

EFL Teachers' Beliefs and Conceptual Understanding of Integrating Critical Thinking into Classroom Instruction in Senior High School in Shandong, China

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Abstract: Integrating critical thinking (CT) into English as a Foreign Language (EFL) instruction has been widely advocated in curriculum reforms and research has found largely positive attitudes among instructors. However, little is known about EFL teachers' reservations about integrating CT into classroom instruction and how this links to their conceptual understanding of CT. This study examined EFL teachers' beliefs and conceptual understanding of integrating CT in senior high schools in Shandong, China. Data were collected through semi-structured interviews with 22 teachers from five senior high schools. The findings revealed that although teachers generally expressed positive beliefs about CT integration, their understanding of CT was limited when examined against established CT frameworks. Most teachers conceptualised CT primarily as personal expression of ideas or reading comprehension ability rather than as a set of higher-order cognitive skills. When evaluated against Facione's (1990) framework, teachers' understanding of CT was concentrated primarily on interpretation. Only a small number demonstrated awareness of inference, analysis, or evaluation, while explanation and self-regulation were absent from all responses. Teachers also identified limited instructional time and students' English proficiency as the main barriers to CT integration, and attributed their minimal integration of CT to these practical obstacles rather than to their limited understanding of CT instruction.

Keywords: Critical Thinking, EFL Instruction, Senior High School, Semi-Structured Interviews, Teacher Beliefs.

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I. INTRODUCTION

The 21st-century education reform movement is a major force behind the global emphasis on Critical Thinking (CT). CT involves higher-order cognitive abilities such as analysis, assessment, and reasoning (Peng & Deng, 2017; Zhong, 2020). The importance of CT for both academic success and productive social interaction is becoming more widely acknowledged. In keeping with this tendency, CT has become a fundamental part of the curriculum for English as a Foreign Language (EFL) instruction. Including CT in language instruction can help students develop their critical and reflective skills (Barnawi, 2011; Sun, 2011, 2015; Tang, 2016).

A growing body of research suggests that EFL teachers generally recognise the value of integrating CT into language

teaching (Cáceres et al., 2020; Liang & Fung, 2021; Li, 2023; Van der Zanden et al., 2020). Teachers believe that CT promotes higher-order thinking and independent learning (Ab Kadir, 2017; Cáceres et al., 2020), enhances language learning through discussion, reasoning, and meaningful communication (Li, 2023; Liang & Fung, 2021), and prepares students for higher education and active participation in society (Cáceres et al., 2020; Van der Zanden et al., 2020). Researchers have also studied how EFL teachers conceptualise and implement CT in classroom instruction. In a mixed-methods study of Chinese secondary school EFL teachers, Li (2023) found that teachers generally recognised the importance of CT and questioning and dialogic interaction were commonly used to promote students' CT. The study also showed that teachers drew on cultural and subject-specific understandings to explain CT.

Thus far, research shows that CT is not effectively implemented in practice in primary, secondary, and tertiary education contexts (Li, 2023; Lu & Zheng, 2024; Zhao, 2017) despite their positive attitudes teaching (Ab Kadir, 2017; Cáceres et al., 2020; Liang & Fung, 2021; Li, 2023; Van der Zanden et al., 2020). Although many studies have reported that teachers hold positive attitudes towards CT, these favourable beliefs are not always reflected in classroom practice. One possible explanation is that teachers' self-reported beliefs may be influenced by social desirability bias, with teachers expressing support for CT because it is regarded as an important educational goal. Only a few studies have reported teachers' reservations or reluctance towards implementing CT. Baidon and Sim (2009) found that examination pressure discouraged social studies teachers in Singapore from implementing CT in their classrooms. In Iran, Aliakbari and Sadeghdaghighi (2013) also found that although nearly 95% of university teachers believed that teaching strategies could improve students' CT, but 54% were unwilling to adopt new teaching strategies. More than 75% also reported that changing their existing teaching practices was difficult, highlighting teachers' reluctance to implement innovative instructional approaches. Although these studies have identified barriers and uncertainties, relatively little research has examined teachers' reservations about incorporating CT into classroom instruction in China. Examining these reservations may provide important insights into why CT is not consistently implemented or fully understood in EFL classrooms.

➤ Purpose of Study

This study examined EFL teachers' beliefs and conceptual understanding of integrating CT in senior high schools in Shandong, China. The objectives are to:

- Examine teachers' understanding of core CT skills based on Facione's (1990) framework;
- Investigate teachers' beliefs about the integration of CT in EFL instruction;
- Compare teachers' beliefs and understanding of integrating CT in the EFL classroom.

II. METHODOLOGY

This study adopted a qualitative research design, using semi-structured interviews, to study beliefs and conceptual understanding of integrating CT into English language classrooms. A qualitative approach is appropriate as it enables in-depth exploration of teachers' beliefs in their natural contexts (Creswell & Poth, 2018; Merriam & Tisdell, 2016).

➤ Respondents

Twenty-two teachers from five senior high schools in Qingzhou City, Shandong Province, were selected to participate in semi-structured interviews. The following selection criteria guided the purposive sampling: (1) EFL teachers must be working full-time; (2) they must come from key, model and regular high schools; (3) they teach Grade 10 to Grade 12; and (4) they must have at least five years of teaching experience. The requirement of at least five years of teaching experience was intended to ensure that participants had sufficient classroom exposure to reflect meaningfully on

CT integration. Table 1 presents the demographic characteristics of the interview participants. The teachers were aged 30-48, and 20 were female. Most of them had a Bachelor's degree in teaching. More teachers were teaching in key schools (n=12) than regular (n=6) and model (n=4) schools. There were 16 experienced teachers (5–15 years) and eight veteran teachers (16 years or more).

➤ Instrument

One-to-one semi-structured interviews were conducted with the 22 teachers to explore their beliefs regarding CT integration. Semi-structured interviews were adopted due to their flexibility and effectiveness in uncovering participants' beliefs in greater depth (Borg, 2006). The interview protocol was developed with reference to several previous studies on language teacher cognition and the integration of CT in EFL contexts (Ma & Liu, 2022; Ma & Luo, 2021; Zhao, 2017).

The interview questions covered four main areas: (1) teachers' understanding of CT (e.g., "What does critical thinking mean to you as an EFL teacher?"); (2) their beliefs about integrating CT into EFL teaching (e.g., "Do you think CT can be integrated into language instruction? Why or why not?"); (3) their self-reported practices (e.g., "How do you develop your students' CT skills in your courses? For example, what instructional strategies do you use develop CT skills in your students?"); and (4) perceived challenges and support needs (e.g., "What factors hinder or facilitate your CT integration efforts?").

➤ Procedure

Ethical approval was obtained before the study commenced (Approval No. HREC(NM)/2024(1)/84). Data collection began with a formal request sent to the principals of the five participating high schools and the local education authorities for permission to conduct the study. After approval was granted, the researcher collected basic demographic information, such as years of teaching, academic qualifications, age, gender, and grade level taught, and teaching schedules from the school offices. Based on this information, 22 teachers were purposively selected to ensure diversity in teaching experience, academic qualifications, school types, and grade levels taught. All selected teachers were informed of the purpose of the study and provided written consent before participating in the interviews.

Semi-structured interviews were then conducted individually with the 22 teachers in private rooms at their respective schools, each lasting about 15 minutes and carried out in Mandarin Chinese. Before each interview, participants were given a clear explanation of the study's purpose and provided written informed consent; they were also told that their participation was voluntary and that they could withdraw at any time. All interviews were audio-recorded with the participants' permission using a digital voice recorder, while the researcher also took brief field notes to capture non-verbal cues. All interviews were audio-recorded, transcribed verbatim, and anonymised before analysis.

➤ Data Analysis

The interview data were analysed using thematic analysis following Braun and Clarke (2006). All 22 interviews

were included in the analysis. Audio recordings were transcribed using an intelligent verbatim approach (Halcomb & Davidson, 2006), in which fillers such as “um” and “ah” were removed, while meaningful discourse markers (e.g. “I think”, “to be honest”) were retained to preserve participants’

meanings. Transcripts were checked against audio recording for accuracy and the researcher engaged in repeated reading to become familiar with the data and generated initial impressions.

Table 1 Demographic Information of 22 Teachers

Code	Gender	Age	Experience Group	Highest Degree	Teaching Grade	School Type
T01	F	44	Veteran	Bachelor	11	Key
T02	F	35	Experienced	Bachelor	12	Key
T03	F	35	Experienced	Bachelor	10	Regular
T04	F	30	Experienced	Bachelor	10	Model
T05	F	41	Experienced	Bachelor	12	Key
T06	F	34	Experienced	Bachelor	10	Model
T07	F	44	Veteran	Diploma	10	Regular
T08	F	45	Veteran	Diploma	12	Regular
T09	F	45	Veteran	Bachelor	11	Key
T10	F	47	Veteran	Bachelor	10	Regular
T11	F	30	Experienced	Bachelor	10	Key
T12	F	36	Experienced	Bachelor	11	Key
T13	F	30	Experienced	Bachelor	11	Key
T14	F	37	Experienced	Bachelor	12	Regular
T15	M	38	Experienced	Bachelor	12	Key
T16	F	48	Veteran	Bachelor	11	Key
T17	F	42	Veteran	Diploma	11	Key
T18	F	41	Experienced	Diploma	10	Model
T19	F	30	Experienced	Bachelor	10	Key
T20	F	32	Experienced	Master	11	Regular
T21	F	32	Experienced	Bachelor	12	Key
T22	M	44	Veteran	Bachelor	11	Model

Note. F = Female; M = Male. Experience group: Experienced = 5–15 years; Veteran = 16+ years. School types: Key = provincial/municipal key school; Model = demonstration/model school; Regular = general public school.

The analysis proceeded through six cyclical phases. First, the researcher familiarised with the data by repeatedly reading all transcripts and noting initial ideas. Second, initial codes were generated inductively across the entire dataset using NVivo 14. Coding was conducted line by line to capture meaningful segments of text. Third, codes were organised into potential categories by grouping similar meanings together. Fourth, these categories were reviewed and refined to ensure internal similarity and external difference. Fifth, themes were defined and named according to their conceptual significance. Finally, the themes were reviewed again in relation to the full dataset to ensure coherence and consistency (Braun & Clarke, 2006).

An initial coding framework informed by the research objectives was also used as an analytical framework, focusing on teachers’ understanding of CT, beliefs about CT integration, and reported instructional strategies. However, inductive coding was applied when data did not fit the initial categories, allowing new meanings to emerge. For example, when teachers repeatedly mentioned time constraints and students’ limited English proficiency, which were not in the initial framework, a new code, “perceived contextual constraints,” was created.

The researcher conducted the coding systematically, following the established framework. The process was iterative, involving multiple rounds of review. When

uncertainties arose, the researcher re-examined the relevant transcript and cross-checked it against the coding definitions. Ambiguities that persisted were discussed with the supervisor, and final decisions were made by the researcher. The final coding scheme was reviewed for consistency with the research objectives.

Informal follow-up conversations with two participants were held to confirm key interpretations. For instance, one participant was contacted to clarify their earlier comment on students’ limited English proficiency, and confirmed that the researcher’s interpretation was consistent with their intended meaning. All themes were continuously refined through comparison with the original transcripts

III. RESULTS

The findings are presented in three areas. First, teachers’ understanding of CT is reported. Their grasp of core CT skills is examined against Facione’s (1990) framework. Second, their beliefs about integrating CT into EFL instruction are described. Third, the relationship between their reported integration strategies and their CT understanding is analysed.

➤ Teachers’ Understanding of CT

The interview data showed that most teachers had an incomplete understanding of CT. Rather than viewing CT as a set of higher-order cognitive skills, most teachers understood

it primarily as personal expression or reading comprehension ability. Only four teachers described CT in terms of higher-order thinking. These three themes will be described next, illustrated using excerpts.

Firstly, most teachers understood CT as expressing personal views and considering issues from different perspectives. First, teachers defined CT as expressing personal views. For example, T10, a veteran teacher with 25 years of experience at a regular school, said: “Developing CT is all about inspiring the student to think further about the issue and then express his or her views.” T07, a veteran teacher with 21 years of experience at a regular school, also stated: “CT means giving students opportunities to speak their minds.” Second, teachers defined CT as considering issues from different angles. T04, a teacher with six years of experience at a model school, said: “When thinking about problems, you should consider them from different angles, not follow a single path.” Compared with many other teachers, T02 and T04 demonstrated a relatively broader understanding of CT by referring to concepts such as considering issues from different perspectives and adopting a dialectical perspective. However, their descriptions still emphasised ability to express opinions rather than the evaluation of evidence or arguments emphasised in academic CT frameworks.

Secondly, six teachers understood CT as reading comprehension ability. To them, students with CT can understand texts, that is, they can identify the main idea and supporting details. Although these activities may involve higher-order thinking when applied to complex or implicit texts, the teachers described them only at the level of basic comprehension. They did not refer to higher-order CT processes such as analysing arguments, evaluating evidence, or making reasoned judgements. This suggests that they conceptualised CT primarily as literal text comprehension rather than critical engagement with the content.

Thirdly, only four out of the 22 teachers understood CT as higher-order thinking. Some teachers associated CT with questioning assumptions or challenging authority, while a few referred to skills such as inference, evaluation, and self-regulation. Among all participants, T11, a female teacher with six years of teaching experience at a key senior high school, provided the definition that most closely reflected the scholarly conception of CT.

Teachers’ understanding of CT skills was evaluated against Facione’s (1990) framework, which comprises six

core cognitive skills: interpretation, analysis, evaluation, inference, explanation, and self-regulation. Although only four teachers explicitly conceptualised CT as higher-order thinking in the previous analysis, further analysis of the interview data using Facione’s framework revealed that individual CT skills were evident in some teachers’ responses, although these skills were rarely integrated into a comprehensive understanding of CT. As shown in Table 2, interpretation was the most frequently identified skill, followed by inference, whereas analysis and evaluation were identified much less frequently, with no teacher demonstrating an understanding of explanation and self-regulation. Overall, teachers’ understanding reflected only a limited range of the six core CT skills proposed by Facione (1990). Table 2 presents the evaluation of each teacher’s understanding of these six CT skills.

• Excerpt 1

CT means that students need to understand things from different perspectives, generate diverse views, and fully discuss a topic. They should express their personal opinions, there’s no absolute right or wrong, what matters is being able to voice their thoughts and spark intellectual exchange. (T16-interview)

Inference was identified in the responses of only five teachers (T2, T6, T8, T15, and T19), making it the second most frequently demonstrated CT skill after interpretation. These teachers associated CT with making logical deductions from textual information, identifying implicit meanings, or predicting content based on available cues. Their descriptions focused on the cognitive process of drawing conclusions from given information, a key component of CT often assessed in reading comprehension tasks. As reflected in T2’s response, a female teacher with 10 years of experience at a key senior high school, inference was described as drawing conclusions from textual clues when answering reading comprehension questions. Her comments illustrate how inference was understood primarily as a reading skill that does not involve higher order thinking. According to Facione (1990), inference involves drawing reasonable conclusions from available information. However, their understanding of inference was largely confined to reading comprehension tasks given in examinations, such as inferring an author’s attitude or identifying implicit meanings in a text. They rarely referred to broader forms of inferential reasoning, such as generating alternative explanations or weighing different possible conclusions.

Table 2 Evaluation of Teachers’ Understanding of the Six Core CT Skill

Teacher	Interpretation	Inference	Analysis	Evaluation	Explanation	Regulation
T1	✓	—	—	—	—	—
T2	✓	✓	—	Δ	—	—
T3	✓	—	—	—	—	—
T4	✓	—	—	—	—	—
T5	Δ	—	—	—	—	—
T6	✓	✓	—	Δ	—	—
T7	✓	—	—	—	—	—

T8	✓	✓	✓	✓	—	—
T9	✓	—	—	—	—	—
T10	✓	—	—	—	—	—
T11	✓	—	—	—	—	—
T12	✓	—	—	—	—	—
T13	✓	—	✓	—	—	—
T14	✓	—	—	✓	—	—
T15	✓	✓	—	Δ	—	—
T16	✓	—	—	—	—	—
T17	✓	—	—	—	—	—
T18	✓	—	—	—	—	—
T19	✓	✓	—	Δ	—	—
T20	✓	—	—	—	—	—
T21	✓	—	—	—	—	—
T22	—	—	✓	—	—	—
Total	20	5	3	2	0	0

Note. ✓ = accurately demonstrated understanding of the CT skill; Δ = demonstrated an inaccurate or incomplete understanding of the CT skill; — = the CT skill was not evident in the teacher's interview responses.

• *Excerpt 2*

CT involves making judgments and inferences. In English, we have inference questions that ask students to infer the author's attitude or the main idea of a passage. These questions require students to read between the lines and draw conclusions based on the evidence provided in the text. It's not about finding the answer directly; it's about putting together clues and reasoning to arrive at a logical conclusion. When students can do this well, they are demonstrating CT. (T2-interview)

Analysis was identified in the responses of three teachers (T8, T13, and T22). These teachers associated CT with breaking down information into component parts, examining relationships between ideas, or identifying underlying structures in texts or problems. The comments of T13, a female teacher with 12 years of experience at a key senior high school, suggest that analysis was understood as examining the thinking process of scientists and the sequence of scientific inquiry. Her comments illustrate that analysis was directed mainly towards understanding textbook content rather than evaluating the structure or quality of arguments. This understanding is partially consistent with Facione's (1990) framework, in which analysis involves examining relationships among ideas and identifying the reasoning underlying arguments.

• *Excerpt 3*

When we study scientists like John Snow, we analyse their thinking process. We look at the seven scientific steps they followed, how they identified a problem, gathered data, tested hypotheses, and drew conclusions. We don't just learn the facts; we examine how they arrived at their findings. I ask students to identify what scientific qualities the scientist demonstrated and how each step contributed to the final outcome. Then we do brainstorm to compare different scientists across different fields. What methods did they use? What thinking skills did they need? This helps students

understand what it means to think like a scientist. (T13-interview)

Evaluation was reported by only two teachers (T8 and T14) in the interviews, with another four teachers (T2, T6, T15, and T19) reporting partial or incomplete understanding of this skill. The two teachers who accurately described evaluation referred to activities such as identifying strengths and weaknesses in peers' writing or judging the correctness of statements and identifying reasons for errors. The interview with T8, a female teacher with 24 years of experience at a key senior high school, shows that he associated evaluation with identifying strengths and weaknesses in peers' writing. His comments illustrate that evaluation was understood primarily as classroom assessment. According to Facione (1990), evaluation involves assessing the credibility of information and the strength of arguments. The two teachers who demonstrated this skill described evaluation mainly in terms of identifying strengths and weaknesses in peers' writing or judging whether responses were correct. The interviews revealed that a small number of teachers recognised evaluation as a distinct CT skill, but their understanding was largely confined to classroom assessment activities rather than to the critical evaluation of arguments emphasised in Facione's framework.

• *Excerpt 4*

We develop students' analytical skills through group discussions and communication. During writing activities, I ask students to identify the strengths and weaknesses in their peers' work. I ask them to find the good points and the areas that need improvement; this is a form of mental training. (T8-interview)

Explanation and self-regulation were not identified in any teacher's responses. According to Facione (1990), explanation involves articulating and justifying one's reasoning, whereas self-regulation refers to monitoring and evaluating one's own thinking. Although one teacher (T8)

referred to CT as “reflective thinking,” this description did not indicate an awareness of self-regulation as a process of critically monitoring and revising one’s reasoning. These findings suggest that teachers did not regard explaining or justifying reasoning, or monitoring and evaluating their own thinking, as essential components of CT. Instead, their understanding remained largely confined to observable cognitive activities rather than the metacognitive dimensions emphasised in Facione’s framework.

➤ *Teachers’ Beliefs About CT Integration*

The interview data indicated that teachers generally held positive beliefs about integrating CT into EFL instruction. Among the 22 teachers interviewed, 21 explicitly acknowledged the benefits of integrating CT into their teaching. Their perspectives focused on various student-related outcomes, including enhanced enthusiasm (4 teachers), broadened thinking (4 teachers), increased interest (3 teachers), and improved cognitive abilities (3 teachers). In addition, four teachers highlighted CT’s contribution to better learning outcomes and test-taking performance. Excerpt 5 shows the comments of T22, a teacher with 22 years of experience. His comments reflect the emphasis many teachers placed on CT as a tool for cognitive development. His reference to “comparative analysis” and reflection aligns with the broader pattern observed across teacher responses, where CT was associated with improved learning outcomes. As a veteran teacher, his positive orientation suggests that favourable beliefs towards CT are not confined to early-career teachers but are shared across different career stages.

• *Excerpt 5*

Every question should involve thinking. I think thinking should be approached in different levels, from easier to more difficult. This allows students to engage in comparative analysis, learn how others think, and then reflect on their own reasoning, which ultimately helps them improve their own thinking. (T22-interview)

Although teachers generally expressed positive attitudes towards CT integration, the interviews also revealed several reservations about its classroom implementation. The most frequently reported concerns were limited class time (20/22 teachers) and students’ limited English proficiency (18/22 teachers). In addition, 13 teachers acknowledged that their own understanding of CT was insufficient, none reported having received professional training specifically related to CT, and eight teachers referred to examination pressure as a factor discouraging CT integration.

Excerpt 6 Illustrates how teachers perceived time constraints as limiting opportunities for deeper CT activities in the classroom. In this excerpt, T9, a 45-year-old female teacher with 19 years of teaching experience at a key senior high school, explained how limited lesson time constrained both students’ engagement in extended discussion and teachers’ ability to facilitate deeper CT activities. Her comments illustrate that time constraints were perceived not simply as a scheduling issue but as a factor influencing the depth of classroom learning. Rather than encouraging sustained reasoning and debate, teachers reported simplifying

discussion tasks so that they could be completed within the available lesson time.

• *Excerpt 6*

Time is indeed a real constraint. Our lessons usually last only 40 to 45 minutes. For a reading lesson, it normally takes about 60 minutes to achieve a thorough and in-depth understanding of the text. As a result, our regular lessons often do not provide enough time for students to engage in extended debates. In demonstration lessons, time is even more limited, so teachers shorten discussion activities and focus on more superficial issues that are easier for students to discuss. Consequently, the time available not only limits students’ opportunities to debate and think critically but also restricts teachers’ ability to explore topics in greater depth. (T9-interview)

Eighteen teachers identified students’ limited English proficiency as another major barrier to CT integration. Excerpt 7 from T3 illustrates how teachers perceived language proficiency as influencing students’ ability to engage in CT activities. In this excerpt, T3, a 35-year-old female teacher with nine years of teaching experience at a regular senior high school, described students’ English proficiency as a prerequisite for CT development. Her comments suggest that CT was viewed as dependent on students’ language competence, with weaker language skills perceived as limiting students’ capacity to participate in higher-order thinking activities.

• *Excerpt 7*

For students with relatively weak English proficiency, developing CT may not be particularly meaningful. Students’ language ability can influence the development of their thinking skills. If their English proficiency is relatively strong, it may facilitate the development of CT. However, if their language ability is weaker, it may hinder their ability to improve their thinking skills. (T3-interview)

Additionally, 13 out of 22 teachers acknowledged their own insufficient understanding of CT, illustrated by Excerpt 8 from T1, a 44-year-old female teacher with 21 years of teaching experience at a key senior high school. T1’s comments highlight a widely acknowledged concern among teachers: their own insufficient understanding of CT. Her metaphor of a teacher needing “a full bucket of water” before pouring it out to students reflects the belief that effective CT teaching depends on teachers’ own mastery of the skill. This concern is particularly significant given that T1 is an experienced teacher at a key senior high school, yet even she acknowledged her own limitations.

• *Excerpt 8*

Teachers’ own competence needs to be improved. A teacher must first have a full bucket of water before they can pour it out to their students. If teachers themselves do not understand CT, they cannot develop these skills in their students. Some teachers may think that they just need to teach basic language knowledge and have students memorise it. But if teachers do not guide students, they will never learn CT. (T1-interview)

None of the 22 teachers had participated in any CT-specific professional training. T11 is a 30-year-old female teacher with six years of teaching experience. Her comment (Excerpt 9) is representative of the teachers' lack of formal training opportunities in CT. Her reference to learning about CT "during graduate studies" suggests that any exposure to CT occurred during pre-service education rather than through in-service professional development, and that this knowledge was not retained or reinforced over time.

• *Excerpt 9*

To be honest, I have never participated in any targeted training or seminars on this topic. What I know comes from what I learned during my graduate studies, but I didn't study it in depth at the time, and over the years I have forgotten some of it. So my understanding is quite superficial. (T11-interview)

Eight teachers referred to examination pressure as a factor discouraging CT integration, as illustrated by Excerpt 10 from the interview with T5, a 41-year-old female teacher with 14 years of teaching experience at a senior high school. T5's comment reflects the reality that CT integration was constrained by the demands of examination-oriented teaching, particularly in the final year of senior high school. As a teacher with extensive experience in Grade 12, her observation carries particular weight in illustrating how the pressure of the national college entrance examination shapes teachers' instructional priorities, often at the expense of CT-oriented activities.

• *Excerpt 10*

In Grade 12, the focus is primarily on consolidating basic knowledge and reviewing exercises, with little room for CT. With the national college entrance examination approaching, the priority is test preparation. (T5-interview)

➤ *Relationship Between Teachers' CT Beliefs, Understanding and Reported CT Integration Practices*

A comparison of the three types of data (Table 3) show that most teachers held positive beliefs about CT integration and conceptualised CT as personal expression and reading comprehension, and their reported strategies primarily focused on discussion-based activities and comprehension-oriented tasks. This suggests that teachers' favourable beliefs and their understanding of CT, both of which were largely confined to lower-order dimensions. Therefore, this can explain why they reported using activities that require low level cognitive skills.

A closer examination of Table 3 reveals several patterns in the relationship between teachers' CT understanding and their reported classroom practices. Teachers who conceptualised CT primarily as personal expression, reading comprehension, or considering multiple perspectives generally reported practices centred on discussion, brainstorming, and presentations. By contrast, teachers who demonstrated a somewhat broader understanding of CT, such as evaluating phenomena (T2), analysing pros and cons (T6), or asking meaningful questions (T22), reported a wider range of instructional activities, including debates, writing tasks, and questioning. Nevertheless, discussion remained the most frequently reported activity across both groups.

Table 3 Teachers' CT Beliefs, Understanding and Reported CT Integration Practices

Code	CT Beliefs	CT Understanding	Reported CT Practices	Perceived Challenges
T1	Concerns	Reading, summarizing	Brainstorming, mind-maps, debates	Time constraint, teachers' CT knowledge
T2	Concerns	Evaluating phenomena, dialectical thinking	Questioning, debates, writing	Time constraint, lack of training
T3	Concerns	Active thinking, reading, raising questions,	Questioning, discussion, role-play	Time constraint, students' poor English
T4	Concerns	Multi-perspective thinking, open-mindedness	Brainstorming, discussion	Time constraint, students' poor English
T5	Concerns	Creative thinking, reading	Discussion, student presentations	Time constraint, students' poor English
T6	Concerns	Analyzing pros and cons, thinking on a topic	Group discussion, role-play	Time constraint, teachers' CT knowledge
T7	Concerns	Expressing own thoughts, deep thinking	Debates, brainstorming, writing	Time constraint, students' initiative
T8	Concerns	Analytical competence, open-minded thinking	Group discussion, predictions	Time constraint, students' poor English
T9	Concerns	Expressing personal opinions	Group discussion, debates	Time constraint, students' poor English
T10	Concerns	Further thinking, expressing own thoughts	Role-play, poster design, writing	Time constraint, students' poor English
T11	Concerns	Thinking and analyzing to find answers	Student discussion	Time constraint, students' initiative
T12	Concerns	Viewing issues from different angles	Group discussion, presentations	Time constraint, teachers' CT knowledge
T13	Concerns	Expressing personal views	Brainstorming	Time constraint, teachers' CT

				knowledge
T14	Concerns	Being inclusive, cultural awareness	Mind-maps, debates	Time constraint, lack of training
T15	Concerns	Dialectical thinking	Role-play, debates	Students' initiative, teachers' CT knowledge
T16	Concerns	Expressing personal views	Group discussion, brainstorming	Time constraint, teachers' CT knowledge
T17	Concerns	Expressing personal views	Discussion, role-play, debates	Time constraint
T18	Concerns	Understanding from multiple angles	Follow-up questioning	Time constraint, students' poor English
T19	Concerns	Expressing personal views	Discussion, mind-maps	Time constraint, students' poor English
T20	Concerns	Expressing personal views	English speeches, role-play	Time constraint, students' initiative
T21	Concerns	Higher-order thinking, deeper understanding	Debates, debate, writing	Time constraint, students' poor English
T22	Positive	Asking questions, expressing personal views	Group discussion, pair work	Students' initiative

Four teachers (T11, T15, T18, and T21), whose understandings included elements of independent thinking, dialectical reasoning, or deeper comprehension, reported classroom practices similar to those of teachers with more basic conceptualisations. Overall, group discussion was reported by 19 of the 22 teachers regardless of differences in their understandings of CT.

In addition to demonstrating an incomplete understanding of CT skills, T18, a teacher with 14 years of experience at a model school, also expressed concerns about students' ability to develop such skills (Excerpt 11). T18's comment reveals an additional level of belief about CT implementation: her perception that students' thinking skills were insufficient and that teachers themselves lacked the necessary qualities for CT instruction. Her reference to school support and time constraints also reflects the gap between institutional encouragement and classroom realities. This belief appeared to constrain her willingness to adopt CT-oriented practices, as she viewed CT as requiring a level of competence that neither students nor teachers possessed.

• *Excerpt 11*

I feel that students' thinking skills are somewhat lacking, and CT is difficult for them. This is mainly because teachers themselves do not possess this quality. The school does support CT development, but time is always a constraint. We only have limited class time, so we can only hold these activities when there is an appropriate opportunity. (T18-interview)

IV. DISCUSSIONS

This study yielded three main findings which will be discussed in this section. First, although teachers expressed positive beliefs about CT integration, they demonstrated only a limited conceptual understanding of CT. This finding is consistent with previous research showing that teachers often value CT but possess only a limited understanding of its conceptual foundations. Li (2023) conducted a mixed-methods study in Chinese secondary schools using questionnaires (182 teachers), focus group interviews (12 teachers), and classroom observations (three teachers). The

study found that although teachers incorporated CT into their teaching, their understanding was shaped more by subject-specific and cultural perspectives than by a comprehensive understanding of CT as a set of cognitive skills. Van der Zanden et al. (2020), drawing on semi-structured interviews with nine Dutch secondary school teachers, reported that teachers lacked a shared understanding of CT skills and interpreted them in different ways based on their own educational experiences. Likewise, Yuan and Stapleton (2020), through focus groups and email interviews with pre-service language teachers, found that even beginning teachers demonstrated limited understanding of CT and felt unprepared to teach it. These studies, taken together, suggest that the belief-knowledge gap is a widespread challenge across different settings and teacher populations.

While these studies reported that teachers' understandings of CT were varied or limited, the present study extends this literature by evaluating teachers' conceptualisations against Facione's (1990) six-core-skill framework, providing a more precise diagnosis of what is missing. The findings showed that teachers' understandings were concentrated primarily on interpretation, whereas analysis, inference, explanation, and self-regulation were almost entirely absent from their conceptualisations. This framework-based analysis offers clearer direction for professional development: simply reinforcing positive attitudes toward CT is unlikely to change classroom practice if teachers do not also develop a more differentiated understanding of what CT skills involve.

Second, these positive beliefs were only partially reflected in their reported classroom practices. The discrepancy between teachers' positive beliefs and their reported practices observed in this study has been documented in other contexts as well. Fung and Liang (2018), drawing on classroom observations and teacher interviews in Hong Kong primary and secondary schools, found that although CT had been formally promoted in the curriculum, teachers' actual implementation through group work remained superficial. Lu and Zheng (2024), based on observations and interviews with six senior high school EFL teachers in China, reported that CT questions accounted for

only a small fraction of total questions posed in class; repetition was the most common questioning technique, and feedback focused on clarity rather than deeper reasoning. Mok (2008), who observed over 1,500 minutes of teaching by five Hong Kong secondary English teachers, identified only two CT encounters across all lessons, attributing the gap to a product-oriented, exam-driven system that left little room for CT.

The present study reinforces these earlier findings. The constraints identified by teachers, particularly limited class time (20/22) and students' limited English proficiency (18/22), are similar to Mok's (2008) findings regarding the influence of contextual pressures on CT implementation. However, the present study extends previous research by demonstrating that the discrepancy between teachers' positive beliefs and their reported classroom practices is also associated with their limited understanding of CT. Evaluating teachers' responses against Facione's (1990) framework revealed that their reported practices reflected only a narrow range of CT processes, suggesting that effective CT integration requires strengthening both teachers' conceptual understanding and their pedagogical knowledge.

Third, teachers identified several contextual barriers to CT implementation, most notably limited class time, students' limited English proficiency, and examination pressure. The constraints identified by teachers in the present study are broadly consistent with barriers reported in previous research, although some important differences emerged across educational contexts. Aliakbari and Sadeghdaghighi (2013) surveyed 100 English teachers in Iran and found that student characteristics ($M = 2.67$), self-efficacy ($M = 2.59$), and lack of pedagogical knowledge ($M = 2.26$) were the main barriers to CT implementation. Time constraint ($M = 0.60$), was among the least significant in their study, a finding that stands in contrast to the present study, where 20 out of 22 teachers cited time as a major concern. This discrepancy may reflect the different educational levels sampled: Aliakbari and Sadeghdaghighi's study included university teachers with potentially more curricular flexibility, whereas the present study focused on senior high school teachers whose schedules are heavily shaped by examination preparation.

Baildon and Sim (2009), in a case study of Singaporean social studies teachers, identified three intersecting tensions constraining CT implementation: examination culture, uncertainty about political and social boundaries, and challenges to professional identity. Their work highlights that high-stakes assessment pressures are not unique to the Chinese mainland but are shared across similar exam-driven systems in Asia, a point supported by the eight teachers in this study who explicitly cited the tension between CT integration and examination demands.

In addition to examination-related pressures, teachers in the present study frequently identified students' limited English proficiency as a major obstacle to CT implementation, suggesting that language competence plays a particularly important role in shaping opportunities for

higher-order thinking in EFL classrooms. Taken together, these findings indicate that while some barriers to CT implementation are shared across educational contexts, others are closely related to the specific demands of senior high school EFL education.

V. CONCLUSION

These findings contribute to the existing literature in two important ways. First, while previous studies have mainly reported teachers' generally positive attitudes towards CT, this study provides a more detailed examination of teachers' conceptual understanding by analysing their interview responses against Facione's (1990) framework. The findings show that teachers' understandings were concentrated primarily on interpretation, with limited awareness of other core CT skills. Second, by focusing on Chinese senior high school EFL teachers, a relatively underexplored group in CT research, this study identifies teachers' reservations about CT implementation, particularly concerns regarding limited instructional time and students' English proficiency. These findings help explain why CT remains difficult to implement in examination-oriented EFL classrooms despite teachers' generally positive beliefs.

The findings suggest that teacher professional development should focus explicitly on helping teachers understand the core CT skills proposed by Facione (1990), particularly analysis, inference, explanation, and self-regulation, which were largely absent from teachers' conceptualisations. Training should also provide concrete examples of how these skills can be incorporated into senior high school EFL lessons, enabling teachers to move beyond discussion-based activities towards instructional practices that promote higher-order thinking.

Future research could investigate whether professional development explicitly based on Facione's (1990) CT framework improves teachers' conceptual understanding and leads to measurable changes in their classroom practices. Such research would help determine whether strengthening teachers' knowledge of CT skills can reduce the gap between teachers' positive beliefs and their implementation of CT in EFL classrooms.

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