

## 12 - Instructional Translanguaging Patterns in Taiwan High School CLIL Biology Class

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### Abstract

The growing emphasis on bilingual education in Taiwan has brought increased attention to the teachers' translanguaging practices in subject classroom. This qualitative study aims to classify the patterns of instructional translanguaging use and to probe the teachers' rationales of adopting these patterns. With class observations and semi-structured interviews, this study investigated two high school CLIL biology classrooms in northern and central Taiwan and concluded five patterns indicating teachers' translanguaging use. It was found that the more experienced teacher demonstrates a greater integration of body language, teaching aids, and English within teaching processes. Also three factors were found to affect teachers' use of translanguaging, including disparities in students' English proficiency, the establishment of an English-speaking environment, and teachers' own English proficiency level. Furthermore, it was revealed that teachers need to attain a requisite English proficiency level to diversify translanguaging practices and foster a natural English-speaking milieu within CLIL classes. At the end of the presentation suggestions for future study and pedagogical implications will be discussed.

**Keywords:** translanguaging, bilingual education, CLIL biology, instructional strategies, teacher proficiency, Taiwan.

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### 1. Introduction

As globalization accelerates and English functions as a Lingua Franca (ELF), bilingual education has gained significant importance. To support this, Taiwan's Bilingual 2030 Policy aims to boost English proficiency and international competitiveness. Content and Language Integrated Learning (CLIL) is a dual-focused educational approach originating from Europe, involves using an additional language (typically English) as the medium of instruction for both content and language learning (Coyle et al., 2010). It has been identified as an effective method for building students' subject knowledge alongside English skills, aligning with Taiwan's internationalization goals. However, given varying English proficiency levels among students and the extra preparation required for teachers, Mandarin remains a critical support in CLIL classes, making translanguaging an essential strategy.

This study investigates translanguaging in CLIL biology classes at two Taiwanese junior high schools, addressing the gap in research on secondary bilingual contexts. Translanguaging, here defined as the use of multiple languages and multimodal aids to enhance comprehension, enables teachers to support meaning-making and students to leverage their linguistic repertoire.

With Taiwan's Bilingual 2030 policy encouraging English use and bilingual instruction, biology classes, which often rely on visual aids, provide an ideal setting for examining translanguaging. Unlike existing studies focused on TESOL or higher education EMI, this research explores instructional translanguaging patterns in CLIL biology and the factors influencing them. It seeks to answer two questions: (1) What translanguaging patterns are used in CLIL biology classes? (2) What factors shape these patterns? The findings aim to enhance understanding of effective language use in bilingual education.

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## 2. Literature review

### 2.1 Definitions of translanguaging

The word translanguaging originated from the Welsh word '*trawsieithu*' by Cen Williams in 1994 (García & Li, 2014, p.20). It referred to the pedagogical practice of using Welsh and English in bilingual classes. For instance, the teacher delivers the learning content in Welsh, and the students are able to produce the learning output in the target language (English). After the debut of this new term, Baker, the scholar who first translated the Welsh word '*trawsieithu*' to translanguaging in English, made its explanation with more emphasis on its functions. He defined it as "the process of making meaning, shaping experiences, gaining understanding and knowledge through the use of two languages" (Baker, 2011). A year later, several scholars expanded Baker's interpretation with an emphasis on the usage of the two languages. Lewis et al. (2012) considered that "both languages are used in a dynamic and functionally integrated manner to organize and mediate mental processes in understanding, speaking, literacy, and, not least, learning."

Although the definitions above mostly explain translanguaging as a way to switch between languages, they were confined in the idea of the two languages. Canagarajah (2011) defined translanguaging as "the ability of multilingual speakers to shuttle between languages, treating the diverse languages that form their repertoire as an integrated system" (p. 401). Moreover, Garcia extended the concept beyond the constraint of the named languages. She stated that translanguaging refers to bilinguals selecting different linguistic features from their one and only linguistic repertoire to communicate with others effectively (Garcia, 2012). On the other hand, Li (2018) used etymology to explain the word translanguaging by disassembling the word into the prefix 'trans' and the word root 'languaging'. According to Li (2018), he explicated the prefix 'trans' as it transcends the concepts of so-called named languages, including the use of semiotics, multimodalities, etc. The word root 'languaging' displays the dynamic feature of language in the gerund form, which means the development of languages is an ongoing process.

Concluding the definitions of translanguaging mentioned above, this research defines translanguaging as "Teachers use different languages simultaneously with the incorporation of multimodal resources during the teaching process to communicate and help students understand the subject contents."

### 2.2 Translanguaging in language classrooms

The research on translanguaging in language classrooms has highlighted its potential benefits for language learning and development. Several empirical studies have explored the implementation and impact of translanguaging pedagogies in various educational contexts.

Two studies conducted in European countries and regions have noted that translanguaging plays a vital role in both mainstream education and CLIL lessons (Duarte, 2020; Karabassova & San Isidro, 2020). Duarte (2020) examined the use of translanguaging in classrooms in Luxembourg and the Netherlands, where teachers incorporated migrant and minority languages into their teaching. The analysis of classroom transcripts revealed that translanguaging helps acknowledge migrant languages, reduces language separation in immersion models, and enhances content understanding, demonstrating its potential as an effective pedagogical strategy. In the context of Kazakhstan, Karabassova & San Isidro (2020) conducted an exploratory qualitative study on CLIL teachers' perceptions of translanguaging in trilingual schools. Their findings showed an ambiguous stance towards translanguaging, with teachers employing it as a scaffolding tool, a transitional practice, and a means to address their own language proficiency limits.

Pun & Tai (2021) and Tai & Li (2021) investigated the role of translanguaging in EMI secondary schools in Hong Kong. Pun & Tai (2021) focused on how students used their multilingual and multimodal resources during laboratory work to co-construct scientific knowledge and practice their science apprenticeship. Despite the English-only policy, students employed translanguaging to mediate their understanding of science, facilitate peer collaboration, and create an enjoyable learning environment. Similarly, Tai & Li (2021) analyzed playful talk in multiple languages and modalities in EMI mathematics classrooms. Their findings demonstrated that translanguaging was a critical resource for constructing playful talk, transforming the classroom into a translanguaging space. This space allowed teachers and students to engage in creative acts, experiment with various voices, and facilitate meaning-making and knowledge construction. Both studies highlight the importance of translanguaging as a pedagogical tool in EMI contexts in Hong Kong.

Regarding the application of translanguaging in the Taiwanese educational context, Ke & Lin (2017) examined the viability of a translanguaging approach in TESOL. Their study provided an example of translanguaging practices in an EFL classroom in a rural junior high school. The results illustrated the potential of translanguaging pedagogy for developing learner agencies and identities. Concluding the empirical studies above, although they all show the positive influence of translanguaging in different educational contexts, there is a lack of studies related to translanguaging practices in Taiwanese CLIL classrooms.

### **3. Methodology**

#### *3.1 Participants*

Due to the specificity of this research (focused on CLIL biology classes), it is challenging to find suitable participants. The recruitment process was confined to the following criteria: 1) teaching biology at a junior high school level, and 2) currently teaching CLIL biology classes. After contacting numerous schools and receiving an introduction through a professor, two in-service biology teachers agreed to participate in this study with verbal commitments and paper-based informed consents. To protect their personal information, pseudonyms were used.

Henry is a male teacher from a bilingual junior high school in Northern Taiwan, while Vivian is a female teacher from a general junior high school in Central Taiwan. Both teachers have over 20 years of experience in biology instruction. Regarding CLIL teaching experience, Henry has more experience in CLIL teaching. He has been co-teaching CLIL biology classes with a foreign teacher for three years. Although Vivian is new to CLIL, she completed the CLIL enhancement program for in-service teachers in 2022, which equipped her with knowledge and practical skills in CLIL teaching.

#### *3.2 Data collection methods and procedures*

Class observations and interviews were conducted to gather qualitative data from the two teacher participants. The entire process of data collection and transcription into verbatim transcripts spanned four months, from September to December 2022.

First, the researcher observed a 45-minute class taught by each teacher to document translanguaging practices in naturalistic classroom settings. During these sessions, the researcher took field notes on the translanguaging practices observed. The observations were video-recorded, and the recordings were transcribed verbatim for detailed analysis.

Second, each participant was interviewed twice to gather insights into their course design and the purposes behind different translanguaging patterns. Due to the fluency in the interaction, all interviews were conducted through Mandarin. Each interview lasted 35 to 40 minutes and followed a semi-structured format. Because of geographical constraints, the interviews with Henry were conducted over the phone, while those with Vivian were conducted face-to-face. All interviews were audio-recorded with participants' consent and subsequently transcribed. The participants also reviewed these transcripts to confirm their accuracy.

#### *3.3 Data analysis*

Given the diverse translanguaging practices observed in the CLIL biology classes, the researcher applied thematic coding (Braun & Clarke, 2006) to categorize the transcribed verbatim data into five distinct instructional patterns. For the interview data, open coding (Strauss & Corbin, 1990) was employed to identify the underlying factors affecting these instructional translanguaging patterns. All data were inductively analyzed following grounded theory principles (Glaser & Strauss, 1967), ensuring that insights emerged directly from the data itself.

### **4. Results**

#### *4.1 Instructional translanguaging patterns*

Five distinct instructional translanguaging patterns were presented, accompanied by excerpts and images. Detailed descriptions of each pattern were provided to highlight the integration of language use and the specific teaching resources utilized by teachers in the CLIL biology classes. This approach



aimed to authentically depicting teaching scenarios, illustrating how teachers employed translanguaging in various contexts. Transcription conventions are provided in the appendix.

#### 4.1.1 Target vocabulary translation

In Excerpt 1 and 2, both Henry and Vivian used L1 (Mandarin) to translate the target vocabulary, which foster students' understanding of these particular words.

##### Excerpt 1 (Henry, Life Cycle of a Butterfly)

- 17:17 你有沒有看到一個字叫 lays (Do you see a word called lays?), 下蛋 (Laying eggs).  
 18:01 這隻毛毛蟲啊 (This caterpillar), 牠會吃很多的 vegetation (It can eat a lot of vegetation), 很多的植物 (lots of plants).

##### Excerpt 2 (Vivian, Your Name)

- 02:49 牠有 (It has) long tail, 有長長的尾巴 (has a long tail).  
 20:34 對 (Yes), 他名字就叫 lookdown (Its name is lookdown.), 叫你往下看 (Ask you to look down).

#### 4.1.2 Confirming Chinese understanding

In Excerpt 3 and 4, both Henry and Vivian asked the Chinese meaning of keywords to check students' understandings, which ensure students accurately grasps the key concepts.

##### Excerpt 3 (Henry, Life Cycle of a Butterfly)

- 03:15 有沒有人知道 abdomen 是哪個字? (Does anyone know which Chinese word abdomen refers to?)  
 16:07 Life cycle. 有沒有人用中文講? (Can anyone say it in Chinese?) 中文怎麼說? (How to say it?)

##### Excerpt 4 (Vivian, Your Name)

- 12:18 It lives in the sky. Sky 是哪裡 (Where is sky)?  
 16:59 It lives in the river. River 是什麼 (What is river)?

#### 4.1.3 Translation of classroom English or instructions

In Excerpt 5, Henry delivered instructions in English, Mandarin, and non-verbal action, helping students to understand the regulations in CLIL biology classes and encourage their participation.

##### Excerpt 5 (Henry, Life Cycle of a Butterfly)

- 07:50 Uhh, if you need any help, please raise your hand. [Raising his left hand.]  
 你需要什麼幫忙 (If you need any help), 請你舉起你的手 (Please raise your hand), 我們都可以幫你 (Both of us can help you out.).

#### 4.1.4 Personal sharing of thoughts or feelings

In Excerpt 6, through the sharing of personal feelings or thoughts, Henry turned the classroom atmosphere into a more relaxed one. By the joke or praise from the teacher, students will feel comfortable or even enhance their participation in class.

##### Excerpt 6 (Henry, Life Cycle of a Butterfly)

- 14:12 John?! Oh, 總算找到你了 (Finally found you.). 來 (Come), John, 被稱讚的時候講 "Hi, John" (When being praised say "Hi, John") [Waving his hand] and maybe someone will raise your hand.  
 15:42 英文小老師啊 (English pupil teacher). Oh, no wonder. Your English is wonderful.

#### 4.1.5 Encouraging informal conversations

In Excerpt 7, Henry made a start for the informal conversation based on students' life experiences. Although most students replied in Mandarin, the responses were not the answers he expected. He simplified the question again and asked for students' non-verbal response, so students raised their hand as a reply.

##### Excerpt 7 (Henry, Life Cycle of a Butterfly)

- 19:26 T: 有沒有同學回家的話把棉被變成蛹的? (Anyone wraps yourself like a chrysalis with the quilt at home?) 包起來 (wrap), especially in winter?

S1: 只有冬天才會 (Only in winter.)

S2: 冬天才會做的事情 (Do it only in winter.)

T: 不是喇 (No), 我說冬天吶 (I said in winter.), in winter, 做成蛹 (Make it a chrysalis), yeah? 會的舉手 (Raise your hand if you do that.)

Ss: [Raising their hands]

T: Wow! So many!

## 4.2 Factors affecting teachers' instructional translanguaging patterns use

Three affecting factors revealed in the interview transcripts, which are disparities in students' English proficiency, the establishment of an English-speaking environment, and teachers' English proficiency level. Descriptions and extracts were presented to clearly interpret how these factors influence teachers' translanguaging practices in class.

### 4.2.1 Disparities in students' English proficiency

The researcher asked Henry why he translated the target vocabulary in Mandarin for students. In Extract 1, although the original course design tended to use the target language (English) as much as possible, due to the huge gap between students' English proficiency level, Henry had to explain in Mandarin again to ensure their understanding.

#### Extract 1 (Henry, November 6th, 2022):

基本上，我們原先的課程設計是盡可能都不要去用中文解釋，但是後來發現學生程度參差太大。...我們只好出此下策，就是用中文再講一次，讓他至少聽得懂我在講什麼，才不會整堂課有一半的人都聽不懂、覺得實在太多英文。(Basically, our original course design is to avoid using Mandarin to explain as much as possible. However, I discovered that there's a huge gap between students' English proficiency. ... Therefore, that's why I scraped the bottom of the barrel. I used Mandarin to explain the content again, making students at least understand what I was talking about. If I didn't do so, half of the students in class couldn't understand the learning content and felt there was too much English.)

The researcher asked Vivian why she read the target sentences in the slides first. In Extract 2, she revealed the authentic scenario of students' disparities in English proficiency.

#### Extract 2 (Vivian, December 20th, 2022)

因為我們的落差很大，所以可能，譬如說對其中三分之一會覺得說：這個句子很簡單啊，就住在海裡這樣；但其實我知道我們有一些小孩，他們是連 sea 是什麼都不知道的，所以我才會想說我至少先念一次。(Because there is a huge gap among students. So it may be, for example, one third students considered that "This sentence is easy, it just means living in the sea". But actually I know some of my students, they don't even know the word 'sea', so I thought of at least reading the sentence for them first.)

### 4.2.2 The establishment of an English-speaking environment

The researcher asked Henry about whether he used classroom English frequently to communicate with students. According to his reply in Extract 3, we can know that as he increased the times of speaking classroom English in the classroom, students will gradually get accustomed to using English in class. Moreover, the more they listen, the more they understand. It is a kind of setting up a beginner-friendly English environment.

#### Extract 3 (Henry, November 6th, 2022)

對，因為我們這堂課有一些基本用語，學生要學會習慣這些...，然後，在我提問的時候，因為平常上課已經養成習慣了，他們就會直接聽得懂，我就不會再解釋，所以我也常常會用，讓他們習慣這種用法，習慣在英文學習的氛圍裡面。(Yes, because we have some basic instructions for this class, students have to get used to them. ... Then, when I raise questions, as the habit formation, they can understand directly, I won't explain again. So I use them frequently to make students get used to these instructions. Make them accustomed to the English-learning environment.)

The researcher asked Vivian why she read the target sentences for students in English. According to her reply in Extract 4, she took a lead as a sample for students to make comparison with. With her beginning of speaking English in class, students will be more willing to accept English happened in their classroom and gradually speak the target language during the CLIL classes.



**Extract 4 (Vivian, December 20th, 2022)**

如果貿然叫學生站起來念，對那些不敢開口的同學來說壓力太大，所以我比較想要先營造出那樣的環境，讓他們覺得說，反正老師念得不標準都敢念了，那我們等一下如果念得不好也沒關係。其實最主要是營造一個「我念得很輕鬆，而且也沒有到太差」。(If I unexpectedly asked students to stand up and read the sentences, it would be too stressful for some classmates to be afraid of speaking, so I want to build that kind of environment to make them feel that 'The pronunciation of our teacher is not clear but she can speak anyway, it would be okay if we can't read the sentences well.' In fact the main idea is to build a concept that "I read the sentences comfortably, and the results are not too bad".)

#### 4.2.3 Teachers' English proficiency level

In Extract 5, the researcher asked why Henry spoke English only in vocabulary in some unexpected or unplanned situations. His response indicated that his English proficiency level is not sufficient enough to switch between English and Mandarin flexibly. Based on his current condition, he could speak the keywords to convey meanings to students.

**Extract 5 (Henry, November 6th, 2022)**

因為我英文能力沒那麼強，沒辦法說出完整的句子，所以我只能把 keyword 講出來，達到我要的意思就好。(Because my English proficiency is not good enough to speak full sentences, I can only speak out the keyword to express my ideas.)

The recordings in Extract 6 is a following statement about reading the target sentences for students. Although Vivian initiated English speaking in her CLIL biology classroom, she was really worried about her deficiency in English speaking would cause some mistakes in pronunciation. Therefore, she also considered that the course design was not only based on the students, but also her English proficiency level.

**Extract 6 (Vivian, December 20th, 2022)**

我其實沒有讓他們跟著我念，一方面是很擔心我念錯；另一方面是因為我還沒有覺得我能夠做為一個模板，讓他們能夠去模仿我的發音。所以目前真的是考量到他們的程度，可是某方面也是考量到我的程度。(Actually, I didn't ask them to read the sentences after me. On one hand, I'm afraid of reading the words in the wrong way; on the other hand, I don't consider that I can be a template for students to imitate my pronunciation. Therefore, the current situation is considering their English proficiency, but also mine in a certain level.)

## 5. Discussion

The identification of five instructional translanguaging patterns and three influencing factors reveals an authentic view of the teaching and learning dynamics in Taiwanese bilingual education.

In terms of translanguaging patterns, both Henry and Vivian employed translanguaging to translate key vocabulary and confirm meanings in Chinese, ensuring students' understanding and supporting knowledge construction. These practices align with Nikola & Moore's (2016) concept of salient translanguaging, where teachers use L1 to facilitate content learning. Furthermore, these patterns reflect similarities with Wang's (2016) explanatory translanguaging strategies, which are primarily teacher-initiated.

The additional three translanguaging patterns used by Henry underscore his objectives in classroom management and interaction. Unlike Vivian's more knowledge-focused approach, Henry placed greater emphasis on teacher-student engagement. Although he translated classroom English into Chinese to enhance clarity and understanding, these practices align closely with Wang's (2016) managerial translanguaging strategies. Additionally, he employed translanguaging to share personal thoughts and facilitate informal conversations with students, resonating with Wang's (2016) interpersonal strategies. While these practices were teacher-initiated rather than student-led, they effectively fostered a more interactive classroom environment.

Regarding the factors affecting translanguaging practices, both Henry and Vivian aimed to create an English-speaking learning environment in their CLIL biology classrooms. However, limitations in English proficiency for both teachers and students meant that translanguaging primarily involved the

translation of key vocabulary and phrases. This illustrates the tension between promoting CLIL and the constraints posed by limited English proficiency.

## 6. Conclusion

This qualitative study sheds light on the key roles that instructional translanguaging plays in CLIL biology classrooms in Taiwan, specifically highlighting its functions in knowledge construction, classroom management, and fostering interpersonal relationships. Despite the evident benefits of translanguaging for navigating bilingual instruction, limited English proficiency among teachers and students poses challenges to fluid language-switching and incorporating additional teaching resources effectively.

While the small sample size ( $n = 2$ ) limits generalizability, the findings offer preliminary insights that can inform bilingual education practices. Translanguaging shows potential as a tool for teachers to convey complex subject knowledge, manage classroom interactions, and cultivate a collaborative learning environment. Future research could build on this work by exploring students' perspectives on translanguaging and evaluating its effectiveness in supporting both content comprehension and language development. By focusing on these areas, future studies could provide a more comprehensive view of translanguaging's impact on CLIL classrooms and help shape more effective bilingual instructional strategies in Taiwan and beyond.

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## Appendix. Transcription conventions

T = teacher; S1, S2, S3, etc. = single student;

Ss = more than one student;

() = Translation of Chinese utterances;

[] = nonverbal actions;

\_\_\_ (at the end of questions) = short pauses indicating blank filling questions\;

... = some lines deleted