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Analyzing EMI Medical Classroom Discourse to Identify Language Strategies for Teachers: an Application of the 'English-for-Teaching' Framework

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ABSTRACT

Conceptualizing how EMI teachers use language in multilingual university settings remains a challenge. While previous studies have explored the language challenges faced by EMI science teachers, few have operationalized 'classroom routines' for understanding classroom language use. This feasibility study applies Freeman et al.'s (2015) 'English-for-Teaching' framework to a graduate-level EMI medical training program in Thailand, the first of its kind, designed to prepare students for residency in Thailand and BANA (Britain, Australasia, and North America) countries. Findings suggest that the EMI medical teachers under study heavily relied on their lesson content, with opportunities for teachers to situate student learning more through language strategies in assessments and feedback to enhance student understanding

and engagement. The study highlights the importance of EMI medical teachers preparing language strategies for higher-order communication tasks, such as when using metaphors or analogies. Overall, the 'English-for-Teaching' framework can allow EMI medical teachers to reflect on the language strategies they employ to achieve their teaching goals by focusing on producing comprehensible input rather than on being measured by native-speaker standards.

Keywords: English-for-Teaching, classroom language use, EMI medical classroom, classroom routine, classroom discourse analysis

Introduction

The internationalization of higher education has led to an explosion of English-medium instruction (EMI) across the globe (Macaro, 2018). Efforts to use English in university curricula have been viewed as a way to raise curricular quality and to improve student opportunities after graduation (Galloway & Sahan, 2021). Classrooms are rapidly changing where students are no longer strictly monolingual. Whereas many studies focus on language ability thresholds for students to learn in EMI classrooms, few explore bi/multilingual classrooms where non-native English-speaking instructors teach bi/multilingual students in English. In these education settings, what kinds of pedagogical choices do EMI teachers make when they transform academic content from their first language into English?

In Thailand, efforts to internationalize Thai education have occurred since the 1990s (Tayjasanant & Robinson, 2013), with EMI programs ever-increasing across many academic subjects including engineering, architecture, economics, and medicine. This study is an investigation of Thailand's first 4-year international medical program delivered at the graduate level. Out of the many disciplines, studying medical education is exigent because it is one of the most high-stakes subject areas. While all subject areas are important, medical knowledge is highly sensitive insofar that procedures and clinical information influence the diagnoses of patients. To this end, the way that EMI medical teachers use classroom language to impart highly specialized knowledge is highly consequential over time as students develop intuitions, values and even automaticity towards medical approaches from their early formative years in EMI medical classrooms.

While existing research has explored the language challenges faced by EMI teachers in science classrooms (Gustafsson, 2020; Pun et al., 2024), there is limited understanding of how medical teachers adapt their teaching

strategies in response to these challenges. When asked by university administrators to teach the same technical subjects (e.g., computer science, chemistry, architecture) teachers normally do in their first language in English, recruited EMI teachers often report language challenges (Galloway & Sahan, 2021; Pun et al., 2024). The administrators are likely to judge teaching quality through 'native-speaker' standards (Selvi, 2019) and a Hallidayan lens (Halliday & Martin, 2015), where lexical phrases are scrutinized for substance (i.e., phonics), form (i.e., grammar, lexis), and semantics (McCarthy & Clancy, 2019). Such an approach leads to a *deficit view* that if teachers are not 'native-like,' they are not teaching effectively (Freeman, 2017). This study addresses this gap by analyzing how EMI medical teachers use language in the classroom to enact their pedagogical goals without imposing native-speaker standards.

For policymakers and university administrators who influence hiring decisions of EMI teachers, we hope that this study will help inform deliberations about potential forms of language support that do not focus solely on grammatical accuracy but rather on teachers' comprehensibility. We believe that this feasibility study can help EMI medical teachers better understand how language strategies can be used to enact various teaching purposes. Ultimately, we hope that our findings in medical education can be extrapolated to other higher education settings.

To these ends, the present study seeks to find answers to the following questions:

1. To what extent is the 'English-for-Teaching' framework applicable for analyzing the classroom language strategies of EMI medical teachers in multilingual higher education settings?

2. What pedagogical activities are evident in EMI medical classrooms, and how can the 'English-for-Teaching' framework facilitate their identification and analysis?

Literature Review

For a better understanding of EMI classroom language discourse, this section will discuss four major issues: EMI medical classrooms in multilingual settings; 'grammar-of-choice' and 'deficit' views of language proficiency; current research on the language challenges faced by EMI science teachers; and teachers' classroom routines as informed by their teaching purposes.

EMI Medical Classrooms in Multilingual Settings

While definitions of English-medium instruction (EMI) are critically debated (Akıncıoğlu, 2024), EMI can be focally attributed as "the use of the

English language to teach academic subjects (other than English itself) in countries or jurisdictions where the first language (L1) of the majority population is not English" (Macaro, 2018, p. 19). As many university settings transition into multilingual sites for English-medium education (EMEUS), content teachers increasingly find themselves tasked with transforming their subject matter expertise from their native L1 into English (Dafouz & Smit, 2023). Although medical textbooks are written by professionals residing in BANA (Britain, Australasia, and North America) countries, EMI medical teachers must pedagogically transform their subject-specific knowledge into English for a multilingual classroom (Richards & Pun, 2022). Content teachers in 'hard subjects' such as architecture, physics, and medicine often do not receive EMI training, and thus report struggling with agency and confidence using EMI (Galloway & Sahan, 2021).

Since Julie Dearden's initial global survey in 2015 of EMI as a growing global phenomenon up to the present, Dearden and Beaumont (2024) have proposed that while teachers' language proficiency is important, teachers' professional development should focus on pedagogical training in areas such as that of language awareness and session planning. Specifically, Dearden and Beaumont (2024) believe that because EMI teachers are not necessarily experts in linguistics, teachers must be trained to use language strategically to help scaffold content and to encourage interactive learning.

To map teachers' experiences using EMI and their language proficiency, Richards and Pun (2022) have classified EMI teachers based on their English proficiency and EMI training as shown in Table 1. The EMI medical teachers in this study can be characterized as those with "limited proficiency in English,' or 'English Restricted' according to Richards and Pun's (2022) classification in Table 1.

Table 1

Categories of Emi Content Teachers Based on English Proficiency

Approach	Classification
Teachers are monolingual speakers of English and do not speak the students' L1	Monolingual Teacher
Teachers are native speakers of English and also speak the learners' language(s)	Bilingual Native Speaker Teacher
Teachers are proficient speakers of English as L2	English Proficient
Teachers have limited proficiency in English	English Restricted
Teachers must pass a proficiency test to teach EMI or be assessed as having sufficient English proficiency for EMI	English Competent

Note. Richards and Pun, 2022, p. 49

Parallel to the target group described by Young et al. (2014, p. 6), this study characterizes the EMI medical teacher as someone who may or may not use English fully or partially as the medium of instruction, but is well-acquainted with the relevant curricular content. That is, they are familiar with classroom routines, including basic classroom management and teaching strategies, and are capable of carrying out predictable tasks and routines in the classroom. The teacher is expected to follow a defined curriculum and often draws upon instructional materials that provide English language support. They use English to interact with students in expected, consistent ways, teaching a diverse group of bi/multilingual students in the process.

For university administrators, the most challenging aspect of recruiting EMI teachers is arguably in establishing instructional thresholds and professional training for pre- and in-service EMI teachers. That is, what aspects of 'general language proficiency' and 'language for specific purposes' (LSP) are pertinent for fostering student learning (Macaro, 2018)? Among EMI medical teachers who have not had prior EMI training, we would expect to observe wide variation in the kind of English used in the classroom.

In summary, English medium education in multilingual settings presents a unique challenge for recruited EMI teachers and university administrators. Recruited EMI teachers may not have had prior EMI training and might be judged by university administrators according to native-speaker standards. In order to give EMI teachers greater latitude in their use of grammar and pronunciation, how then might we think about language proficiency thresholds in EMI medical classrooms that are not prescribed by native-speaker standards (Selvi, 2019)? The following section explores how scholars are approaching conceptualizations of language proficiency that transcends native-speaker standards.

'Grammar-Of-Choice' and 'Deficit' Views of Language Proficiency

With the imperative that teacher education and development ought to be prioritized over nativeness, EMI teachers should be allowed to freely use language strategies in ways that they feel best allows them to achieve their goals. This *grammar-of-choice* view (McCarthy & Clancy, 2019) allows teachers more range in their transformation of discourse. For example, take the situation below where a teacher is monitoring students completing an in-class activity.

Teacher: "You done?"
Student: Not yet.
Teacher: "Alright, please take your time."
Student: Thank you.

In this example, the teacher has chosen to say, "You done?" rather than a complete sentence such as "Are you done?" Conventionally, grammar rules would select *Are you done?* over *You done?* where the inclusion of *are* is a choice. Although this example may seem trivial, the point at hand is that L1 English speakers often do not get stigmatized for using incomplete grammar. That is, L2 speakers of English may be judged unfavorably for shortened or unconventional sentences simply because of their accent or pronunciation. Beyond this simple example, one could imagine more complex sets of classroom language where utterances take different physical forms, but have congruent semantics based on a teacher's teaching purposes within the classroom.

In cases where EMI teachers have strong accents or produce 'unconventional' sentences (McCarthy & Clancy, 2019), it is not categorically possible to say that comprehensibility would be completely hindered. That is, some studies have showed that students who share the same L1 as their EMI teachers may have familiarity with their teachers' accents, and over time through exposure, students by and large may increasingly become familiar with their teacher's language production (Jensen & Thøgersen, 2017). As such, scholars continue to debate about which linguistic or pedagogic criteria would be most pertinent for teachers to be considered EMI-ready.

Depending on the academic discipline (e.g., physics, history), the way English is constructed and employed by EMI teachers varies according to the knowledge-making practices endemic to an academic domain. For example, 'pure hard' knowledge disciplines like that of medicine have a "cumulative, atomistic structure, concerned with universals, simplification and a quantitative emphasis" (Neumann et al., 2002, p. 407). In contrast, 'pure soft' knowledge disciplines such as history or anthropology are "reiterative, holistic, concerned with particulars, and have a qualitative bias" (Neumann et al., 2002, p. 406). From a pedagogical perspective, 'pure hard' knowledge disciplines such as that of medicine may require language skills that yield pragmatic expressions based on factual comprehension—expressions that are simultaneously related to expertise in practical applications and of the physical environment. In short, the demands for manipulating English are thus disparate across academic disciplines.

In short, by taking a 'grammar-of-choice' view to language proficiency, this study examines the language strategies of EMI teachers in terms of 'acts of meaning' through 'language as discourse' by "looking at the meanings given to language and the actions carried out when language is used" (McCarthy & Clancy, 2019, p. 202). Focusing on language as discourse, the study extends the construct of 'English-for-Teaching' by looking at how EMI medical teachers situate their language in the classroom through an approach that does not stigmatize their speech. With this conceptualization of language

proficiency in mind, the following section reviews past research on the language challenges faced by EMI science teachers and explains how the 'English-for-Teaching' framework can help practitioners connect their language strategies to their teaching purposes.

Current Research on the Language Challenges Faced by Emi Science Teachers

On a macro-level, many university teachers report context-specific language challenges. Some studies like that of Pun and Macaro (2019) have looked at the insufficient use of high-order questions in EMI science classrooms, while others like that of Soysal (2020) have explored the way that different types of discursive functions produce different cognitive demands for producing scientific inquiry. Overall, insufficient professional development programs for EMI teachers contribute to unimproved teaching quality (Sahan et al., 2021).

While content teachers like that of EMI medical teachers may be expert users of their disciplinary discourse, this is not equivalent to having expertise in explaining to others how to employ such disciplinary literacy (Pun et al., 2024; Richards, 2017). Only a limited amount of research has been conducted on the quality and effects of content lectures when L1 tertiary level content is changed into English (Aguilar-Pérez & Khan, 2022). Ultimately, teaching through English necessitates content teachers to utilize an array of strategies that may include code-switching, translanguaging, translation, and methods for adapting his or her language (Richards & Pun, 2022). When a teacher's English is limited, pedagogical delivery could be realized in ways that are less flexible and improvisational than when teachers are teaching in their first language (Pun et al., 2024).

In general, although the language challenges faced by EMI science teachers have been extensively documented, majority of past research have studied the language challenges experienced by EMI science teachers from a 'language as a system' approach (McCarthy & Clancy, 2019), and not necessarily from a 'pedagogy-as-discursive' point of view. This includes studies such as Pun et al.'s (2024) systematic review of 66 empirical studies of EMI classrooms across subjects such as physics, biology, engineering, chemistry, and mathematics, which identified two key language-related challenges in EMI science classrooms as the lack of high-order questioning and limited opportunities for teachers to develop their PCK (i.e., pedagogical content knowledge) of Content and Language Integrated Learning.

In summary, while previous studies have identified various language functions produced by EMI teachers similar to this research, such language functions have been viewed from its "linguistic units of EMI competence"

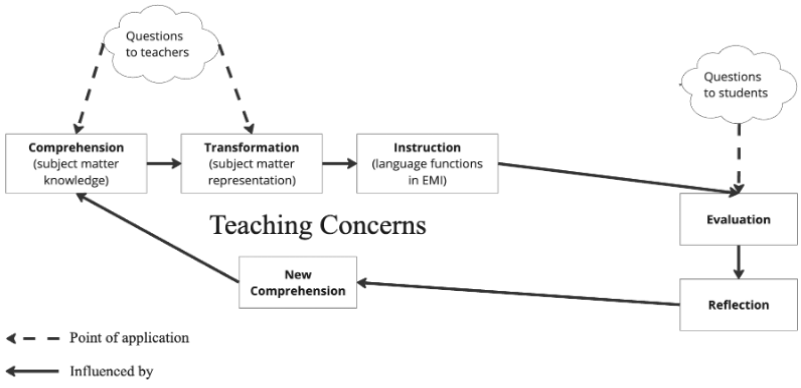
(Gustafsson, 2020, p. 1074). When identifying such 'linguistic units' as language functions, a gap remains for how such teaching episodes can be linked to a unitary pedagogical framework that describes how language strategies are used to situate teachers' teaching purposes in a classroom. To this end, we believe that by analyzing EMI medical classroom discourse using the 'English-for-Teaching' framework, EMI medical teachers can be made more aware of how they may use their classroom language strategies to enact their classroom routines and teaching purposes.

Classroom Routines and Their Teaching Purposes

In this study, we regard 'classroom routines' as part of teachers' pedagogical reasoning. In other words, teachers are using *pedagogical reasoning* by 'taking up' some subject matter content and situating it in the EMI classroom—a multidimensional process, where teachers are taking the content they know and "making it ready for effective instruction" (Shulman, 1987, p. 14). For example, an EMI medical teacher may have an intention of 'providing background information' to their students, but to enact this, the teacher must through some pedagogical reasoning (e.g., activate students' prior knowledge) connect their medical knowledge to students in ways that meet a situated use. To take another example in turn, a teacher may have an intention to 'direct students through a clinical procedure' and may choose pedagogical reasoning such as using metaphors or other figurative language to do so. Figure 1 depicts the process that teachers undergo when enacting their classroom routine.

Figure 1

The Process of Pedagogical Reasoning and Action in Emi Classrooms



Note. Nilsson, 2009, p. 244

In other words, teaching is not simply an act of telling, and learning is not simply an act of listening (Loughran, 2013). Language knowledge and pedagogical reasoning are related such that pedagogical reasoning works to support classroom language use. That is, language proficiency alone is not sufficient to enact teaching (Freeman, 2017). According to Freeman et al. (2015, p. 4), the use of English to enact classroom routines is supported by some "pedagogical reasoning that underlies its use." We argue that students understand subject matter knowledge better when teachers situationally use the content knowledge in-class. Without such transformations (i.e., pedagogical reasoning), knowledge remains propositional, rather than something meaningful or useful to students.

In short, recognizing the process of pedagogical reasoning and action in EMI medical classrooms enables practitioners to better understand the language demands required for their classroom teaching.

Theoretical Framework

Depending on the degree to which classrooms have stated content and language proficiency goals, English is used to serve different purposes for teachers and for students (Macaro, 2018). In the field of English Language Teaching (ELT), teachers are expected to have wide flexibility in their use of English. ELT teachers must be able to mediate, accommodate, and scaffold their speech to support their students who have limited English knowledge. In general, we know that teachers have classroom routines they frequently enact, which serve specific purposes in their teaching (Richards, 2017). To this end, through a 'languages for specific purpose' (LSP) approach, Freeman et al. (2015) developed the 'English-for-Teaching' framework to help ELT teachers understand what English language skills they would need to deliver lessons in English.

To be specific, Freeman et al. (2015) defines the 'English-for-Teaching' framework as "the essential English language skills a teacher needs to be able to prepare and enact lessons in a standardized curriculum in English in a way that is recognizable and understandable to other speakers of the language" (Young et al., 2014, p. 5). The 'English-for-Teaching' domain arose out of the understanding that general language or specific-purpose language proficiency alone does not automatically qualify someone to teach; in other words, a teacher's language mastery does not automatically improve student learning outcomes (Freeman et al., 2015). It is therefore important for teachers to reflect on their classroom routines first to better understand what language is needed to enact their teaching.

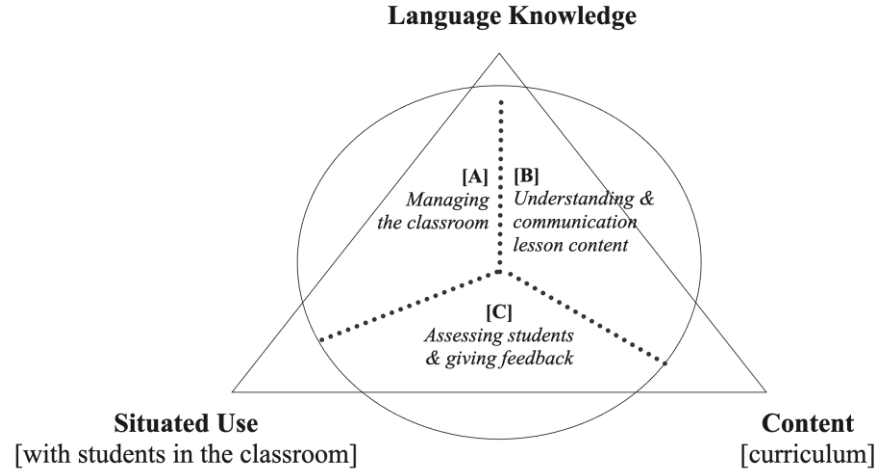
While the 'English-for-Teaching' domain was intentioned for ELT classrooms, we believe that the framework is pertinent to EMI medical

teachers. Based on this rationale, this study used the 'English-for-Teaching' framework to capture the language used by teachers in EMI medical classrooms to understand how EMI medical teachers delivered academic content to their bi/multilingual students.

In the classroom, the 'English-for-Teaching' framework groups classroom routines into three functional areas as shown in Figure 2:

Figure 2

Functional Areas of Classroom Language Use



Note. Freeman et al., 2015, p. 7

According to Freeman et al. (2015), Figure 2 illustrates that teachers employ language skills related to classroom management by using their English language knowledge to its situated use with students in the classroom (A). To understand and communicate lesson content (B), teachers use their command of English to deliver lesson content based on a standardized curriculum. To assess students and provide feedback (C), teachers connect curricular content with how it is situated in real time.

Finally, it is important to note that teacher's classroom routines would arguably vary according to class size, student backgrounds, and teachers' own teaching styles. Teachers are constantly situating forms of knowledge to match classroom characteristics. That is, the 'English-for-Teaching' framework can help capture these factors because "the English-for-Teaching integrates linguistic resources with methodology so that in using the language, the teacher is enacting forms of instruction" (Freeman, 2017, p. 42).

Methodology

Context & Method

This research was part of a pilot teacher training initiative to help EMI medical teachers improve delivering lectures in EMI. As such, the research team was comprised of specialists in Medical Education and Applied Linguistics. The study was conducted at a graduate-level, English language medical training program of a large, urban, academic institution in Thailand, a first of its kind.

The medical training program under study aims to prepare students for residency training in Thailand and BANA (Britain, Australasia, and North America) countries. Approximately 35-40 students make up the program per year. The four-year curriculum consists of three phases: Preclinical (18 months), Clinical Rotations (12 months of Core Rotations and 12 months of domestic and oversea electives) and Special Project (6-month research block). The Preclinical phase, the focus of the study, consists of 4-6 weeks of classroom- or laboratory-based modules centered around the organ system (e.g., hematologic system, the cardiovascular system, the respiratory system). The educational sessions take a variety of instructional methods: e.g., large-group lectures (30-40 students), case-based learning (about 10 students in each small group), problem-based learning (PBL), team-based learning (TBL), laboratory skills group, and exam preparation (reviewing exam questions in a large group). All sessions, except for the last two formats, were recorded and stored in a Learning Management System (LMS) for students to access and review at a later date, a practice commonly used in institutions of higher learning.

The teaching team consists of approximately 220 medical teachers– from both basic science and clinical practice—across medical specialties related to the organ systems. These teachers are Thai L1 speakers, and have received their training from Thai institutions, licensed by the Thai Medical Council. An overwhelming majority of them completed further training, fellowship, and other certificate programs abroad in BANA institutions. Despite having completed their education using academic English, teachers report challenges teaching in an EMI classroom. Conversely, almost all of their students are bilingual Thai citizens who have attended BANA international schools during their K-12 education in Thailand and have earned their undergraduate degrees in a variety of fields in BANA countries.

The data were sampled from a set of recorded educational sessions from the Preclinical phase of the curriculum. The sampling was done purposefully to include a wide range of organ systems and pedagogical

formats. The intention was to explore common resources of medical teachers in EMI classrooms in more than one format.

Data Preparation and Collection: Selection of Videotaped Classroom Lectures

An administrative team at the medical program, separate from the research team, handled the recording, organization and storage of all video recordings of classroom teaching across the program's pre-clinical sessions from August 2021 to November 2022. Access to the videos was granted to the research team by one of the authors, who is an education consultant and member of the International Advisory Board of the medical program under study for the sole purpose of educational research. None of authors neither personally know nor had recruited any of the teachers participating in the video recordings. This study was approved by the institution's Office of the Research Ethics Review Committee (approval no. 670248).

Out of the 294 available sessions, 83 sessions did not have videorecording, and 24 sessions had restricted access. From the accessible 187 sessions, the criteria to include particular video recordings included the following (adapted from (Creswell & Guetterman, 2020)Creswell & Poth, 2018, as cited in Creswell & Guetterman, 2020, p. 264):

a. the lecture is conducted in English;
b. the teacher's voice is audibly comprehensible;
c. there are no disruptive room sounds;
d. there are no difficulties with focusing and positioning the camera; the video quality is of viewable quality.

Overall, the exclusion criteria included sessions without video recordings; recordings of poor video and audio quality; and recordings where it was difficult to distinguish the voices of students from the instructors (adapted from (Creswell & Guetterman, 2020)Creswell & Poth, 2018, as cited in Creswell & Guetterman, 2020, p. 264).

In total, 50 audiovisual samples were selected as candidates for analysis from a total of 294. The 50 audiovisual samples were selected as candidates to ensure that each sampling round would be from of a representative collection—to reflect the widest format of teaching. Recordings were transcribed using ATLAS.ti 24.2.1 for Mac. Time stamps were used at least every 30 seconds of speech.

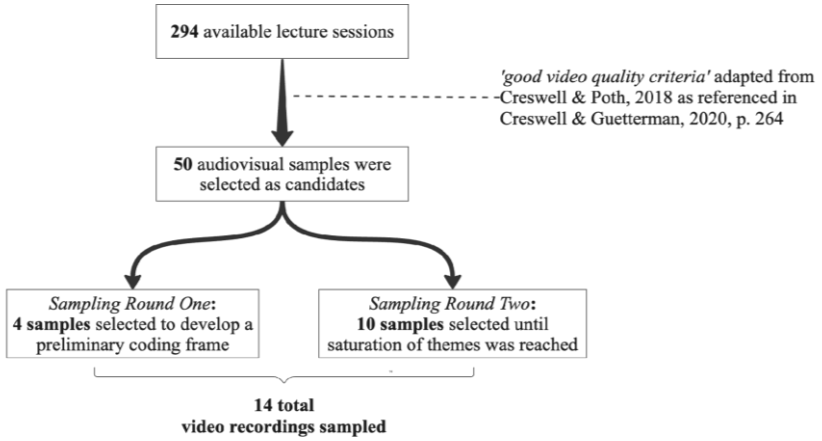
In the first round, four recordings were selected from the 50 audiovisual candidates. The four recordings were initially selected to help develop a preliminary coding frame. In the second round, an additional ten video recordings were selected from the 50 audiovisual candidates. An array of teaching delivery formats was chosen to be reflective of the pre-clinical

curriculum. Some classes were in-person while others were conducted online via Zoom. Some classes were large with predominately monologic lecturing while others were smaller with interactive question-and-answer sessions. In some recordings, more than one teacher taught the class, each taking turns passing the microphone. In such cases, the teachers interacted with one another as well as with the students. The lecture samples used in this study were continually added until coding themes repeated at a saturation point. Thematic saturation was reached after 14 lectures or approximately 18.5 hours of classroom recordings.

In summary, there were four key delivery formats including in-class PowerPoint lectures, in-class case studies, in-class group discussion, and online lectures. Figure 3 below summarizes the data collection process.

Figure 3

Overview of Data Collection Process Using Criterion Purposive Sampling



Data Analysis

The transcripts for the audiovisual data were analyzed using qualitative research methodology through inductive thematic analysis (Saldaña, 2021) in an iterative manner. In the first cycle of coding, initial codes were generated, which were then grouped into categories. In the second cycle of coding, the categories were then sorted into thematic buckets, where naming and specifics of each theme were also refined. In the third phase of coding, the themes were sorted using the 'English-for-Teaching' framework by further categorizing themes into functional areas.

Since the research team consisted of three co-investigators, discrepancies were solved through consensus based on conversations. In total, the research team aligned on the initial coding frame (after four video

samples), the refined coding frame (after ten video samples), the salient themes (i.e., classroom routines) and their naming, as well as the final categorization of classroom routines into functional areas using the 'English-for-Teaching' framework. For codes, categories and themes related to Applied Linguistics, the second co-investigator took the lead in discussions and consensus-building. For codes, categories and themes related to Medical Education, the third co-investigator led deliberations and facilitated consensus.

Focusing on how teachers used classroom language, the data were organized to three broad themes: ideational organization, pedagogical speech acts, and classroom management language.

Findings & Discussion

Based on our analysis of video recordings, we will present findings together with discussion based on the research questions.

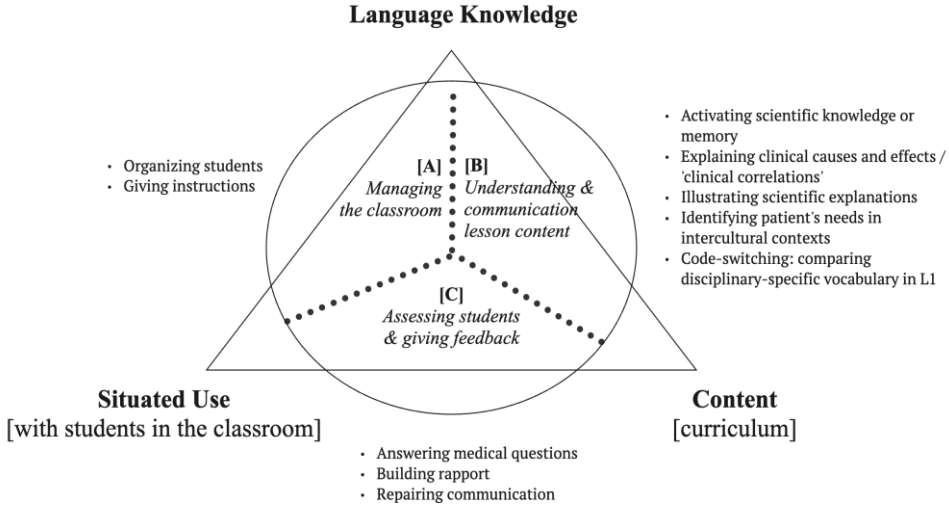
RQ1: To what extent is the English-for-Teaching framework applicable for analyzing the classroom language strategies of EMI medical teachers in multilingual higher education settings?

Using the 'English-for-Teaching' framework is feasible in EMI medical classrooms

As a feasibility study, this research finds that the 'English-for-Teaching' framework can be used to describe the language used by teachers in EMI medical classrooms. Much like in ELT classrooms, EMI medical teachers are guided by their teaching purposes as evidenced by teachers' preparation through PowerPoint slides and their references to the syllabi in the video recordings. By identifying teachers' classroom routines as instances of teaching enacted by EMI medical teachers, teachers' classroom language can be described as heavily indexing to 'understanding and communicating lesson content' (see Figure 4, [B] and Table 2) while language related to 'managing the classroom' (see Figure 4, [A]) and 'assessing students and giving feedback' (see Figure 4, [C]) were less frequent.

Figure 4

Instances of Emi Classroom Routines Within Functional Areas of Classroom Language Use



Through referencing the functional areas of the 'English-for-Teaching' framework, EMI medical teachers would be able to pinpoint not only their classroom routines, but also the language challenges they may face from undertaking such pedagogical activities. In other words, the framework helps teachers take what they already know about classroom teaching to develop specific classroom language based on their classroom routines. Rather than EMI medical teachers be concerned with using a broad range of language, teachers may focus instead on defined sets of language patterns (see Table 2) that are already sufficiently familiar to them (Freeman et al., 2015). For EMI teachers who experience language challenges while teaching, becoming aware of comprehensible language patterns become paramount for maintaining teaching quality and student learning.

Based on the findings, this next section will now discuss how the language strategies used by EMI medical teachers can be described by using the 'English-for-Teaching framework.'

Using the 'English-For-Teaching' Framework to Capture the Language Strategies Used by Emi Medical Teachers

Based on the classroom data, it was observed that teachers were using their own language strategies to situate subject matter content in ways they believe would best transfer to their students. That is, in some cases, it was

observed that teachers were reading off prepared PowerPoint slides, while at other times opening the class up for discussion. The 'English-for-Teaching' framework allows practitioners to describe how EMI medical teachers were using language based on their teaching purposes. To what extent these teaching purposes were planned in advance would require future investigation.

In non-EMI classrooms, content teachers do not need to scaffold their speech, as their students use English as their first language. In EMI classrooms, however, teachers can foster comprehensible input through using modification strategies such as paraphrasing, rephrasing, and discourse markers (Richards, 2017). The EMI medical teachers in this study can readily 'tell' students facts but would need to use discourse markers to transform content in ways that produce a scientific narrative, especially through a scientific story that students can situationally use. Providing short summaries of main ideas, breaking down lectures into sections, and clarifying content are arguably key components of producing comprehensible input. In short, by using the 'English-for-Teaching' framework, EMI medical teachers can use the functional areas to better understand how their language strategies are used to enact various classroom routines.

RQ2: What pedagogical activities are evident in EMI medical classrooms, and how can the 'English-for-Teaching' framework facilitate their identification and analysis?

In the previous section, we have discussed how the 'English-for-Teaching' framework can be extended to EMI medical classrooms to capture how language strategies are used by EMI medical teachers. In this next section, we will discuss how the framework can be used to identify and analyze pedagogical activities in EMI medical classrooms. Specifically, we will be able to see the composition of various classroom routines enacted by EMI medical teachers.

Pedagogical Activities Are More Indexed to 'Communicating Lesson Content' Than to 'Assessing Students and Giving Feedback'

The 'English-for-Teaching' framework can be used to identify a wide range of pedagogical activities (i.e., classroom routines) in EMI medical classrooms. Table 2 categorizes our findings of classroom language use by EMI medical teachers according to the functional areas of the 'English-for-Teaching' framework.

Majority of classroom routines were associated with functional area [B] (see Table 2), as teachers spent most of the class time delivering lesson

content. Teaching in graduate-level classrooms, teachers were not spending much time disciplining students or giving instructions, so few classroom routines were observed in functional area [A] (see Table 2). Interestingly, it was found that EMI medical teachers were not frequently assessing students (see functional area [C] in Table 2). While the frequency of formative assessments by teachers varies across different contexts, past studies such as Pun and Macaro's (2019) have found that the use of questions in EMI science classrooms in Hong Kong was related to language proficiency in the medium of instruction. That is, cognitively challenging questions were found in EMI classrooms where language proficiency was high as opposed to the use of lower order questions in EMI classrooms with lower language proficiency. Note that quantifying language use was not one of our research objectives. This point deserves further investigation.

Table 2

Using the 'English-For-Teaching' Framework to Capture Instances of Language Use by Emi Medical Teachers

Functional area	Item	Classroom routine/ Pedagogical activity	Instances of language use
[A] Managing the classroom	i.	Managing students	"Alright, let's get started."
	ii.	Building rapport	"Please feel free to participate. There is no right or wrong answer to this question."
	iii.	Discourse management	"This question is multipart. Let me get back to you."
	iv.	Giving instructions	"Please form 4 groups."
	v.	Activating students' prior knowledge	"You have likely learned this in high school biology as it relates to the cell.....can anyone remember the process for this?"
	vi.	Illustrating scientific explanations (e.g., analogy)	"The mitochondria is the powerhouse of the cell."
	vii.	Giving personal anecdotes	"I once met a patient who had these exact symptoms, and ..."

	viii.	Providing examples in local context	"In Thailand, we often see..."
	ix.	Citing sources of scientific information	"According to the journal Nature...."
	x.	Categorizing concepts	" the subtypes of myopathy include..."
	xi.	Prioritizing content	"Just so you know, you don't need to memorize all the steps of this process. You only need to recognize its name."
	xii.	Defining clinical conditions	"So we call the disease hypokalemic periodic paralysis"
	xiii.	Explaining concepts	"The neuromuscular junction is transmitted by a chemical neurotransmission"
[B] Understanding & communicating lesson content	xiv.	Explaining causes and effects	"When the Acetyle-CoA binds to this receptor it will cause the influx of the sodium into the muscle fiber"
	xv.	Using clinical context: doctor-patient relationship	"You have to find the right combination of practice and medication to help you and the patient deal with pains and stress."
	xvi.	Using clinical context: managing patient expectations	"Your patient might expect the doctor to send him or her for an MRI first, but checking their medical history will be first important"
	xvii.	Using clinical context: intercultural medical model of disease	"For the most common cases in Thailand, we find that..."
	xviii.	Illustrating the clinical reasoning process	"The patient has subacute progressive vertiginous symptoms and right facial weakness, which is a lower motor neuron type and right-sided limb ataxia, okay? Where is the lesion?
	xix.	Code-switching: Giving equivalent definitions in L1	"In Thailand, we would call the cerebrum 'สมองใหญ่' in Thai."
	xx.	Code-switching: providing local examples in L1	"In many villages in Thailand, patients would often กินหน่อไม้." (*Thai:* "eat bamboo")

[C] Assessing students and providing feedback	xxi.	Giving feedback: Affirmative	"Right hemiplegia yes! Yeah, because you know, if you have only one lesion and produce the weakness of both arm and leg in the same side, you must have the lesion in the corticospinal tract in the opposite side of the brain right?"
	xxii.	Giving feedback: Corrective	"If we have the lesion of right anterior cerebral artery occlusion, the answer will be the contralateral leg monoparesis"

In summary, having discussed the various classroom routines used by EMI medical teachers, the following section will now discuss the significance of classroom routines in various functional areas. As EMI teachers reflect on how best their students learn, teachers might consider how they might best situate their pedagogical activities to students' backgrounds.

Differences in Pedagogical Activities That Situate Subject Matter Knowledge and Those That Are Communicated Generally

From the classroom data, we observed differences in the way that classroom language was used by EMI medical teachers to enact pedagogical activities that situated subject matter compared to those that were communicated generally. That is, language challenges (i.e., language disruptions such pauses and speech repair) seemed to most frequently occur when the EMI medical teachers were attempting to situate knowledge using students' perspectives (Table 2, items v, xiv, xv, xvi) and less so when delivering propositional knowledge from their own point of view (Table 2, items vii, viii, xxi, xxii). The EMI medical teachers tended to also have less language disruptions when discussing scientific facts (Table 2, items x, xii, xiii) likely because such information addressed descriptions of things, events, or processes that were static. These challenges suggest that for classroom routines that involve situated use (see Figure 4, bottom left of triangle), such classroom routines arguably presented the most difficulties for the EMI teacher because the teacher must extend content knowledge beyond their own personal comprehension for their students. This also suggests that language support for EMI medical teachers in this study ought to be focused on classroom language that directly or indirectly interacts with students.

It is important to not simply view the research findings (see Table 2) as a list of 'usage-based' language functions that are stochastic. Rather, we

propose that teachers and stakeholders should view these instances of classroom routines through 'purpose-based' perspectives. 'Use' refers to how people normally employ language in specific situations, but 'purpose' points to what they are trying to achieve using that language (Freeman, 2017). In enacting 'purpose,' teachers are constantly situating/mediating their medical knowledge to the classroom emergently, code-switching, localizing, and/or globalizing content they wish to deliver. Both 'use' and 'purpose' are interwoven functions that cannot be separated.

While the classroom routines listed in Table 2 are not exhaustive, findings from our analysis of classroom discourse demonstrates a 'goodness of fit' (Hanson et al., 2011), where the identified classroom language is not to be used prescriptively (Emden & Sandelowski, 1998). In other words, this research centers on "appreciating contexts rather than controlling it; exploiting human potential to analyze and interpret; and providing descriptive foundations," (Hanson et al., 2011, p. 375) in line with transcending 'native-speaker standards' (Selvi, 2019).

Recommendations

Pedagogical Recommendations

Based on our observations, we believe that our findings in medical education can be extrapolated to other EMI settings in medicine and to other EMI classrooms in higher education writ large. While this study focused on pre-clinical classrooms, EMI medical teachers teaching in other formats (e.g., team-based learning (TBL), bedside teaching, laboratory skills group, etc.) could benefit from exploring the language strategies they use through the *English-for-Teaching* framework. Overall, the 'English-for-Teaching' framework could be used by teachers in other EMI subjects to help teachers understand the composition for their classroom routines. That is, the framework can help teachers become more aware of their current teaching purposes and what language strategies might be needed to help enact those teaching aims.

Furthermore, given that the majority of classroom routines were those in 'understanding and communicating lesson content,' EMI teachers might think about the degree to which they need to prepare their language strategies in anticipation of lesson areas requiring higher order communication. For example, if teachers wish to use figurative language to illustrate scientific explanations, they may need to prepare their analogies and metaphors prior to overcome the challenges that may arise from extemporaneous productions.

Finally, the 'English-for-Teaching' framework can serve as one of many tools for EMI professional development. Specifically, the framework might be helpful for reflective practices. According to Farrell (2020), professional development through reflective practices for EMI teachers refers to when teachers are systematically looking at what they do and the reasons for taking such actions. Farrell (2020) discusses several tools including dialogue, writing, classroom observations, action research, narratives, and team-teaching. Based on classroom observations, the 'English-for-Teaching' framework can be used as a tool for EMI teachers to analyze data about their teaching, from which teachers can make appropriate adjustments to their practice.

Research Recommendations

Overall, this research article functions as a methodology paper for practitioners seeking to explore the relationship between classroom routines and classroom language strategies. There is an opportunity for future studies to quantify classroom strategies and to narrow in on high frequency classroom routines. For example, if teachers are using personal anecdotes or code-switching to give equivalent definitions in L1 frequently, what linguistic features are most often occurring in these utterances? If teachers' speech is transcribed into textual data, can generative AI models be trained to provide feedback to teachers?

Furthermore, it was found that informal formative assessments were infrequently used in the classroom. Majority of the questions asked in the EMI medical classrooms studied were part of a series of inductive scientific questioning (i.e., teaching through clinical reasoning). Future research is warranted to better understand how formative assessments can be used more effectively.

Conclusion

In Thailand, the number of EMI university programs have soared as part of initiatives in higher education to internationalize. As such, content teachers initially hired by their university to teach academic subjects in Thai have frequently been recruited to teach through a medium of English without any EMI training. Our findings encourage teachers to take what they already know about classroom teaching to develop language strategies for their existing classroom routines.

As a feasibility study, we find that the *English-for-Teaching* framework is applicable not only in ELT classrooms, but also in EMI medical classrooms as well. The *English-for-Teaching* framework can help practitioners become

more aware of the pedagogical activities that are being undertaken in EMI medical classrooms. The feasibility of the *English-for-Teaching* framework in analyzing EMI medical classroom discourse indicates that there may be applicability to other EMI settings in higher education (e.g., engineering, mathematics, economics).

As practitioners think about EMI pedagogies, based on our findings, pedagogical activities enacted in EMI classrooms are not symmetrical in quality and quantity. In terms of quality, depending on classroom routines, language strategies used by EMI teachers vary in cognitive load and preparation. In particular, EMI teachers experienced greater difficulties in their language use when situating knowledge for student purposes as opposed to when recounting information from personalized knowledge. By way of quantity, the frequency of pedagogical activities enacted in the EMI classroom was heavily indexed towards 'understanding and communicating lesson content,' where 'assessing students and giving feedback' was underrepresented.

Given that EMI medical classrooms are content-laden, it was no surprise that the majority of pedagogical activities were in 'understanding and communicating lesson content.' Nonetheless, it was observed that perhaps the EMI medical teachers in this study may be over-reliant on their content. Pedagogical activities such as explaining causes and effects, categorizing concepts, and giving personal anecdotes are all teacher-centered talk based on the teacher's personal comprehension. Using content in these ways as pedagogical activities arguably does not guarantee learning. Rather, we surmise that subject matter transfer to students might be most effective when students are assessed for their understanding or when students are given ownership in the pedagogical activities introduced in the classroom. As a result, teacher training should not be focused on subject matter content. Rather, teacher training should be focused on helping teachers develop language strategies to assess and give feedback to students or in other learner-centered activities.

Finally, when we think about how language strategies are formulated, we would not be able to separate classroom language use from the pedagogical reasoning that animates it. Our findings illustrate that teachers' pedagogical activities are equivalent to their pedagogical reasoning. That is, EMI medical teachers are not simply 'telling' or 'listing' scientific facts in the classroom. Rather, EMI medical teachers are thematically transforming scientific facts into scientific narratives that allows students to use such knowledge for their own purposes. As describable through the 'English-for-Teaching' framework, meaning-making of academic content requires situating subject matter knowledge in the classroom.

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