Teacher Questioning for Engaging EMI: A Quest for the Holy Grail?

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Abstract Questions asked by teachers are vital to maintaining and sustaining learner engagement. In Hong Kong secondary classrooms where English is used as the medium of instruction (EMI), productive teacher questioning is key to promoting both language and content learning. Drawing on classroom observations and in-depth interviews, this study investigated the questioning practices of two teachers from EMI schools in Hong Kong. Quantitative and qualitative analyses of the data revealed that the teachers adopted different approaches to questioning. Their questioning practices can be captured by a dynamic model of two intersecting dimensions: cognitive demand (lower- and higher-order questions) and interactional orientation (authoritative and dialogic discourses). The findings of this study support the notion of teacher questioning as pedagogy and demonstrate how productive teacher questioning can mediate learner engagement. A guiding framework is proposed for productive teacher questioning that relies on the synergistic combination of cognitive demand and interactional orientation.

Keywords Teacher questioning · English-medium instruction (EMI) · Learner engagement · Classroom discourse · Cognitive demand

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Introduction

Language teachers grapple with the task of creating an entrancing classroom where students are motivated to participate, vie to answer questions, and feel engaged in active learning. Learner engagement in language education, defined as "the dynamic state when learners are actively thinking about, focusing on, and enjoying their language learning" (Mercer, 2019, p. 643), comprises "situated notions of cognition, affect, and behaviors including social interaction in which action is a requisite component" (Hiver et al., 2020, p. 3). It is widely recognized as a precondition for effective learning and a holy grail for teachers (Alexandra, 2020; Hiver et al., 2020; Littleton & Mercer, 2013). In Hong Kong, this quest is even more daunting: lack of student engagement in K-12 English-as-medium-of-instruction (EMI) classrooms has been a perennial challenge for teachers entrusted with the task of maximizing both subject and language learning (Lo, 2014; Pun et al., 2022; Tai, 2024).

The challenge is rooted in prevalent pedagogical practices in Hong Kong schools as well as a unique combination of contextual factors in the metropolis. Lau characterizes Hong Kong as "a multilayered context" where "political, social, economic and educational agendas" have interacted in complex ways to impact policies and practices (2020, p. 457). Factors such as the economic value attributed to English by parents (i.e., individual), resources provided by schools (i.e., institutional), and an exam-oriented culture (i.e., community) shape classroom practices fundamentally. To enhance Hong Kong's competitiveness and status as a financial hub, English has been officially promoted as the medium of instruction (see Pun & Macaro, 2019, for a review of the policy). However, when the EMI policy interacts with the various factors identified by Lau (2020), a discrepancy between policy/curricular priorities

and school/classroom practices has emerged. More specifically, dominant EMI practices have often been transferred from other contexts to Hong Kong without due attention to Hong Kong's unique contextual factors. As a result, the challenge redoubles for teachers to create an engaging EMI classroom in Hong Kong. This situation has created a dire need for locally developed practices to support the effective implementation and sustainability of EMI (Pun & Macaro, 2019; Pun et al., 2022).

Against this backdrop, the present study revisits teacher questioning, an instructional tool that both language and non-language teachers use day to day. To conceptualize productive teacher questioning, we propose a dynamic approach to questioning based on evidence from EMI classrooms in Hong Kong secondary schools to support teachers in their quest for an engaging classroom.

Teacher Questioning

As the linchpin of classroom discourse, teacher questions have a key role in mediating student learning. Studies have shown that teacher questions are crucial because productive questions can provide rich language input (Hu & Duan, 2019), elicit linguistically more complex responses (Lee & Kinzie, 2012), and promote critical thinking (Caravaca, 2019; Pun & Macaro, 2019). In EMI, productive questions can foster students' understanding of content and provide opportunities to use the target language meaningfully in non-language classrooms. Conversely, Lo and Macaro (2012) found that content teachers' lack of pedagogical skills with respect to teacher-student interactions had an adverse effect on student learning in Hong Kong classrooms. Furthermore, as Li and Ke (2023) point out, sociocultural context and institutional culture can impact on teachers' questions used as a form of feedback by influencing their beliefs/practices and leading to an unproductive conceptualization and operationalization of questions. This underscores the need for context-sensitive professional development in productive teacher questioning in EMI contexts such as Hong Kong secondary schools.

The importance of teacher questions has motivated a quest for practices that can create productive classroom discourse. For instance, to explore productive questioning strategies, Chin (2007) identified four constructive approaches: (1) Socratic questioning, which employs a succession of questions to guide students to generate ideas, (2) verbal jigsaw, which involves "the use of scientific terminology, keywords and phrases to form integrated propositional statements" (p. 823), (3) semantic tapestry, which focuses on abstract ideas and concepts to weave them into a coherent framework, and (4) framing, which leverages questions to frame an issue and structure the subsequent discussion to help students see the relationships between the questions and the content. These approaches are believed to "stimulate productive thinking" (p. 823), but it is not empirically clear that students will become more engaged and learn more effectively when these questioning approaches are adopted, especially in EMI contexts where teachers need to combine subject content and language instruction.

Productive Teacher Questioning

Teacher questions have a central role in determining the productivity of classroom discourse because of their inherent qualities. One such quality is their cognitive demand. Drawing mostly on Bloom's revised taxonomy of educational objectives (Anderson et al., 2001), scholars have viewed the cognitive demand of questions (i.e., higher-/lower-order) as an indicator of productive classroom discourse and underlined the need for frequent use of higher-order questions (Caravaca, 2019; Pun & Macaro, 2019; Wong, 2010). Higher cognitive demand has been associated with learner engagement. Hiver et al. (2020), for instance, posited that students perceive higher-order thinking tasks as more cognitively and emotionally engaging than lower-order ones.

Another fundamental quality of teacher questions is dialogicality. Dialogic questions asked to explore students' perspectives, even when they diverge from the canonical content knowledge, are central to dialogic teaching and contribute to productive learning (Alexander, 2020). Monologic questions, however, are unproductive because they discount students' ideas, are used mainly to evaluate what students know, and monopolize knowledge claims without critical discussion (Chin, 2007). As a result, teacher-student interactions dominated by monologic questions result in an *authoritative discourse*, whereas those scaffolded by dialogic questions foster a *dialogic discourse* (Tee et al., 2023). The literature suggests that dialogic discourse is often associated with learner engagement and productive learning in the classroom. For instance, Littleton and Mercer (2013) demonstrate that dialogic discourse is essential to *interthinking*, the very process of collaboratively constructing meaning through dialogue by which teachers and students think and make knowledge together. Authoritative discourse often prevails in teacher-centered, authoritarian classrooms (Qin et al., 2023).

We use the term *interactional orientation* to characterize the aforementioned quality of teacher questioning (i.e., monologic/dialogic). The interactional orientation of teacher questions has only recently drawn research attention. For example, Vrikki and Evagorou (2023) found that dialogic questioning gave space to learners in EMI settings to elaborate on their ideas rather than merely giving the correct and expected answers. Their study provided empirical evidence that teachers' dialogic questioning fostered greater student engagement and productive classroom discourse. However,

in a Malaysian secondary school context, Tee et al. (2023) showed the pedagogical value of both monologic and dialogic classroom discourses and called for interactional practices representing a spectrum of interactional orientations. Surely, teachers ask questions targeting different types of cognitive demand (e.g., lower-/higher-order) or interactional orientation (e.g., monologic/dialogic). However, we still lack knowledge about what practices contribute to an active and engaging learning environment in secondary-level EMI classrooms in Hong Kong.

Teacher Questioning in Hong Kong

Studies in the Hong Kong context have mostly focused on the cognitive demand of teacher questions and investigated how questions influenced the productivity of classroom discourse. In an early study, Wu (1993) reported that Hong Kong teachers overwhelmingly employed restricted (i.e., close-ended) and lower-order questions. Such factual questions were mostly used for teaching vocabulary or checking for understanding. Similarly, Wong (2010) found a preponderance of questions targeting lower-order cognitive processes in EMI settings. Of direct relevance to the present study, Lo and Macaro (2012) found that teachers tended to ask lower-order questions when the medium of instruction was English. More recently, Pun and Macaro (2019) found that the number and frequency of higher-order questions determined the quality of interactions in EMI classrooms and that teacher questions were commonly used to elicit lower-order cognitive activities.

Lo (2014) examined classroom discourse in relation to the school subjects taught in English. She investigated student responses as well as teacher questions and compared them between Humanities and Science subjects. She reported that teacher-student interactions in Humanities classes allowed students to produce more elaborate responses, which would bring along more language learning and use opportunities. Given these preliminary findings, further inquiry into EMI Humanities subjects is needed to understand subject teachers' questioning practices and to identify how these practices can be advanced to promote learner engagement. Arguably, Hong Kong teachers of Humanities subjects can benefit from a research-informed and contextually sensitive pedagogical model of productive teacher questioning to enhance student engagement and learning. To this end, our study focused on EMI teachers of personal, social, and humanities education (PSHE) in Hong Kong secondary schools and set out to address the following questions:

1. How does the cognitive demand of PSHE teachers' questioning influence student engagement?
2. How does the interactional orientation of PSHE teachers' questioning influence student engagement?

Method

This study is part of a larger research project on professional development for secondary school teachers in Hong Kong that aims to improve teacher questioning in classroom interactions. As part of our agenda, we needed to explore current questioning practices that would facilitate or detract from students' active participation. To this end, we employed a comparative case-study design to explore two teachers' questioning practices.

Participants and Context

We adopted purposive sampling and invited two teachers to participate in the study. Both schools where they taught were public ones, ranked similarly in the Hong Kong context, and adopted EMI for all PSHE subjects for more than three years. The class sizes were also similar (30–35 students). Both teachers had been teaching PSHE subjects in English for more than seven years. We observed their *Life and Society* (L&S)[1] lessons. The first participant, Ms. W, had 21 years of teaching experience and had been teaching L&S at the same school for 5 years. Ms. M, the second participant, had 7 years of teaching experience and had been teaching L&S for three years. We selected these two teachers because their teaching contexts and backgrounds were alike, but their questioning practices differed fundamentally and stood out as contrasting cases in our project database. The contrasts between their questioning practices allowed us to examine the impact of cognitive demand and interactional orientation on student engagement.

We focused on L&S because it is a junior secondary-level core subject. L&S aims to develop students' values and social competence to become informed members of Hong Kong society. Its curriculum has been developed in response to Hong Kong's global-economic stance, diverse social structure, and integration with Mainland China. L&S comprises modules, and in line with the school-based curriculum policy, individual schools curate their curricula by selecting among those modules. The course provides a platform for students to develop their English proficiency before exam-related demands grow drastically at senior levels. Furthermore, in the last cycle of EMI policy fine-tuning in 2021, the Education Bureau aimed to increase English language learning opportunities and enhance the four macro language skills of listening, speaking, reading, and writing

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[1] As of the 2023/4 academic year, *Life and Society* has been renamed *Citizenship, Economics and Society*. It is taught by the same teachers, and its content remains largely the same.

Fig. 1 Ms. W's lesson

in junior-level subjects including L&S.[2] Therefore, L&S is a critical subject for EMI and English learning in Hong Kong secondary schools.

Data Collection and Analysis

Prior to data collection, IRB approval of this study was given by the Human Subjects Ethics Subcommittee of the authors' university (Reference No.: HSEARS20210317008). The two focal teachers gave informed consent in writing to participate in the study. Data comprised lesson observations and post-observation interviews. We observed both participants twice on different days for a 1 h lesson each time. The four observed lessons added up to 159 min. The interviews, each lasted around 40 min, focused on the teachers' beliefs about questioning practices in EMI and PSHE. All lessons and interviews were audio-recorded and transcribed for subsequent analyses.

To explore the teachers' questioning practices, we first examined the quantitative aspects of our data (i.e., the number and length of questions and responses; their ratios). We focused on the questions related to subject teaching and excluded rhetorical questions. More specifically, we excluded house-keeping and comprehension-check questions (e.g., *Do you understand*?) and operationalized rhetorical questions as those with a waiting time of less than three seconds (Hu & Duan, 2019; Larson & Lovelace, 2013). Furthermore, we identified student responses to each valid teacher question. Based on the coded teacher questions and student responses, we created document portraits, which were visual representations generated by MAXQDA software to display coded data segments. Each portrait visualizes the coded data (i.e., teacher questions and student responses in an observed lesson) divided into 1200 units (*u*) (see Fig. 1 for an example). These units indicate the relative length and frequency of the coded segments. For example, the first 33 green squares in Fig. 1 indicate the proportional length of a teacher question, whereas the next three blue squares display that of a student response. These portraits enable us to make a comparison across lessons based on a standardized unit and determine the question/response ratios.

The questions were further coded for their level of cognitive demand based on Bloom's Taxonomy revised

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[2] More information about the EMI fine-tuning policy can be found at: https://www.edb.gov.hk/en/edu-system/primary-secondary/applicable-to-secondary/moi/fine-tuning-the-moi-for-secondary-schools.html

by Anderson et al. (2001). We defined lower-order questions as those targeting only the first two levels (i.e., remembering and understanding) and higher-order questions as those targeting the four remaining levels of the taxonomy (i.e., applying, analyzing, evaluating, and creating). Also, the interview data were analyzed to identify the teachers' beliefs about questioning-as-pedagogy. In line with the key qualities of productive teacher questioning (i.e., cognitive demand and interactional orientation), we sought to understand the focal teachers' questioning approaches in three stages. First, we read the lesson and interview transcripts repeatedly and recursively to create memos of each teacher' beliefs about questioning and note their relevance to the lessons observed. Second, we identified episodes of teacher-student interaction evidencing active student participation, or lack thereof, that either matched or were inconsistent with our memos. Finally, we drew connections between the cognitive demand and interactional orientation of each teacher's questioning approach and her students' engagement in learning activities.

Findings

Cognitive Demand of Teacher Questions and Student Engagement

In response to our first research question about how the cognitive demand of teacher questions may influence student engagement in the EMI PSHE classroom, our study revealed that an interactional approach balancing the cognitive demand of teacher questions enhanced student engagement. In this regard, the two focal teachers provided a clear contrast. In her first lesson, Ms. W asked 46 questions, but her questions elicited only 24 responses from the students. Figure 1, the document portrait of Ms. W's first lesson, shows that her questions took up 1026 units (85.5%), in contrast to the 174 units (14.5%) accounted for by the student responses. Although Ms. W used questions actively, her students were not responsive to many of them.

A closer look at the classroom discourse revealed that Ms. W's questioning was not intended to promote higher-level cognitive engagement evidently. All her 46 questions but one were lower-order ones. Thus, the questions that she asked mostly required her students to remember facts and/or understand concepts. Excerpt 1 exemplifies this.

Excerpt 1

Lower-order, factual questioning

1	Ms. W	What are your rights and duties as HK residents? Ok. Let's
2		remember the duties first. What duties do we have in Hong
3		Kong? [silence] Oh, there are many. [silence] Yes? [silence]
4		[S1], What duties should Hong Kong people do?
5	S1	Pay the tax
6	Ms. W	Pay the tax. Ok, good. When you find a job in the future, you
7		should pay the tax. Ok no matter you are a teenager, adult, or
8		elderly, what are their duties? So check the fifth paragraph
9		What are our duties?
10	S1	Laws
11	Ms. W	Ok, when you say law, what is our duty? What should you do?
12		You should [pause] follow the law. Ok. Yes, that's it. Follow
13		the law also including what? Which law?
14	S2	Basic law
15	Ms. W	Yes, basic law, ok? And then, for example, instead of follow
16		the law, you can say abide by law, ok?

In Excerpt 1, Ms. W used "pumping" (Chin, 2007, p. 824), a Socratic questioning technique, when she asked students to name the duties of Hong Kong residents (Line 4), identify a specific duty from a reading passage (Line 8), and a particular law (Line 13). She used a "verbal cloze" technique (Chin, 2007, p. 826) asking for a verb-noun collocation (pausing before *follow the law* in Line 12). Merely requiring students to recall or identify terms, these questions demanded low-level cognitive engagement and embodied authoritative discourse where the teacher is the sole authority of knowledge (Alexander, 2020) and validator of responses (Chin, 2007; Tee et al., 2023).

In contrast, Ms. M used only 27 questions in her first lesson. Her questions accounted for 539 units, whereas her students' 29 responses took up 661 units (55.1%). Figure 2 shows the portrait of this lesson.

As for the cognitive demand of Ms. M's questioning approach, surprisingly, neither lower- nor higher-order questions dominated her discourse. Of her 27 questions, 13 were higher-order questions, and 14 were lower-order ones. Figure 2 represents a more engaging learning environment in that students actively contributed to the classroom discourse with extended responses. Notably, neither questions nor responses dominated any particular part of the teacher-student interactions in Ms. M's lessons, suggesting that students' participation was initiated and sustained by dynamic teacher questioning (Mercer, 2019). The balanced

Fig. 2 Ms. M's lesson

Table 1 Teacher questions by cognitive demand and student response

Teacher	Lesson	Cognitive demand	Teacher question		Student response		
			(n)	(u)	(n)	(u)	%
Ms. W	1	lower-order	45	985	24	174	14.5
		higher-order	1	41			
		total	46	1026			
	2	lower-order	14	901	13	144	12.0
		higher-order	3	155			
		total	17	1056			
Ms. M	1	lower-order	14	215	29	661	55.1
		higher-order	13	324			
		total	27	539			
	2	lower-order	39	169	93	731	60.9
		higher-order	18	300			
		total	57	469			

u = unit of length (within 1200)

% = responses as proportions of 1200 units

distribution of higher- and lower-order teacher questions in Ms. M's lesson contributed to a more engaging classroom discourse that involved students actively. Their active participation, a core component of engagement (Hiver et al., 2020; Mercer, 2019), was manifested in their language outputs. Table 1 confirms the teachers' different questioning practices in terms of cognitive demand and summarizes the relative length and frequencies of the student responses elicited by the teacher questions.

Interactional Orientation of Teacher Questions and Student Engagement

To address our second research question about the potential influence of interactional orientations on student engagement, we took a close-up look at the teacher-student interactions to identify what made Ms. M's students participate more actively and productively, that is, more engaged in the learning activities. In Excerpt 2, Ms. M started the lesson by showing five photos on the board along with three questions: (1) "What do you see in the photo?" (Choose one); (2) "What do you think about the photo?"; (3) "What do you wonder about the person in the photo?". Her framing approach by means of a question-based prelude (Chin, 2007) enabled her to guide her students' interthinking in a dialogic space (Alexander, 2020), allowing them to provide their answers as tentative suggestions.

Excerpt 2

Questioning for interthinking

1	Ms. M	(Showing the photos). What's happening here? Any volunteers?
2	S1	I don't like the photo at the bottom
3	Ms. M	You don't like the photo. Why?
4	S1	Well, these are very concerning
5	Ms. M	Oh, ok. This one?
6	S1	Yeah, because I feel like no one should be living in such
7		a crowded space and it is terrible to [pause] living in
8	Ms. M	Very crowded, right. So, anything you guys wonder about the
9		photo? Because you already told us it is crowded living area,
10		right? So, anything you wonder at seeing the photo?
11	S2	I wonder how they can survive like this
12	Ms. M	Ok you wanna know how we can survive like this. Ok, this is
13		really a difficult life, right. And later on, you are going
14		to look at that as well. Why is it there? […] Any other
15		volunteers, you want to choose a photo? Or you want to choose
16		someone you think will be willing to share with us?
17	S2	I think [S3] would like to share

Starting with a lower-order question in Line 1 (*What is happening here?*), Ms. M mirrored the first question in her lead-in. She repeatedly invited other students to think more deeply about what they *saw* in the photos. Later, her question in Line 10 (*anything you wonder at seeing the photo?*) echoed the last question in her question-based prelude and

guided students to go beyond what they saw and engage in further analysis. At this point, S2 jumped in and partook in the interthinking (Littleton & Mercer, 2013). Subsequently, she used a higher-order question in Line 14 (*why is* [the photo] *there?*) to invite students to establish the connections between the photo and the issues to be examined. These questions were then combined with a reflective toss (asking S2 to further elaborate or nominate another volunteer). Evidently, the interactions created by Ms. M were not authoritative; she took a neutral stance and facilitated the students' interthinking by opening up the discursive space for collaborative reasoning and meaning-making. In Excerpt 2, she managed to foster a dialogic discourse by making her position neutral. For example, she elaborated on each response by repeating or rephrasing it without passing judgement or imposing her views on the students (Lines 3, 8, and 12). In the interview, Ms. M elaborated on her views of questioning as follows:

> *First,* [questioning] *helps students to think. Because it gives the students a direction; what to think about.… Sometimes they know the answer, but they are not sure, and when you give them some follow-up questions, they get on the right track. So, they will be more willing to share.*

Ms. M prioritized deeper thinking as the purpose of her questioning and saw teacher questions as a means of "helping students to think." Notably, her modulation of the cognitive demand of her questions was motivated by her interactional orientation. She explained:

> *In the end, it is not really what I tell that matters. It is actually the students' answers or their thinking. So, I ask questions to help them to think about, to reflect. I help them reach a certain point.*

Thus, Ms. M regarded student responses and thinking as what "mattered" in the classroom discourse that she orchestrated. She positioned herself as a facilitator who scaffolded students' meaning-making through questioning and constructed a dialogic space where students could freely share their ideas (Lines 1–3 in Excerpt 2), explore perspectives (Lines 8–10), and contribute to interthinking (Lines 12–16).

Apart from her balanced use of lower- and higher-order questions to choreograph the cognitive engagement of her lessons, Ms. M also leveraged student responses, especially wrong answers, to promote dialogicality in her classroom:

> *Sometimes* [students] *give wrong answers that I expect, because there are some tricky questions. And if they give me those wrong answers, it's actually a good opportunity because we can actually talk about the concept again, but sometimes they give me wrong*

answers that I don't really expect. Then I'll just ask the other girls to try to get the answer.

Utilizing inaccurate student responses as productive moments to promote dialogicality in the classroom was a useful strategy for her to cultivate a dialogic and engaging classroom discourse.

Excerpt 3 from the second observation provides another illustration of her questioning approach. Similar to Excerpt 2, she guided an open discussion with questions that invited students to offer their answers as tentative suggestions in support of collective meaning-making (i.e., interthinking). In Line 4, she built on students' understanding of two concepts, "need" and "want," and encouraged them to exemplify the concepts with a higher-order question that invited them to *apply* their conceptual understanding to their everyday lives. However, the students failed to answer the question initially, which prompted her to scaffold their understanding of these concepts through lower-order questions. This retreat to lower-order cognitive engagement prepared her students for the subsequent revisit of her original question (Line 9). Apparently, this combination of questions allowed the students more time to consolidate their cognizance of the concepts before they were ready to apply their understanding to another similar context.

Excerpt 3

Ms. M's dynamic questioning and dialogicality

1	Ms. M	How you can save up, how you can make sure you have money to get
2		what you want. Buying, that's consumption, ok? So, last time
3		when you drew the pie chart, you already told me two concepts,
4		the need and the want. Ok. So, anyone can give me an example of
5		the need from your lives?
6		[silence]
7	Ms. M	Ok. What classifies as the need? What is a need?
8	S1	If you don't have it, you can't survive
9	Ms. M	Oh, ok. Then, what classifies as a need for you?
10	S1	Probably transport
11	Ms. M	Transport yeah for example if you go to school, you need
12		transport. Right? What else?
13	S2	Food and water
14	Ms. M	Food and water. And you mentioned clothes right. All these
15		are some necessities, right? Any example for want?
16	S3	Clothes
17	Ms. M	Clothes? Do you think you need clothes, or you want clothes?
18	S3	More clothes
19	Ms. M	Oh, more clothes. More than you need?
20	S4	New swimming goggles
21	Ms. M	Ok. "new" swimming goggles. I like that. She added word
22		"new", Right? Because sometimes you already have an item and
23		Even if it is not broken yet, you buy something new. That
24		might actually be your want. Even if you need goggles

Excerpt 3 also provides an example of constructing a productive classroom discourse for both language and content learning. In Line 16, a student nominated clothes as things that people want rather than need. Ms. M responded to the response with a constructive challenge (Chin, 2007), inviting the student to reconsider the conceptual distinction between "want" and "need" in her own context. The student responded by using her own desire for "more clothes" to justify her earlier answer. The collective meaning-making was maintained in Line 20 by another student, who used the adjective *new* to emphasize that "want" is related to people's desire for "new" things. This conceptual extension was elaborated by Ms. M in her effort to engage her students in conceptual development. Ms. M, gave her students the responsibility to think deeper about her questions and visit back the content (Line 7), which was also evident in Excerpt 2 (Line 16), where she used a reflective toss to engage more students in the interthinking that she was building with the help of multimodally enhanced questioning. Throughout her lessons, there were examples of her dynamic use of lower-order questions (e.g., remembering concepts) in support of students' effort to answer her higher-order questions that required them to apply their understanding to similar situations, analyze related issues, and evaluate judgments.

By contrast, Ms. W asked questions with a different instructional purpose. She stated that she asked questions mostly to get students' attention to the content she would deliver:

[Questions] draw their attention. I ask questions because [students] need to know, for example, how to write an essay. If I don't tell them, then they don't know how to do it because I think the exam is more important than subject knowledge later in senior forms.... I ask questions to see if they understand me. So, I ask questions to teach them how to write the essays better or learn the keywords for the exams.

Ms. W's philosophy of teacher questioning revealed a different but also purposeful approach. She intentionally used questions to assert authority, which can be related to her

prioritization of examination performance over the development of content knowledge and language skills. This pedagogical and interactional orientation led her questions to focus on itemized knowledge, often indexed by keywords, that was likely to be targeted by test questions. This pattern of questioning is evident in Excerpt 4.

Excerpt 4

L&S keywords

1	Ms. W	Can you remember some keywords? Keywords. [S1], do you want to
2		list them for me? [silence] The rights that Hong Kong residents
3		can enjoy? [silence] Some keywords, vocabulary. Concept word
4	S1	Freedom
5	Ms. W	Freedom of …?
6	S1	Of opinion
7	Ms. W	Yes, opinion. Freedom of opinion. Very good. Freedom of opinion
8		And freedom of communication. Actually, anymore? What rights can
9		enjoy?
10	S2	Freedom of education
11	Ms. W	Yes. Freedom of education. That means you can choose any school

In Excerpt 4, Ms. W relied exclusively on lower-order questions (e.g., *Can you remember some keywords? Can you list them for me?*). In Line 5, she also used *verbal cloze*, a potentially productive questioning strategy (Chin, 2007). However, her questioning approach focused on eliciting factual/authoritative information (e.g., fundamental rights) as evidence of learning and in preparation for possible examination questions. Little effort was made to induce students' higher-order cognitive engagement, such as figuring out how they could enjoy a particular right in their everyday lives, through dialogic scaffolding. Such dialogic interactions could have promoted interthinking, as we have seen in the case of Ms. M's lessons. Instead, Ms. W asserted authority by validating students' answers (e.g., Line 6 and Line 11) or explaining the correct answer (e.g., *That means you can choose any school*) and maintained an authoritative discourse in line with her pedagogical philosophy and local academic culture (e.g., examination-driven teaching). As she explained in the interview,

> Sometimes I think, to fulfill the skill requirement, you need to have some high-order thinking questions. You

> need to have some enjoyment. But for lessons, you need to ask some questions, you can ask directly. I'm just checking their learning. Do they understand what I mean? And do they understand the content?

Ms. W was concerned about her students' levels of English proficiency. This concern contributed to her questioning being more oriented toward the assessment of learning. She was worried that her students were unable to follow her in English and understand the instructional content. Because she felt she needed to ensure that the students would grasp the lesson content, she asked questions predominantly to check for understanding, leading to lower-order cognitive engagement in her students. Thus, both the exam-oriented approach and concerns with the inadequacy of students' English proficiency for EMI led to a skew toward lower-order teacher questions and a mistaken perception of higher-order questions as being needed only for occasional "enjoyment" or for fulfilling curricular "skill requirements." Ms. W's questioning practice (as illustrated in Fig. 1 and Excerpts 1 and 4) and her philosophy led us to posit that the unique configuration of cultural and disciplinary factors (e.g., perceptions of junior forms as a preparatory period for senior forms and centralized examinations) had an impact on her questioning.

Discussion and Conclusion

Our analysis revealed that one of the focal teachers used virtually only lower-order questions. This partially corroborates Wu's (1993) and Wong's (2010) observations of the common use of restricted question types in Hong Kong classrooms. Consistent with what Wong (2010) and Lo (2014) found, the prevalence of lower-order questions in Ms. W's lessons had a negative effect on the productivity of classroom discourse. Furthermore, her questioning practice affected her students' language output (Hu & Li, 2017; Lee & Kinzie, 2012). These observed effects seemed to come about through the workings of student engagement: when lower-order questions dominated the teacher's interactions, student engagement was reduced, leading to superficial participation (Mercer, 2019) and a lack of interthinking (Littleton & Mercer, 2013). Given that Ms. W mainly used canonical knowledge and normative content as a structure for classroom interaction, her practice promoted monological and authoritative discourse (Tee et al., 2023), which, considering her philosophy, could be related to the sociocultural context and the exam culture of Hong Kong secondary schools (Li & Ke, 2023). Such an approach hinders students' engagement in higher-order thinking when English is used for classroom interaction,

which constitutes one of the main challenges faced by EMI schools in Hong Kong (Lo, 2014; Pun & Macaro, 2019).

Ms. M, by contrast, employed a balanced mixture of higher- and lower-order questions. Not only did she utilize varied productive questioning strategies as identified by Chin (2007), but she also treated questioning as scaffolding. She weaved higher- and lower-order questions into an orchestrated bid for student participation. She used questions to cognitively challenge students and drew on constructive frameworks such as think-pair-share instead of traditional question-response-evaluation chains that are more familiar to Chinese students (Hu, 2002; Qin et al., 2023). As a result, her students were engaged and willing to partake in the co-construction of knowledge. In the process, they also availed themselves of more opportunities to produce extended responses in English in authentic and meaningful communication, all being necessary conditions for language development (Hu & Duan, 2019).

Our study underscores the importance of teacher questioning as a means of sustaining student engagement. When used strategically, teacher questions can cultivate a dialogic space for interthinking (Littleton & Mercer, 2013) where teachers and students are co-constructors of knowledge (Alexander, 2020). Furthermore, uninformed and excessive use of certain types of questions (e.g., lower-order questions) can lead to an authoritative discourse that positions the teacher as the sole agent of knowledg(ing) (Tee et al., 2023). As a result, students' content and language learning suffers.

Based on our findings, we propose a preliminary framework of productive teacher questioning for further validation and development (see Fig. 3). In this framework,

teachers use questions to create an engaging classroom discourse that varies on an authoritative-dialogic dimension (i.e., the x-axis). A dialogic discourse enables teachers to build up a socio-constructive and engaging learning environment where students take on the role of knowledge-makers. Teachers can also vary their questioning along the dimension of cognitive demands (i.e., the y-axis) from lower- to higher-order questions. The arrows in the framework indicate permissible (i.e., positive) and impermissible (i.e., undesirable and potentially problematic) movements, and their colors mirror those of universal traffic lights. The red arrows indicate undesirable movements, for example, from a largely authoritative discourse that features higher-order questions to an equally or more authoritative discourse that employs predominantly lower-order questions. The yellow arrows indicate potentially problematic movements, for example, from a dialogic discourse making good use of higher-order questions to an authoritative discourse that still employs higher-order questions. Such movements are potentially problematic from a long-term perspective because they may restrict students' meaning-making or engagement over an unduly long period. It should be acknowledged, however, that short-term movements of this nature could induce students' cognitive engagement by scaffolding their thinking with lower-order or authoritative questions if they fail to engage in higher-order thinking in the first place. Thus, yellow-arrow movements allow teachers to retreat temporarily to a lower-order or more authoritative plane of teacher questions and sustain student engagement at the same time before eventually leading students back to the green zone. Finally, the green arrows point to desirable
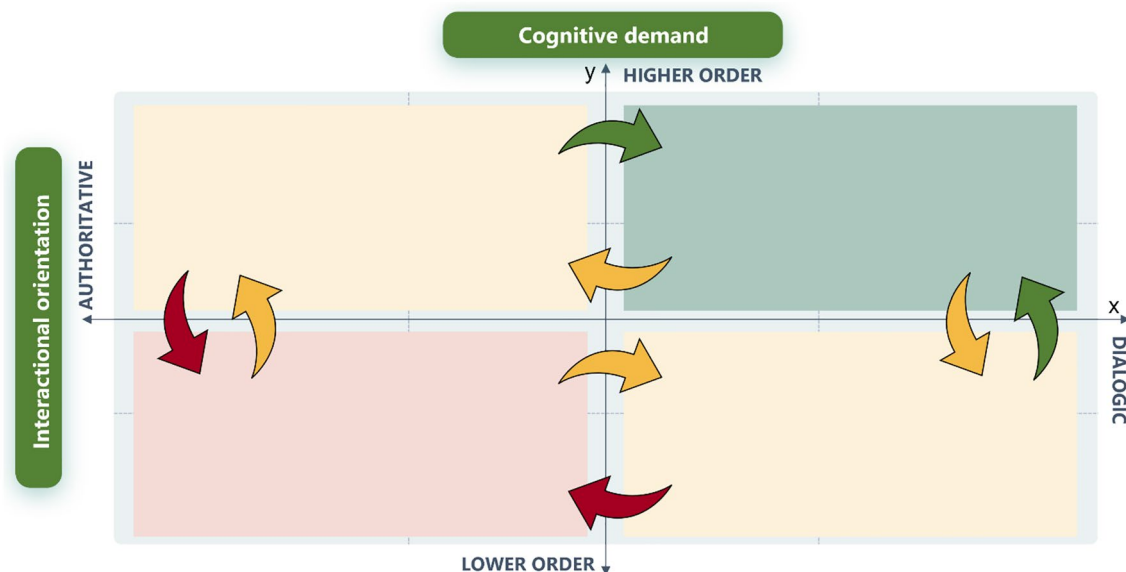

Fig. 3 A dynamic framework of teacher questioning

movements, for example, from an authoritative to a dialogic discourse, although the cognitive level of the questions utilized in the discourses remains the same. The most productive classroom discourse would be both dialogic and engage higher-order processes, as approximated by Ms. M's practice.

The guiding framework proposed here aims at helping teachers make their questioning practices more dialogic, more cognitively demanding, and therefore potentially more engaging. It must be acknowledged that student engagement is a multidimensional construct that is manifested affectively, behaviorally, cognitively, and socially. Therefore, the conceptualization of teacher questioning and engagement mainly in cognitive terms is a limitation of our study, which needs to be addressed in future research on teacher questioning. Additionally, our framework may need to be further developed by incorporating other important dimensions, for example, student responses and the linguistic complexity of questions and responses. We also need more studies to verify our findings and test the validity of claims derived from our framework in different school settings and cultures in Hong Kong and beyond. We are cognizant that in some cultures of learning, it can be difficult and unrealistic for teachers to abandon authoritative discourse altogether. However, we also believe that this is not an inherent limitation of our framework. Rather, we suggest that a strategic interplay between authoritative and dialogic stances and a dynamic combination of lower- and higher-order questions could cater to the diverse, culturally-shaped needs found in different educational contexts. Perhaps, this is the holy grail that teachers in different EMI contexts should be in quest for.

Ethical declaration statement

This study was approved by the Institutional Review Board of The Hong Kong Polytechnic University (Approval No.: HSEARS20210317008). All participants provided written informed consent prior to participation in the study.

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