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Exploring College English Teachers' Abilities in CLIL-Based Classrooms in Undeveloped Areas of China

Jiajie Zhang, Hanita Hanim Ismail*, Nur Ainil Sulaiman
Faculty of Education, Universiti Kebangsaan Malaysia
Bangi 43600, Malaysia

Abstract. Content and language integrated learning (CLIL) aims at the simultaneous teaching of language and content in the classroom, an approach which has gained considerable interest among researchers in China. They argue that college English classrooms offer the ideal environment for implementing CLIL. However, existing studies primarily focus on developed regions or prestigious universities in China, overlooking its potential in undeveloped areas. Recognizing the crucial role of teachers to implement CLIL, this study investigated college English teachers' abilities under CLIL in undeveloped areas of China. This quantitative study used questionnaires adapted from Liu (2019) to collect data from 277 teachers and 565 students, which were analyzed using Statistical Package for Social Sciences 26.0. The findings show that seven dimensions of ability with sub-abilities are required in CLIL-based classrooms for targeted teachers. These are: (1) language teaching ability, (2) content teaching ability, (3) the ability to integrate language teaching and content teaching, (4) the ability to cultivate students' cognitive skills, (5) the ability to select and use teaching resources, (6) classroom management ability, and (7) evaluation and reflection ability. The findings provide valuable insights for college English teachers in Chinese undeveloped areas into their abilities to achieve successful CLIL and offer a theoretical underpinning for future research on CLIL in China.

Keywords: abilities under CLIL; college English teachers; content and language integrated learning; Chinese undeveloped areas

1. Introduction

Globalization has led to an increasing demand for versatile talents in every country, including China. Due to the development of the economy and society, individuals who are talented in two or more fields are urgently needed to facilitate international communication (MoE PRC, 2022). To achieve this goal, content and language integrated learning (CLIL) has been recommended by local researchers

* Corresponding author: *Hanita Hanim Ismail, hanitahanim@ukm.edu.my*

(e.g., Huang, 2019; Liu, 2019; Xia, 2019; Zhang, 2020; Zhu et al., 2021) to be used in classrooms. CLIL is regarded as helpful for learners to gain content knowledge and language skills at the same time (Barra et al., 2018; Lyster & de Zarobe, 2018). Just as claimed by Coyle et al. (2010), CILL "*is a dual-focused educational approach in which an additional language is used for the learning and teaching of both content and language*" (p. 21). In China, classrooms in higher education are more flexible for applying CLIL compared to basic education (He, 2017; Zhuang et al., 2012). In addition, students majoring in English are noted to have sufficient English proficiency to learn effectively in a CLIL-based classroom conducted in English (Maximova, 2020; McClintic, 2022). Hence, the classroom of English majors in higher education is regarded as one of the most suitable contexts in which CLIL can be applied in China.

Based on economic measures, administrative regions in China can mainly be categorized into developed and undeveloped (Guizhou Provincial Humanities and Social Sciences Base of Colleges and Universities, 2015). Studies on CLIL and CLIL teachers are mainly conducted in developed areas of China (e.g., Liu, 2019; Li, 2019; Tsang, 2020; Zhu et al., 2021), leaving relevant research in undeveloped areas ignored. Teachers in these areas have outdated teaching ideas and limited abilities (Zhao & Chen, 2023) as well as restricted access to various teaching resources compared to those in developed regions (Liu, 2020). As a teaching method that can cultivate comprehensive talents (Liu, 2019), the introduction of CLIL is also necessary and vital in undeveloped areas. With the consideration of the crucial role of teachers for the effective implementation of CLIL (Azparren Legarre, 2022; Li, 2021; Zhu et al., 2021), CLIL teachers and their abilities in undeveloped areas of China should be given more concern. Hence, the research objective of this study was to explore the abilities that college English teachers should master to ensure the effectiveness of CLIL-based classrooms in Chinese undeveloped areas. Accordingly, the research question is: What abilities should college English teachers master to ensure the effectiveness of CLIL-based classrooms in Chinese undeveloped areas?

2. Literature Review

In CLIL, *language* refers to a language that learners need to master in addition to their mother tongue (Zhu et al., 2021). *Content* can be defined as (1) other non-linguistic subjects (Martinez Agudo, 2022), such as mathematics or history; (2) the theme of a unit or some units in the course (Pérez & Malagón, 2017), such as understanding ball sports; and (3) a topic of a class (Coyle et al., 2010), such as understanding Chinese and Western dining habits. In addition, *integrated learning* is defined as a feature of interdisciplinary teaching, wherein both language learning and content learning are to be considered, regardless of the primary and secondary goal (Zhao et al., 2020). The close relationship between language teaching and content teaching is regarded as critical to ensure the smooth development of CLIL (Lyster & de Zarobe, 2018; Villabona & Cenoz, 2022). To sum up, CLIL emphasizes the integration of language acquisition and content comprehension.

The 4Cs framework proposed by Coyle (2002) is the recognized model of CLIL,

which shows that CLIL aims to systematically integrate contextualized content, cognition, communication, and culture into its teaching practice (Coyle, 2002). Specifically, *content* should be taught and learned through *communication*, which refers to *language* in CLIL; *language* is a learning medium as well as a learning object, which tends to be internalized in the process of understanding *content* (Coyle et al., 2010). Moreover, for *culture*, CLIL takes the development of cross-cultural awareness as one of its main axes (Pérez Gracia et al., 2017) and pays attention to broadening students' international horizons (Li, 2021). Regarding *cognition*, Coyle et al. (2010) and Pérez Gracia et al. (2017) emphasized that the design of CLIL-based classrooms needs to help students develop cognitive skills, such as thinking abilities, problem-solving ability, and so on. In summary, based on the 4Cs model, when implementing CLIL, teachers are supposed to focus on integrating content and language teaching as well as connecting with culture and cognitive skills to design the course.

Through investigations, researchers have mentioned that the successful implementation of CLIL is related to various factors. These include the students' knowledge reserve of the target language (Amat et al., 2017); resources and motivations from the faculty (Kim & Lee, 2020; McDougald & Pissarello, 2020); developing opportunities and expectations from educational institutions (Almerich Díaz, 2019; Campillo et al., 2019; McDougald, 2015; Pham & Unaldi, 2022); and support and cooperation from students, school administrators, and other colleagues (McClintic, 2022; McDougald & Pissarello, 2020; Segura, 2023). However, the discussion on the efficient application of CLIL has mainly focused on teachers' abilities.

First, teachers are supposed to have corresponding abilities based on the 4Cs model. Specifically, teachers must have the ability to teach language and content (Xia, 2019; Zhao et al., 2020), effectively combine content teaching with foreign language teaching (Huang, 2019; Villabona & Cenoz, 2022), and cultivate students' cognitive skills (Almerich Díaz, 2019; Coyle et al., 2010; Kim & Lee, 2020). Second, teachers need to gain the ability to consider appropriate support, management, and encouragement in the classroom (Almerich Díaz, 2019; Chen et al., 2020; Lo & Jeong, 2018) to ensure that learners will not be overloaded by learning content and language at the same time (Chen et al., 2020). Third, utilizing a wide range of activities (e.g., groupwork, debate, etc.) and proper resources is necessary for teachers to motivate and attract students to maintain cognitive participation (Budiarta et al., 2020; Liu, 2019; Torres-Rincón & Cuesta-Medina, 2019) and involve them in higher level thinking (Coyle et al., 2010). Fourth, it is crucial for teachers to gain the evaluation ability in assessing students and self-reflection to improve the quality of the classroom (Coyle et al., 2010; Li, 2019). In other words, teachers under CLIL are required to have abilities for language teaching and content teaching and to guide students to actively think deeper, as well as the ability of organizing the classroom by providing proper resources and classroom activities, and the ability of evaluating and reflecting.

In China, some studies have focused on college English teachers under CLIL (e.g., Hu, 2017; Huang, 2019; Li, 2019; Liu, 2019; Xia, 2019; Zhao et al., 2020; Zhu et al.,

2021), but they were conducted in developed areas or top-level universities of China, overlooking the research in undeveloped areas. Given the crucial role of teachers in successful CLIL implementation, it is vital to explore the abilities of college English teachers under CLIL in undeveloped regions.

3. Methodology

3.1 Research Design

This study aimed to collect data through a wide-ranging survey in the research setting. Hence, quantitative research, enabling researchers to study a large sample size with a wide survey scope and objective results (Taherdoost, 2021), was considered for this study. This study involved both teacher and student respondents to explore teachers' abilities in the CLIL-based classroom from both practitioners' and learners' perspectives.

3.2 Research Site and Respondents

The research was conducted in Guizhou province, which is regarded as an undeveloped region in China (Guizhou Provincial Humanities and Social Sciences Base of Colleges and Universities, 2015). We selected six universities in Guizhou as participating universities that offer English majors. The location and distribution of the participating universities is shown in Figure 1.

Figure 1: Location and distribution of participating universities

For the sample of teacher respondents, we selected 277 in-service English teachers in the participating universities. For the sample of student respondents, two classes in English majors from each university were selected by cluster sampling. Cluster sampling is a sampling technique used to divide the main population into different parts (clusters), which is a technique suitable for handling large and dispersed populations (Sedgwick, 2014). Overall, 277 college English teachers and 565 students from 12 classes majoring in English participated as respondents in this survey.

Additional respondents were selected for a pilot study. According to Tseng and

Sim (2021), it is reasonable to set the sample size of the pilot study at 25% of the main study sample size. A total of 69 teacher respondents were involved in the pilot study, who were selected randomly. In addition, we selected one class from each university from which to draw a sample of student respondents for the pilot study by using cluster sampling, with a total of 144 respondents in 6 selected classes, which accounts for 25.5% of the number of student respondents in the formal survey.

3.3 Research Instruments

The research instruments used in this study were the questionnaires adapted from Liu (2019), which were administered to teacher and student respondents, respectively. The questionnaire for teachers was designed with 33 items (Appendix 1). The student questionnaire also had 33 items, of which 3 were removed considering they were not suitable for students to answer, leaving 30 items (Appendix 2). The content of items for each group was the same, with slight differences in wording and sentences. According to the discussion in Section 2, we organized items into seven parts: (1) language teaching ability, (2) content teaching ability, (3) the ability to integrate language teaching and content teaching, (4) the ability to cultivate students' cognitive skills, (5) the ability to select and use teaching resources, (6) classroom management ability, and (7) evaluation and reflection ability. The questionnaires employed five interval scales for items and were designed for Likert-scale responses. Respondents were asked to indicate the importance of each item by marking one of the options, ranging from *completely unimportant* to *very important*.

3.4 Research Procedures

With the assistance of the dean and course teachers, the questionnaires were administered online through a link connected to a questionnaire distribution platform accessible in China, resulting in more trustworthy results for study reliability. After the data collection, Statistical Package for Social Sciences 26.0 (SPSS 26.0) was used to conduct the descriptive analysis using statistical markers such as frequency, percentages, mean, and standard deviation. Likewise, Cronbach's alpha, Kaiser-Meyer-Olkin measure of sampling adequacy (KMO), and Bartlett's test of sphericity were used in the stage of the pilot study. The pilot study is claimed as the first step in experimental research to intervene in research feasibility and provide information on how research implementation will play a role (Tseng & Sim, 2021).

The KMO test was used to determine how well the data are suitable for factor analysis. The test was used to compare the relative size of the correlation coefficients and partial correlation coefficients for the observed variables, as follows: above .9, *excellent*; above .8, *better*; above .7, *ordinary*; with the minimum accepted statistical score being .6 (Spicer, 2005). Furthermore, Bartlett's test of sphericity was employed to determine if the data are from non-normal distributions (Snecdecor & Cochran, 1991). When the Bartlett's test value is less than .05, it indicates that there are meaningful correlations between variables. The values of the KMO test and Bartlett's test for the two questionnaires are displayed in Table 1.

Table 1: KMO test and Bartlett's test values for the questionnaires in the pilot study

Pilot study questionnaire	KMO test value	Bartlett's test value
Teacher questionnaire	.717	< .001
Student questionnaire	.852	< .001

As shown in Table 1, the values of the KMO test and Bartlett's test are acceptable. For the teacher questionnaire, the value of the KMO test is .717, which is regarded as ordinary for studies (Spicer, 2005). The value of the KMO test for the student questionnaire is .852, which is considered better for studies (Spicer, 2005). Moreover, the values of the Bartlett's test for the teacher and student questionnaires are both less than .001, showing positive correlations between variables.

Second, according to Anderson et al. (1987), the internal consistency test is conducted for questionnaire reliability. It is used to determine whether numerous items claiming to measure the same basic concept provide similar results, which are measured using Cronbach's alpha. When the value is more than .7, the questionnaire is regarded to be reliable (Bathgate et al., 2015). The Cronbach alpha values for the questionnaires in the pilot study are shown in Table 2.

Table 2: Cronbach alpha values for questionnaires in the pilot study

Pilot study questionnaire	Cronbach alpha value
Teacher questionnaire	.752
Student questionnaire	.757

Table 2 shows that the Cronbach alpha value of the teacher questionnaire is .752, and for the student' questionnaire, .757. Therefore, the questionnaires for both groups can be deemed reliable. In summary, the pilot study demonstrated the reliability and validity of the questionnaires, allowing us to use the questionnaires in the formal survey.

4. Findings

The valid teacher questionnaire was completed by 100% of the teacher respondents, with a total of 277 responses. Five hundred and sixty-five (565) student questionnaires were collected, but since in some questionnaires, the same option was selected continuously in different questions, 53 questionnaires were filtered out and 512 student questionnaires were retained for data analysis. The data for each of the seven dimensions of ability in correspondence with the identified sub-abilities are presented in this section.

4.1 Language Teaching Ability

Tables 3 and 4 show the results of the questionnaires for teachers and students, respectively, regarding language teaching ability (LTA). The three sub-abilities in this domain are: (1) explaining English language knowledge (LTA-1), (2) comprehensively improving students' listening, speaking, reading, writing, and translation abilities (LTA-2), and (3) speaking clear English at a moderate speed without a strong accent (LTA-3).

Table 3: Results on the importance of language teaching ability for teacher respondents

Language teaching ability (LTA)	Completely unimportant % (n)	Not very important % (n)	Uncertain % (n)	Important % (n)	Very important % (n)	Mean	SD
LTA-1	5.1 (14)	7.2 (20)	17.7 (49)	40.1 (111)	30.0 (80)	3.83	1.093
LTA-2	2.9 (8)	5.8 (16)	17.0 (47)	40.1 (111)	34.3 (95)	3.97	1.003
LTA-3	5.1 (14)	4.0 (11)	14.1 (39)	40.8 (113)	36.1 (100)	3.99	1.058

The results in Table 3 show that teacher respondents considered LTA-1 as important for them (70.1%, M = 3.83). They also considered LTA-2 as vital (74.4%, M = 3.97), and 78.9% of respondents regarded LTA-3 as important (n = 213, M = 3.99).

Table 4: Results on the importance of language teaching ability for student respondents

Language teaching ability (LTA)	Completely unimportant % (n)	Not very important % (n)	Uncertain % (n)	Important % (n)	Very important % (n)	Mean	SD
LTA-1	7.0 (36)	7.2 (37)	15.0 (77)	32.2 (165)	38.5 (197)	3.88	1.202
LTA-2	8.0 (41)	7.2 (37)	13.9 (71)	32.8 (168)	38.1 (195)	3.86	1.230
LTA-3	7.0 (36)	8.4 (43)	11.9 (61)	36.3 (186)	36.3 (186)	3.87	1.198

Table 4 shows the results in relation to the perceptions of student respondents regarding language teaching ability. For LTA-1, 70.7% (n = 362, M = 3.88) of student respondents considered it important, with LTA-2 (70.9%, M = 3.86) and LTA-3 (72.6%, M = 3.87) also regarded as significant.

4.2 Content Teaching Ability

The second dimension is content teaching ability (CTA), with the results for teacher and student respondents displayed in tables 5 and 6, respectively. The sub-abilities in this domain are: (1) teaching content based on students' needs and existing abilities (CTA-1), (2) providing professional explanations of subject knowledge (CTA-2), and (3) guiding students to analyze subject content from different cultural perspectives (CTA-3).

Table 5: Results on the importance of content teaching ability for teacher respondents

Content teaching ability (CTA)	Completely unimportant % (n)	Not very important % (n)	Uncertain % (n)	Important % (n)	Very important % (n)	Mean	SD
CTA-1	5.8 (16)	4.3 (12)	15.2 (42)	36.1 (100)	38.6 (107)	3.97	1.111
CTA-2	3.2 (9)	5.4 (15)	17.7 (49)	39.7 (110)	33.9 (94)	3.96	1.013
CTA-3	4.3 (12)	5.4 (15)	17.3 (48)	38.6 (107)	34.3 (95)	3.93	1.059

The results in Table 5 show that 74.7% (n = 207, M = 3.97) of teacher respondents considered CTA-1 as important for content teaching ability, with CTA-2 (73.6%, M = 3.96) and CTA-3 (72.9%, M = 3.93) also regarded as important.

Table 6: Results on the importance of content teaching ability for student respondents

Content teaching ability (CTA)	Completely unimportant % (n)	Not very important % (n)	Uncertain % (n)	Important % (n)	Very important % (n)	Mean	SD
CTA-1	6.3 (32)	4.9 (25)	15.0 (77)	34.2 (175)	39.6 (203)	3.96	1.143
CTA-2	3.1 (16)	6.1 (31)	14.1 (72)	39.1 (200)	37.7 (193)	4.02	1.021
CTA-3	5.1 (26)	5.9 (30)	13.3 (68)	39.5 (202)	36.3 (186)	3.96	1.090

Student respondents also supported the notion that content teaching ability is important: CTA-1 (73.8%, M = 3.96), CTA-2 (76.8%, M = 4.02), and CTA-3 (75.8%, M = 3.96).

4.3 Ability to Integrate Language Teaching and Content Teaching

Five sub-abilities are listed under the ability to integrate language teaching and content teaching (ATI). These are: (1) explaining content in English (ATI-1), (2) constructing a language learning environment during the content teaching process (ATI-2), (3) reasonably integrating language teaching and content teaching in the classroom (ATI-3), (4) adjusting the proportion of language teaching and content teaching in the classroom appropriately according to the students' level and course nature (ATI-4), and (5) using Chinese to explain when teaching in English is not effective (ATI-5). The respective findings can be seen in tables 7 and 8.

Table 7: Results on the importance of ability to integrate language teaching and content teaching for teacher respondents

Ability to integrate language teaching and content teaching (ATI)	Completely unimportant % (n)	Not very important % (n)	Uncertain % (n)	Important % (n)	Very important % (n)	Mean	SD
ATI-1	3.2 (9)	6.9 (19)	12.6 (35)	37.2 (103)	40.1 (111)	4.04	1.047
ATI-2	6.5 (18)	4.7 (13)	14.1 (39)	38.6 (107)	36.1 (100)	3.93	1.129
ATI-3	2.9 (8)	4.3 (12)	18.4 (51)	37.5 (104)	36.8 (102)	4.01	0.994
ATI-4	5.1 (14)	4.0 (11)	19.5 (54)	32.1 (89)	39.4 (109)	3.97	1.098
ATI-5	5.1 (14)	4.7 (13)	15.9 (44)	37.5 (104)	36.8 (102)	3.96	1.083

The results in Table 7 show that teacher respondents agreed on the importance of all five sub-abilities: ATI-1 (77.3%, M = 4.04), ATI-2 (74.7%, M = 3.93), ATI-3 (74.3%, M = 4.01), ATI-4 (71.5%, M = 3.97), and ATI-5 (74.3%, M = 3.96).

Table 8: Results on the importance of ability to integrate language teaching and content teaching for student respondents

Ability to integrate language teaching and content teaching (ATI)	Completely unimportant % (n)	Not very important % (n)	Uncertain % (n)	Important % (n)	Very important % (n)	Mean	SD
ATI-1	5.9 (30)	6.3 (32)	14.6 (32)	39.1 (200)	34.2 (175)	3.89	1.121
ATI-2	5.9 (30)	6.4 (33)	13.1 (67)	37.3 (191)	37.3 (191)	3.94	1.135
ATI-3	5.1 (26)	5.9 (30)	13.1 (67)	40.2 (206)	35.7 (183)	3.96	1.086
ATI-5	5.7 (29)	8.0 (41)	11.9 (61)	36.5 (187)	37.9 (194)	3.93	1.151

The four sub-abilities of ATI relevant to the student respondents were considered by the respondents as vital, with the rate of 73.3% (n = 375, M = 3.89) for ATI-1, 74.6% (n = 382, M = 3.94) for ATI-2, 75.9% (n = 389, M = 3.96) for ATI-3, and 74.4% (n = 381, M = 3.93) for ATI-5.

4.4 Ability to Cultivate Students' Cognitive Skills

Six sub-abilities are listed under the ability to cultivate students' cognitive skills (ATC). These are: (1) cultivating students' creative ability (ATC-1), (2) cultivating students' self-evaluation ability (ATC-2), (3) cultivating students' cooperative ability (ATC-3), (4) cultivating students' critical thinking ability (ATC-4), (5) cultivating students' problem-solving ability (ATC-5), and (6) teaching students to acquire other skills such as presentation and use of some software (ATC-6). The results of the questionnaires are displayed in tables 9 and 10.

Table 9: Results on the importance of ability to cultivate students' cognitive skills for teacher respondents

Ability to cultivate students' cognitive skills (ATC)	Completely unimportant % (n)	Not very important % (n)	Uncertain % (n)	Important % (n)	Very important % (n)	Mean	SD
ATC-1	3.2 (9)	4.7 (13)	19.9 (55)	32.5 (90)	39.7 (110)	4.01	1.039
ATC-2	7.2 (20)	5.1 (14)	14.8 (41)	38.3 (106)	38.3 (106)	3.88	1.156
ATC-3	5.1 (14)	5.1 (14)	14.1 (39)	33.6 (93)	42.2 (117)	4.03	1.106
ATC-4	2.5 (7)	6.1 (17)	18.1 (50)	35.4 (98)	37.9 (105)	4.00	1.018
ATC-5	6.9 (19)	3.2 (9)	13.4 (37)	38.3 (106)	38.3 (106)	3.98	1.126
ATC-6	2.9 (8)	5.8 (16)	18.1 (50)	35.0 (97)	38.3 (106)	4.00	1.029

To be specific, the importance of ATC-1 gained support from 72.7% (n = 200, M = 4.01) of teacher respondents, with ATC-2 also indicated to be important (76.7%, M = 3.88). For ATC-3, 75.8% (n = 210, M = 4.03) of teacher respondents agreed on its importance. Furthermore, the last three sub-abilities were also indicated by teacher respondents as vital, with 73.3% (n = 203, M = 4.00) agreeing in this regard for ATC-4, 76.6% (n = 212, M = 3.98) for ATC-5, and 73.3% (n = 203, M = 4.00) for ATC-6.

Table 10: Results on the importance of ability to cultivate students' cognitive skills for student respondents

Ability to cultivate students' cognitive skills (ATC)	Completely unimportant % (n)	Not very important % (n)	Uncertain % (n)	Important % (n)	Very important % (n)	Mean	SD
ATC-1	5.7 (29)	7.0 (36)	13.7 (70)	40.2 (206)	33.4 (171)	3.89	1.119
ATC-2	5.3 (27)	6.1 (31)	15.0 (77)	41.8 (214)	31.8 (163)	3.89	1.084
ATC-3	4.9 (25)	6.4 (33)	17.0 (87)	37.3 (191)	34.4 (176)	3.90	1.097
ATC-4	7.0 (36)	5.7 (29)	14.5 (74)	38.1 (195)	34.8 (178)	3.88	1.157
ATC-5	4.1 (21)	6.4 (33)	14.6 (75)	38.9 (199)	35.9 (184)	3.96	1.065
ATC-6	6.4 (33)	6.8 (35)	19.7 (101)	33.6 (172)	33.4 (171)	3.81	1.162

As seen in Table 10, 73.6% (n = 277, M = 3.89) of student respondents considered

ATC-1 as important, and for ATC-2, 73.6% (n = 277, M = 3.89) agreed on its importance. In addition, ATC-3 (71.7%, M = 3.90), ATC-4 (72.9%, M = 3.88), ATC-5 (74.8%, M = 3.96), and ATC-6 (67.0%, M = 3.81) were all considered as important.

4.5 Ability to Select and Use Teaching Resources

Regarding the ability to select and use teaching resources (ATS), this ability has six sub-abilities that are included and explored. These are: (1) properly arranging and presenting the content of the textbook according to the needs of students (ATS-1), (2) supplementing extracurricular learning materials according to students' needs (ATS-2), (3) selecting and using multimedia teaching resources according to teaching needs (ATS-3), (4) supplementing materials that are close to students' real life (ATS-4), (5) providing some websites or resources related to learning (ATS-5), and (6) using some tools such as artificial intelligence to assist in teaching (ATS-6). Tables 11 and 12 present the relevant results for the teacher and student questionnaires, respectively.

Table 11: Results on the importance of ability to select and use teaching resources for teacher respondents

Ability to select and use teaching resources (ATS)	Completely unimportant % (n)	Not very important % (n)	Uncertain % (n)	Important % (n)	Very important % (n)	Mean	SD
ATS-1	5.1 (14)	3.2 (9)	16.2 (45)	36.5 (101)	39.0 (108)	4.01	1.068
ATS-2	5.1 (14)	5.1 (14)	11.6 (32)	33.6 (93)	44.8 (124)	4.08	1.104
ATS-3	6.5 (18)	3.6 (10)	14.1 (39)	33.2 (92)	42.6 (118)	4.02	1.140
ATS-4	2.9 (8)	6.9 (19)	15.5 (43)	36.8 (102)	37.9 (105)	4.00	1.036
ATS-5	6.1 (17)	3.2 (9)	12.3 (34)	40.1 (111)	38.3 (106)	4.01	1.092
ATS-6	5.4 (15)	5.1 (14)	15.5 (43)	31.0 (86)	43.0 (102)	4.01	1.131

Overall, teacher respondents considered all six sub-abilities as important: ATS-1 (75.5%, M = 4.01), ATS-2 (78.4%, M = 4.08), ATS-3 (75.8%, M = 4.02), ATS-4 (74.7%, M = 4.00), ATS-5 (78.4%, M = 4.01), and ATS-6 (74.0%, M = 4.01).

Table 12: Results on the importance of ability to select and use teaching resources for student respondents

Ability to select and use teaching resources (ATS)	Completely unimportant % (n)	Not very important % (n)	Uncertain % (n)	Important % (n)	Very important % (n)	Mean	SD
ATS-1	6.8 (35)	4.5 (23)	13.9 (71)	42.6 (218)	32.2 (165)	3.89	1.116
ATS-2	5.7 (29)	4.7 (24)	14.8 (76)	39.6 (203)	35.2 (180)	3.94	1.094
ATS-3	7.0 (36)	5.9 (30)	15.0 (77)	37.9 (194)	34.2 (175)	3.86	1.159
ATS-5	5.1 (26)	5.5 (28)	20.5 (105)	39.3 (201)	29.7 (152)	3.83	1.073
ATS-6	4.9 (25)	5.3 (27)	14.8 (76)	43.2 (221)	31.8 (163)	3.92	1.055

Five of the six sub-abilities for this ability were relevant to the student respondents. Table 12 shows that 74.9% of student respondents agreed on the importance of ATS-1 (n = 383, M = 3.89) and 74.8% on the importance of ATS-2 (n = 383, M = 3.94). Furthermore, the other three sub-abilities also obtained support in relation to their importance, at a rate of 72.1% (n = 369, M = 3.86) for

ATS-3, 69.0% (n = 353, M = 3.83) for ATS-5, and 75.0% (n = 384, M = 3.92) for ATS-6.

4.6 Classroom Management Ability

The results for the five sub-abilities under classroom management ability (CMA) are presented and discussed in this section. These sub-abilities are: (1) considering students' emotional factors in classroom activities (CMA-1), (2) helping students integrate into classroom learning through various classroom activities (CMA-2), (3) giving students the opportunity to express their views through classroom activities (CMA-3), (4) mobilizing students' interest and enthusiasm in learning through classroom activities (CMA-4), and (5) arranging teaching time and classroom activities reasonably. The data from both teacher and student respondents are presented in tables 13 and 14, respectively.

Table 13: Results on the importance of classroom management ability for teacher respondents

Classroom management ability (CMA)	Completely unimportant % (n)	Not very important % (n)	Uncertain % (n)	Important % (n)	Very important % (n)	Mean	SD
CMA-1	4.7 (13)	5.1 (14)	15.9 (44)	34.7 (96)	39.7 (110)	4.00	1.088
CMA-2	4.7 (13)	4.3 (12)	15.2 (42)	31.0 (86)	44.8 (124)	4.07	1.093
CMA-3	4.7 (13)	5.4 (15)	17.0 (47)	32.9 (91)	40.1 (111)	3.98	1.102
CMA-4	4.7 (13)	5.8 (16)	15.2 (42)	36.1 (100)	38.3 (106)	3.97	1.092
CMA-5	3.2 (9)	4.7 (13)	20.6 (57)	35.7 (99)	35.7 (99)	3.96	1.023

Based on Table 13, CMA-1 (74.4%, M = 4.00), CMA-2 (75.8%, M = 4.07), CMA-3 (73.0%, M = 3.98), CMA-4 (74.4%, M = 3.97), and CMA-5 (71.4%, M = 3.96) were all considered by teacher respondents as important sub-abilities for teachers under CLIL.

Table 14: Results on the importance of classroom management ability for student respondents

Classroom management ability (CMA)	Completely unimportant % (n)	Not very important % (n)	Uncertain % (n)	Important % (n)	Very important % (n)	Mean	SD
CMA-1	7.4 (38)	8.0 (41)	18.4 (94)	35.2 (180)	31.1 (159)	3.74	1.192
CMA-2	8.2 (42)	7.4 (38)	13.5 (69)	36.3 (186)	34.6 (177)	3.82	1.219
CMA-3	7.8 (40)	6.1 (31)	16.6 (85)	35.7 (183)	33.8 (173)	3.82	1.191
CMA-4	7.2 (37)	6.6 (34)	17.0 (87)	35.0 (179)	34.2 (175)	3.82	1.183
CMA-5	8.6 (44)	6.3 (32)	15.0 (77)	37.3 (191)	32.8 (168)	3.79	1.209

Student respondents also agreed on the importance of CMA-1 (66.3%, M = 3.74), CMA-2 (70.9%, M = 3.82), CMA-3 (69.5%, M = 3.82), CMA-4 (69.2%, M = 3.82), and CMA-5 (70.1%, M = 3.79).

4.7 Evaluation and Reflection Ability

The last dimension is on CLIL teachers' evaluation and reflection ability (ERA), which is divided into five sub-abilities. These are: (1) using different evaluation methods to evaluate students (ERA-1), (2) evaluating and providing timely

feedback on students' learning in content and language (ERA-2), (3) evaluating and providing timely feedback on students' comprehension skills (ERA-3), (4) reflecting on and evaluating own teaching regularly (ERA-4), and (5) making targeted improvements to the problems based on the self-evaluation results (ERA-5). Tables 15 and 16 present the results for the two respective groups of respondents.

Table 15: Results on the importance of evaluation and reflection ability for teacher respondents

Evaluation and reflection ability (ERA)	Completely unimportant % (n)	Not very important % (n)	Uncertain % (n)	Important % (n)	Very important % (n)	Mean	SD
ERA-1	4.0 (11)	5.1 (14)	16.6 (46)	43.3 (120)	31.0 (86)	3.92	1.017
ERA-2	5.1 (14)	6.5 (18)	13.7 (38)	38.6 (107)	36.1 (100)	3.94	1.102
ERA-3	7.9 (22)	4.3 (12)	17.0 (47)	31.4 (87)	39.4 (109)	3.90	1.203
ERA-4	4.3 (12)	5.1 (14)	17.7 (49)	35.0 (97)	37.9 (105)	3.97	1.073
ERA-5	6.1 (17)	4.0 (11)	14.8 (41)	38.3 (106)	36.8 (102)	3.96	1.109

For teacher respondents, the five sub-abilities were regarded as important in applying CLIL. The proportion of respondents showing their support in the importance of each aspect respectively are 74.3% (n = 206, M = 3.92) for ERA-1, 74.7% (n = 207, M = 3.94) for ERA-2, 70.8% (n = 196, M = 3.90) for ERA-3, 72.9% (n = 202, M = 3.97) for ERA-4, and 75.1% (n = 208, M = 3.96) for ERA-5.

Table 16: Results on the importance of evaluation and reflection ability for student respondents

Evaluation and reflection ability (ERA)	Completely unimportant % (n)	Not very important % (n)	Uncertain % (n)	Important % (n)	Very important % (n)	Mean	SD
ERA-1	4.9 (25)	5.9 (30)	16.6 (85)	40.0 (205)	32.6 (167)	3.90	1.076
ERA-2	6.1 (31)	6.8 (35)	15.2 (78)	37.3 (191)	34.6 (177)	3.88	1.142
ERA-3	5.7 (29)	7.4 (38)	17.4 (89)	38.1 (195)	31.4 (161)	3.82	1.125
ERA-5	5.5 (28)	6.8 (35)	12.3 (63)	39.6 (203)	35.7 (183)	3.93	1.115

Four of the five sub-abilities of this domain were relevant to the student respondents. All four sub-abilities were regarded as important by most student respondents: ERA-1 (72.6%, M = 3.90), ERA-2 (71.9%, M = 3.88), ERA-3 (69.5%, M = 3.82), and ERA-5 (75.3%, M = 3.93).

In summary, in this study, data were collected on teachers and students' perceptions of the importance of the targeted teacher abilities from the seven dimensions of teachers under CLIL. Over 70% of the teacher respondents considered each sub-ability as being important, with an overall mean score of over 3.8. Furthermore, approximately 70% of the student respondents agreed on the importance of these various abilities, with an overall mean score of around 3.8.

5. Discussion

Results from the survey showed that most respondents emphasized the importance of items across the seven dimensions in the questionnaire. In terms of language teaching ability, the focus should be on (1) explaining English

knowledge, (2) comprehensively improving students' English skills, and (3) using clear English at a moderate speed without a strong accent. Studies have highlighted the importance of language teaching in CLIL (Hurajová & Luprichová, 2015; Xia, 2019), emphasizing the cultivation of students' language skills (Liu, 2019) and the use of language that students can accept and understand to ensure effective classroom teaching (Huang, 2019).

The content teaching ability involves three sub-abilities: (1) teaching content based on students' needs and existing abilities, (2) providing professional explanations of subject knowledge, and (3) guiding students to analyze subject content from different cultural perspectives. CLIL-based classrooms should be student-centered (Coyle et al., 2010; Hu, 2017). They should offer professional subject knowledge (Pérez Cañado, 2016), while combining diverse cultural perspectives related to the content (Ayu, 2020; Coyle et al., 2010; Wu, 2017) to cultivate students' cognition and respect for cultural diversity (Li, 2021).

This study identified five sub-abilities of the ability to integrate language teaching and content teaching. These are: (1) explaining content knowledge in English, (2) constructing a language learning environment during the content teaching process, (3) reasonably integrating language teaching and content teaching in the classroom, (4) adjusting the proportion of language teaching and content teaching in the classroom appropriately according to the students' level and course nature, and (5) using Chinese to explain content when teaching in English is not effective. Specifically, realizing that the dual task required by CLIL is the responsibility of teachers (Mancho Bares & Arnó Macià, 2017), ensuring the existence of both language teaching and content teaching is one of the necessary conditions for successful CLIL (Li, 2019; Lyster & de Zarobe, 2018; Villabona & Cenoz, 2022). However, many research findings maintain that an absolute balance between content teaching and language teaching is difficult (cf. Oattes et al., 2018; Pérez Gracia et al., 2017; Pham & Unaldi, 2022). Thus, there is support for adjusting the proportion of language teaching and content teaching appropriately (Ohmori, 2014; Zhu et al., 2021) based on the needs of students and the nature of the course (Liu, 2019). Meanwhile, the use of the mother tongue is encouraged in CLIL-based classrooms (Espinet et al., 2018; Gülşen & Dikilitaş, 2023; Kim & Lee, 2020; Ohmori, 2014) for effective teacher–student communication when necessary (Kim & Lee, 2020; Oattes et al., 2018).

As Coyle et al. (2010) emphasized, students' cognitive skills and its training need to be valued in the CLIL-based classroom. For this ability on cultivating students' cognitive skills, six sub-abilities were identified: (1–5) cultivating creative, self-evaluation, cooperative, critical thinking, and problem-solving abilities, and (6) teaching additional skills such as presentation and software use. These abilities were summarized according to the *Talent Training Plan* of English majors in the six participating universities. The MoE PRC (2018) considers this endeavor in the overall design of talent cultivation for each major in higher education institutions, including major information, course requirements, graduation criteria, and other pertinent details.

This study delved into the significance of six sub-abilities regarding the selection and use of teaching resources. First, teachers must properly arrange and present the content of the textbook according to students' needs, as emphasized by Sievert et al. (2019), who indicated that adapting and presenting textbooks are important for teachers in the classroom. Second, it is vital for teachers in CLIL-based classrooms to supplement extracurricular learning materials according to students' requirements. Just as mentioned by Sievert et al. (2019), expanding and developing extracurricular materials is necessary for teachers. The third sub-ability is selecting and using multimedia teaching resources, which also correlates with the sixth sub-ability: using some tools such as artificial intelligence to assist teaching. This corresponds with the statement that using multimedia as teaching materials is crucial in the digital age (Starkey, 2020). It can help enhance future teachers' technological pedagogical content knowledge (TPACK) through CLIL, which combines technology and pedagogy to enhance educational content in the classroom to ensure efficient learning processes (Wahab et al., 2023). Supplementing materials that are close to students' real life is the fourth sub-ability, a concept supported by Pérez and Malagón (2017), which contributes to enhancing the relevance and engagement of learning experiences for students. The fifth sub-ability is providing some websites or resources related to learning, with scholars advocating for broadening students' perspectives (Xia, 2019) and developing their self-learning abilities (Zhao et al., 2020).

For classroom management ability, five sub-abilities were included: (1) considering students' emotional factors in classroom activities, (2) helping students integrate into classroom learning through various classroom activities, (3) giving students the opportunity to express their views through classroom activities, (4) mobilizing students' interest and enthusiasm in learning through classroom activities, and (5) arranging teaching time and classroom activities reasonably. Classroom management ability is important as teachers need to create a reassuring and relaxing classroom atmosphere (Mehisto et al., 2008), motivate learning through activities (Puspitarini & Hanif, 2019), promote student expression (Derakhshan et al., 2015), encourage students to engage in the classroom (Huang, 2019), and manage class time efficiently (Derakhshan et al., 2015).

Lastly, for evaluation and reflection ability, five sub-abilities were highlighted. The first is to use different evaluation methods to evaluate students, which is regarded as valuable (Makransky et al., 2019). The second is to evaluate and provide timely feedback on students' learning (language and subject content), and the third is to evaluate and provide timely feedback on students' comprehensive skills. Based on Svendsen (2020), making reasonable and adequate judgment about students' current learning outcome is indispensable. Reflecting on and evaluating one's own teaching regularly is the fourth sub-ability, and making targeted improvements to the problems based on the self-evaluation results is the fifth. In other words, teachers' evaluation of and reflection on their own teaching cannot be overlooked. According to scholars, adjusting teaching plans regularly is needed (Svendsen, 2020) for the continuous improvement in classroom practice (Xia, 2019).

Overall, through this study, it has been found that college English teachers in Chinese undeveloped areas should master the seven dimensions of ability and their respective sub-abilities for effective CLIL-based classrooms which also meet the characteristics of 21st century English language teachers. As highlighted by researchers, modern language teachers should know how to enhance language proficiency, expand pedagogical knowledge, employ interactive teaching techniques (Renandya & Jacobs, 2023), and engage in regular self-assessment (Cabahug et al. 2024). Furthermore, they should be able to equip students with essential life skills for their future (Maba et al., 2023), and use appropriate teaching materials to meet global educational standards (Purwanto et al., 2023). Therefore, mastering the abilities outlined in this research can not only help teachers effectively apply CLIL but also enhance their competences in line with the demands of the 21st century.

6. Conclusion

CLIL, a dual-goal teaching method, has captured the interest of Chinese researchers, who have argued that the college English classroom is an ideal setting for its implementation. However, existing studies have mainly focused on developed regions and top-tier universities, overlooking its potential in undeveloped areas. Recognizing the crucial role of teachers in successful CLIL, in this study, we have focused on college English teachers in undeveloped areas, asking: What abilities should college English teachers master to ensure the effectiveness of CLIL-based classrooms in Chinese undeveloped areas? This study aimed to enrich the domestic research on CLIL and its practitioners in Chinese undeveloped areas.

Through administering the survey in six universities in Guizhou province, we identified seven key dimensions of ability with sub-abilities for teachers in CLIL-based classrooms: (1) language teaching ability, (2) content teaching ability, (3) the ability to integrate language teaching and content teaching, (4) the ability to cultivate students' cognitive skills, (5) the ability to select and use teaching resources, (6) classroom management ability, and (7) evaluation and reflection ability. These findings offer valuable guidance for English teachers in undeveloped areas of China to improve their CLIL application skills, ultimately supporting the success of CLIL-based classrooms. Furthermore, the empirical research provides theoretical support for future studies on CLIL application and teachers in China.

While offering valuable insights, this research had notable limitations. First, using questionnaires adapted from research conducted in developed regions may not fully capture the perspectives of teachers and students in undeveloped areas. Additionally, the study's focus on a specific undeveloped region limits the generalizability of its findings. To address these limitations, future research should diversify research instruments and expand the scope to encompass other undeveloped regions in China, ensuring more comprehensive and reliable data.

7. References

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APPENDIX 1
A SURVEY FOR COLLEGE ENGLISH TEACHERS' ABILITIES REQUIRED IN CLIL-BASED CLASSROOMS

Dear Sir or Madam,

Thank you for your participation in "A Survey for College English Teachers' Abilities Required in CLIL-Based Classrooms". CLIL stands for Content and Language Integrated Learning, where students develop language skills while acquiring knowledge in English in this educational context. Your responses are anonymous and confidential. Your input will aid in enhancing CLIL English teachers' abilities and improving teaching quality.

We appreciate your cooperation and support!

Note: Please draw "◯" on the corresponding number after each question.

The abilities CLIL teachers should master		**Completely unimportant**	**Not very important**	**Uncertain**	**Important**	**Very important**
Language teaching ability	Be able to explain English language knowledge (e.g., words, pronunciation, grammar, etc.)	1	2	3	4	5
	Be able to comprehensively improve students' listening, speaking, reading, writing, and translation abilities	1	2	3	4	5
	Be able to speak clear English in a moderate speed without strong accent	1	2	3	4	5
Content teaching ability	Be able to teach content based on students' needs and existing abilities	1	2	3	4	5
	Be able to provide professional explanations of subject knowledge	1	2	3	4	5
	Be able to guide students to analyze subject content from different cultural perspectives	1	2	3	4	5

Ability to integrate language teaching and content teaching	Be able to explain content in English	1	2	3	4	5
	Be able to construct a language learning environment during the content teaching process	1	2	3	4	5
	Be able to reasonably integrate language teaching and content teaching in the classroom	1	2	3	4	5
	Be able to adjust the proportion of language teaching and content teaching in the classroom appropriately according to the students' level and course nature	1	2	3	4	5
	Be able to use Chinese to explain when teaching in English is not effective	1	2	3	4	5
Ability to cultivate students' cognitive skills	Be able to cultivate students' creative ability	1	2	3	4	5
	Be able to cultivate students' self-evaluation ability	1	2	3	4	5
	Be able to cultivate students' cooperative ability	1	2	3	4	5
	Be able to cultivate students' critical thinking ability	1	2	3	4	5
	Be able to cultivate students' problem-solving ability	1	2	3	4	5
	Be able to teach students to acquire other skills (such as presentation, PowerPoint production, using some software, etc.)	1	2	3	4	5

Ability to select and use teaching resources	Be able to properly arrange and present the content of the textbook according to the needs of students	1	2	3	4	5
	Be able to supplement extracurricular learning materials according to students' needs	1	2	3	4	5
	Be able to select and use multimedia teaching resources according to teaching needs	1	2	3	4	5
	Be able to supplement materials that are close to students' real life	1	2	3	4	5
	Be able to provide some websites or resources related to learning	1	2	3	4	5
	Be able to use some tools such as artificial intelligence to assist teaching	1	2	3	4	5
Classroom management ability	Be able to consider students' emotional factors in classroom activities	1	2	3	4	5
	Be able to help students integrate into classroom learning through various classroom activities	1	2	3	4	5
	Be able to give students the opportunity to express their views through classroom activities	1	2	3	4	5
	Be able to mobilize students' interest and enthusiasm in learning through classroom activities	1	2	3	4	5
	Be able to arrange	1	2	3	4	5

	teaching time and classroom activities reasonably					
Evaluation and reflection ability	Be able to use different evaluation methods to evaluate students	1	2	3	4	5
	Be able to evaluate and provide timely feedback on students' learning (language and subject content)	1	2	3	4	5
	Be able to evaluate and provide timely feedback on students' comprehension skills	1	2	3	4	5
	Be able to reflect and evaluate the own teaching regularly	1	2	3	4	5
	Be able to make targeted improvements to the problems based on the self-evaluation results	1	2	3	4	5

Adapted from Liu (2019)

APPENDIX 2
A SURVEY FOR COLLEGE ENGLISH TEACHERS' ABILITIES REQUIRED IN CLIL-BASED CLASSROOMS

Dear students,

Thank you for your participation in "A Survey for College English Teachers' Abilities Required in CLIL-Based Classrooms". CLIL stands for Content and Language Integrated Learning, where students develop language skills while acquiring knowledge in English in this educational context. Your responses are anonymous and confidential. Your input will aid in enhancing CLIL English teachers' abilities and improving teaching quality.

We appreciate your cooperation and support!

Note: Please draw "◯" on the corresponding number after each question.

The abilities CLIL teachers should master		Completely unimportant	Not very important	Uncertain	Important	Very important
Language teaching ability	The teacher can clearly explain language knowledge (e.g., language, pronunciation, vocabulary, etc.)	1	2	3	4	5
	Through teaching, the teacher can improve my language skills (the ability of listening, speaking, reading, writing, and translation)	1	2	3	4	5
	The teacher can speak clear and understandable English to teach.	1	2	3	4	5
Content teaching ability	In the classroom, the teacher can appropriately arrange and present the content according to the needs of students	1	2	3	4	5
	In the classroom, the teacher can provide professional explanations of subject knowledge	1	2	3	4	5
	Through teaching, the teacher can guide students to view content from different cultural perspectives	1	2	3	4	5
Ability to integrate language	The teacher can explain content knowledge in English	1	2	3	4	5

teaching and content teaching	The teacher can construct a language learning environment during the content teaching process	1	2	3	4	5
	The teacher can reasonably integrate language teaching and content teaching in the classroom	1	2	3	4	5
	The teacher can use Chinese to explain content when teaching in English is not effective	1	2	3	4	5
Ability to cultivate students' cognitive skills	Through teaching, the teacher can cultivate my creative ability	1	2	3	4	5
	Through teaching, the teacher can cultivate my self-evaluation ability	1	2	3	4	5
	Through teaching, the teacher can cultivate my cooperation ability	1	2	3	4	5
	Through teaching, the teacher can cultivate my critical thinking ability	1	2	3	4	5
	Through teaching, the teacher can cultivate my problem-solving thinking ability	1	2	3	4	5
	Through teaching, students can acquire other skills (such as presentation, PowerPoint production, using some software, etc.)	1	2	3	4	5
Ability to select and use materials	The teacher can properly arrange and present the content of the textbook and other materials	1	2	3	4	5
	In the classroom, the teacher can supplement extracurricular learning materials according to students' needs and real life	1	2	3	4	5
	In the classroom, the teacher can appropriately select and use multimedia teaching resources based on teaching needs	1	2	3	4	5

	The teacher can provide some websites or resources related to learning	1	2	3	4	5
	The teacher can assist learning through some artificial intelligence methods	1	2	3	4	5
Classroom management ability	In classroom, the teacher can consider my emotion	1	2	3	4	5
	In the classroom, the teacher can teach knowledge through various classroom activities (e.g., games, group discussion, etc.)	1	2	3	4	5
	In the classroom, the teacher can give me the opportunity to express my views	1	2	3	4	5
	In the classroom, the teacher can use some means to stimulate students' interest in learning	1	2	3	4	5
	The teacher can allocate classroom time reasonably	1	2	3	4	5
Evaluation and reflection ability	The teacher can use different evaluation tools (such as oral presentations, classroom performance, tests, exams, etc.)	1	2	3	4	5
	The teacher can evaluate my learning in content and language and provide timely feedback	1	2	3	4	5
	The teacher can evaluate my comprehensive skills and provide timely feedback	1	2	3	4	5
	The teacher can make targeted improvements to the problems based on the self-evaluation results	1	2	3	4	5

Adapted from Liu (2019)