (procedural question) might not be asked or were rarely asked in our corpus. Compared to the other types of questions, the most frequent type of question was the display question, which was mainly related to the content of the lesson and was therefore used to test the students' content knowledge of the lesson.

Table 2

The Frequency and the Types of Instructional Questions

No	Types of Instructional Questions	Frequency	Percentage
1	Display	392	41.75%
2	Referential	254	27.05%
3	Confirmation check	114	12.14%
4	Rhetorical	43	4.58%
5	Procedural	43	4.58%
6	Retrospective	36	3.83%
7	Language	24	2.56%
8	Indirect	16	1.70%
9	Self-answered	15	1.60%
10	Repetition	2	0.21%
11	Off-task	0	0.00%
	Total Questions	939	100.00%

The Formula of Questions Asked in English in a CLIL Classroom

The Pearson correlations between the total questions and each type of question are first examined. It was found that with the exception of the Language, Self-answered, Rhetorical and Off-task question types, the other seven question types were significantly correlated with the total questions (shown in Table 3). These were therefore taken as predictors for the linear regression analysis to

determine the effects of each question type on the total questions and the estimated equation is:

The total question = β_0 + β_1 * *Display* + β_2 * *Referential* + β_3 * *Repetition* + β_4 * Confirmation Check + β_5 * Retrospective + β_6 * Indirect + β_7 * Procedural + e_i

As described in Table 4, the R value is .988 and indicates a good level of prediction. The F-ratio (F_{31}^{7}=187.11) is significant, p=.000 (<.0005), which means that the overall regression model is a good fit to our data. These seven types of questions can explain up to 97.2% of the total variance (adjusted R2=.972). However, the t-value of 'Repetition' question type is .546 and insignificant (p=.589>.05), which means the coefficient is not statistically significantly different from 0. It was found that the multicollinearity statistics (VIF) were all not greater than 10, the largest VIF value is 1.914, so it is determined that the collinearity between the independent variables does not exist and the regression model can effectively predict the dependent variables. It is shown that the six types of questions: Display, Referential, Confirmation Check, Retrospective, Indirect, and Procedural had statistically significant effects on the total number of questions, excluding repetition. The form of the equation for predicting the total number of questions can be taken from Table 5 and is presented below:

The total question = .962 + 1.085 * *Display* + 1.066 * *Referential* + 1.092 * *Repetition* + 1.007 * Confirmation Check + .900 * Retrospective + 1.348 * Indirect + .805 * Procedural

The equation shows that, for example, if the 'Display' question increases by 1, the expected increase in the total number of questions is 1.085 times. An increase of 1 in the 'Referential' question would be expected to increase the total number of questions by 1.066 times, and so on. And looking at the standardised coefficientsβ (Table 5), it can be seen that the three most influential question types on the total number of questions are Display (β=.538), Referential (β=.401) and

Confirmation Check (β=.228).

It was again found that CLIL teachers in Taiwanese secondary CLIL classrooms need additional training in questioning skills in order to achieve the pedagogical goals of CLIL, i.e., using the target language for both content and language learning and teaching. It is assumed that the way they teach in CLIL classrooms is similar to the way they are still used to teaching in Chinese medium instruction (CMI) classrooms and that they are still fully proficient in English questioning skills. The questions most frequently asked by the teachers were the display questions, which led to closed-ended questions with short answers and made it easy for the students to answer. In contrast, the 'referential' questions were often posed with a specific scenario. Students could express their opinions or talk about their experiences, which can help develop individualised learning. In our corpus, the 'confirmation check' question type was usually formatted with 'OK?' or 'right?' at the end of the questions. All three question types above were less cognitively demanding and did not involve the complexities associated with comprehension learning and knowledge processing. Therefore, students may simply need to recall and not require much mental effort. This may not lead to the expected improvement in students' English proficiency through the oral use of longer texts.

Table 3

Pearson Correlation of Type of Questions

Type of Question	Display	Referential	Repetition	Confirmation check	Retrospective	Indirect	Procedural	Total Q
Display	1							
Referential	.450**	1						
Repetition	.057	.441**	1					
Confirmation check	.084	.297	.266	1				
Retrospective	.135	.301	.393*	-.056	1			
Indirect	.276	.470**	.302	.048	.255	1		
Procedural	.231	.348*	.512**	.111	.259	.171	1	
Totals	.798**	.824**	.400*	.408*	.329*	.488**	.429**	1

** p<.01; *p<.05

Table 4

Model Summary of the Regression Model of Total Questions

Model	R	R^2	Adj. R^2	S.E. of the Estimate	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
1	.988[a]	.977	.972	2.026	.977	187.112	7	31	.000

a. Predictors: (Constant), Procedural, Confirmation check, Indirect, Display, Retrospective, Repetition, Referential

Table 5

Standardized Beta Coefficients of Total Questions

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	*B*	S. E	Beta	t	Sig.	Tolerance	VIF
(Constant)	.962	.783		1.229	.228		
Display	1.085	.064	.538	16.903	.000	.736	1.359
Referential	1.066	.100	.401	10.622	.000	.522	1.914
Repetition	1.092	1.999	.020	.546	.589	.541	1.848
Confirmation check	1.007	.132	.228	7.625	.000	.832	1.202
Retrospective	.900	.300	.093	3.003	.005	.778	1.286
Indirect	1.348	.450	.095	2.995	.005	.738	1.354
Procedural	.805	.297	.089	2.711	.011	.688	1.454

In order to determine whether the frequency and type of questions could be predicted from the demographic variables of the teachers (gender, year level, type of subject and lesson duration), multiple regression analysis was carried out again. The predicted regression model is shown below:

$Y_i = \beta_0 + \beta_1 * gender + \beta_2 * grade\ level + \beta_3 * class\ duration + \beta_4 *$ nature of subjects $+ e_i$

The total number of questions and each question type was sequentially served as the dependent variable (Y_i). The results demonstrated that only the question type 'confirmation check' could

be statistically significantly predicted by the demographical variables. As presented in Table 6, F_{34}^{4}=3.573, p=.015 (<.05), implying the model fitted the data well and Adjusted R^2=.213 denoting the demographical variables accounted for 21.3% of the variability of the 'confirmation check' question type. Table 7 shows the coefficients of the variables of gender and grade level are statistically different from 0. As revealed in Table 7, the predicted regression model could be obtained as follows:

Confirmation check = -.549 + 2.979 * *gender* + -1.181 * *grade level* + .729 * class duration + -.045 * nature of subjects

It shows that the frequency of the 'confirmation check' questions was almost three times higher for male lecturers than for female lecturers. The longer the teaching time, the more the 'confirmation check' question will be raised and the subjects that belong to the nature of instruction are almost 0.5 times less than the courses of lecture. The absolute value of the standardised coefficients beta suggested that gender had the most significant effect on the 'confirmation check' question, followed by grade level and class duration. The male teachers preferred to use confirmation check questions to interact with the students, and also, as the class duration increased, the teachers used confirmation check questions more frequently. However, the higher the grade level, the fewer confirmation check questions teachers asked. Teachers would spend more time confirming students' understanding of the content at lower levels, as the CLIL approach may be relatively new to them.

Table 6

Model Summary of the Regression Model of the 'Confirmation Check' Questions

					Change Statistics				
Model	R	R^2	Adjusted R^2	SE of the Estimate	R^2 Change	F Change	df1	df2	Sig. F Change
1	.544[a]	.296	.213	2.420	.296	3.573	4	34	.015

a. Predictors: (Constant), gender, grade level, class duration, nature of subjects

Table 7

Standardized Beta Coefficients of the 'Confirmation Check' Questions

		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model		*B*	S. E.	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-.549	2.404		-.228	.821		
	Gender	2.979	.957	.483	3.113	.004	.860	1.163
	Grade Level	-1.181	.520	-.337	-2.268	.030	.941	1.063
	Class Duration	.729	.559	.199	1.305	.201	.894	1.118
	Nature of Subjects	-.045	1.126	-.006	-.040	.968	.910	1.099

a. Dependent Variable: Confirmation check

Significant Differences of Teacher-Led Questions by the Variables

About the frequency of question types and the total number of questions, the independent t-test was used to examine mean differences in gender and subject type. The one-way ANOVA was also used to investigate whether there were statistically significant mean differences between the grade level and class duration groups. The results showed that the number of total questions did not show a significant mean difference between the groups, regardless of gender, subjects, year level or class duration. In addition, the frequency of 'type of subject' did not differ significantly between groups either, evidencing that teaching styles may be the main reason for teachers asking different questions rather than discipline-related cultures or

differences.

Gender

It was found that male teachers showed a significantly higher frequency in the 'confirmation check' question type, t= -2.729, p=0.010 (<.05) and the effect size of 0.93 in Cohen's d. The results were consistent with the regression analysis above, that is, male teachers used this question more often. The mean difference in the frequency of the 'language' and 'self-answered' question types for female lecturers was significantly higher than for male lecturers, and its t-value was 2.668 with p=.013 (<.05) and 3.198 with p=.003 (<.05), respectively. However, none of the male teachers used both the 'language' and 'self-answered' question types. It was assumed that the female teachers might be more sensitive to language due to their experience or training, and they used the 'self-answered' questions more often to draw the students' attention to focus on the main content messages, as their class duration was usually longer than that of the male teachers.

Table 8

The Independent T-Test of Gender (Female=29, Male=10)

Question Type	Gender	mean	SD	T-Test for Equality of Means						
				t	df	Sig. (2-tailed)	Mean Difference	SE Difference	95% C.I. of the Difference	
Confirmation check	Female	2.28	2.33	-2.729	37	.010	-2.52	.93	Lower -4.398	Upper -.650
	Male	4.80	3.05							
Language	Female	.83	1.67	2.668	28	.013	.83	.31	.192	1.463
	Male	0.00	0.00							
Self-answered	Female	.52	.87	3.198	28	.003	.52	.16	.186	.849
	Male	0.00	0.00							

Grade Level

We are interested in whether grades (7, 8 and 9) with three levels affect question type, and the ANOVA test showed that the difference in mean scores reached significance (F(2,36)= 3.295, p=.049 <.05) on the 'confirmation check' question. The post hoc Tukey HSD test result

suggested that the 'confirmation check' question type frequency was significantly higher in 'Grade 7' than in 'Grade 8'. There was no statistically significant difference between Grade 7 and Grade 9 (p=.421) or between Grade 8 and Grade 9 (p=.716) (see Table 9). After reviewing the corpus data, it was found that the frequency of 'confirmation check' questions was 81 times and they were mainly asked in Grade 7 rather than in Grade 8 (16 times) or Grade 9 (17 times). This suggests that teachers tend to use this type of question to confirm that students have actually understood what they have said and taught, and that this may be necessary for the younger students to respond to less cognitively demanding questions.

Table 9

Multiple Comparisons of the Grades (7, 8 and 9)

Grade Level		Mean Difference	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
7	8	2.403*	.959	.044	.06	4.75
	9	1.429	1.125	.421	-1.32	4.18
8	7	-2.403*	.959	.044	-4.75	-.06
	9	-.974	1.246	.716	-4.02	2.07
9	7	-1.429	1.125	.421	-4.18	1.32
	8	.974	1.246	.716	-2.07	4.02

Class Duration

The ANOVA test revealed that the means of the 'class duration' groups differed significantly in the 'display' question type (F (2,36) = 4.655, p=.016 < .05) and the result of the post hoc Tukey HSD test suggested that the frequency of the 'display' question type decreased significantly (ca. seven times) in the 'short' class duration than in the 'medium' (p =. 018) and in the 'long' (p =. 023) class duration. There was no statistically significant difference between the medium and long groups (p = .928) (see Table 10). From the data in our corpus, the 'referential' questions are adopted more often (33 out of 89 times, 34%)

in the 'short' class duration than the 'display' questions (23 out of 89 times, 26%) and it is assumed that this may be because the shorter CLIL lessons are more demonstrative and performing in nature, which indicates the importance of longitudinal and frequent exposure for future observations in CLIL classrooms to obtain a holistic teaching scenario.

Table 10

Multiple Comparisons of Class Duration

Class Duration	Mean Difference	Std. Error	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
medium	-7.782*	2.698	.018	-14.38	-1.19
long	-7.067*	2.544	.023	-13.29	-.85
short	7.782*	2.698	.018	1.19	14.38
long	.715	1.947	.928	-4.04	5.48
short	7.067*	2.544	.023	.85	13.29
medium	-.715	1.947	.928	-5.48	4.04

CONCLUSION AND IMPLICATIONS

This study collected 39 CLIL classroom videos from Taiwanese secondary schools to investigate what types of questions teachers usually ask in CLIL classrooms. It was found that the teachers in the corpus tended to ask display, referential and conformity-checking questions in CLIL classrooms. We also found significant differences according to the variables of teacher gender, class level and course duration but not according to the variable of subject nature. Our results are generally consistent with previous findings on the ranking of different types of questions teachers ask in bilingual classrooms. Although previous research shows that discipline-related cultures (or subject nature) do not significantly influence questioning practices, but individual teaching styles do (Kuteeva & Aiery, 2014; Chang, 2012), the current study shows that our teachers would adapt their question types according to the learners' maturity or familiarity with

the CLIL approach and the time available for CLIL instruction.

Moreover, more questions were identified in the current corpus compared to EMI classes where fewer questions are asked (Lasagabaster, 2023), probably due to the recent adaptation of the new approach, i.e., CLIL, to monitor and ensure the quality of instruction. However, judging from the three main question types and the vast majority of lower-order display questions, it is questionable whether they fulfil the intended pedagogical role and may lead to limited learner participation and low learning gains, as most questions only elicit short and closed-ended answers or filler expressions, which may demotivate learners (Doiz & Lasagabaster, 2023). More challenging questions are needed to stimulate learners' cognitive development.

The study also has the following pedagogical implications. Firstly, teachers must be aware of the importance of questioning to support better interactive discourse in CLIL classrooms. Most CLIL teachers are not language specialists and, therefore, may not be as sensitive to how questioning can help them to improve the quality of teaching and learning experiences. Therefore, CLIL teachers must be aware of the different interactional techniques, particularly what questions to ask, that can either enhance or limit students' progress in subject and language acquisition. This understanding is essential to guide students towards effective content and language comprehension and to avoid pitfalls such as limited learning outcomes (Dafouz & Sánchez-García, 2013). The type of questions CLIL teachers ask substantially influences learners' ability to acquire subject and language simultaneously. Through questions, particularly open-ended ones, requiring detailed answers, teachers create a setting where students are encouraged to express their opinions, promoting active mental involvement with the subject matter (Villabona & Cenoz, 2022).

Furthermore, when teacher-led questions establish connections between concepts or expand upon existing information, they enhance the comprehension of discipline-related principles to a greater extent (Dalton-Puffer, 2006). Prior investigations show noticeable differences in the types of questions teachers ask, which are influenced by the language used for teaching. This highlights the significance of language in influencing the type of investigations conducted within the CLIL framework (Serna-Bermejo &

Lasagabaster, 2023). The importance is placed on ensuring that questions in CLIL settings achieve a balanced combination of language and subject objectives to maximise the advantages of CLIL methodology (Villabona & Cenoz, 2022).

Second, we also support the need for adequate professional development (PD) on classroom questioning skills for CLIL practitioners, as the importance of classroom questioning needs to be addressed in PD courses (Lasagabaster & Doiz, 2022). Firstly, CLIL teachers can be encouraged to reflect on their classroom practice and include a focus on interaction in a CLIL PD design. Coaching CLIL teachers to ask questions and encourage students to ask questions is essential to making CLIL classrooms more engaging, interactive and learner-centred. Greater levels of interactivity can promise better bilingual education (Guarda & Helm, 2017). In addition, Morell (2020) explicitly suggests that CLIL PD training needs to address the differences between different types of questions and have teachers practice how to formulate referential questions to guide learners' thinking. Furthermore, teachers need to provide sufficient time for CLIL learners to produce full-sentence responses and facilitate and negotiate meaning as they also have to overcome another obstacle in CLIL classrooms, namely presenting content knowledge through an unfamiliar L2 (An, Macaro & Childs, 2021; Morell, 2020; Lasagabaster, 2023). Finally, the role and practices of translanguaging or L1/L2 translation, as well as the application of multimodalities, should be emphasised in CLIL PD as they benefit teachers in bridging students' contributions to scientific talks and shaping their responses into academic expressions, thereby constructing learning opportunities to enhance students' engagement with discipline-related literacies and language (Can Daşkın, 2015; Jacknick & Duran, 2021; Tai, 2023).

As we may be one of the first to study teacher-led questions in Taiwanese CLIL classrooms, so subsequent studies can build on it. As Sánchez-García (2020) suggests, whether teachers ask different questions due to poorer proficiency or familiarity with L2 compared to L1 classrooms can be further explored. Second, more variables can be studied regarding teachers' teaching styles, L2 competency, students' characteristics, or discipline-related disparities (e.g., testing

vs. non-testing domains). This research can help explain why teachers ask specific questions or prefer certain sorts. Our research is quantitative; thus, it may not fully explain why and how teachers employ particular question types in different contexts. Therefore, future studies should analyse classrooms to understand how asking questions helps teachers facilitate interaction and negotiation of meaning and achieve their pedagogical goals, as classroom interaction is complex, dynamic, and variable across multiple contexts. Although several measures aforementioned have been taken to ensure the CLIL teachers' behaviour was not altered due to the camera or observation intrusion, we still acknowledge that data collected from YouTube might be set and arranged to some extent (Lorenza et al., 2023) and thus likely less authentic and natural. Several variables, such as the timing of conducting observations, frequency of observations, nature of subjects, personal teaching styles, learning aims of lessons, and other contextual unpredictable factors, may also potentially affect what types of questions teachers will ask in a dynamic setting like classrooms. Hence, we suggest future studies considering these factors as research focuses seek to reveal a more holistic picture of teacher-led questions in Taiwan CLIL classrooms.

Note: [1] During this paper's writing and afterwards, more CLIL lesson videos were uploaded for watching and thus were not included in the current database.

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