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# 'This is valuable professional development for me': integrating the multimodalities-entextualization cycle (MEC) in a Chinese DLBE classroom via teacher-researcher collaboration

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## ABSTRACT

The Multimodalities-Entextualization Cycle (MEC), proposed by Lin (2015, Conceptualizing the potential role of L1 in content and language integrated learning (CLIL). *Language, Culture and Curriculum*, 28(1), 74–89), is a curriculum model designed for teachers to systematically incorporate translanguaging in lessons. Limited studies have addressed the implementation of this model. Further, the significance of teacher-researcher collaboration in translanguaging design is recognized, but the depth of researcher involvement in the co-design process remains unclear. Therefore, this study examined how a novice teacher integrated translanguaging within the MEC model to teach a Science topic in a Chinese DLBE context, focusing on the dynamics of teacher-researcher collaboration and its impact on the planning process. The findings reveal that throughout the learning segment, the teacher intentionally incorporated elements from each stage of the MEC model, along with translanguaging practices, to build students' background knowledge, facilitate learning, differentiate instruction, and assess student progress according to their needs. This collaborative process not only enhanced the implementation of the MEC model but also provided significant professional development and mentorship opportunities for the teacher. The study underscores the necessity of targeted support for novice teachers in applying translanguaging and the MEC model, emphasizing that teacher-researcher collaboration should extend beyond theoretical discussions to offer guidance and strategies that are responsive to the specific needs of both teachers and students.

## ARTICLE HISTORY

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## KEYWORDS

Chinese DLBE; CLIL; multimodalities-entextualization cycle; novice teacher; teacher-researcher collaboration; translanguaging

## 1. Introduction

Research on translanguaging has experienced significant growth over the past decade, marking a pivotal 'trans-turn' in applied linguistics (Ho, 2022, p. 3). This growth is particularly evident in the realm of Content and Language Integrated Learning (CLIL), which is dedicated to the simultaneous learning of subject matter and a new language (Coyle et al., 2010). A similar trend can be found in dual language bilingual education (DLBE),

a setting where the balance between separation or integration of instructional languages has often been a topic of much debate (Hamman-Ortiz, 2024).

From a linguistic perspective, translanguaging is defined as ‘the deployment of a speaker’s full linguistic repertoire without regard for watchful adherence to the socially and politically defined boundaries of named languages’ (Otheguy et al., 2015, p. 283). In classroom settings, translanguaging is viewed as an approach to bi/multilingualism that recognises and leverages the fluid and dynamic ways in which emergent bi/multilinguals (EMLs) engage in language use for meaning making (García et al., 2017; García & Li, 2014). This pedagogical approach is particularly relevant in DLBE settings serving EMLs whose cultural and linguistic practices have traditionally been framed as deviant from an unmarked norm due to deficit discourses related to dominant language hegemony and standard language ideologies (Sánchez & García, 2021)

To support teachers in implementing translanguaging pedagogy effectively, researchers (e.g. García et al., 2017; Lin, 2015) have developed frameworks that provide guidance for integrating translanguaging into lesson planning. One notable framework is the Multimodality Entextualization Cycle (MEC) proposed by Lin (2015). The MEC model is specifically designed for CLIL teachers to systematically plan their lessons with a focus on integrating language and content learning (Lin, 2015). While there have been a handful of studies (e.g. Liu et al., 2020; Wu & Lin, 2019) that have shown how the model assists CLIL teachers in effectively integrating translanguaging while teaching academic content, to the best of our knowledge, none have explored the use of MEC in DLBE settings primarily serving English-dominant learners of Chinese in the U.S., a setting which brings with it a unique set of sociopolitical and pedagogical circumstances. Thus, there is a need for further research to obtain a more comprehensive understanding of how teachers mobilise different resources to create translanguaging spaces using the MEC model in varied educational contexts.

Additionally, there has been growing acknowledgement of the importance of teacher-researcher collaborations as a means to bridge the gap between theory and practice and to explore the practical implementation in real-world settings (Tian, 2022a; Tian & Lau, 2023; Wong, 2024b; Wong & Tian, 2025). Although novice teachers might have acquired a translanguaging stance through professional development (PD) or teacher preparation, they often express uncertainty in its practical implementation (Wong, 2023; Wong et al., 2023). In response to this reality, Sato (2023) advocates for greater teacher-researcher collaborations to facilitate dialogue between research and practical classroom applications. Recent studies (e.g. Tian, 2022a; Tian & Lau, 2023; Wong, 2024a; Wong & Tian, 2025) have begun exploring how DLBE teachers incorporate translanguaging in their classrooms as a result of such teacher-researcher collaborations.

However, the dynamics of these collaborative relationships, especially in the context of applying translanguaging and innovative models such as the MEC in DLBE, are not well understood. As Chinese DLBE programmes continue to expand globally, the imperative for research that critically attends to the academic content and multilingual needs of DLBE students intensifies (Wang, 2024). Therefore, the purpose of the study is to examine how a novice DLBE teacher adapted the MEC model when teaching a Science unit in a Chinese DLBE setting through a teacher-researcher

partnership and to explore the dynamics of this collaboration. The research questions posed were:

RQ (1) How did a novice teacher adapt the MEC model in teaching a Science topic in a Chinese DLBE setting?

RQ (2) How did the teacher-researcher collaboration contribute to the novice teacher's adaptation of the model?

## 2. Literature review

### 2.1. *Translanguaging for critical consciousness in DLBE*

Scholars of DLBE have increasingly advocated for the centering of critical consciousness, or the process of overcoming hegemonic ideologies that perpetuate oppressive educational conditions, to be a foundational goal of DLBE (Cervantes-Soon et al., 2017). One pedagogical practice identified to be impactful in promoting critical consciousness is that of translanguaging (Dorner et al., 2022). The concept of translanguaging was first coined by a Welsh educator to refer to alternating input and output between English and Welsh (Williams, 1994). Since then, the concept has been expanded by scholars in bilingual education and applied linguistics to incorporate a social justice orientation, advocating for equitable education for bi/multilinguals' natural language practices and rejecting monoglossic ideologies with associated teaching approaches that neglect parts of EMLs' linguistic resources (García & Li, 2014; Otheguy et al., 2015). Translanguaging pedagogy encourages students to use their full linguistic resources beyond simply mixing language structures or switching from one language system to another (Li, 2011; 2018). It embraces leveraging multilingual and multimodal resources to make sense of content as a pedagogy designed to support EMLs in acquiring academic content (Lin, 2015; Tai, 2024). Cenoz and Gorter (2021) further describe this approach as pedagogical translanguaging aimed at increasing EMLs' proficiency while tapping into their pre-existing linguistic knowledge.

Existing literature on translanguaging shows that allowing EMLs to use their entire communicative repertoires not only aids their learning and language development (Wong & Tai, 2023; Wu & Lin, 2019), but also strengthens their identity as legitimate? multilinguals (Wong, 2024b). Several studies have addressed teachers' enactment of the pedagogy in CLIL settings (e.g. Kao, 2023; Tai, 2024; Tai & Li, 2020). These studies describe how these teachers, without prior training on translanguaging, naturally mobilise various resources to create a translanguaging space to support students' learning. However, particularly in Chinese DLBE settings where Chinese is still a minoritized language, uncritical and unstrategic ways of applying translanguaging pedagogies may lead to the reproduction of existing language hierarchy that over-privileges English over Chinese (Tian & Lau, 2023). Thus, teachers need to be provided sufficient knowledge of and experience in the implementation of translanguaging to design lessons with clear intention and pedagogical purposes (Cenoz & Gorter, 2021; Wong, 2023; Wong et al., 2023), so that spaces for minoritized languages are protected while students' authentic linguistic repertoire and multilingual practices are recognized.

A growing body of research in Chinese DLBE has begun to focus on how teachers, as a result of training in pedagogical translanguaging, use planned strategies to create a translanguaging space to support EMLs' learning (e.g. Tian, 2022a, 2022b; Wong, 2024a; Wong & Tian, 2025; Zheng, 2021). These studies collectively demonstrate how teachers and students mobilize their full communicative repertoires to enhance academic learning while expanding Chinese proficiency. For instance, Zheng (2021) investigated a Chinese teacher's creation of a translanguaging space using a language ecology approach, revealing that students' use of their home language (L1) aided peers with lower proficiency levels. Similarly, Wong and Tian (2024, 2025) examined how Chinese DLBE teachers integrated translanguaging into their instruction to support students' learning of both content and Chinese. The findings from both studies revealed that the teachers skillfully mobilized a range of communicative resources and connected the EMLs' lived experiences to facilitate their acquisition of academic content and Chinese.

An aspect of translanguaging that has received comparatively less attention is that of translanguaged assessments (Jiang et al., 2024). In order for translanguaging pedagogy to truly be transformative, translanguaging practices must extend beyond instruction to include assessments that also avoid restrictive and deficit approaches to student evaluation (Grapin & Ascenzi-Moreno, 2024). For example, in a study with novice Chinese L2 learners in New Zealand, Wang and East (2024) found that most students were able to both express their identities and complete writing assessments more fully when given the space to draw on their entire trans-semiotic repertoire. Others, such as Wong (2024a), found that greater confidence, proficiency in Chinese, as well as appreciation for other languages were produced by students as a result of translanguaged formative assessments in a fifth grade Chinese DLBE classroom.

Despite these notable insights, in both Chinese DLBE and translanguaging assessments, there is still a significant shortage of studies in Chinese DLBE contexts compared to other DLBE contexts (Tian, 2022b). This lack of research is particularly concerning given the context-specific nature of pedagogical translanguaging (Cenoz & Gorter, 2021). The pressing need for further research is amplified by the extensive number of Chinese DLBE programmes in the U.S., with over 317 such programmes at the present (Tian et al., 2021). As Chinese DLBE programmes continue to expand globally, the imperative to investigate these areas becomes more critical (Wang, 2024). The current research shortfall not only represents a gap in academic knowledge but also a missed opportunity to impact a large and growing learner demographic. Therefore, addressing this deficiency could lead to improved educational practices, benefiting a substantial, but currently underserved student population (Wang, 2024).

## ***2.2. The multimodalities-entextualization cycle as a heuristic for translanguaging pedagogical designs***

As part of ongoing efforts to enhance the implementation of translanguaging pedagogies, Lin (2015, 2019) introduced the MEC, a framework tailored for lesson planning to support EMLs. The MEC model leverages students' complete communicative repertoires, enabling a pedagogical approach that integrates translanguaging strategies. This approach aims to connect students' own experiences to their learning and expand their academic content and academic literacies in an L2 (Lin, 2015, 2019; Wu & Lin, 2019).

The model comprises three dynamic stages (Lin, 2015). In the first stage, teachers use various multimodalities to generate interest in the topic. The second stage involves students engaging with relevant texts and processing main ideas using different language and multimodal resources. In the third stage, students articulate the meaning of the text (entextualization) in academic language, utilizing scaffolding strategies provided by the teacher. The strength of the MEC model lies in its emphasis on strategic and intentional design across curriculum stages, providing spontaneous translanguaging spaces in stages 1 and 2, and planned translanguaging spaces in stage 3 (Lin, 2019). This approach enables teachers to support learning by allowing students to use various forms of communication and draw on their cultural and language repertoires in the earlier stages, preparing them for the entextualization of content in the target language in the later stages (Lin, 2015). The attention to designing systematic and intentional spaces for translanguaging and extextualization in the target language makes the MEC a great heuristic for translanguaging designs in Chinese DLBE contexts where there is an important need to protect spaces for the use of minoritized Chinese partner language while honoring students' authentic multilingual practices.

A few studies (e.g. Liu, 2020; Liu et al., 2020; Wu & Lin, 2019) have explored how teachers utilized the MEC model in their teaching. For example, Wu and Lin (2019) examined how a Science teacher in Hong Kong applied the MEC model and integrated translanguaging in a high school Biology class. They reported that the teacher successfully adapted the model, facilitating a collaborative meaning-making process between the teacher and the students, leading to transformative learning outcomes. The students were not only deeply engaged in the learning process but also developed both confidence and a genuine interest in the subject matter. However, as we have alluded to previously, the application of translanguaging pedagogies require thoughtful adaptation across different sociopolitical and sociolinguistic contexts to avoid a reproduction of a linguistic hierarchy mirroring social hierarchies that privilege the majoritized language in the classroom (Ballinger et al., 2017). Despite the positive results reported in these studies, there is a notable scarcity of research on how teachers implement the MEC model in young learner contexts where English is the primary majoritized societal language, with target or partner languages like Chinese in a minoritized position instead. Existing studies have concentrated on specific settings, such as English as a medium of instruction (He & Lin, 2018; Wu & Lin, 2019) and at the university level (Liu et al., 2020). Thus, there is a clear need for more comprehensive research to understand how teachers adopt the MEC model in diverse educational contexts beyond these specific scenarios.

### ***2.3. Teacher-researcher collaboration for training on enacting translanguaging pedagogies***

While teachers, particularly novices, may have developed a translanguaging stance from a teacher preparation course, they often lack experience and guidance in planning and implementing the pedagogy in their practices (Wong, 2023; Wong et al., 2023). Novice teachers, as defined by Farrell (2012), are those within their first three years in the teaching field. This initial period is often the most challenging, underscoring the importance of providing targeted support and mentorship (Troesch & Bauer, 2020). Recognizing this need, researchers emphasize the vital role of teacher-researcher collaboration not only for

connecting theoretical understanding with classroom application (Sato, 2023), but also for offering PD and mentorship on innovative teaching techniques (Juuti et al., 2021). In response, researchers have increasingly focused on partnering with teachers to co-design lessons that integrate translanguaging as a pedagogy (He & Lin, 2018; Liu et al., 2020; Tian & Lau, 2023; Wong, 2024a; Wong & Tian, 2025). These studies illustrate how teachers skillfully incorporated translanguaging pedagogy in their classes to facilitate students' learning of academic content and the new language as a result of teacher-researcher collaboration. As a result, teachers have the potential to transform from users of particular constructs to analysts, and eventually, even educators of that construct (He & Lin, 2018, p. 168). These collaborations not only provided PD opportunities for teachers but also served as a form of mentorship, deepening their understanding of translanguaging pedagogies (Wong, 2024a). However, despite the many successful collaborations reported in the literature, researchers and teachers working jointly on design and translanguaging implementation are often riddled with complications and tensions. For example, teachers may be hesitant to fully embrace translanguaging work due to constraints from school monoglossic language policies or a lack of time and access to teaching materials (Shepard-Carey & Tain, 2023; Wong, 2023). Thus, researchers and teachers need to develop a deeper appreciation of how translanguaging practices must be adapted in each language classroom based on student needs and teaching circumstances rather than to follow idealized visions of translanguaging stances (Shepard-Carey & Tian, 2023).

Among the studies exploring teacher-researcher collaboration, Liu et al. (2020) and Tian and Lau (2023) provide relatively more detailed insights into how they supported the teachers' PD during the collaboration. Specifically, Tian and Lau (2023) documented the development of a shared understanding between a teacher and a researcher regarding the implementation of translanguaging pedagogies in a Chinese DLBE classroom through negotiation of meaning, which at times involved resolving moments of joint confusion, hesitations, and doubts, but which ended in mutual learning on both the teacher and researcher's part. Others, like Liu et al. (2020) used the MEC framework to co-design lessons with a medical school instructor in China, integrating translanguaging strategies to enhance students' academic literacies by utilizing their full linguistic and semiotic repertoires. This collaboration not only heightened the teacher's awareness and implementation of translanguaging but also demonstrated how the researchers provided insights, guidance, and negotiated meaning with the teacher in the collaborative process. It is important to note that the success of the collaboration in Liu et al. (2020) not only laid in the rapport between teacher and researcher, but also in the teacher's self-motivation and investment in self-studying, experimenting, and refining translanguaging materials provided to her by the researcher. While offering valuable perspectives on teacher-researcher collaboration in translanguaging for adult learners in professional settings, this study highlights the need for further research across various educational contexts to better understand these interactions, including in Chinese DLBE settings with young children.

### 3. Researcher positionality

As a multilingual individual fluent in Cantonese, English, and Mandarin, as well as a teacher educator with expertise in translanguaging pedagogy, Cathy's identity and professional experiences significantly shaped this study. Her commitment to normalizing

multilingual education informed her decision to adopt a participatory research approach, emphasizing collaboration and co-construction of knowledge. Cathy's dual role as researcher and collaborator presented both opportunities and challenges. On one hand, her shared linguistic and cultural background with the teacher fostered trust and open communication. On the other hand, this dual role required careful navigation to ensure that the teacher's voice and autonomy were not overshadowed by Cathy's expertise or research priorities. To address this, Cathy actively sought Ting's feedback throughout the process, co-constructed learning materials, and created opportunities for mutual reflection. This reflexive approach not only strengthened the partnership but also ensured that the research remained grounded in the teacher's lived experience and professional knowledge.

Vashti, the second author, also a multilingual speaker of Cantonese, English, and Mandarin, brought valuable perspectives to the project through her research interests and expertise in DLBE. Her role as a collaborator was pivotal in ensuring the study's methodological rigour. Collectively, the authors' complementary backgrounds and shared commitment to DLBE enabled a nuanced approach to examining and interpreting the dynamics of teacher-researcher collaboration and teaching practices in a Chinese DLBE setting.

## 4. Methods

Grounded in constructivist epistemology, we adopted a participatory approach in the study (Tracy, 2020). This approach views researchers and participants as collaborative contributors in the teaching and learning process, aiming to cultivate participants' knowledge (Tracy, 2020). Within the approach, we utilised ethnographic methods (Tracy, 2020) for data collection and analysis. Cathy actively engaged with the participating teacher during the lesson planning process, with the aim of enhancing her knowledge and understanding of the subject matter (Tracy, 2020). Throughout the study, we strived to ensure rigour by achieving confirmability, credibility, dependability, and transferability (Lincoln & Guba, 1985), which we will explain throughout the following subsections.

### 4.1. Context

The study was conducted in a third grade (G3) class at Crestview Bilingual School [1], located in the U.S. At the time of the study, Crestview offered a full-time education in both English and Chinese from preschool through eighth grade, with an emphasis on diverse cultural and linguistic backgrounds within its student body. The language policy of the school stated that 75% of instruction should be conducted in Chinese for G3. The curriculum included academic subjects such as English Language Arts, Mathematics, Science, and Chinese Language Arts. Notably, Science at the elementary level was taught in Chinese. Teachers at Crestview were provided with a list of topics for the Science curriculum and were given the autonomy to design and deliver lessons according to their professional knowledge.

In the G3 classroom, there were 10 students, representing a diverse cultural and linguistic demographic: one student of Chinese descent, three Black students, four bi-racial students, and two White students. All students predominantly spoke English and their proficiency in Chinese varied. According to the teacher, the students' proficiency levels ranged from



novice-mid to intermediate-high, as per the American Council on the Teaching of Foreign Languages proficiency guidelines (ACTFL, 2012). Specifically, the students' proficiency levels ranged as follows: one at the novice-mid level, four at the novice-high level, two at the intermediate level, and three at the intermediate-high level.

#### **4.2. Participant**

The participant in this study was Ting, the classroom and Science teacher for G3 at Crestview. A native Mandarin speaker from China and proficient in English, Ting moved to the U.S. to pursue a master's degree in Chinese linguistics and cultures. After graduating two years ago, she began her teaching career at Crestview, initially working at upper-grade levels. Ting did not undergo a formal teacher training programme prior to her position at Crestview. Currently in her third year of teaching, Ting considered herself a novice teacher. Additionally, this academic year marked her first experience teaching at the G3 level.

Prior to this study, Ting participated in a 45-minute professional development (PD) session on translanguaging pedagogy conducted by Cathy. This session introduced foundational concepts and strategies, which Ting found particularly impactful, as it occurred during a period of significant administrative turnover and resource scarcity at Crestview. These challenges were especially acute for novice teachers like Ting, who faced limited institutional support and resources for Chinese language instruction in the U.S. Although initially inspired by the translanguaging approach, Ting encountered difficulties integrating these strategies into her teaching practice, particularly with younger students, due to her school's constrained support system. Recognising Ting's interest and struggles, Cathy initiated a follow-up conversation to discuss her post-PD experiences. During this conversation, Ting expressed enthusiasm for the potential of translanguaging pedagogy but voiced uncertainty about its practical application in her classroom. This dialogue marked the beginning of a teacher-researcher collaboration. Together, they outlined a plan that included identifying specific translanguaging strategies to support content learning in science, co-creating lesson plans that integrated these strategies, implementing the lessons in Ting's Grade 3 Science class, and engaging in post-lesson reflections to refine their approach.

The collaboration developed through an iterative process of co-planning, implementation, and reflection. Initial meetings focused on identifying specific challenges in Ting's classroom and brainstorming potential solutions grounded in translanguaging principles. Cathy introduced potential frameworks, including the MEC model, to address these challenges. After exploring different frameworks, Ting stated that the MEC model was the most suitable for her context and could be applied across different subjects. Utilising the MEC model as the framework, Cathy and Ting co-designed a two-week learning segment on 'the parts and functions of plants' based on the Science curriculum. Ting contributed her knowledge of her students' needs and classroom context, while Cathy provided expertise in translanguaging pedagogy, offering suggestions, clarifying concepts, and supplying examples to support the design process. Despite Cathy's input, Ting made the final decisions, adapting the model based on her professional knowledge and understanding of the students.

During the implementation phase, Cathy observed lessons and provided constructive feedback, while Ting reflected on the strategies' effectiveness and suggested adjustments. Regular discussions allowed for continuous refinement of the lessons and

ensured a reciprocal exchange of ideas, ensuring the collaboration was grounded in both practical classroom realities and the model.

### 4.3. Data collection

The data for this study were triangulated and included four main sources: (1) transcripts from the co-planning session and other communications, (2) detailed field notes from classroom observations, (3) teaching materials and students' artifacts, (4) transcripts from an interview with Ting, and (5) Cathy's reflections about the collaboration process.

Prior to the two-week learning segment, Ting and Cathy engaged in a co-planning session, which was both audio-recorded and transcribed, lasting approximately two hours. Their collaboration extended throughout the learning segment, informed by the students' performance, Ting's questions about the logistics of implementing translanguaging pedagogies, and her thoughts on how each segment of the curriculum genre went. This ongoing collaborative communication, documented through email exchanges, text messages, post-observation discussions, and comments on a shared online folder provided valuable insights into the planning process and the integration of translanguaging and the MEC model. In this paper, we use 'co-planning notes' to refer to our collaborative communication, which was conducted in both Chinese and English.

In addition, Cathy observed all of Ting's Science classes during the learning segment, taking detailed field notes with thick and rich descriptions (Rossman & Rallis, 2003). These notes captured the implementation of the co-planned lessons, highlighting teacher-student interactions, student engagement, and the practical application of the MEC model. Ting also uploaded all her teaching materials and the students' work onto an online shared folder, allowing for analysis of her implementation and the students' responses to the lessons. Shortly after the completion of the learning segment, Cathy conducted a 40-minute one-on-one interview with Ting, during which they conversed in both Chinese and English. This interview explored her reflections on our collaboration, her implementation of the MEC model, and the students' performance. In addition, Cathy took reflective notes throughout the collaboration process, which provided additional insights by capturing her thoughts on the overall collaboration with Ting, including the co-planning sessions and other interactions. Table 1 provides the details of each data source in the study.

### 4.4. Data analysis

Adopting a content analysis approach, Cathy applied an abductive methodology (Charmaz, 2014), conducting the analysis in two rounds. In the first round, she utilised a concurrent data collection and analysis strategy (Quintanilha, 2021), which allowed for immediate analysis of co-planning and fieldnotes, as well as artifacts as they became available. This approach facilitated confirmability through continuous reflection and adjustment. During this stage, Cathy utilised an open coding strategy and to make sense of the data (Charmaz, 2014). Cathy also documented her thoughts concerning various aspects, including the dynamics of the collaboration with Ting, her concerns and implementation of the model, and the students' work through memo writing (Saldaña, 2016). The memo writing served as a reflexivity strategy, enhancing the dependability of the analysis (Quintanilha, 2021). Examples of initial codes for RQ1 included 'discovery inquiry,' 'utilizing

**Table 1.** Details of each data source.

Data Source	Collection Method	Details/Quantity
Co-planning notes: Transcripts of audio recording	Co-planning session	1 session lasting approximately 2 hours; conducted in both Chinese and English. A research assistant transcribed and translated the session, which was then verified by Cathy.
Co-planning notes: Emails, text messages, post-observation discussions, and Google documents	Ongoing collaboration and communication	Continuous throughout the two-week learning segment; included feedback, questions, suggestions, and comments from both Cathy and Ting; notes are in both Chinese and English.
Fieldnotes	Classroom observations	8 classes observed, with detailed descriptions
Artifacts: Teaching materials and student work	Ting uploaded to online shared folder	6 sets of student work, 7 teaching artifacts, weekly lesson plans for 2 weeks
Interview	One-on-one recorded and transcribed interview with Ting after the learning segment.	1 interview conducted by Cathy lasting 40 minutes conducted in Chinese and English. The purpose was to understand Ting's perspectives about her teaching and the collaboration. A research assistant transcribed and translated the session, which was then verified by Cathy
Reflections	Cathy's reflections	Ongoing reflections during and after the co-planning session and other interactions throughout the collaborative process, capturing Cathy's thoughts and providing additional context and insights.

students' linguistic repertoires,' 'multimodal resources,' 'accommodations,' and 'strategies', Sample codes for RQ2 were 'open-mind,' 'uncertain,' 'modifications,' and 'lack of materials', Additionally, Cathy employed *in vivo* coding (Saldaña, 2016) to authentically capture the co-planning process, classroom interactions, and Ting's reflections.

In the second round of analysis, Cathy's focus shifted to a more detailed examination of the co-design and its implementation in relation to the MEC model. Employing a constant comparative method (Glaser & Strauss, 2017), she carefully compared and contrasted fieldnotes, co-planning notes, artifacts, the interview transcript, and Cathy's reflective notes. This comprehensive analysis aimed to create a detailed overview of the collaboration, Ting's implementation, student engagement, and Ting's perceptions of the model and collaboration. Utilising axial coding (Saldaña, 2016), Cathy connected the codes to develop broader categories that related to each RQ. For RQ1, axial codes such as 'translanguaging practices,' 'assessment,' and 'intentional strategies' were identified, capturing the ways Ting facilitated students' learning. For RQ2, 'mentorship moments,' 'co-design,' and 'level of confidence' were identified.

After that, Cathy invited Vashti to join the project as a 'critical friend' to help refine the interpretations and deepen the analysis. This concept of a 'critical friend' is used to describe someone who provides a constructive critique of the work to ensure rigorous examination and enhancement of the research (Noor & Shadee, 2021). Vashti's primary role was to review the data and its interpretation for clarity, coherence, and alignment with the research questions, while also probing deeper questions to further refine and deepen the analysis. This collaboration was instrumental in ensuring that the conclusions drawn were well-supported by the data, enhancing credibility of the study (Lincoln & Guba, 1985). The two authors worked collaboratively to synthesise the findings into

distinct themes, derived from a deeper engagement with the data, reflecting the dynamics of the collaborative efforts between Cathy and Ting, the implementation of the MEC model, students' responses, and Ting's perceptions.

Our analysis clearly demonstrated that the teacher-researcher collaboration played a pivotal role in enhancing Ting's instructional practices, providing her with essential PD opportunities and mentorship as a novice teacher. Thus, we view it as more effective to interweave the report of the findings from the two research questions to better illustrate how the collaboration influenced Ting's pedagogical decisions. Accordingly, four themes were generated: (1) Building students' background knowledge (Stage 1), (2) Facilitating and reinforcing students' learning of new concepts (Stage 2), (3) Employing translanguaging in summative assessments (Stage 3), and (4) The teacher's perceptions on the collaboration. Cathy, then, integrated key quotes and detailed descriptions in the report to enhance transferability (Lincoln & Guba, 1985). To validate the interpretations, Cathy conducted member checking with Ting, presenting a summary of the findings for her feedback, to further ensure confirmability (Lincoln & Guba, 1985).

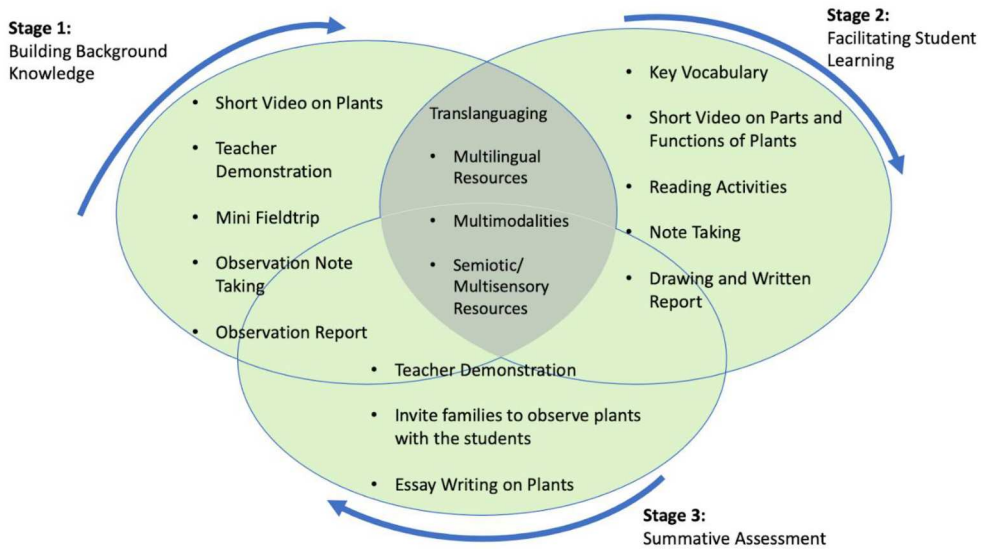
## 5. Findings

When Cathy and Ting first began co-designing the learning segment, Cathy introduced two potential frameworks, including the MEC model. After reviewing both options, Ting felt that the MEC model would provide the structure she needed. In response, Cathy explained the MEC model in detail, outlining its three stages and offering examples of activities for each stage, ensuring that the explanation was clear and easy to follow (Co-planning notes). Ting confirmed her understanding of the model and recognised its potential to enhance her instructional practices across different content subjects. The co-planning focused on furthering Ting's understanding and integrating the MEC model with pedagogical translanguaging.

The analysis revealed that throughout the learning segment, Ting intentionally adapted elements of each stage of the MEC model to suit her students' needs. She introduced and reinforced the students' learning of the topic, enhanced their Chinese proficiency, and provided opportunities for students to present their work, all while incorporating pedagogical translanguaging. [Figure 1](#) displays the various activities Ting implemented at each stage of the MEC model and how she *adapted* and integrated them across different stages within the unit.

### 5.1. Building students' background knowledge (Stage 1)

The teacher-researcher pair first established the learning and language objectives for the segment, followed by exploring strategies to spark the students' interest in the topic. To create a rich experiential context for the first stage of the MEC model, Cathy suggested incorporating multisensory resources, proposing a mini field trip as part of the learning activity. This inspired Ting to have the students observe plants around the campus (Co-planning notes). Following the guideline of utilising various multimodalities in stage one, Cathy also suggested that Ting create a graphic organiser with guiding questions for students to draw and note their observations using their full communicative repertoires. The excerpt below demonstrates the conversation.



**Figure 1.** Ting's Adaptation of MEC Elements Across Stages.

R (Researcher): What do you think about creating a graphic organizer for them to record their observations?

T (Ting): What kind of graphic organizer?

R: You can provide guiding questions and space for them to draw what they see. Students can also write down their observations using any languages they prefer.

T: Hmm...can you send me a sample?

R: Sure! I'll share an example and upload it onto our shared folder.

Ting's question, 'What kind of graphic organizer?' and her request for Cathy to send her a sample, reflected her teaching inexperience, but eagerness to learn. Understanding the challenges that novice teachers may face due to their inexperience, lack of administrative support, and access to existing language teaching materials, Cathy promptly created a sample for Ting (Reflections). Ting then took the sample and adapted it by incorporating pinyin (the official romanisation system for Mandarin Chinese) and visual aids to suit her students' varying language proficiency needs (See [Figure 2](#)).

Before the mini field trip, Ting prepared the students by showing a video in their dominant language (English) about different plant parts, accompanied by her own demonstrations on how to record observations using the graphic organiser. As she explained her thought process in Chinese and drew the plant on the graphic organiser, the students actively engaged in the activity by sharing their ideas with their full linguistic repertoires (Fieldnotes). Extract 1 illustrates this classroom interaction between Ting and the students.

日期： \_\_\_\_月\_\_\_\_日      姓名： \_\_\_\_\_

nǐ kàn dào shén me      qǐng bǎ nǐ kàn dào de jì lù xià lái。  
你看到什么？ 请把你看到的记录下来。

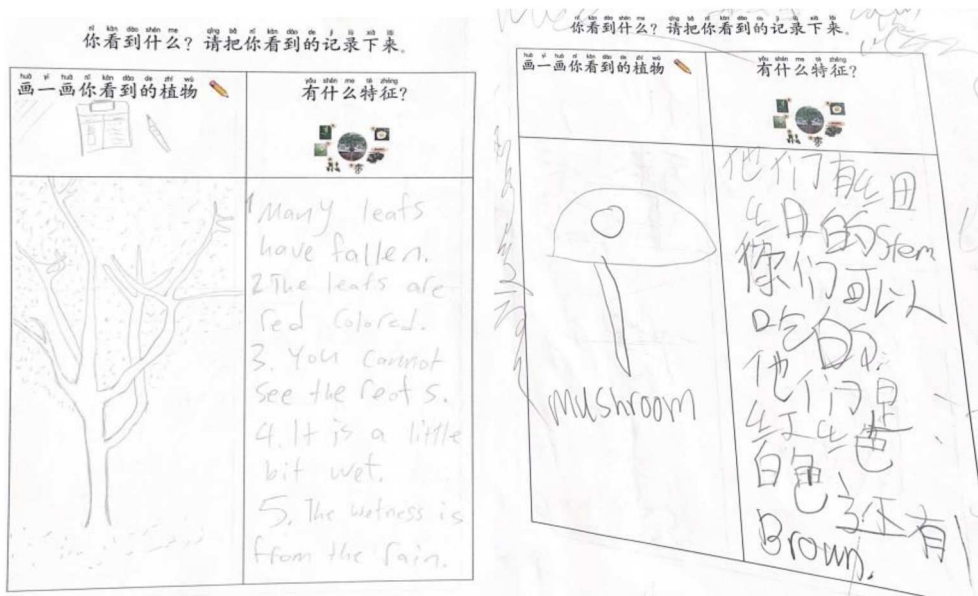
<p>huà yì huà nǐ kàn dào de zhí wù </p> <p>画一画你看到的植物</p>	<p>yǒu shén me tè zhēng?</p> <p>有什么特征？</p> 
Empty space for drawing	Empty space for notes

Figure 2. Graphic organizer modified by Ting.

Extract 1. Classroom interaction (T: Teacher; S: Student)

	Utterances	Gestures
T:	它有什么特点或者特征呢? ((What are its features?))	writing the words 特征 and its pinyin on the board
T:	每个植物都不一样, 就像我们每个人长得都不一样 ((each plant is different, just like each of us looks different))	pointing at the students
T:	这个植物你看到它, 它有什么不一样? 你看到什么? ((What do you see that's different about this plant? What do you see?))	
S1:	它们的 umm...leaves 是很大 ((Their umm... leaves are very big))	
T:	叶子很大。嗯。是这样的大吗? 还是 ((The leaves are big. Hmm. Are they this big? Or))	opening her arms wide and big horizontally
S1:	不是 ((No))	putting his hands up and straight in the air
S1:	很长 ((Very long))	
T:	嗯, 很大, 很长 ((Hmm, very big, very long))	extending her arms up and straight in the air
S2:	很...很尖尖 ((Very...very pointy))	
T:	嗯, 它有尖尖的叶子 ((Hmm, it has pointy leaves))	
S2:	oh! 还有它们 inside the pot ((And they are inside the pot))	
T:	啊, 它们在盆子里面, 你们都看到了 ((Ah, they are inside the pot, you all see it))	pointing at the pot in the photo
S3:	它们有很多图案 ((They have many patterns))	
T:	你们看到它们的图案是怎样的? ((What do you see about their patterns?))	pointing at the patterns on the leaves
S4:	小小的 ((Small))	
T:	blended 还是? ((or?))	drawing some circulating lines on the board
S5:	organized!	
T:	是, 是很整齐的. 而且是从上到下 ((Yes, they are very neat. And they go from top to bottom))	drawing lines on top of each other on the board

During the mini field trip, Ting actively engaged the students by posing questions, to which they responded using their full linguistic repertoires (Fieldnotes). Students recorded their observations in the graphic organiser, predominantly in English, with



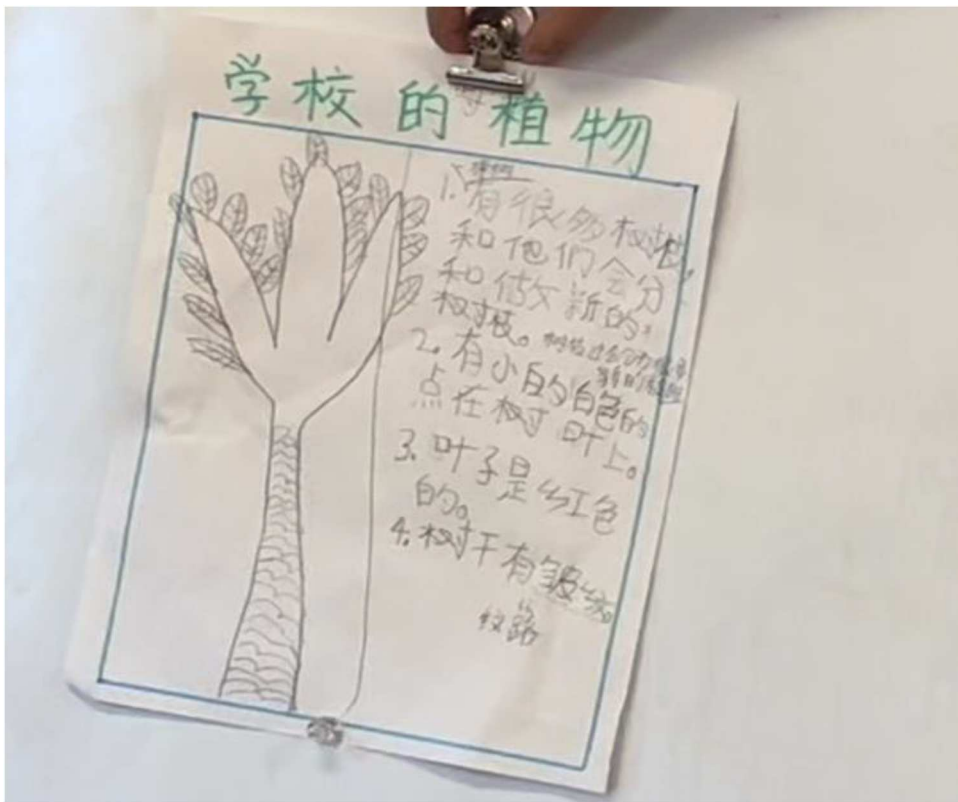
**Figure 3.** (a–b) Samples of the students' notes during the field trip.

one intermediate-high student opting to write primarily in Chinese (Fieldnotes). **Figures 3(a–b)** contain samples of the students' notes at this stage.

Following the field trip, an activity based on stage one of the MEC model, Cathy and Ting decided it would be beneficial for students to extend the field trip note taking activity by sharing their observations with each other. To support this, Cathy strategically suggested incorporating an element from stage three of the MEC model – entextualizing experiences using academic language (Co-planning notes). This decision was not a deviation from the model, but rather a scaffolding technique intended to prepare students for deeper engagement with academic language later in the unit (Reflections). Specifically, Cathy proposed that students organise their notes and verbally share their observations with peers, using the targeted vocabulary.

Ting agreed and further expanded on this idea, instructing the students to select one observed plant for a detailed description in Chinese. Importantly, she allowed for the use of their entire communicative repertoire, including drawings, pinyin, or English terms for unfamiliar words (Fieldnotes). Most students composed their reports in Chinese, but also included other elements such as drawings, pinyin, or English terms for unfamiliar words (Artifacts). **Figure 4.** displays a sample of a student's observation report. The following day, Ting encouraged each student to present their reports in Chinese to the class, drawing on target vocabulary to express their existing knowledge and observations about plants, but also to help build onto each other's knowledge (Fieldnotes). When reflecting on the activities carried out in this stage, Ting acknowledged that by introducing this mini-entextualizing segment early in the lesson, not only did it enrich students' engagement, but it also laid the groundwork for more complex tasks in subsequent stages (Interview).





**Figure 4.** A student's observation report after the field trip.

### **5.2. Facilitating and reinforcing students' learning of the new concept**

After completing their planning on how to build the students' background knowledge (Stage one), Cathy and Ting transitioned to stage two of the MEC model, which focused on facilitating deeper learning. To support this transition, they planned to use a variety of translanguaging resources, such as readings with semiotic elements, a bilingual word wall, multilingual videos, and graphic organisers (Co-planning notes). Ting expressed difficulty in locating teaching materials in Chinese, a common challenge associated with less commonly taught languages due to lack of resources. Understanding this widespread issue, especially for novice teachers like Ting, Cathy leveraged her educational resources and professional networks to compile a list of age-appropriate videos and books aligned with the learning objectives (Reflections). Ting then selected the most suitable ones for her lesson. The excerpt below indicates our conversation regarding this.

T: It's very difficult to find Chinese videos and books that are suitable for the students.

R: Where do you usually find these materials?

T: 一般来说都是以前的老师用过的。你看能不能也帮我找找看? (Generally, it's what previous teachers have used. Do you think you could also help me look for some?)

R: 好的 (okay) I'll see what I can find and perhaps you can select from there?



Figure 5. A bilingual word wall.

In the classroom, Ting initiated stage two by introducing essential vocabulary through a bilingual word wall with pinyin and visuals (See Figure 5). After ensuring that all students understood the targeted vocabulary, Ting began reading one of the books Cathy had recommended. Figure 6 presents a sample of the book's content.

To further reinforce the students' learning objectives, Ting intentionally showed an English video about parts and functions of plants twice. During the first viewing, her aim was to give the students a general overview of the content. To teach students how to take notes during the overview segment, she provided a graphic organiser to label different plant parts. She encouraged students to take notes on their functions using their full linguistic repertoires (Fieldnotes). On the second viewing, Ting focused on deepening comprehension by pausing the video periodically for discussions. Extract 3 captures the classroom interaction that occurred during this process. Ting expressed during a post-observation conversation that this approach was instrumental in assessing students' understanding and encouraging them to revise their notes. Figure 7 illustrates notes taken by a student using English and drawings to indicate their understanding.



**Figure 6.** A sample content from the selected book. Fang and Chin (2023).



Figure 7. An example of students' note taking.

## Extract 3

Utterances	Gestures
T: 我们看一下叶子 ((let's take a look at leaves))	
T: 它需要什么? ((what does it need?))	pointing at the sun on the screen
Ss: Sunlight	
T: 谁记得 sunlight 用中文怎么说? ((who remembers how to say sunlight in Chinese?))	raising her hand
S3: 果实 ((fruits))	
T: 不是 ((no))	
S2: Ahh...	looking at classmates for help
T: 阳... ((sun...))	
Ss: 阳光 ((sunlight))	
T: 阳光...叶子需要阳光吸收营养 ((sunlight...leaves need sunlight to absorb nutrition))	
T:	continues playing the video
T:	pauses the video
T: 茎是干什么的? ((what is the function of a stem?))	
T: 可以把水送到每个叶子 ((it can deliver water to leaves))	Students are silent putting her hands together in cupping shapes, moving from bottom to top
S4: for nutrition	

While still in stage two of the MEC model, Ting expressed some uncertainty about strictly adhering to the model's sequential stages but was open to exploring new strategies. After discussing the students' needs with Cathy, Ting agreed that incorporating elements from stage three, specifically 'using academic genres with language scaffolds provided' would be beneficial at this point to support her students (Co-planning notes). This decision was driven by the belief that appropriate scaffolding is crucial for student learning, regardless of the model's sequential stages, and that ongoing formative assessment is a best practice (Reflections). Together, they decided that conducting a formative assessment was necessary to gauge students' understanding before moving forward.



**Figure 8.** Student's note demonstrating their understanding of plants.

Initially, Ting considered having students simply label pictures (Co-planning notes). However, Cathy suggested a way to build greater engagement with the topic into the activity: students were to review their notes and draw a plant of their choosing, detailing each plant part and its function in Chinese as homework (Co-planning notes). This task not only aligned with the 'engaging students in note-taking' aspect of stage two, but also introduced more complex language scaffolding typical of stage three. Given the students' varied language proficiency levels, Ting was concerned that the task might be too challenging for those with weaker writing skills. In response to Ting's concern, Cathy suggested allowing students to draw on multimodal resources, which could support differentiated instruction (Co-planning notes). Building on this idea and referring to the features on stage two of the model, Ting strategically opted to provide an alternative option for students: recording a video in which they verbally described the functions of plant parts in Chinese while showing the picture they drew. Extract 4 below illustrates the conversation while [Figure 8](#) showcases a student's work that reflects their notes and understanding of plants. Reflecting on this, Ting observed that the students generally grasped the concepts. She also noted the benefits of translanguaging, especially for lower proficiency students, explaining that allowing students to take notes and watch a video in English prior to having them write their thoughts in Chinese helped develop their understanding (Interview).

## Extract 4

T: What can they do besides labeling?

R: By then, students would have taken notes from the reading and the video, right? How about having them review their notes and write the functions of each part in Chinese? (showing the MEC graph to Ting)

T: Hmm... I'm afraid those with lower proficiency levels won't be able to produce much in writing. Some students won't even turn in their work when they don't know how to do it.

R: How about their speaking skills?

T: They can speak, that's no problem.

R: How about having them produce multimodal work?

T: Yeah, I can have them show their drawing and explain the parts in a video on [LMS].

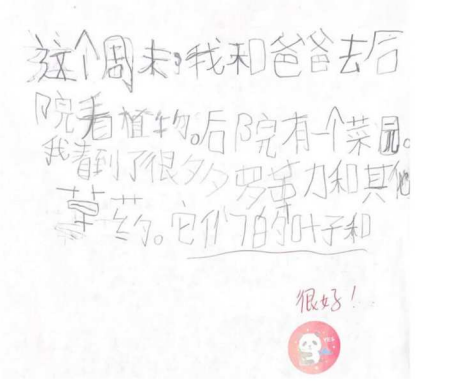

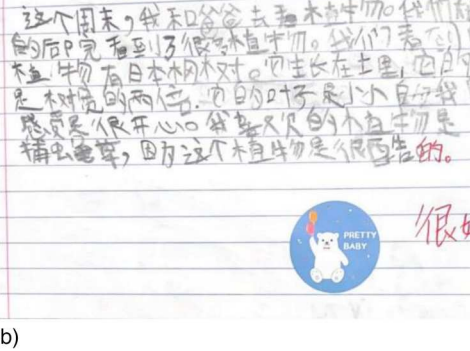

(Co-planning Notes)

### 5.3. Translanguaging in summative assessment (Stage 3)

Stage three of the MEC model focuses on enabling students to entextualize and synthesise the knowledge and experiences, with a significant emphasis on the application of academic language. Thus, building upon Ting's routine use of journal writing at the end of each learning segment, Cathy suggested adapting this practice into a more structured summative assessment. This adaptation was designed to more directly showcase the students' learning within the segment. Ting believed this approach would offer insights into her students' learning. In her words, 'This will give me a clear picture of what they've learned' (Co-planning notes).

In designing the summative assessment, Ting and Cathy implemented a strategic plan that included three mini-curriculum spaces, each tailored to reflect the distinct pedagogical focus of the corresponding stages of the MEC model. The assessment began with a discovery activity in mini-curriculum space 1, aiming to create a rich experiential context as outlined in stage 1. Here, aligning with the 'juntos' concept in translanguaging assessment (García et al., 2017), which promotes collaborative learning and language use, students and their families were encouraged to observe plants in natural settings, using their L1 to discuss and gather observational notes. Transitioning to mini-curriculum space 2, the focus shifted to engaging students in note-taking during the activity, a key component of stage 2. This stage was designed to help students process their observations and apply translanguaging strategies to expand their understanding. Finally, the activities from the first two stages culminated in mini-curriculum space 3, which encapsulated stage 3's goal of entextualizing experiences by tasking students with producing a written report in Chinese, employing academic language supported through scaffolds, such as word banks and sentence stems.

However, Ting recognised that some students, particularly those with lower proficiency levels, often struggled to complete written assignments independently (Co-Planning notes). Thus, Cathy recommended including additional semiotic resources to support their language and content learning. Ting, having limited experience in creating such

 <p>这个周末我和爸爸去后 院看植物。后院有一个菜园。 我看到了很多罗勒和其他 草药。它们的叶子和 茎很好!</p> <p>很好!</p> 	<p>Translation by Cathy:</p> <p>This weekend I went to the backyard with my dad to observe plants. There is a vegetable garden in the yard. I saw a lot of basil and other herbs. Their leaves are very small.</p>
 <p>这个周末,我和爸爸去观察植物。我们看到的 的后院看到了很多植物。我们看到了 不植物,有日本枫树。它生长在土里,它的 是树的两倍。它的叶子是小小。我很喜欢 感觉是很开心。我最喜欢的小植物是 捕虫蝇,因为这个植物是很酷的。</p>  <p>很好</p>	<p>Translation by Cathy:</p> <p>This weekend I went to observe plants with my dad. We saw a lot of plants in our backyard. The plants we saw were Japanese maple trees. They live in soil. Their roots are twice the size of the trees. Their leaves are small. I felt very happy. My favorite plant is flytrap because this plant is very cool.</p>

**Figure 9.** (a–d) Samples of students' writing in the summative assessment (Translation provided by Cathy).

accommodations, requested assistance in developing these aids. Eager to support both teacher growth and student learning, Cathy created a sample to demonstrate possible effective scaffolding practices. The sample was designed not only to aid the students directly but also to serve as a practical example for Ting. By providing her with a template that could be adapted and used in future lessons, Cathy aimed to empower Ting to independently create similar resources in the future. This support was intended to enhance her professional development and instructional confidence (Reflections). Extract 5 showcases our collaborative conversation on developing these scaffolds, which Ting then skillfully adapted to meet her students' specific needs. Consistent with the teacher demonstration aspects of stages 1 and 2, she created a writing sample to demonstrate to her students how to effectively utilise the provided word banks and sentence stems in their writing assessment (Artifacts).




<p>星期天,我自己去我家外面看植物。我看到的植物是(圈)他的大树。树的茎也很大,然后你只可以看到一点树根。它没有花,可是果实是棕色的松果。然后叶子像针一样尖。我很开心看到(圈)个植物。</p> <p>(圈)是我写的植物:</p> 	<p>Translation by Cathy:</p> <p>I went to see plants outside of my home on Sunday. The plant that I saw was a big tree. Its stem is also very big. Then you can see a little bit of its root. It doesn't have any flowers, but there were some brown pinecones. Then, its leaves were pointy like needles. I felt happy to see plants.</p> <p>This is the plant that I was writing about:</p>
<p>我知道比很多树对树,我只有看到它的茎,也没看到它的根,它的叶子小小的,它是绿色的,它的树枝是细细的,用了这么多的植物,我的感受是木有牛很漂亮,我喜欢植物,很开心,因为这个植物分很漂亮,还有红色的,我也很开心,因为我跟妈妈一起看植物,我分到一些话的词,比如,王,理,白,木,根,打,茶,还有叶。</p>	<p>Translation (highlighted) by Cathy:</p> <p>I'm also very happy because I got to observe plants with my mom. I also learned some Cantonese words, for example, roses, Japanese maple trees, stems, and leaves.</p>

Figure 9 Continuede

Extract 5

- T: Inviting students' families to observe plants with the students is a good idea.
- R: They can write about their favorite plant observed. It can prompt them to use the language and knowledge they learned in this learning segment.
- T: But some students, especially those with lower levels of proficiency often do not turn in their weekend journal writing assignment.
- R: Did you figure out why they wouldn't turn in their work?
- T: A lot of times they didn't have help at home, and they couldn't finish it on their own.
- R: Would you consider providing a word bank and sentence stems for them?
- T: Yes, I will. I need your support on the word bank and stance for them. I don't have a specific sample yet.
- (Co-planning notes)

As for the results of the summative assessment, based on Ting's observation and comparison with previous journal entries, the students not only applied their knowledge about the topic and its associated language in Chinese, but they also wrote about their experiences and feelings while observing plants with their families. Some students even shared insights they learned from their parents. Figures 9(a–d) illustrate examples of the students' writings in the summative assessment. Ting observed significant improvement, especially among students with lower Chinese proficiency, who began using more Chinese and incorporating academic vocabulary into their writing. She said, '水平比较低的学生, 他们以前都不怎么写作业, 现在他们写句子和运用学过的生词。你看, 我们班这周做了很多东西' (Students with lower proficiency levels didn't used to turn in assignments, but now they're writing sentences and using the vocabulary they've learned. Look at all the things our class has accomplished this week).

Despite the overall positive performance, Ting noticed that three students struggled to fully grasp the use of the guiding questions and word bank in the writing assignment. To address this, Cathy suggested that Ting have the students share their writings with the class. This would not only allow students to showcase their work and feel successful, but also serve as examples for peers who were uncertain about how to effectively use the provided scaffolds.

Reflecting on the summative assessment, Ting observed improvements in student writing. In her words, comparing student performance between now and prior to the teacher-researcher collaboration, '学生有很大的进步, 按照 guiding questions 写出来清晰的段落。水平比较低的学生也可以加更多的细节, 他们有努力写一些句子。我打算之后都用这个 format 给他们写 writing assessments' (The students made significant progress, writing clear paragraphs following the guiding questions. Even those with lower proficiency levels were able to add more details and make an effort. I plan to use this format for their writing assessments in the future.)

#### **5.4. The Teachers' perceptions on the collaboration**

When reflecting on this collaborative experience, Ting expressed gratitude for the collaborative process and acknowledged the effectiveness of the MEC model and pedagogical translanguaging in supporting students with varying proficiency levels in her class. Ting observed noticeable improvements in the students' use of language and content knowledge regarding plants. As a result of our collaboration, she felt more confident about lesson planning and integrating translanguaging in her instruction and assessment, and was now equipped with some examples of how specific scaffolding activities may look like. Ting's additional comments from the interview not only highlighted the success of the teacher-research collaboration but also emphasised that it evolved into a valuable mentorship experience for her:

I really want to express my gratitude for your collaboration. Being new to teaching, this is valuable professional development for me. There are many levels of proficiency within the class, which often makes it difficult to plan lessons. But in this learning segment, we were able to accomplish so much. Their writing has improved significantly. Now when I prepare for class, I am much more confident.

In sum, the findings reveal that there are mini-curriculum spaces for each stage within each major curriculum space, with elements from all three stages seamlessly, but

intentionally integrated throughout the learning segment. Through teacher-research collaboration, Ting effectively implemented the MEC model and valued this collaboration as a significant PD opportunity for herself.

## 6. Discussion

The findings from this study highlight the dynamic and non-linear approach in applying the MEC model within a Chinese DLBE context. The MEC was particularly needed in this context in order to provide opportunities for students to draw on their L1, but in systematic and intentional ways (Lin, 2015), so as to '[protect] the minoritized language from English hegemony while recognising the dynamic nature of bilingualism' (Tian & Lau, 2023, p. 962). This model provided Ting with a structured pathway that was at the same time adaptable to her teaching context to plan and conduct her lessons, allowing for the creative use of various strategies to engage her young EMLs and deepen their understanding throughout the curriculum stages. The strategic planning of MEC stages according to specific curriculum and mini-curriculum genre was crucial, allowing Ting to be responsive to her students' diverse learning needs. Furthermore, the structured way that the MEC model was applied to Ting's lesson planning allowed Ting to provide differentiated instruction to her entire class, which resulted in the enhanced learning outcomes and engagement of her students. This outcome echoes the existing literature that suggests the model can effectively facilitate students' learning in a CLIL classroom (He & Lin, 2018; Lin, 2019; Liu et al., 2020; Wu & Lin, 2019), or in this specific case, a Chinese DLBE classroom. Ting observed a significant improvement in the students' writing, noting that compared with their writing prior her collaboration with Cathy, their writing became more precise and detailed, particularly in terms of their knowledge of content and the targeted Chinese vocabulary. This suggests a need to reconsider traditional, linear models of curriculum design in favour of approaches with more structured, but adaptable stages that can be implemented according to the specific diverse linguistic and cognitive needs of students in different multilingual classrooms.

In addition, Ting's implementation of the MEC model with planned strategies was intentional and responsive to her students' varying learning needs, as demonstrated in the findings. In particular, she effectively employed a variety of multilingual, multimodal, and semiotic resources along with teacher demonstrations not only engaged students but also provided accessible learning opportunities for those with lower proficiency levels. The incorporation of multisensory experiences, particularly a field trip in stage one and family observation activities in stage three, significantly aided students' learning and application of knowledge. Thus, the study contributes to existing research on the effectiveness of pedagogical translanguaging in diverse educational contexts (Kao, 2023; Tai, 2024; Tai & Li, 2020; Wong, 2023; Wong & Tai, 2023), including DLBE programmes (Tian, 2022b; Wong & Tian, 2024, 2025) where English is both a majoritized language and the dominant language of most students. It specifically illustrates how integrating translanguaging with the MEC model can enhance student engagement and enrich understanding of both content and academic language. Thus, leveraging students' communicative repertoires throughout the MEC model stages not only boosted participation, but also enabled them to construct meaning and demonstrate knowledge, aligning with findings from previous studies examining teachers' application of the MEC model (Liu et al., 2020; Wu & Lin, 2019).

Further, the incorporation of translanguaging in assessment by through integrating the concept of ‘juntos’ in assessment (inviting families to observe and discuss plants with the students), mobilizing multimodalities (providing options for students to either write or record a video describing parts and functions of plants in Chinese) and semiotic resources (using sentence stems) demonstrate a conscious effort to support all learners, regardless of their proficiency in Chinese. Such results underscore the vital role of translanguaging in both instruction and assessment (García et al., 2017; Wang, 2024; Wong & Tian, 2025). Accordingly, we argue that translanguaging is an invaluable asset for supporting EMLs’ linguistic, cognitive, and identity development (Grapin & Ascenzi-Moreno, 2024; Jiang et al., 2024), and it should be systematically incorporated into diverse curriculum models and assessments.

Like the teacher-researcher collaboration focused on language awareness demonstrated in He and Lin (2018), Ting started out as a novice teacher who simply was a ‘user’ of translanguaging in her everyday communication as a multilingual. Ting then progressed into an ‘analyst’ of translanguaging pedagogies as she worked with the researcher to incorporate translanguaging pedagogies into her lessons. By the end of the study, Ting then transformed into an independent and more confident ‘teacher’ (p.168) of translanguaging pedagogies. Thus, these findings indicate several key elements as pivotal to the successful collaboration between the teacher and the researcher, each of which supported the design and implementation of the MEC model, while also serving as both a PD tool and a form of mentorship for Ting, expanding our understanding of effective teacher-researcher collaboration in supporting novice educators.

First, in contrast to the issue addressed by Shepard-Carey and Tian (2023), where teachers’ resistance to translanguaging often hinders successful teacher-researcher collaboration, Ting’s openness to new ideas, willingness to adapt and implement them, and strong stance on translanguaging provided a solid foundation for the effective collaboration in our study. This receptiveness enabled a smoother integration of the MEC model and facilitated the productive partnership between the teacher and the researcher. Hence, we recommend teachers who would like to engage in similar collaborations to approach new teaching methods with a readiness to experiment and adapt it according to students’ needs.

Second, the role of the researcher extended beyond mere observation and guidance, emphasising the importance of deep involvement in co-designing and understanding the challenges faced by novice teachers. Cathy’s supportive approach, characterised by a readiness to assist and provide actionable feedback, from explaining the MEC model to creating samples, locating teaching materials, and offering tailored suggestions and ongoing clarifications, helped bridge the gap between theory and practice. Thus, we recommend researchers engaging in this type of collaboration to be prepared to invest time and effort to help search or co-create teaching materials for teachers who are already stretched thin on time and other competing responsibilities.

Third, the collaborative process was grounded in mutual trust and respect. The findings demonstrated Ting’s willingness to express her concerns and vulnerability about her challenges, which allowed for open communication and effective problem-solving based on different logistical concerns that arose. Upon receiving suggestions from Cathy, Ting actively adapted the ideas based on her understanding of her students’ needs and

pedagogical knowledge. For example, she adjusted the graphic organiser to better align with her students' prior knowledge, demonstrating her ability to apply theoretical concepts practically. There were also times when Ting expressed some hesitations before accepting a suggestion from Cathy. In stage 2 of the MEC lesson planning segment, Ting was unsure if her all students had the ability to complete an extension activity that Cathy suggested. This led Cathy to refine the suggestion slightly to incorporate more multimodal aspects, which then positioned Ting well to further adapt Cathy's suggestion into an even more appropriate activity. This collaborative effort highlighted the crucial role of trust appreciation for the expertise of each party in such partnerships (Wong, 2024a), enabling both collaborators to effectively address and negotiate the inherent challenges and tensions that often arise in teacher-researcher collaborations (Liu et al., 2020; Tian & Lau, 2023).

Ting's insights and expertise were crucial to adapting the MEC model and trans-languaging strategies to fit the specific context of the classroom, illustrating the success of these models relies heavily on the teacher's active involvement and understanding. This was how a potential tension between teacher and researcher led to fruitful negotiations that resulted in an activity better than what each person could have come up with on their own. A related consequence of this collaboration was that Ting experienced invaluable mentorship, enhancing her confidence and skills in lesson planning. Such collaborations, especially in contexts lacking robust support systems for novice teachers, offer significant PD opportunities, as they allow for the tailored application of educational theories to meet specific classroom needs (Juuti et al., 2021; Kirsch & Hornberger, 2024; Sato, 2023).

Furthermore, the school leaders' open-mindedness in allowing the collaboration between Cathy and Ting within the school context significantly enabled the project. When Ting requested help from Cathy, the principal and academic director facilitated a conducive environment where such collaborations could thrive without bureaucratic hindrances, illustrating the importance of institutional support in the success of such collaborative endeavours.

Despite these positives, the findings also highlighted several challenges to conducting and sustaining teacher-researcher collaborations, including time constraints for teachers in adapting new teaching strategies, a scarcity of readily available Chinese teaching materials, and the ongoing need to accommodate diverse student proficiency levels. The collaboration further emphasised that effective planning and implementation of the MEC model, or any new teaching approach, can require substantial time and effort from researchers to provide continuous feedback and develop teaching resources. However, such investment is essential, as it leads to support for EMLs and serves as a valuable PD and mentorship opportunity for novice teachers, as demonstrated in this study. These challenges underscore the dynamic nature of bridging theory and practice, reinforcing the need for ongoing support and practical resources to ensure the success of trans-languaging and other teaching approaches (Wong, 2023; Wong et al., 2023). Thus, we suggest that teacher-researcher collaborations should not only prioritise open communication and practical support but also frame these interactions as mentorship opportunities, tailored to the specific needs of novice teachers. This approach moves beyond theoretical discussions, creating a supportive environment that nurtures both teacher development and the application of theories.

## 7. Conclusion

This study highlights the dynamic application of the MEC model in a Chinese DLBE context, providing structured yet flexible approaches to lesson planning. Additionally, the study illustrates the impact of teacher-researcher collaboration on the integration of translanguaging via the MEC model. Our collaborative efforts aided Ting in creating an enriching bilingual learning environment. Additionally, this collaboration turned into valuable PD and mentorship opportunities for her, further enhancing her teaching skills and understanding of translanguaging practices. A notable limitation of this study is its focus on one learning segment within a content subject. While this provided a detailed illustration of the implementation of the model from design to summative assessment, student performance may vary across different topics and subjects. Additionally, while we illustrated how Ting incorporated a translanguaging summative assessment in the unit, we did not explore how she formally evaluated the students' writings. This aspect, concerning the evaluation methods used for translanguaging assessments, presents an important avenue for further research. The exploration of evaluation methods would provide deeper insights into the effectiveness of translanguaging practices in assessing student learning and linguistic development.

Further, the study centered on a collaboration between one teacher and one researcher. Given the growing recognition of the importance of such partnerships in educational research, this is particularly relevant as different teachers and researchers bring diverse experiences, personalities, styles, cultural backgrounds, and teaching philosophies, which can influence the nature and extent of collaboration. Hence, further exploration is warranted to understand the dynamics of these collaborations more comprehensively.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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