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Article

Comparing co-teaching and single instructor approaches on student satisfaction in online medical English courses

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Abstract: This study examined the dissatisfaction among Chinese medical students with online medical English courses, which overemphasize grammar yet fail to provide practical opportunities related to medical situations. This study compared co-teaching's effects, involving native and non-native instructors, with a single-instructor (traditional) model on student satisfaction in online medical English courses. Using a qualitative design, pre- and post-course interviews were conducted with 49 second-year medical students across seven classes, exploring their perceptions of instruction, curriculum, and course satisfaction. The findings indicated that the co-teaching model improved student engagement and satisfaction, not specifically due to the native English-speaking instructor but likely because of the focus on more interactive and discussion-oriented strategies. In contrast, the single-instructor model maintained the traditional grammar-focused instruction, leading to lower satisfaction levels. Both instructional models faced limitations related to their reliance on textbooks for delivering core material needed for the course's comprehensive exam. These results suggest that the instruction design and approach, rather than the native instructor alone, was the main driver of positive outcomes in co-teaching. The study's findings suggest a need for curriculum reforms that reduce textbook dependence and incorporate more practical, interactive learning strategies. Future research should consider applying various research techniques, such as mixed-method approaches, longitudinal studies, and experimental designs, to comprehensively assess the long-term effects of instructional strategies and curriculum innovations on student outcomes.

Keywords: Chinese higher education; constructivist learning; curriculum relevance; instructional methods evaluation; student engagement; student feedback; teaching methodology; textbook reliance

1. Introduction

In 2020, China's Ministry of Education reformed College English teaching, reaffirming its importance for student. A key component of this reform is the focus on English for Specific Purposes (ESP), particularly in fields like medicine. English proficiency is essential for accessing the latest research and engaging in the global medical community (Huang and Lu, 2021). EMP (English for Medical Purposes) courses are designed to equip future healthcare professionals with the language skills necessary for obtaining accurate medical information, which is predominantly published in English.

The COVID-19 pandemic accelerated the shift from traditional face-to-face classroom learning to online platforms. While this transition to online learning has been largely successful (Swanson and Valdois, 2022), with Chinese higher education institutions and students showing increased acceptance (Li et al., 2021), concerns

about the quality of curriculum and instruction in medical English courses have emerged (Su et al., 2021). Recent studies reveal that students feel that current course content and textbooks are not practical for medical communication needs (Chi, 2020; Guan and Scott, 2024). Chinese students have become more vocal, expressing dissatisfaction with the traditional, lecture-oriented approach commonly used by Chinese instructors, which overemphasizes textbook learning and rote memorization while lacking contextual medical discussions (Guan and Asavisanu, 2023; Ma, 2022; Zhao, 2022).

This reliance on traditional teaching methods, prioritizing instructor-led lectures over, student-centered learning, has been linked to a lack of instructor self-efficacy (Scott et al., 2023; Yao and Zhu, 2015). This lack of self-efficacy often prevents teachers from adopting engaging, student-centered methods, reducing student satisfaction and engagement (Cao, 2016; Chen et al., 2020; Scott and Guan, 2022). In response to these challenges, co-teaching integration—particularly involving native English-speaking instructors—has emerged as a promising strategy for medical English courses (Sharma et al., 2017). Co-teaching can enhance communication, increase student engagement, and shift the focus from lecture-based to more discussion-oriented, interactive learning (Crow and Smith, 2005). By focusing on collaborative learning, co-teaching can transform the learning experience, improving knowledge acquisition and student satisfaction (Mofield, 2020).

This study aims to determine how a co-teaching model, including a native English-speaking instructor, influences student satisfaction and learning outcomes in an online Medical English course. By examining students' perceptions of instruction, curriculum, and overall satisfaction, the study seeks to identify key factors contributing to or hindering effective learning and engagement. This investigation will provide insights into the potential benefits of co-teaching in overcoming the limitations of traditional teaching methods. To achieve this aim, the study addresses the following question: How do co-teaching and single-instructor models impact student engagement and satisfaction in online medical English courses?

2. Materials and methods

2.1. Study design

This study employed a qualitative design to explore the impact of a co-teaching model in an online synchronous Medical English course for second-year Chinese undergraduate medical majors. The research examined students' perceptions of course instruction, curriculum, and overall satisfaction. By focusing on the co-teaching model, the study sought to understand how these different teaching approaches affected students' learning experiences and outcomes. This study aimed to describe and interpret the experiences of the medical students through pre- and post-course interviews. The pre-interviews, conducted before the start of the semester, were designed to establish a baseline understanding of students' initial expectations, learning goals, and previous experiences. This baseline was important for understanding students' starting points and how their perceptions and attitudes might have shifted over the course of the semester (Buschle et al., 2022). Post-interviews, conducted after course completion, aimed to capture changes in students' perceptions

and assess the impact of the co-teaching model on their satisfaction and learning outcomes.

The use of pre- and post-interviews allowed researchers to compare responses from before and after the course, providing insights into the dynamic nature of students' learning experiences and highlighting the factors that contributed to their satisfaction or dissatisfaction. A semi-structured interview protocol was developed, drawing on previous research related to educational quality (Jacob and Furgerson, 2012; McGrath et al., 2019). Before participating, each student received a consent form and an information sheet detailing the study's objectives, participant criteria, procedures, and their rights as respondents. The interviews were conducted in Chinese via the WeChat video chat application. The interviews ranged from 14 to 34 m for the pre-course interviews and 17 to 41, with an average length of 24:31 and 25:18 respectively. All interviews were audio-recorded, transcribed, and thematically coded to identify significant constructs emerging from the data. This method allows researchers to organize and interpret data, highlighting key themes related to student satisfaction. Thematic coding is particularly useful in educational research, where diverse perspectives and experiences can be categorized and analyzed to reveal underlying trends and insights (Nowell et al., 2017).

The researchers translated key themes and quotations into English to ensure clarity and accuracy. A bilingual expert familiar with educational terminology and the study's context reviewed and confirmed these translations, ensuring the original responses were accurately captured. The themes were described and supported by quotes from the participants, providing insights into the experiences and perceptions of the students involved in the study. The study obtained ethical approval from the participating university's Institutional Review Board (IRB), ensuring that all research procedures adhered to ethical study guidelines.

This study used a constructivist framework to explore students' perceptions of learning experiences. Constructivism emphasizes that learners construct knowledge through interactions with their environment, integrating new information with their existing beliefs and knowledge (Mogashoa, 2014). This perspective was ideal for understanding how students perceived the influences of a co-teaching model involving both a native English-speaking instructor and a non-native (Chinese) instructor on their learning experiences. By focusing on how students interpreted and assigned meaning to different teaching methods, the study aimed to understand how co-teaching impacted students' learning experiences, offering insights into the effectiveness of varied instructional approaches.

2.2. Study participants

The research was conducted at a provincial-level medical university in Southern China. This institution, one of five medical universities in Guangdong Province, has the largest medical student enrollment in the province. The large and diverse student body makes it an ideal setting for exploring varied student experiences and perspectives (Cohen et al., 2018). During the second semester of the 2022/2023 academic year, the total population consisted of 2697 second-year medical majors. Seven classes were selected from this population using convenience sampling,

focusing on those with similar demographic profiles, academic performance, and class schedules to ensure consistency in the sample. Convenience sampling was chosen due to practical constraints, such as the availability of students within the selected classes. This method allowed the researchers to select participants who were readily accessible and willing to participate, ensuring a representative sample.

The classes were divided into two instructional formats: one group of three classes, taught by a single non-native English instructor (263 students), while the other group of four classes, utilizing a co-teaching approach with a native English speaker (329 students). Both groups had a similar gender distribution of approximately 55% female and 45% male. To obtain a representative sample, interviews were conducted with 49 students, 21 from the single instructor group and 28 from the co-teaching group (Appendix A). A quota sampling approach was employed, and four females and three males from each class were selected to reflect the overall gender distribution. The sample size aligns with Creswell's (2013) recommendation of 20–30 interviews to ensure comprehensive data. This approach aligns with the constructivist view that the richness of learning is enhanced by incorporating multiple viewpoints and experiences, fostering an inclusive and equitable educational setting.

2.3. Course design

The Medical English course was structured to provide second-year medical students with comprehensive language instruction through a carefully designed curriculum. Classes were scheduled as 90-min sessions (comprising two 45-min periods) and held online weekly via Tencent Meeting for 17 weeks. The single-instructor classes took place on Tuesdays, while the co-teaching sessions were scheduled for Wednesdays. The second-semester course material covered five key topics: public health, autism, precision medicine, pandemics, and psychology and life. These topics were drawn from a textbook developed by the university's Foreign Language Department, ensuring relevance and alignment with the student's medical studies. Each unit spanned three weeks, focusing on topic background, terminology, and case studies related to China.

The single instructor and co-teaching classes followed the same curriculum content, with the native English instructor conducting one lesson every three weeks. In the co-teaching model class focused on discussion-oriented activities, including small and large group discussions, debates, and role-plays. The single instructor's class included a review of content, and a new case study related to the set topic. The final two weeks of the semester were dedicated to course review and exam preparation for both groups, ensuring students were well-supported in achieving their learning outcomes.

Both instructors were well-suited for the study, with extensive experience teaching medical English at the university level. The Chinese instructor has over a decade of experience, while the native-English instructor has nearly two decades, including developing professional development programs for hospitals and pharmaceutical companies. Their combined knowledge ensured that the single-instructor and co-teaching models were supported by instructors familiar with the specific language demands of medical students.

2.4. Interview questions

The pre- and post-course semi-structured interview questions were designed to explore how the course influences student satisfaction and learning experiences, grounded in a constructivist framework. Constructivism emphasizes that students actively construct knowledge through interactions with the course content, instruction, and activities. The pre-course questions aimed to capture students' expectations and initial perceptions. While, the post-course questions focused on students' reflections, assessing how their interactions with the course influenced their learning and whether it aligned with their initial goals. The following are the semi-structured questions asked in both interviews:

Pre-Course Interview Questions:

1. Reflecting on your medical English course last semester, how did you find the teaching methods? What worked well for you?
2. How important do you think the course content will be in helping you achieve your academic goals?
3. What factors contribute most to your satisfaction?

Post-Course Interview Questions:

1. Reflecting on this course, what aspects of the instruction were most effective in helping you learn?
2. In what ways did the course content support your academic and professional goals?
3. How did the course meet or exceed your expectations?
4. What factors contribute most to your satisfaction?

3. Findings

Pre-course interviews were conducted between January and February 2023, while post-course interviews were conducted between August and September 2023.

3.1. Instruction

3.1.1. Pre-course perceptions

Students' expectations were influenced by their experience of lecture-based instruction, with several students expressing concerns that this approach would dominate the upcoming course (**Table 1**). Student 3.1 mentioned, *"Last semester, [the teacher] usually just talked, and we listened. It's hard to stay focused when it's only lectures."* This feeling was mirrored by student 2.4, who noted that while the instruction in past courses was clear, it was too focused on grammar and rules, making it difficult to engage with the material. *"[The teacher] explained everything clearly,"* (student 2.4), *"but it was all grammar. We need more than just rules."* Several students acknowledged that the clarity of the teaching was beneficial. However, they hoped for a more balanced approach that included real-world usage of medical English rather than just theoretical knowledge. Many students believed that the course would continue the pattern of lecture-oriented instruction. Student 6.5 stated, *"I think it will be the same—just listening to the teacher talk. I hope there will be more chances to practice."* This expectation of passive learning led some to express concerns about boredom with the teaching methods, student 1.7 shared, *"The classes were always the*

same last semester. We just listened and wrote some notes. I hope this semester will be different."

Despite these concerns, some students expressed optimism. Student 6.7 hoped that the course would offer a more step-by-step approach allowing for a better understanding of complex medical English concepts. *"If the online lessons are organized better, it would be easier to follow."* Similarly, student 4.3 anticipated that the course might be more practical *"I hope we can use English more, not just study grammar"* (Student 4.3). Other students noted that if the online class focused more on real-life situations, the class would be more useful and engaging.

Table 1. Pre-course perceptions of instruction.

	Subfactors	Keywords (Frequency)	Total Frequency	Theoretical Link
Instruction	Teaching Methods	Positive: Understandable (9), Clear (6), Organized (4), Practical (1)	20	Effective teaching methods support knowledge construction.
		Negative: Boring (7), Lecture Oriented (6), Grammar Focused (5), Outdated (4), Repetitive (3), Little Interaction (3), Challenging (1)	29	
	Effectiveness	Positive: Helpful (4), Informative (3), Relevant (3), Enjoyable (1)	11	
		Negative: Confusing (9), Limited (6), Basic (5), Disconnected (3), Irrelevant (3), Lacks Effort (1)	27	

Students had mixed expectations about the effectiveness of the instruction in addressing their needs as medical students. Many expressed concerns that last semester's Medical English course (Medical English 1) was confusing or too limited in scope, often failing to bridge the gap between grammar and practicality. Student 1.6 commented, "*Last semester's courses didn't really prepare us for real work. We learned a lot of grammar, but I don't see how it will help me at work*." This belief was shared by several other students, such as 3.4, 6.4, and 7.4, who felt that the previous course did not cover the medical English they would need in their careers. Student 3.4 reflected, "*I hope this course will be more about medical English and less about general English.*"

Some students worried that the course might lack relevance to their future jobs. Student 2.2 said, "*I think it will still be focused on vocabulary and grammar.*" Other students voiced concerns that the material could be disconnected, with the past course feeling unrelated to practical needs. Frustration with previous instruction was also a common theme, with Students 1.5, 6.1, and 7.6 expressing that the last course was too simple to help them develop the proficiency required for their future careers. Student 1.5 said, "*I think we need better lessons to be competitive for jobs.*" While student 6.1 explained, *"... [the teacher] wasn't an expert on the topics, so how are we going to be experts?*"

Despite these concerns, some students remained hopeful that the course might be more helpful and informative than previous experiences. Student 1.2 was optimistic that the new course would provide more detailed explanations of medical terminology. They said, "*If we learn more case studies and how to* talk *to patients, it will be much more helpful.*" Students 3.2, 5.4, and 6.7 similarly hoped that the course would focus

more on practical elements. Student 3.2 remarked, "*I want to learn how to use English with patients or in reports, not just memorizing words*."

3.1.2. Post-course perceptions—Single instructor

After completing the course, a noticeable improvement in students' perceptions of the teaching methods was observed (**Table 2**). Many students found that organization of the class allowed them to engage more effectively with the material. Students 1.3, 2.5, and 3.4 appreciated how the teacher's explanations were understandable and well-structured. *"The lessons were clear and organized, so I could follow what was being taught"* (student 1.3). Several others, including 2.2 and 3.5, noted that the structure helped them stay focused and made the lessons feel more engaging despite the remote setting. Student 3.5 shared, *"Even though it was online, the classes were helpful."*

While the course still involved grammar instruction, students 1.4 and 3.1 noted that these lessons were more closely linked to medical situations. *"We still learned grammar, but it was connected to medical topics,"* (student 1.4). However, some students expressed lingering concerns about the lecture-heavy approach of the course. Students 2.3, 1.6, and 3.1 reported that the course's online nature exacerbated the passive learning style, with limited interaction. Student 2.3 said, *"Even though the lessons were clear, we didn't get much chance to participate."* Others, such as students 1.6 and 3.3, felt that while the lessons were more structured, the repetitive and lecture-oriented style still left them wanting more interactive engagement. *"[The teacher] explained things well, but we didn't have many chances actually to use what we were learning…it's difficult to be active in large classes when we are learning online."* (student 1.6).

Table 2. Post-course perceptions of instruction—Single instructor.

	Subfactors	Keywords (Frequency)	Total Frequency
Instruction	Teaching Methods	Positive: Understandable (9), Clear (6), Organized (6), Engaging (5), Helpful (4), Balanced (2)	32
		Negative: Boring (3), Grammar Focused (3), Outdated (3), Lecture Oriented (2), Unclear (1)	12
	Effectiveness	Positive: Relevant (5), Detailed (3), Helpful (3), Informative (2), Fair (1)	14
		Negative: Confusing (3) Limited (3), Basic (1)	7

Students' perceptions of the effectiveness of the instruction also showed positive changes following the course. Many reported that the online lessons felt more relevant (**Table 2**). Student 1.5 stated, *"This time, the lessons felt a little more connected to what we'll need. We talked more about medical topics, and that was helpful."* Other students, such as 2.1 and 3.4, appreciated the increased depth and relevance of the instruction. Student 3.4 commented, *"[The teacher] provided more details for medical terms that were useful."* Additionally, students 2.6 and 3.5 noted that the course was more enjoyable than anticipated because it allowed them to apply some of the medical English. Student 2.6 explained, *"It wasn't just about memorizing vocabulary… we learned how to use some terms."* This practical application of knowledge supported their learning in ways that went beyond rote memorization and passive listening. Student 1.2 added, *"We focused a little more on how to communicate."*

Despite these improvements, some students found parts of the course lacking depth. Student 2.3 mentioned that while the material was more relevant, there were still instances of confusion, particularly when dealing with complex medical terminology. *"There were parts where I got lost."* Others, including students 3.1 and 2.4, expressed that while the lessons were more effective, they felt limited in scope, leaving them wanting more advanced material. Student 3.1 shared, *"The course was better, but I still think we need more."* Student 2.4 expanded by explaining, *"Online courses feel rushed; it's harder than regular classes."*

3.1.3. Post-course perceptions—Co-teaching

The co-teaching approach, where students alternated between sessions led by a native English-speaking instructor and the Chinese instructor, was received positively by most students, as demonstrated in **Table 3**. This method allowed students to benefit from diverse teaching styles and improved engagement with the material. Student 5.3 remarked, "*Having two teachers was good. We got different* perspectives*, and I liked that [the native instructor] focused on discussions and activities*." This diversity in instructional approach was particularly valued, as it provided students with a broader understanding of medical English, which they found beneficial in applying the language to real-world contexts. For instance, student 4.2 shared, "*When the [native teacher] led the class, it was more interactive, and we had to speak a lot. It helped me build confidence*."

The activities were praised by students, who noted that these sessions went beyond mere vocabulary acquisition. Student 6.6 emphasized this by stating, "*We didn't just learn words; we practiced using them in role-plays…which helped me understand better.*" This focus on usage was a key factor in the positive reception of the co-teaching method, as it aligned closely with the students' needs. The interactive nature of the co-teaching sessions made the learning experience more engaging, with student 4.7 noting that although the pace was challenging, it pushed them to improve their language skills more quickly. This reflects the importance of effective teaching methods in supporting knowledge construction, a core constructivist theory principle central to the course design.

Table 3. Post-course perceptions of instruction—Co-teaching.

	Subfactors	Keywords (Frequency)	Total Frequency
Instruction	Teaching Methods	Positive: Clear (8), Understandable (7), Engaging (5), Interactive (5), Helpful (3), Practical (2), Supportive (1)	31
		Negative: Fast (7), Challenging (4), Repetitive (2), Unstructured (1), Grammar Focused (1)	15
	Effectiveness	Positive: Enjoyable (6), Relevant (3), Informative (2), Detailed (1)	12
		Negative: Confusing (5), Hard to Engage in Conversation (2), Limited Connection (1)	8

Some students did face challenges adjusting to the differing teaching styles. Students 7.4 and 5.7 mentioned that the native instructor's class moved faster, which was initially difficult for them. "[*The native teacher's] class was good, but sometimes it was a bit too fast for me*," (student 7.4). Despite these difficulties, the fast pace was seen as beneficial in the long run, as it encouraged students to adapt and improve their

language proficiency. Student 7.1 expressed that while the classes with the native instructor required more English, it helped improve their English skills, especially in medical topics. This aligns with the constructivist approach, where students are encouraged to engage with challenging material actively, promoting deeper learning and understanding.

Students generally found the co-teaching approach effective in supporting their learning, particularly in applying English to practical medical situations. The frequent use of positive keywords like "*relevant*," "*enjoyable*," and "*informative*," as shown in **Table 3**, underscores the effectiveness of this instructional model in meeting the students' needs. Student 7.1 commented, "*I enjoyed the classes, especially with [the* native *teacher]. We talked about medical situations and practiced conversations we might. That was very useful*." This focus on real-world application was a recurring theme in the feedback, with many students recognizing the value of sessions. Student 6.1 emphasized that the lessons led by the native instructor were particularly beneficial, describing them as *"...very relevant to what we'll need."* The explanations from both instructors helped clarify complex medical terminology. Student 5.5 appreciated this aspect, noting that "*the lessons weren't just about remembering phrases, but understanding how to use them.*"

While the overall response to the co-teaching model was positive, some students mentioned challenges related to the transition between the two instructors' different teaching styles. For instance, student 7.2 explained, "*Sometimes it felt like we were switching too much between teachers,*" reflecting the difficulty some students had adapting to the different approaches. This belief was shared by others who initially struggled with the native instructor's discussion-focused classes, which required higher English skills and faster thinking. However, these challenges were generally seen as an opportunity for growth. Student 6.5 noted, "*It was tough at first, but by the end, I felt more confident in my English,*" indicating that the co-teaching model, despite its difficulties, led to improvements in language skills.

3.2. Curriculum

3.2.1. Pre-course perceptions

Some students expressed optimism that the upcoming course would better align with their future than previous courses had. Student 1.3 said, "*I hope this course will be more useful for our jobs, not just for passing exams.*" This feeling was shared by students 2.1 and 6.5, who hoped that the curriculum would focus more on situations that are "*career-focused*" and "*useful*." They emphasized the need for lessons that would provide them with the specific language skills necessary for their future roles in healthcare. This aligns with Constructivism, where relevant curriculum supports academic and career goals. However, a large number of students expressed concerns about the relevance of the curriculum, drawing from their prior experiences with Medical English 1. Student 3.5 voiced a common frustration: "*Last semester's lessons didn't feel medical enough. We need more than general English.*" This view was shared by students 6.3 and 7.1, who worried that the curriculum might lack a clear connection. The frequent use of terms like "*irrelevant*" and "*pointless*" in the interviews highlights these concerns (**Table 4**). Students were apprehensive that the

course would continue to emphasize general English skills at the expense of more specialized medical content, which they felt was essential.

Table 4. Pre-course perceptions of curriculum.

	Subfactors	Keywords (Frequency)	Total Frequency	Theoretical Link
Curriculum	Content Relevance	Positive: "Relevant" (7), "Useful" (6), "Practical" (5), "Career-focused" (2)	20	Relevant curriculum content aligns with academic and career goals.
		Negative: "Irrelevant" (12), "Pointless" (7), "Not Medical" (4), "No Purpose" (2)	25	
	Importance to Goals	Positive: "Important for career" (6), "Helpful" (4), "Beneficial" (3)	13	Curriculum content is expected to support future academic and professional success.
		Negative: "Minor" (6), "Not applicable" (5), "Not Important" (5), "Lacks Purpose" (2)	18	

Students 1.6, 1.7, and 3.2, believed the course had the potential to be beneficial, stating that it could help "…*prepare us for working after we graduate*" and "…*be more helpful for our future careers*," there was also a noticeable sense of skepticism. Student 4.7 questioned the value of the course, stating, "*If it's like the last semester, it won't be that good.*" This thought was also expressed by Students 5.6 and 7.4, who expressed doubts about the course's ability to provide any benefits. They were concerned that the curriculum might again be too broad. These pre-course perceptions underscore a divide among students. While some were hopeful that the course would meet their academic and career-related needs, others remained concerned that it would not deliver the required relevant, career-focused content. The mixed expectations reflect broader anxieties about whether the curriculum would be appropriate.

3.2.2. Post-course perceptions—Single instructor

The post-course interviews highlighted a mixed response regarding the curriculum's relevance and content quality. Student 1.2 shared, "*A few lessons felt more connected to what I'll actually need.*" Likewise, Student 3.6 said, "*This course included more examples that I could see myself using in the future.*" This shift suggests that while there was some progress, it did not entirely satisfy the students' expectations for a curriculum as many students still found the curriculum lacking in relevance for their goals. Student 2.4 remarked, "*There were still too many lessons that felt like general English rather than something specific to medicine.*" Student 1.3 added, "*I felt like we were still spending time on things, like grammar, that I think aren't really important for our future*." This ongoing disconnect between the course content and the students' needs remained a concern, reflecting a broader frustration that the curriculum did not fully address the specific demands of medical English.

Regarding content quality, some students appreciated that the material was slightly more aligned. Student 3.2 noted, "*This course touched on a few areas that seemed important, like how to speak to parents if their child has autism*." Similarly, Student 1.5 mentioned, "*There were parts that seemed* more *helpful, like when we discussed the impact of pandemics or psychology."* However, most students still found the content to be superficial. Student 2.7 commented, "*The content was still too basic and didn't go deep enough into the medical terminology we need to know*." Student 1.6 and 3.1, both expressed concerns that the material remained "*surface-level*" and

"*not fully applicable*" to their future (**Table 5**). These findings illustrate that while some students recognized incremental improvements in curriculum relevance and quality, a significant number remained dissatisfied with the course content.

Table 5. Post-course perceptions of curriculum—Single instructor.

	Subfactors	Keywords (Frequency)	Total Frequency
Curriculum	Relevance to Goals	Positive: "Relevant" (8), "Applicable" (6), "Career-focused" (3)	17
		Negative: "Irrelevant" (7), "Not Medical" (5), "Not useful" (2), "Disconnected" (1)	15
	Content Quality	Positive: "Important for career" (5), "Helpful" (2), "Beneficial" (2), "Comprehensive" (2)	11
		Negative: "Superficial" (5), "Not applicable" (3), "Lacking depth" (2)	10

3.2.3. Post-course perceptions—Co-teaching

Students expressed varied perceptions of the curriculum under the co-teaching model, with some highlighting the differences between sessions led by the native and non-native instructors. When the native instructor led the class, students often felt the curriculum was more engaging and relevant. This sense of relevance was supported by activities such as role-plays, group discussions, and debates, allowing students to apply medical English in practical scenarios. As Student 4.1 shared, "*When we did role-plays and case studies, it felt like we were learning how to actually use English when speaking with people.*" Similarly, Student 6.3 said, "*The discussions helped us think about how to talk to patients or explain.*" This approach connected the curriculum to students' goals, aligning with constructivism by fostering connections between new knowledge and real-world applications (**Table 6)**.

Table 6. Post-course perceptions of curriculum—Co-teaching.

	Subfactors	Keywords (Frequency)	Total Frequency
Curriculum	Relevance to Goals	Positive: "Relevant" (11), "Career-focused" (6), "Applicable" (4), "Useful" (4)	25
		Negative: "Irrelevant" (6), "Not Useful" (5), "Not Medical" (3), "No Purpose" (2)	16
	Content Quality	Positive: "Helpful" (8), "Beneficial" (4), "Important for career" (3), "Comprehensive" (1)	16
		Negative: "Superficial" (4), "Not applicable" (2), "Lacking depth" (2), "Minor" (1)	9

By contrast, when the non-native instructor led the class, students felt the curriculum was more traditional and often too closely tied to the textbook. This approach led to concerns about the curriculum's lack of depth and relevance. Student 6.1 commented, "*Sometimes, it felt like we were just going through the material in the book, and I didn't feel like I was learning something I'd use.*" Another student, 7.2, stated, "Some *of the lessons were just like any regular English class.*" Despite these concerns, many students still appreciated the non-native instructor's teaching style, which was clear and well-structured. However, the curriculum's reliance on a standardized textbook sometimes limited its value.

The content quality also saw mixed reactions. The native instructor's sessions were frequently viewed as helpful. Student 5.7 said, *"[The native instructor's] lessons were more active and let us cover more useful situations; it helped me understand things better.*" Likewise, Student 4.6 explained, "*I learned a lot more from [the native instructor's lessons] because they were more focused on what we need to know and how to use them.*" These comments reflect the benefits of a more dynamic, less textbook-dependent approach to curriculum design, which allows students to engage more deeply with the material. At the same time, some students felt that while the traditional curriculum was clear, it did not prepare them for future challenges. Student 6.2 noted, "*The lessons were too simple, and I wished we had discussed precision medicine and public health more*." Another student, 7.6, shared, "*I liked how we learned things about autism, but I felt like we needed to talk about how to be effective in these situations*." These reflections highlight an ongoing challenge in balancing clear and structured instruction with the need for more comprehensive, career-focused material. Although the co-teaching model brought about improvements, particularly in how the curriculum was applied, the reliance on textbook-based lessons in some classes limited the curriculum's overall impact. These findings indicate that while the co-teaching model enhanced certain aspects of the curriculum—particularly through more interactive lessons—there remained concerns about the traditional, textbook-reliant approach in some sessions. This balance between the two approaches reflects the need for curriculum reform that better aligns with students' professional aspirations while maintaining clarity and accessibility.

3.3. Satisfaction

3.3.1. Pre-course perceptions

The interviews showed that majority of students felt that the previous medical English course "*fell short*" of their expectations, with many expressing disappointments over its lack of focus. Students such as 1.6, 2.3, and 4.4 believed the course content did not meet their needs. As Student 4.4 put it, "*I'm disappointed the class was exactly like the general English classes from last year.*" Similarly, Student 1.6 stated, "*I was hoping for a more medical focus.*" These students expressed that the course "*did not meet their needs*" and felt disconnected from the real world (**Table 7**).

Table 7. Pre-course satisfaction.

	Keywords (Frequency)	**Total Frequency**	**Theoretical Link**
Satisfaction	Positive: "Satisfied" (9), "Valuable" (5), "Met expectations" (4)	18	Course value is anticipated to contribute significantly to students' future careers.
	Negative: "Fell short" (15), "Disappointed" (7), "Not worth it" (4), "Needs Improvement" (3), "Did Not Meet Needs" (2)	31	

Many students also felt that the course was "*not worth it*" because of the over-reliance on textbooks and the instructors' lack of specialized medical knowledge. Students 2.5, 4.3, and 7.4 voiced their disappointment with the teaching methods, with Student 7.4 noting, "*I feel the* instructor *didn't know a lot about medicine, this needs to improve.*" Student 4.3 shared similar feelings, stating that while the course tried to cover useful topics, "…*it needs more activities for practice*." The reliance on

textbooks made it difficult for students to see the value of the course, with some feeling that the course content "*wasn't applicable*" to their specific needs. Students 3.6, 4.7, and 7.3 mentioned feeling "*disconnected*" from the learning experience due to large class sizes and few opportunities for interaction. "*It was hard because there weren't enough chances to ask questions*" (Student 7.3). These challenges contributed to a broader disappointment, with several students believing that the course "*fell short*".

However, a minority of students did report positive experiences, finding certain aspects of the course "*valuable*" or "*satisfying*." Students 6.2, 5.1, and 7.6 appreciated the focus on medical terminology. Student 5.1 explained, "*There were parts of the course that were valuable, like when we learned medical vocabulary*." Student 7.6 added that although the course had weak points, some "*met expectations*". These students expressed that the course had some merit but acknowledged that these positive elements were limited compared to the overall course structure.

3.3.2. Post-course perceptions

Satisfaction with the courses, both in single-instructor and co-teaching formats, was influenced significantly by the instructional strategies and curriculum design. As the interviews indicate, many students had positive experiences with their teachers' effort to link the course material. In the single-instructor model, students appreciated efforts to include warm-up activities related to the topics. Student 1.5 said, "*I'm happy [the teacher] included more activities...*" However, the same student and others like 2.4 and 3.6 expressed dissatisfaction with the heavy reliance on textbooks that required "*memorizing text*" and "*rote learning*." Many students indicated that this approach "*fell short*" of their expectations for an engaging and interactive medical English course, leading to feelings of disappointment (**Table 8**).

Table 8. Post-course satisfaction—Single instructor.

	Keywords (Frequency)	Total Frequency
Satisfaction	**Positive**: "Satisfied" (6), "Valuable" (4), "Met expectations" (2), "Engaging" (1)	13
	Negative: "Fell short" (3), "Disappointed" (3), "Not worth it" (2)	8

The co-teaching group's satisfaction was noticeably higher due to the native instructor's focus on discussions, debates, and role-plays. Students 5.1, 6.3, and 7.7, mentioned that these activities were more engaging and made the course feel "*valuable*". Student 5.1 noted, "*The discussions led by [the native instructor] were really helpful in* understanding *the topic better.*" Yet, some students in the co-teaching group still felt the course content, particularly when focusing on the textbook did not meet their expectations. Students 4.6, 5.7, and 6.5 mentioned that while the native instructor's lessons were interesting, the overall course curriculum was still somewhat "*disappointing*" and "*not worth it*" (**Table 9**).

Across both models, textbook dependence was a recurring issue that impacted students' satisfaction. For those in the single instructor model, this factor contributed significantly to dissatisfaction, with students 3.3 and 2.7 stating that the course "*did not meet their needs.*" In contrast, the co-teaching model's more interactive design led to a higher satisfaction rate, with many students reporting that the course "*met their*

expectations" and was "*valuable*." These findings indicate that while improvements were made in both groups, the co-teaching model enhanced overall student satisfaction, especially regarding engagement and perceived value.

Table 9. Post-course satisfaction—Co-teaching.

	Keywords (Frequency)	Total Frequency
Satisfaction	Positive: "Satisfied" (7), "Valuable" (6), "Met expectations" (4), "Engaging" (2)	19
	Negative: "Disappointed" (3), "Fell short" (3), "Not worth it" (3)	9

4. Discussion—Comparative analysis of pre- and post-course perceptions

The interviews revealed challenges and improvements between the pre- and post-courses. Pre-course concerns were primarily centered around grammar-focused instruction, over-reliance on textbooks, and dissatisfaction with the course's material. These concerns persisted but were reduced in the post-course interviews, particularly in the co-teaching model where more diverse teaching methodologies were applied. The findings also demonstrate the strong connection between curriculum relevance, active student engagement, and overall satisfaction with the medical English course; aligning with conclusions made by Çakmakkaya (2024), Geraghty et al. (2019), and Peng (2021).

Pre-course interviews highlighted the limited scope of the previous semester's Medical English course, driven mainly by the textbook and focus on grammar instruction. While familiar and comfortable for instructors, this approach failed to address the specific language needs of medical students. The literature suggests that when instructors lack confidence in their content knowledge, they tend to revert to more general English grammar and standardized approaches, as these topics are within their comfort zone (Liu, 2021; Scott and Guan, 2022). "*Last semester's lessons didn't feel medical enough. We need more than general English.*" (Student 3.5). This concern aligns with the broader literature, which underscores the need for instructors in specialized fields to move beyond traditional methods and create opportunities for students to engage context-specific material (Dudley-Evans and St. John, 1998; Huo, 2019; Liu, 2018).

Post-course reflections revealed a slight shift in student perceptions, particularly in the co-teaching model, where methods emphasized interaction rather than grammatical structure. However, the change in methodological approach—specifically, the inclusion of more interactive learning activities—was highlighted as a key factor in enhancing students' engagement and satisfaction. This aligns with the principles of constructivism, where students build knowledge by actively engaging with the material through collaborative activities (Vygotsky, 1978). As one student observed, "*I learned a lot more from [the native instructor's lessons] because they were more focused on what we need to know and how to use the skills we learn.*" (Student 4.6). Research supports that active learning strategies better promote

knowledge construction and retention in specialized language courses (Prince, 2004; Schumacher and Stern, 2023).

Despite these improvements, the post-course reflections still indicated ongoing dissatisfaction with the curriculum. The reliance on textbooks remained a significant concern, as students felt that the material lacked the depth and relevance necessary for their future careers. One student noted, "*Sometimes, it* felt *like we were just going through the material in the book, and I didn't feel like I was learning something I'd use.*" (Student 6.1). Research suggests that when language instruction relies too heavily on textbooks, it often fails to meet the specific needs of students in professional fields, leading to decreased satisfaction and engagement (Chen, 2020). Instructors often feel more secure teaching familiar content rather than addressing more complex, field-specific topics (Scott and Guan, 2022).

Interestingly, the interaction between instructors in the co-teaching model, which involved regular communication and alignment of course objectives, may have contributed to an overall improvement in both teaching models. Although the co-teaching model incorporated more activities, the single instructor also improved instructional clarity and organization, possibly due to the collaboration and professional dialogue with the native instructor. This aligns with Professional Learning Communities (PLC) principles, emphasizing teacher collaboration and shared practice in enhancing instructional quality and student outcomes (DuFour and Fullan, 2013). By working together to ensure the course adhered to the quasi-experimental design and aligning their instructional strategies, the instructors likely benefited from professional dialogue and support. For a detailed visual representation of the study's methodology and findings, refer to Appendix B.

Though improved in the post-course phase, satisfaction remained closely tied to the quality of the curriculum and the teaching methods employed. While including more interactive and context-specific learning activities in the co-teaching model led to increased satisfaction, the reliance on traditional materials and the limited focus on practical medical English continued to hinder students' overall satisfaction. This was especially true in the single instructor model, where students felt that the curriculum "*fell short*" of their expectations despite improved instructional delivery (Cai, 2019). As noted in the literature, student satisfaction is closely linked to the perceived relevance of the course content to their future professional goals (Belcher, 2009; Chen et al., 2024). The research question regarding the impact of co-teaching versus single-instructor models on student satisfaction is addressed by the finding that within this study's context, satisfaction was significantly enhanced by the shift towards collaborative and engaging learning activities rather than the co-teaching structure alone. These findings suggest that implementing interactive teaching methods, rather than the specific instructional model, is important in improving student satisfaction in online medical English courses.

While this study provides valuable insights into the effectiveness of co-teaching and single-instructor approaches in online medical English courses, several limitations should be noted. While the sample size of 49 participants is relatively large for qualitative research, quota sampling aimed at ensuring gender representation may have influenced the diversity of perspectives captured. Additionally, as the study relies on interviews, the data reflects participants' subjective experiences and perceptions,

which are inherently shaped by individual viewpoints. These limitations suggest that further research could benefit from exploring these instructional strategies in different contexts and incorporating additional data sources to enhance the robustness of the findings.

These limitations suggest that further research could benefit from exploring these instructional strategies in different contexts, such as in-person or hybrid, and by incorporating additional data, such as classroom observations or longitudinal studies. Additionally, employing a large-scale statistically robust quantitative or mixed-methods approaches could provide a more comprehensive understanding of these instructional strategies' impact on student satisfaction and academic performance over time.

5. Conclusion

This study explored student perceptions of a Medical English, focusing on the impact of teaching models and curriculum on instructional effectiveness, curriculum relevance, and overall satisfaction. Through pre- and post-course interviews, notable improvements were observed in instructional clarity, engagement, and curriculum relevance, particularly within the co-teaching model. While the co-teaching model did enhance student engagement and satisfaction, the anticipated transformative effect of having a native English-speaking instructor was less pronounced than expected. Instead, the primary improvements were attributed to the methodological shifts toward more interactive activities, which were integral to the co-teaching approach. Including a native English-speaking instructor contributed to a more dynamic classroom environment. However, the results suggest that the success of the co-teaching model was more closely tied to the implementation of student-centered, discussion-oriented activities rather than the instructor's native language abilities alone. These findings indicate that while the co-teaching model offers advantages, particularly in terms of engagement and practical language application, the key to enhancing student satisfaction and learning outcomes lies in the instructional strategies employed rather than the presence of a native speaker.

Students consistently highlighted the limitations of a textbook-reliant curriculum, emphasizing the need for relevance in the course materials. Although the co-teaching model showed potential in addressing some of these concerns, the study suggests that similar improvements in student satisfaction and learning outcomes could be achieved through curriculum reforms that reduce textbook dependence and prioritize interactive, student-centered learning, regardless of the teaching model or instructor's language background. Given the context-specific nature of this study, the findings are not generalizable. However, they offer valuable insights into the conditions and instructional strategies that may enhance learning and satisfaction in specialized language courses like Medical English. Future research should explore these insights through qualitative and quantitative methods, potentially examining the efficacy of curriculum reforms and instructional strategies across different institutions. This research could help identify the most effective approaches to Medical English instruction, whether in a co-teaching model or through alternative pedagogical frameworks.

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Appendix A

Table A1. Participant information.

Participant ID Range	Class ID	Instruction Type	Course	Gender Distribution
1–1 to 1–4	1	Single	Clinical Medicine	4 Females
1–5 to 1–7	1	Single	Clinical Medicine	3 Males
2–1 to 2–4	2	Single	Clinical Medicine	4 Females
2–5 to 2–7	2	Single	Clinical Medicine	3 Males
3–1 to 3–4	3	Single	Medical Technology	4 Females
3–5 to 3–7	3	Single	Medical Technology	3 Males
4–1 to 4–4	4	Co-taught	Clinical Medicine	4 Females
4–5 to 4–7	4	Co-taught	Clinical Medicine	3 Males
5–1 to 5–4	5	Co-taught	Clinical Medicine	4 Females
5–5 to 5–7	5	Co-taught	Clinical Medicine	3 Males
6–1 to 6–4	6	Co-taught	Medical Technology	4 Females
6–5 to 6–7	6	Co-taught	Medical Technology	3 Males
7–1 to 7–4	7	Co-taught	Preventative Medicine	4 Females
7–5 to 7–7	7	Co-taught	Preventative Medicine	3 Males

Note: Participant IDs are grouped by class, instruction type, course, and gender. “Single” indicates classes taught only by the Chinese instructor, while “Co-taught” involves both the native English-speaking and Chinese instructors. Each class includes seven students, with four females and three males.

Appendix B

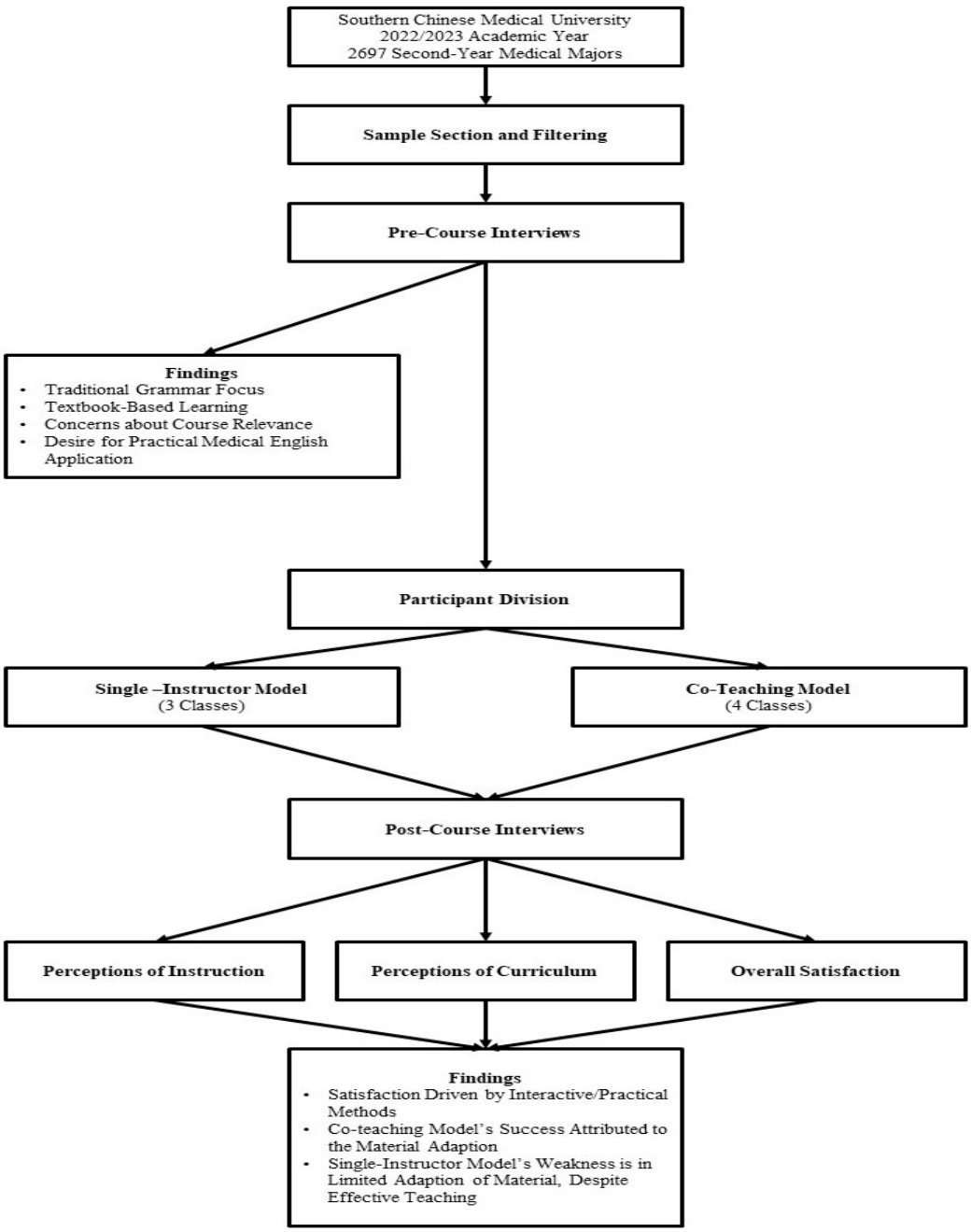

Figure B1. Schematic diagram of study methodology.