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The Thinking Abilities Framework

A report by the University of Reading, in collaboration with the Hubei Institute of Education Science and supported by British Council China.

*Outcome from the **British Council UK-China EMaDA Research and Materials Development Award 2022-23**: Research on students' thinking skills development within the English Subject in primary and secondary schools in Hubei province.*

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Executive Summary

The *research on rural students thinking skills development within the English subject in primary and secondary schools in Hubei province* project, conducted by the University of Reading (UoR) in cooperation with the Hubei Institute of Education Science (HIES) was supported by British Council China from April 2022 to April 2023 through the English Materials Development Award (EMaDA).

The project aims to:

- understand how Hubei English teachers in China compulsory education are developing students' thinking abilities through teaching English as a Foreign Language (EFL) at the primary stage
- identify effective strategies for supporting teachers in their classroom instruction and professional development, specifically to developing their students' thinking abilities.

The two specific goals of the research period were to produce a bilingual framework which illustrates the mapping of thinking abilities within the 2022 English Curriculum Standards, and this landscape research report on thinking ability and its classroom practice. Additional outcomes have been training materials including sample lessons, due to the need to illustrate the function of the Thinking Abilities Framework while engaging with teachers, especially during the framework piloting stage. In due course these training materials will be built on to produce full sets of CPD materials.

In China, compulsory education refers to primary and junior schools. The two levels, together with senior secondary education, constitute ‘basic education’, which is then followed by higher education. With the introduction of the 2017 English Standards relevant to basic education (MoE, 2017) and the 2022 English Curriculum Standards for compulsory education developed by China’s Ministry of Education (MoE, 2022), *thinking capacity* was specified as a core competency, alongside *language ability*, *cultural awareness* and *learning ability*. This highlights the integral role of what the authors prefer to refer to as ‘thinking ability’ across subjects and emphasises the importance of developing thinking abilities in basic English education. There is a strong need, therefore, for teachers and other stakeholders to understand how ‘thinking’ can be taught within the English Curriculum.

The development of thinking ability through English education in China is confronted with many issues and challenges, including the dominance of summative assessment; prevalence of the teacher-centred classroom, and insufficient support for teachers to incorporate the five proposed objectives of English education (Wang & Luo, 2019). Relevant research is currently limited in depth and scope due to its short history in this field. For example, much attention has been drawn to urban and suburban areas and higher education; the empirical studies are scarce and the research methods of the limited number of empirical studies are constrained to the qualitative approach; and a conceptual framework that can serve holistically is absent from the development of thinking ability through the EFL subject.

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In this context, the primary research employed a mixed-methods approach with the use of an online survey and online focus group discussions to collect self-reported data, which was triangulated with observation data from recorded classroom teaching. The investigation involved 7087 respondents in the survey, 35 participants in focus group discussions and nine recorded lessons covering remote rural, rural, suburban, and urban areas in Hubei, spanning teaching Grades from 3 to 9 in compulsory education.

The primary research found English teachers in Hubei have developed preliminary awareness of thinking ability and established some good practices since the introduction of the 2017 and 2022 English Standards. However, the awareness is limited and has been further challenged by the limited English language abilities of young learners and inadequate support and training in relation to the 2022 English Standards. These teachers demonstrated a generally low-to-mixed levels of self-efficacy. Their limited pedagogical competency as well as the inadequate support received have hindered effective classroom practice in developing thinking ability consistently. Regional disparities and external barriers have further compounded the situation, making the transfer of the initiatives in the English Standards into classroom practice difficult and mainly ineffective.

The primary research findings have led to the creation of a fit-for-purpose bilingual Thinking Abilities Framework. The Framework identifies the tripartite conceptual dimensions of a targeted thinking ability: *disposition, knowledge,* and *skill* that emerged from the primary research and sets out skills at the foundational and the higher order thinking stages. It further contextualises the skill objectives in the EFL subject that best fit the year groups. We believe EFL teachers in China and elsewhere will benefit from the structured guidance in understanding the concept of thinking, planning lessons, and monitoring and assessing students' progression. The Framework was piloted with 14 voluntary teachers from Hubei after four piloting training workshops. The piloting impact survey demonstrated both training and the Framework were helpful but the time for them to familiarise themselves with the Framework was once again tight and unavailable in some cases.

It is recognised that most English teachers in China primary and junior education are female, while the proportion of males in education leadership roles is higher. Results of this research have not highlighted any gender-specific attitudes to professionalising, rather the aim is to support all teachers, thereby raising their status, and in this way more females can have their professional role better recognised. The delivery of any CPD training should have an inclusive approach where male and female teachers have equal recognition both at teachers and as teacher trainers.

The project thus suggests that teacher CPD courses are essential to complement the Framework, and to enhance teacher awareness, beliefs, knowledge and pedagogical competencies. The authors are developing relevant CPD resources based on the Framework for teachers and others are encouraged to do the same. We hope these achievements will provide comprehensive support for EFL teachers across China (and perhaps elsewhere) in assisting their classroom teaching and professional development.

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1 Introduction

The development of thinking has been recognised as an essential aspect of education, particularly since 1950s when the emergence of cognitive science in the 1950s to 1960s revolutionised the understanding of thinking by integrating cognitive processes into information processing models (Simon, 1979; Wood, 1998). The publication of the Taxonomy of Educational Objectives (Bloom et al., 1956) spurred the promotion of thinking in educational initiatives and curriculums in North America and the UK during the 1980s and 1990s (Burden & Williams, 1998; Burke et al., 2007; Coles & Robinson, 1991; Ennis, 1987; Facione, 1990; McGuinness, 1999; Segal et al., 1985; Yoram, 2015).

The concept of thinking disposition was introduced to China from the Soviet Union in the 1960s (Zhou, 2017). The development of thinking disposition has been revived in the twenty-first century after a series of curriculum reforms in China. In 1997, the introduction of "Quality Education" aimed to develop well-rounded individuals instead of focusing solely on exam results (Dello-Iacovo, 2009). The 2001 National English Standards promoted student-centred classrooms and formative assessment to align English education with humanistic development goals. In 2017, the English Standards for senior education introduced core competencies, including thinking ability, as a goal of English education. This shift has placed an emphasis on the development of students' character and abilities beyond language proficiency. Based on the 2017 English Standards, the Compulsory English Standards was published in April 2022. One main principle is to address issues “arising from the curriculum reform, and set out clear priorities and tasks, with an emphasis on addressing practical issues effectively.” (MoE, 2022:5). However, research on thinking skills and how it can be embedded into English education has drawn much attention to urban and suburban areas and higher education, leaving rural areas and lower levels of English teaching further behind.

It was in this context that the project was initiated to investigate the perspectives of current primary and junior teachers in Hubei regarding their awareness, attitudes, and practices related to developing thinking ability in English classrooms. During the second phase, the intended framework was created for practical reference as a guidance for classroom practice and teachers’ CPD.

In some official documents and literature, the terms *thinking capacity*, *thinking skills* and *thinking ability* are used interchangeably, and this may in part be down to the translation of the phrase from Chinese. The 2022 English Curriculum Standards (MoE, 2022) state *thinking capacity*, the research funding call referred to *thinking skills*, but the researchers settled on using *thinking ability* due to its inclusive meaning where all of knowledge, dispositions and skills and therefore capacity are all covered. However, within the descriptive and explanatory sections of the report, the terms can be considered interchangeable.

The project was conducted by the research team constituent research members from International Study and Language Institute of University of Reading (UoR), joined by the China partner Hubei Institute of Education Science (HIES).

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ISLI is a strategic academic school within UoR, responsible for delivering positive contributions to UoR's 2026 vision for growing as a globally connected university. ISLI maintains strong collaborative relationships with several universities and governments (for example Uzbekistan, Kazakhstan, Ukraine, as well as China) in the provision of high-quality teaching and teacher development programmes. ISLI has longstanding expertise in hosting teaching staff groups from China, supported by the Chinese Ministry of Education and other local authorities. ISLI design and deliver bespoke professional development training courses in EFL pedagogy as well as other subject areas, therefore well-placed to understand the practical challenges of the classroom teaching in Chinese schools. The two Academic Leads in the project, are experienced TEFL teacher trainers: Dr Carrie Zhang has an extensive knowledge of theories and practice of TEFL and particularly their interlinks; her research interest and teaching specifically focus on the Chinese context. Ms Sharon McIlroy's interests are in mediating between theory and practice, making "dry theories" conceptually understandable and accessible to teachers of low-level proficiencies. Overseeing the project and acting as chief editor was Associate Professor Bruce Howell, who has wide and varied experience of educational management in various contexts. Professor Daguo Li, who has extensive experience of leading China-focused research projects, supervising theses and dissertations, and reviewing journal articles, was Academic Advisor.

HIES is directly accountable to Hubei Education Department. Its main responsibilities include but are not limited to directing research in educational management, educational policy, educational and instructional assessment, and promoting research outcomes by translating them into classroom teaching and school education in support of their educational innovation and reformation. It also promotes communication and exchange with national and international partners in educational research. Mr Zhou Shijie from HIES, project leader and a provincial level teacher researcher in the Hubei team, provided local knowledge and executive support in enabling a successful collection of exceedingly rich data. Active support was received through HIES from Professor Yan Chunmei from Central China Normal University (Director of Language Teacher Education Research Centre) and Professor Liang Xiaohua from Zhongnan University of Economics and Law (Chairperson of Hubei Primary School English Teaching Steering Committee), both of whom contributed to a review of literature which has been published in China, and provided valuable advice on research design and the development of research tools.

This report is intended to present how the Thinking Abilities Framework[1] was developed, from 2022 to 2023. The Framework is intended to be a tool for school teachers in China, which can be used to support CPD training, and which can be added to or adapted in future. It presents ways of progressively integrating the teaching of thinking abilities into classroom practice at three levels, representing Grades 3-4, Grades 5-6 and Grades 7-9 in the China school system. While the Curriculum Standards default to assuming the same progress through the levels in all settings nationally, the contextual differences between urban, suburban and rural teaching settings is acknowledged, so there is some built-in

[1] The June 2023 version of the Thinking Abilities Framework can be seen in Appendix 1. In this report it will be referred to as 'the Framework'.

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flexibility when using the Framework.

The main findings show that there is a need for better understanding of the thinking abilities concept among teachers and that support is required for implementing its teaching, and that those in rural settings tend to have a greater need. Following a literature review, this report describes the data collection methodology, discusses the main findings, justifies the creation of the Thinking Abilities Framework, and gives recommendations for future developments.

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2 Literature Review

The overall theoretical framework draws from Vygotsky's views on language and its central role of in human behaviour and mental activities (Barrs, 2022); Piaget's stages of cognitive development in understanding the active building process of knowledge in young learners; and sociocultural theory (Gauvain & Perez, 2015; Lantolf, 2000), which informs our exploration of thinking styles and modes. At the later stage, our recommended pedagogies are underpinned by Bruner's theory, highlighting the importance of language in developing higher order thinking in early years and teachers' crucial role in creating linguistic environments that support language and thinking development (Gray & MacBlain, 2015).

We have reviewed how the emergence of cognitive science impacted the conceptualisation of thinking and its pedagogical implications for classroom teaching since the 1950s. The subsequent structured programmes on developing thinking in the classroom gave rise to many research studies, including a comprehensive review led by McGuinness (1999) to assess the research and classroom practices in the UK, and another comprehensive review of 35 thinking frameworks produced between the 1950s and 2000s, led by Moseley et al. (2004). These studies acknowledged that effective teaching of thinking should involve a clear understanding of thinking content, explicit goals with the guidance of conceptual frameworks, and appropriate pedagogies (Abrami et al., 2008; Black, 2012; Dewey & Bento, 2009; Marin & Halpern, 2011; McGuinness, 1999). Three main pedagogical approaches to developing thinking in classrooms are the bolt-on approach which treats thinking skills as a separate set beyond the curriculum, the infusion approach which integrates thinking across all subjects, and the subject-specific approach which emphasises the specific disciplinary features of thinking ability (Dewey & Bento, 2009; McGuinness, 1999).

Having discussed relevant terminologies such as ability, skill, disposition, we have recognised the need to integrate both the disposition-approach and the skill-approach (Yoram, 2015) into the development of thinking ability. The review has identified a shift in focus of associated thinking skills from general cognitive skills to higher-order cognitive skills related to reflective, critical and creative thinking in the twenty-first century (Chalkiadaki, 2018; Cheng, 2017; Dwyer et al., 2014; Finegold & Notabartolo, 2010; Gunawardena & Wilson, 2021; Li, 2020; Padget, 2012; Roche, 2015; Schulz & FitzPatrick, 2016; Tan, 2016; Yuan et al., 2022).

We further reviewed three specific higher order thinking skills, i.e., critical thinking, creative thinking and reflective thinking and the incorporation of these skills into EFL teaching.

As a domain free skill, critical thinking has not only been identified as essential for making good decisions and problem-solving but also seen as a key indicator of academic achievement and employability in the twenty-first century (Dwyer, 2017; Naiditch, 2016). It is considered vital for higher education whatever the first language of the student, and

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therefore integrated into the EAP (English for Academic Purposes) setting, but also critical thinking appears in the EFL setting to help students develop argumentation analysis skills, support viewpoints with reasons, and evaluate the reliability of information sources (Beyer, 1995; Black, 2008; Halpern, 1998; Hughes, 2014; Lipman, 2003; Moon, 2008). In young learners' education, critical thinking means preparing students for this complex skill by developing a questioning habit and spirit, along with relevant skills (Eigenauer, 2015; Fisher, 2005; Yoram, 2015).

Creative thinking has been reviewed from the Person-Process-Product perspective (Fisher et al., 2004; Jesson, 2012; Padget, 2012; Sawyer, 2003). EFL offers valuable opportunities for cultivating creativity through crossing boundaries and fostering a bicultural attitude, which leads to open-mindedness and a complexity-seeking attitude (Ellis, 2016; Kim & Lee, 2020; Zhang et al., 2012). English can be involved in generating ideas, reflecting on their relevance and novelty, and problem-solving through language use (Ellis, 2016; Jones & Richards, 2016; PISA, 2020). For beginning learners, the focus of creativity should be on the small-c level with an emphasis on individual experiences in classrooms (Lasky & Yoon, 2020).

The review of metacognition and reflection has indicated a controversy that some researchers prefer reflective thinking to metacognition (Moseley et al., 2005), while others argue that reflection is an integral part of metacognition (Tarricone, 2011; Zhang et al., 2012). The Confucian view of reflection is comparable to Dewey's reflective learning but with a focus on self-cultivation and moral values, and an emphasis on the genesis of new knowledge from the old (Li, 2015). Our project considers metacognition and contrastive intercultural reflection fundamental components of reflective thinking. An effective approach to develop this skill involves self-assessment and/or peer assessment guided by success criteria (Hattie, 2009) so that metacognitive knowledge, learning strategies and emotional strategies will be utilised for an ultimate goal of developing self-efficacy (Bandura et al., 2001; Bandura, 1995).

The review continued to explore the importance of knowledge in young learners' cognitive development and the differences between Chinese and Western modes of thinking (Nisbett, 2003; Peng & Nisbett, 1999; Zhang & Sternberg, 2005). The intercultural perspective highlights the significance of perceiving thinking from a subject perspective as well as incorporating the Chinese thinking style in pedagogical practices to optimise the benefits within the subject of teaching EFL.

The comprehensive review has established a conceptual framework for thinking. We propose this multifaceted construct comprises three interrelated dimensions: Disposition, Knowledge, and Skill. The three dimensions, their interrelated connections, and functions will be fully discussed in Section 7 (Creation of the Thinking Abilities Framework).

On this basis, we examined the development of thinking ability through teaching EFL,

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ultimately aiming for relevance to its implementation in the Chinese context. Educationalists and researchers are continually striving to identify approaches to EFL teaching and learning that is informed by thinking skills development (Jones & Richards, 2016). Many research studies have suggested that teaching EFL can contribute to the development of problem-solving skills, such as critical thinking (Abrami et al., 2008; Heidari, 2020; Liaw, 2007; Lin et al., 2018; Yang & Gamble, 2013) and creative thinking (McDonough et al., 2015) and how the use of thinking skills such as metacognition and critical thinking contributes to EFL learning (Bozorgian, 2014; He, 2011; Thamraksa, 2005). However, in language learning, educators face specific challenges posed by students' limited linguistic skills such as simple tasks, low interest and boredom, resulting in low level of engagement and motivation for thinking ability (Cheng & Sun, 2010; Lin & Mackay, 2004; William, 1998). Additionally, cultural difference has impacted on the interpretation and practice of critical thinking (Atkinson, 1997; Saleh, 2019) and creative thinking (Bereczki & Karpati, 2018; So & Hu, 2019). The greatest challenge, however, has been identified as teachers' inadequate knowledge, awareness, and skills for teaching critical thinking, creative thinking and other thinking skills (Li, 2016; Stapleton, 2011; Tyas et al., 2019).

In researching thinking ability through English in the Chinese context, the review has found that the main focus rested on providing opinions and sharing pedagogical experiences disproportionately on specific teaching aspects such as teaching reading, accounting for 70% (Chen, 2017), followed by 15% on writing (Dong, 2018). Limited attention has been given to exploring the connection between thinking abilities and other aspects of teaching, including vocabulary, grammar, and the integration of writing and reading (Cheng, 2018). Further analysis has found only ten empirical studies, the majority of which investigated senior secondary education and higher education, of which the research approach mainly employed a qualitative approach and used classroom observations as the primary method for data collection (Huang & Chen, 2016; Mou & Li, 2022; Xie & Lu, 2019).

The review suggests a conceptual framework that can serve holistically is currently absent from the development of thinking ability through the EFL subject (Zhong, 2015). Some misconceptions are also identified such as that thinking ability is more linked with reading comprehension (for example, Chen, 2017; Gu, 2020); that thinking ability is independent of linguistic skills (for example, Ge, 2019; Guo & Zhang, 2017; Zhang, 2016); and that thinking ability is often treated as separate from emotions (for examle, Xu, 2018; Zhang, 2016).

Overall, research in developing thinking ability through EFL needs a large-scale mixed-methods approach to study primary and secondary education (Bereczki & Karpati, 2018; Yuan et al., 2022). There is a need for tailored thinking ability framework for EFL in Chinese basic education and a holistic approach to the development of thinking through EFL. With these points in mind, of particular interest was the question of whether there was potential regional disparity in teachers' beliefs and practice. The examination of

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regional disparity was thus incorporated in all three of the following research questions.

Research Questions

1) How do primary and secondary English teachers in Hubei province understand thinking ability and its link with English teaching?

2) How do they develop their students' thinking skills in classroom teaching?

3) How do they view developing thinking skills in their teaching?

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3 Methodology

To address the research questions, a mixed-methods approach was employed. Two sets of self-reported data were collected through an extensive online survey (July 2022) and online focus group discussions (August/September 2022), which were triangulated with observations of recorded classroom videos. Nine recordings of classroom teaching were filmed in Hubei, using guiding principles (June 2022). The classroom teaching recordings were observed by the two academic leads, guided by questions which focused on teaching plans and teaching materials.

All stages of the research received ethical approval within the systems of UoR.

The survey questionnaire, seen in Appendix 2, was translated into Chinese and cross-checked by the whole team. The survey questionnaire was rigorously developed to measure self-reported awareness, knowledge, beliefs, and practice related to thinking ability (see detailed description in the full Methodology chapter here). The formal questionnaire contained 7 items of independent variables, 26 items on beliefs, 22 items on practice, and 2 items on support. From the concept perspective, it consisted of 9 items on the subject of Thinking Ability in general, 14 items on Critical Thinking, 11 items on Creative Thinking, and 12 items on Reflective Thinking. The survey was delivered via JISC Online Surveys and achieved a total number of 7087 of valid responses.

The survey data were analysed in SPSS27. For the qualitative data, we incorporated both inductive thematic analysis and deductive thematic analysis in NVivo. To conduct statistical analysis, 23 items of the questionnaire were computed as one scale named Attitude while the other 17 items computed as another scale called Practice. Figures 1 and 2 below show the reliability statistics of Scale Attitude and Scale Practice are 0.713 and 0.805, which is good and acceptable (Field, 2013; Vakili & Jahangiri, 2018).

Scale Attitude Reliability Statistics

Cronbach's Alpha	N of Items
.713	23

Figure 1 Attitude reliability statistics

Scale Practice Reliability Statistics

Cronbach's Alpha	N of Items
.805	17

Figure 2 Practice reliability statistics

For the focus groups, six discussions involving a total of 35 Chinese participants were conducted via Microsoft Teams, where the main moderator was based in the UK. The guidelines for focus group discussions were based on initial findings from recorded classroom teaching and the survey. They were drafted, reviewed by the whole research

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team, and were then revised and translated into Chinese. All participants were given pseudonyms, and these have been used consistently throughout this report as well as within the data itself, to protect identities.

The final guidelines covered four main subtopics:
1) Understanding of the overall concept of thinking ability and its relevant skills
2) Understanding of the link between developing thinking ability and teaching EFL.
3) Their practice in teaching.
4) Existing training and further training needs

Facilitators were thoroughly briefed about the guidelines and how to guide the sessions online without risking interfering with the natural discussion. Each discussion was automatically transcribed through Microsoft Teams, and selected sections were cleaned and translated.

It is our intention to make available a full explanation of the methodology in due course, on a dedicated website.

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4 Significant Findings and Results

Five significant findings are presented below, with each finding followed by the supporting results from both quantitative and qualitative data.

Finding 1: Regional disparities

As shown below, the statistical tests results of the survey data establish training and region both predict attitude, and attitude predicts practice. This would suggest that, should no other factors interfere, an argument can be made that training and region may impact practice; furthermore, urban vs non-urban regions show differing levels of training prevalence. Regional disparities are further observed through the recorded classroom teaching (see result 4 below) and in focus group discussions (shown in result 5)

Statistical Test Result 1: Correlation test and T-test

Pearson product correlation of teachers' attitude (beliefs and self-efficacy) and practice in the classroom was found to be moderately positive and statistically significant ($r=0.47$, $p<0.01$). This means that as belief scores increase, so too do practice scores. We will argue in the next section that this relationship might be causal.

Correlations

		Attitude	Practice
Attitude	Pearson Correlation	1	.472**
	Sig. (2-tailed)		.000
	N	7806	7806
Practice	Pearson Correlation	.472**	1
	Sig. (2-tailed)	.000	
	N	7806	7806

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 3 Correlation between attitude and practice

A one sample T-test was performed (compared to 0) to see if there was, in fact, any difference between attitude and practice. The summary of the test below indicates ($p=.000$) that the respondents' attitudes (beliefs and self-efficacy) are not congruent with their practices in the classroom.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Practice-Attitude	.09921	.38807	.00439	.09060	.10782	22.587	7805	.000

Figure 4 Paired sample test

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Statistical Test Result 2: Regression tests

We investigated the impact of six independent variables on teachers' practice in the classroom: school, age, gender, training experience, teaching experience, and region. The five significant variables in predicting practice were *attitude with F (9, 7796) =264.9, p=0.00*; *Training Experience with F (9, 7796) =264.9, p<0.01; Teaching Experience with F (9, 7796) =264.9, p<0.01; School with F (9, 7796) =264.9, p<0.01; and Region1 with F (9, 7796) =264.9, p=0.016*. The model explains 23% of the variance in practice (R2 = 0.23). The high beta value of Attitude (*b*=.57, *p*<0.001) >Practice suggests that *attitude* score is a measurable predictor for *practice* score, and thus improving the former may well improve the latter.

Summary of the Regression test

Regression Weights	Beta Coefficient	R^2	F	t-value	p-value
Attitude → Practice	.57	.23	264.9	43.9	.000
Training Experience → Practice	-.057	.23	264.9	-0.67	<.001
Teaching Experience → Practice	.044	.23	264.9	3.36	<.001
School → Practice	-.041	.23	264.9	-4.88	<.001
Region1 → Practice	-.029	.23	264.9	-2.420	.016

Figure 5 Summary of the regression test

From the Figure below, we can see that *training* and *region* are both strong predicators for *attitude*. Thus, this supports the hypothesis that *training* and *region* may impact *attitude* and thus *practice*.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	3.603	.025		141.823	.000	3.553	3.653
	Region1	-.081	.008	-.116	-10.487	.000	-.096	-.066
	Teaching Experience	-.021	.011	-.027	-1.873	.061	-.043	.001
	School	.019	.007	.029	2.637	.008	.005	.033
	Age	.011	.011	.014	.986	.324	-.011	.033
	Training Experience	-.135	.007	-.206	-18.613	.000	-.149	-.121

a. Dependent Variable: Attitude

Figure 6 Coefficients

Statistical Test Result 3: Chi-Square Test (χ^2 Test)

Indeed, Pearson's Chi-Square Test (χ^2 Test) was performed between *region* and *training* and the result of this test below suggests that different areas have different access to training. Comparing the percentage of teachers with training from urban (62%) vs non-urban (49%), this suggests that urban areas have higher levels of training experiences.

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Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	118.054[a]	1	.000		
Continuity Correction[b]	117.528	1	.000		
Likelihood Ratio	118.975	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	118.039	1	.000		
N of Valid Cases	7806				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 1190.28.

b. Computed only for a 2x2 table

Figure 7 Chi-Square tests

Result 4 from the recorded classroom teaching: Regional disparities in teaching and student performance

Observations of the 9 recorded classroom teaching discovered that the more remote, the bigger chances were that teachers taught students in a more traditional, grammar-based way, in which drilling, repetition of the pronunciation, spelling, doing written exercises were remarkably salient, e.g., in G4RR, G5RR, G7RR and G8RR. This trend was throughout all the levels. Embraced with this method, the teachers tended to focus more on discrete linguistic knowledge, i.e., sound, spelling through mechanical drillings instead of teaching meanings. Four lessons (G3S, G6U, G7U, G8S) were activity-driven and question-led and they were more likely to develop students' thinking ability. The main findings were summarised in the table below.

	Teaching methods	**Learning activities**	**Cognitive Skills taught**	**Student performance and motivation**
G4RR*, G7S, G8RR	More traditional, grammar-based teaching; mechanic drilling and rote learning	**Inactive type:** Repetition drilling written exercises (matching, gap filling, chart, translation exercises)	Remembering Recalling Understanding	Passive, quiet, demotivated (particularly G8RR)
G5RR, G7RR		Application type: differentiated tasks (making dialogues)	Application	Showed more interest but still lacked initiative thinking (or they were not given the chance to think)
G3S, G6U, G7U, G8S	More communicative, activity-led and question-oriented teaching	**Production and interactive type**: presentation, discussion, reflection, survey	Comparison and Contrast Evaluation	Much more engaged; responsive to questions; showed more skills in language and thinking ability

*G4RR stands for Grade 4 in a remote rural; S stands for suburban; U stands for urban.

Figure 8 Summary of findings from the recorded classroom teaching

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Result 5 from the focus group discussions: Regional disparities in the use of strategies

Regional differences are highlighted within ***Finding 4.4 The main strategies for developing thinking abilities*** later.

Result 6 from the survey data: Regional disparities in self-efficacy

Regional differences are highlighted within ***Finding 5: Generally low to mixed levels of teachers' self-efficacy of developing thinking ability through EFL teaching*** later.

Result 7 from the focus group discussions: Gap in the number of good practices between more developed areas and less developed areas

Tallying examples of good practice has demonstrated a gap of awareness and confidence levels between the more developed areas and less developed areas.

	Urban and suburban areas	Rural or remote rural areas
Total numbers of examples	19	2
Participants and the example numbers	Daisy (Group 1)-3 Eva (Group 2)-2 Daniela (Group 4)-1 Faye (Group 4)-3 Joyce (Group 5)-1 Alice (Group 5)-1 Daria (Group 5)-1 Emma (Group 5)-1 Fanny (Group 6)-2 Ava (Group 6)-1 Aria (Group 6)-1 Kathy (Group 5)-2	Daphne (Group 3)-1 Elina (Group 4)-1

Figure 9 Numbers of good practices

Good practices are to be discussed in ***Finding 4.5*** later.

Finding 2: Preliminary yet limited awareness of developing thinking ability through EFL

The results shown below suggest that Hubei English teachers have developed preliminary awareness of thinking ability since the introduction of the 2017 and 2022 English Standards. However, these teachers tend to prioritise exam results when confronted with various barriers such as tension between teaching content, the available time under exam pressure, and a lack of motivation from students, parents, and schools, as well as their

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own beliefs in the relationship between thinking ability and language teaching, in particular a misconception of developing thinking abilities in young learners.

Result 1 from the survey data: High importance and relevance of thinking ability to EFL

The survey results showed widespread agreement on the importance and relevance of teaching English to developing students' thinking ability or specific thinking skills. A total of 79.5% agreed learning English would improve students' thinking ability. 73.8% (strongly) agreed teaching English was of high relevance to critical thinking. 55.8% of the teachers believed creativity could be developed through learning while 23.3% of them were unsure and a small number of them viewed it to be innate. Additionally, 80.5% of the teachers found it essential to develop both the Chinese and Western ways of thinking. Nearly 80% acknowledged the importance of developing students' intercultural competence.

Result 2 from the survey data: Exams as the biggest barrier to developing students' thinking ability

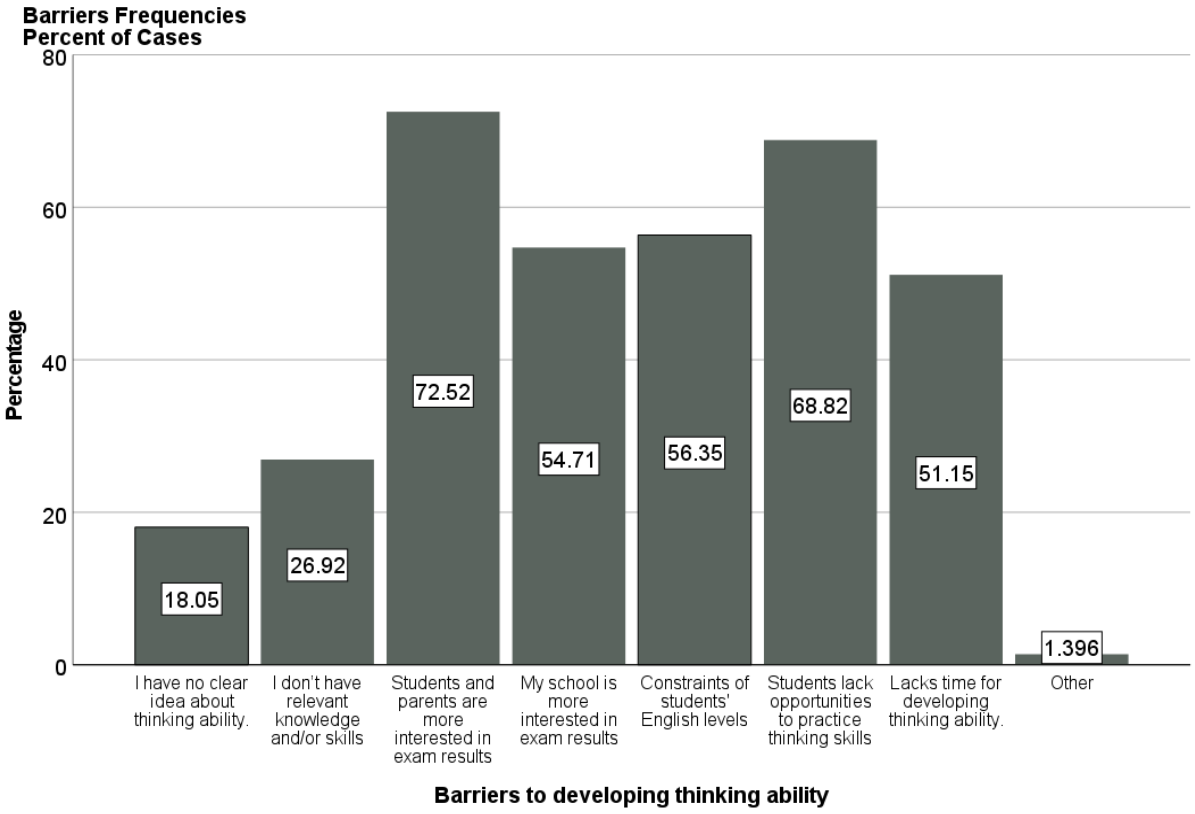

Figure 10 Barriers to developing thinking ability

As shown in Figure 10 above, the main barriers identified in the survey were a lack of interest from parents and students (76.53%) and a lack of opportunities for students to practice thinking skills (68.92%), which essentially is indicative of the backwash of the exam-orientated educational system.

Result 3 from qualitative data: Student linguistic abilities and exams as the biggest barriers to developing students' thinking ability

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The qualitative analysis identified students and exams as two external barriers. The biggest barrier, however, is not the exam system as suggested in the survey but rather the students linguistic and other capabilities. Rural teachers were often frustrated by a variety of student problems exemplified by Donna:

> *I 'm quite confused about developing students' thinking ability… [students] almost refused to open mouths ... they even struggled to learn a few words ... If I'm determined to make learning more communicative and encourage questioning, [the lesson] would end up being dreadful ... most students would be totally lost.*
>
> (Donna, Group 6)

In relation to linguistic deficiency, urban teachers were more concerned about students' inability to express themselves. This usually acted as a barrier to performances in class to the extent that an English lesson would become a Chinese lesson because their students were too fast in thinking and too eager to speak in English, e.g., *"If I ask them an open question about a story ending, or ask for their views towards a character in the story, they would be overly eager to offer their ideas ... but not in English."* (Faye, Group 4)

The second biggest barrier pointed to the impact of exams. Exams were said to be "invisible hands" that drives teachers to keep abreast with the progress set out in the syllabus. Emily (Group 6) summarised the situation concisely: *"What we positively discussed about developing thinking only exists in an ideal world. In reality, we're restricted. It's not that we don't want to, but we're straightjacketed by exams."*

A further widely discussed challenge or barrier related to limited resources, including training opportunities, as exemplified by a comment from Daphne (Group 3): *"Rural schools like mine have very limited opportunities to be exposed to English except for contact time in English lessons ..."*. The survey, meanwhile, indicated an overwhelming 83.3% desiring more support such as fit-for-purpose training, opportunities to exchange practices and observe demonstration lessons. Camila (Group 3) said: *"[We did have training], but this kind of pertinent training to the development of thinking abilities is not yet available."* This was resonated by many other teachers.

Result 4: Tension between development of knowledge and thinking ability

The survey revealed a divided opinion over the relationship between knowledge and thinking ability, which was reflected in their views towards exams. 40.2% opposed prioritising teaching knowledge over thinking ability, while 40.3% supported this approach.

In the group discussions, even though many teachers expressed that thinking ability and knowledge are both important, more teachers agreed that general knowledge and English knowledge is the foundation and precondition for the development of thinking ability as commented by Emily (Group 6): *"For me, thinking abilities can't be developed until students have adequate linguistic skills."* and by Daisy (Group 1): *"as a language teacher, we must, first of all, teach English knowledge. Then it comes to a question of how we can develop their thinking abilities."*

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Finding 3: Limited knowledge and skills

The teachers' understandings of each sub concept and skill are summarised below.

Cognitive skills

Most teachers have some knowledge of cognitive skills but only very few teachers can provide a structured concept. Most teachers are familiar with lower order cognitive skills such as recalling, understanding, comparing, and contrasting and fairly frequently cited some higher order cognitive skills such as evaluating and summarising. Summarising seems to be an important "higher order thinking skill" for Chinese EFL teachers. Lian (2002), a Chinese scholar has studied this skill and regarded it a type of Chinese inductive thinking.

Critical thinking

Critical thinking receives a prevailing dominance of a one-sided view, i.e., "a questioning spirit" in EFL teaching, which aligns with the findings by Chen et al., (2019). Other researchers, for example, Yuan et al., (2022) report similar incomplete and inadequate understanding of the concept.

Creative thinking

According to these teachers, teaching EFL has great potential to promote creative thinking because of its disciplinary features and the role as a window to a new culture. The subject is thus in the best position to promote "a broadened outlook", hence an open mind, a significant disposition that conduces to creativity (Jesson, 2012; Kim & Lee, 2020; PISA, 2020). According to some teachers in the focus groups, Densky's (2016) concerns about Chinese students' resistance of taking risks and making mistakes remains to be true. On the other hand, the challenging view suggested in the survey reminds us creativity has always been controversially contested in teaching and assessment (Lucas & Spencer, 2017).

Logical thinking

The Hubei teachers' understanding of logical thinking is limited to "sequencing sentences or paragraphs", indicating a simplistic comprehension of coherence in English discourse (Hoey, 1991; Thornbury, 2005). Logical thinking is indeed a myth for Chinese speakers. Studies on thinking modes in different cultures, specifically English and Chinese cultures suggest that the Chinese way of thinking is more "holistic" and "intuitive". In comparison, the Western way tends to be more "analytical" and "logical" (Lian, 2002; Nisbett, 2003).

Reflective thinking

Regarding reflective thinking, these teachers either have a minimum understanding or report a simplified concept such as "reflection on errors" or misunderstand it as "repeated thinking". Classroom observations showed this skill was rarely present in their teaching.

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Chinese and English ways of thinking

Both quantitative and qualitative analysis have congruently revealed that the Chinese and English ways of thinking are significantly different in terms of their focus and practice. It is thus of utmost importance for students to develop both modes of thinking through English language instruction. These teachers' "intuitive" comments are in line with previous research, which often present the two modes as dichotomous. Sun (2012) proposes that the traditional Chinese way of thinking which highlights experiences and ethical values, is best described as implicit knowledge. Alternatively, Western thinking is based on rational logic from the linguistic point of view and is best described as coded knowledge. This may explain why the teachers were preoccupied with logical thinking during the discussions and expressed a desire to improve this aspect in their teaching.

Some specific results are presented below.

Result 1 from the quantitative data: Knowledge of relevant thinking skills

The survey revealed that in the teachers' responses to the cognitive skills they taught, Understanding received 94.88% and Application 90.76%. The other major skills included Memorising, Comparing and Contrasting, Recalling and Synthesising respectively by 85.68%, 81.50%, 70.54%, 70.51% of teachers. The least taught skill is Creating and/or Evaluating, chosen by 51.97% of them. Over 60% of respondents disagreed that the concept of Critical Thinking referred to criticising and/or refuting. While more than half of the teachers believed in its teachability, developing creative thinking in the Chinese EFL setting was generally considered challenging due to intensive exam pressure. When asked about their knowledge of metacognition, more than half admitted they had little knowledge of the concept and nearly one third were unsure of the concept.

Result 2 from the qualitative data: Understandings of *Thinking ability*, *Cognitive skills*, *Critical thinking, Creative thinking, Reflective thinking* and/or *Metacognition*

The concept of thinking was conveniently embraced as a series of catchy items, as one teacher put in a long list, including *"logical thinking, abstract thinking, divergent thinking, convergent thinking, concrete thinking, discrete thinking, visual thinking, instinct thinking etc."* (Daisy, Group 1). In line with this were other descriptive words such as *"independent", "agile", "creative", "rigorous"* and *"discrete"* (Camila, Group 3). One or two individual teachers put this concept directly as *"an English way of thinking"* (Elina, Group 4). However, quite a few teachers indicated this concept seemed to be *"a broad term and an obscure concept"* (Charles, Group 3), so teachers themselves *"ha[d] little insights"* (Aria, Group 6).

In terms of a complete understanding of *cognitive skills*, many more admitted that they knew very little if not all. Alex, Daisy, Ella, Brooke in Group 1 all bluntly acknowledged *"I know very little about cognitive skills." "Me too, not much about it."*. Daphne in Group 3 said she was muddled with this concept. Even the confident teacher Kathy in Group 5 honestly commented *"...Cognition often confuses me."*

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Critical Thinking was universally believed to be a "questioning spirit", an idea endorsed by almost every teacher in groups which touched upon this question, and illustrated here by Donna (Group 6): *"[Critical thinking means] questioning by students. They shouldn't blindly accept everything the teacher infilled."* and Claire (Group 2): *"…critical thinking is a valuable characteristic of being able to question. Should I accept all the author's opinions? Do I adopt the same position as the author?"*

Creative thinking was believed to be linked with divergent thinking, and the deposition of open-mindedness. A firm believer, Elina (Group 4), insisted that the learned open-minded outlook would produce a "favourable" learning outcome, for example: *"a child ... growing in bilingual cultures … will develop an outlook different to that of those only nurtured by monoculture. Their outlooks towards the world will be very different ..."*. Her implicit message was categorically explained by Daphne (Group 3): *"[Learning English] actually develops their mindsets, or broadens their horizons."* Divergent thinking featured by the imagination and inspiration that English lessons can bring in are instantiated in the following comments: *"Year 9 has an article about Chang'e Flying to the Moon … I usually … ask students to predicate the story ending ... Students then recreate their own stories. I find it a nice idea to inspire students' thinking."* (Joyce, Group 5).

Logical thinking was viewed as highly relevant to teaching English by these teachers. These teachers' understanding was, however, limited. To most of them, teaching logical thinking was to ask students to do exercises such as *"sequencing a jumbled text"* (Joyce, Group 5) and Betty (Group 3) gives another example: *"… a paragraph with five key sentences missing from the original text ... students should choose the right one for each blank..."*.

The remaining respondents showed concerns about developing *logical thinking* through English due to their lack of conceptual understanding. Blaire (Group 4) agreed *"[D]eveloping logical thinking is still insufficient."* Alex (Group 1) was not satisfied with his teaching of logical thinking because *"My understanding of logical thinking … is still superficial."*

When asked about *metacognition*, most teachers said something similar to Enzo (Group 4)'s *"Honestly, the concept is unfamiliar to me ... I don't know much yet"*. Reflective thinking was the topic least referred to in all groups unless probed. It was clear that teachers either have minimal understanding or report a simplified concept such as "reflection on errors", e.g., suggested by Bella:

> *I always remind my students that they should copy the errors in a notebook, then analyse why they had lost the marks, how mistakes happened as well as any remedial measures and how to avoid these the next time.*
>
> (Bella, Group 2)

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Finding 4: Limited and imbalanced pedagogical practice

The following results indicate that the curriculum and relevant training received by Hubei English teachers have helped establish some good practices in their EFL classrooms. Yet the practices focusing on linguistic skills remain to be inconsistent among all aspects of teaching EFL with distinctive effectiveness in strategies employed in the delivery and varied intentional effort by all different regions.

The main findings regarding pedagogical practice are outlined below under four categories – lesson planning, teaching methods, promoting thinking abilities, and strategies for developing thinking abilities.

Finding 4.1 Lesson Planning

The qualitative results (as shown below) indicate that the 2022 Curriculum has established most teachers' awareness of cognitive skills as teaching goals and the importance of incorporating them into their teaching plans. However, they are commonly challenged by the issue of effectively delivering the prescribed goals for core competencies. Their confusion and disorientation may have been caused by the absence of explicit conceptual understanding of many thinking related concepts and pertinent guidance.

Results from qualitative data

In resonance with most other teachers, Claire made this observation about her lesson plans:

> *My previous teaching plans included key points, challenges, then teaching procedures as such. Since this year [2023] after the publication of the 2022 Curriculum, my teaching plans have undergone major changes. Cognitive skills will be included. I will write "by the end of the lesson, students should be able to summarise what, perceive what, learn what, understand what, and apply what" etc.*
>
> (Claire, Group 2)

One common challenge, however, arises in determining how each lesson can effectively achieve its prescribed goals for core competencies, as Kathy pointed out:

> *As required, thinking ability is a definite part of the lesson plan …, but I'm always stuck here. How can we achieve these? What will help achieve the goals? … We've just started the exploratory journey.*
>
> (Kathy, Group 5)

Finding 4.2 Teaching methods and learning activities

The results outlined below suggest there is a limited emphasis on pro-thinking activities that only involve comparing and contrasting Chinese and English cultures at a superficial

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level. The use of higher order thinking activities is differentiated by the levels of consciousness and confidence. Drilling and chanting activities are deemed necessary at elementary or beginner levels of English learning. Teacher responses suggest a subconscious belief that activities are more useful to engage students but not so useful in academic learning. Their view reflects a common perception of TBLT in EFL whereby activities are useful and beneficial for creating dynamics rather than promoting academic progress (Bao & Du, 2015; Liu et al., 2021).

Result 1 from recorded classroom teaching: Inactive and disinteresting activities

Inactive and disinteresting learning activities in the form of mechanical drilling, translation, doing exercises are dominant in G8RR, G4RR, G7S. A few lessons such as G3S, G6U and G8S demonstrated some level of interaction and efficiency in thinking.

Result 2 from the survey data: Activities organised dominantly for linguistic skills

The survey results show the most often organised activity endorsed by 88.68% of the teachers was for skills training, such as activities to develop listening, speaking, reading and writing. This was followed by activities to promote communication and application, fun activities, and explanation. The much less often organised activities were discussion, debating, reflection, analysing or solving a problem, and extensive reading.

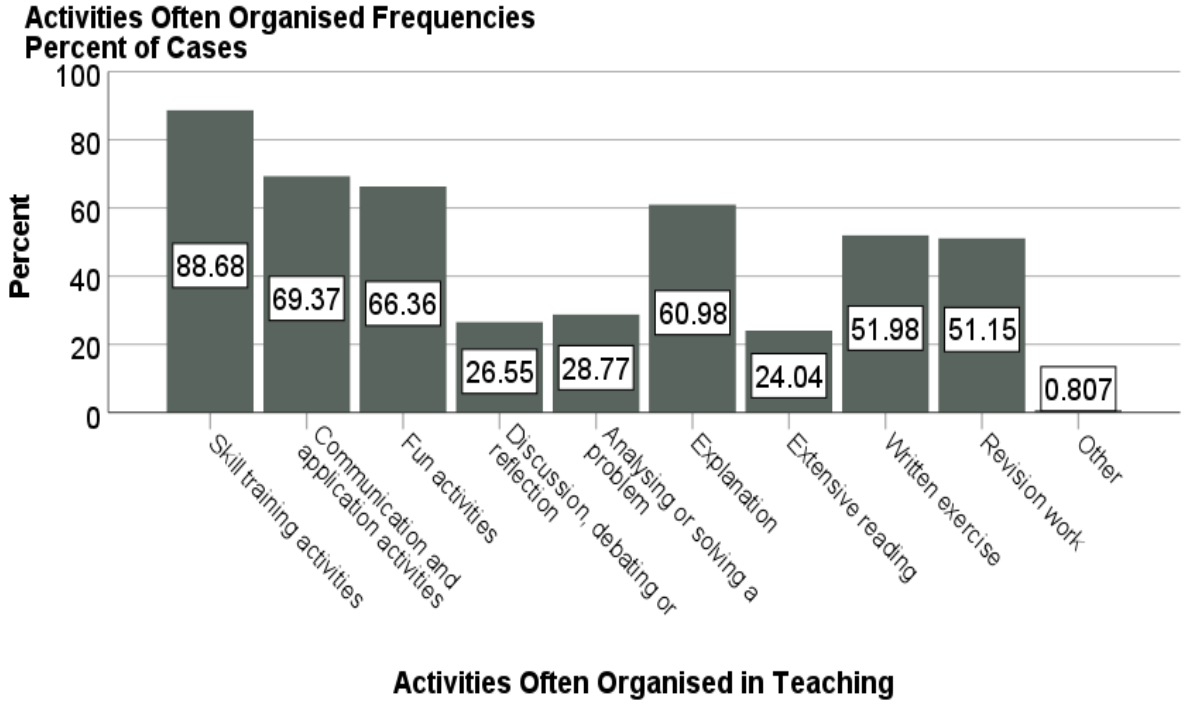

Figure 11 Activities often organised in teaching

Result 3 from qualitative data: The use of activities for engagement and its concerns

A general finding emerging from focus group discussions is the less developed areas the schools are, the more “conventional” type of method is employed. By “conventional”, a rural teacher, Daria (Group 5) explained, *“The conventional teaching methods are, in my*

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view, about using slides, how to design each step, for example a step for games, a step for competitions, a step for dialogue drills etc."

A common feature of using activities in primary school was to engage students through *"…games and competitions, such as memory games, reasoning games…"* (Fanny, Group 6). Chanting for its "rhythmic beats" was also very popular in primary schools because *"Kids [young learners] are very interested in the rhythmic language. And it's so memorable. They're highly motivated [in this way]."*, as Blaire (Group 4) said. Recorded Classroom teaching observed this popularity.

Typical comments on concerns about the use of activities in teaching were related to time constraints and exam pressure, demonstrated by Clara:

> *I think this [lack of activities] is to do with the assigned hours to English, and our teaching content. For example, in Year 7… students showed more interest … In Year 8… With other subjects added to [the students' timetable, where each week has less time for English] … In Year 9, [it's another matter]. Teaching only revolves around exams with no extra time left, let alone developing thinking abilities. It's basically neglected.*
>
> (Clara, Group 1)

Finding 4.3 Aspects that promote thinking abilities

The results suggest teaching reading and intercultural study are more likely to link with thinking ability and promoting its development. However, the major aim of teaching reading seems still for developing linguistic skills, revolving in most classrooms around cognitive development of lower order thinking skills such as observation, understanding, recalling, with some exceptions for teachers who have clearer conceptual understanding of higher order thinking skills like evaluation and reasoning. It is not surprising that teaching reading is viewed as a major channel for thinking ability. Since the introduction of the 2017 English Standards, Qiang Wang (2007), a prominent figure in the field, has advocated the role of teaching reading in teaching thinking. Many more journal articles published in Chinese widely explored various approaches to developing thinking via teaching Reading, such as Liu (2018) and Du (2020), as discussed in the review of literature.

The teaching of writing has been found not significantly to contribute to the development of thinking skills as expected. It was not showcased in the recorded classroom teaching either. This may relate to some perceived difficulty in teaching writing. Many negative comments in the focus groups suggest that teaching writing is notoriously challenging for Chinese teachers, let alone developing thinking through writing. The teachers themselves have limited knowledge of writing pedagogies. For the majority, their understanding of process writing is no more than an intuitive concept, lacking in-depth understanding of the procedures and benefits. In this context, writing is still perceived as an exercise to apply and learn a foreign language rather than an activity that promotes the expression of ideas and transforms thinking from invisible to visible (Lawrence & University of Michigan, 1977).

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Logical thinking seems to be a thinking skill that most teachers can directly relate to English teaching. However, it is broadly acknowledged that the teachers have inadequate knowledge of this thinking skill and explicit teaching of logical thinking is absent from their classes.

Very few teachers in the focus groups could establish a connection between thinking ability and listening, and grammar teaching, which mirrors the fact that little attention has been given to teaching aspects other than reading in prior research, as indicated by our literature review.

Significant results are outlined below.

Result 1 Teaching reading

The graph below shows the main methods for teaching reading included questioning, comprehension exercises, translation and the use of discourse analysis.

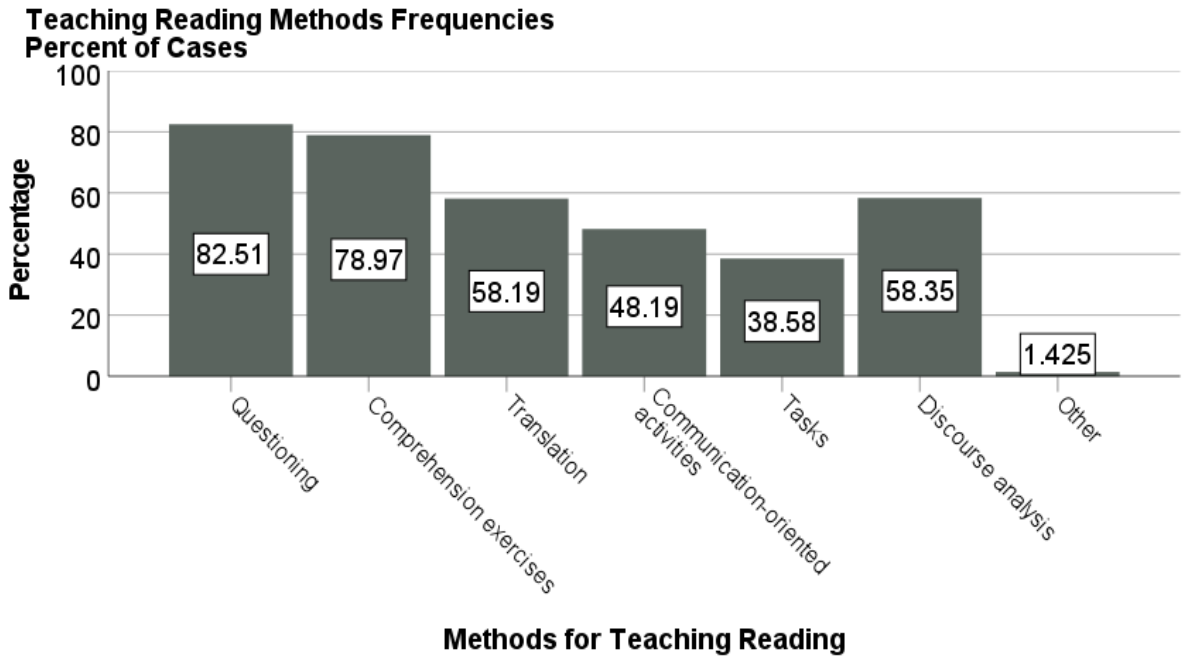

Figure 12 Methods for teaching reading

The focus group discussions discovered that teaching reading was utmost to develop some cognitive skills such as understanding and summarising. Understanding or comprehension was the most discussed skill in their teaching. Two teachers' comments offered insight as to why:

> *First of all, [students] carefully read… then understand [the text] and underline the key information. Based on comprehension, they then carry out exercises. I particularly require them to check the answers against the original text in the article, then correct any mistakes.*
>
> (Alex and Carol, Group 1)

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Only a few individual teachers such as Eva (Group 2) could relate reading to the development of more "advanced" cognitive skills by inviting her students to make comparisons and evaluations in the teaching of illustrated stories. However, logical thinking was usually manifested in a vague manner, for example, *"I would use thinking maps in my teaching to help students sort out the text structure, then to develop their logical thinking."* (Faye, Group 4)

Result 2 Intercultural study

Apart from teaching reading to promote thinking, developing students' intercultural awareness was believed to another highlight in this subject. They were articulate about how intercultural awareness through comprehension, analysis, comparison and contrast, evaluation and critique would ultimately lead to the development of thinking skills. The below is an illustration of how this might happen:

> *I had a lesson about festivals. After learning the Chinese festival and the Western one, I drew a Venn diagram to let them explicitly compare and contrast the two festivals. This presentation was very clear and useful to develop their logical thinking.*
>
> (Faye, Group 4)

Many teachers such as Joyce (Group 5) agreed that cultural comparison was a good way to promote *"kids' own observations and opinions."* However, perhaps due to the barriers mentioned before, this useful approach was mainly limited to comparisons of cultural symbols such as foods and festivals at the superficial level.

Result 3 Teaching writing

As shown below, the most popular teaching approach adopted by 81.07% of the teachers was *Product writing/Model-led writing* followed by *Discourse analysis* adopted by 73.50%. A high percentage of 64.56 claimed using Process writing.

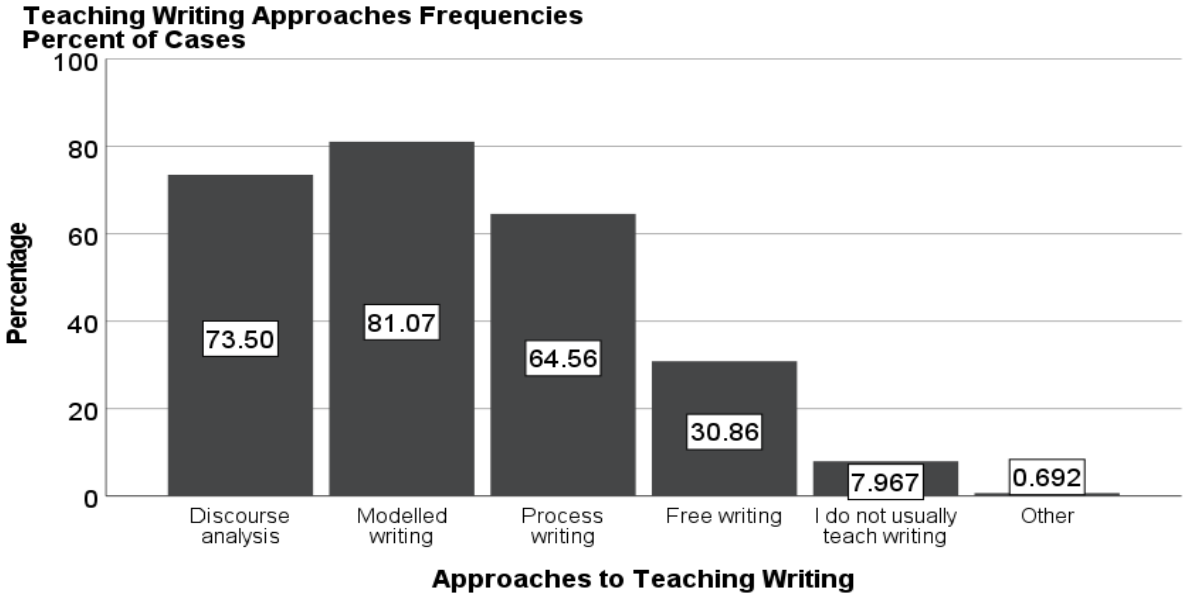

Figure 13 Approaches to teaching writing

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Interestingly, the focus group discussions portrayed a somewhat different picture.

> *We teach [students] to connect words into a sentence in Grade 3. … not to start with a composition … but from phrases, sentences, then paragraphs, then to an article. They start with picture writing, then writing dialogues, then progress to articles. This is a naturally progressive process.*
>
> (Eva, Group 2)

While it was true that the dominant teaching approach was *Modelled* or *Product writing* or a type of guided writing, as illustrated above, when asked about their experiences and opinions towards *process writing*, the majority of teachers seemed to be unfamiliar with this approach, for example: *"[I] don't have much experience in using process writing."* (Eva, Group 2); *"As writing isn't a focus in primary, I have no insight into process writing."* (Emily Group 6)

Teaching writing in these teachers' eye was easy yet challenging. By "easy", they perhaps meant "In primary, writing does not involve thinking or creation". According to Emma (Group 5) teaching was sometimes a simple exercise of *"monkey see monkey do"*. The "challenging" side was reflected in marked negative comments on teaching writing mostly in junior but also in primary. Typical comment was: *"My students always have a headache in writing …"* (Brooke, Group 1). Many teachers agreed that the problem was linked to students' constrained knowledge and the negative transfer of the mother tongue. *"They write in a Chinese way of thinking, the Chinglish thinking mode."*, as commented by Alex (Group 1).

Perhaps due to the perceived difficulty, teaching writing was not showcased in the recorded classroom teaching.

Finding 4.4 The main strategies for developing thinking abilities

Mind-mapping identified in the focus group discussions has received unanimously positive use. Conversely, the use of other strategies presents a mixed picture. Teachers' use of discourse almost exclusively serves teaching structure and general understanding without further sophisticated application. It is no surprise that questions are adopted as a popular instructional strategy by teachers in Hubei, like elsewhere (Arslan, 2006; Kerry, 2002). However, the main purposes are to give instructions and monitor teaching and learning. Despite their recognition of the importance of using questions, the teachers lack awareness and knowledge of using questions in teaching thinking abilities and, particularly, they have inadequate awareness and knowledge of encouraging students to make questions.

Result 1 Discourse analysis

In the survey, more than half (53.4%) were quite confident about this concept while nearly 24% of them acknowledged their inadequacy and 22.9% were unsure. In the focus groups, most of the teachers viewed discourse analysis as *"analysing the structure, e.g., different*

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layers of meanings" (Camila, Group 5); or *"analysing the genre… mainly about its structure, or how it is organised"* (Aria, Group 6).

Result 2 Questioning

The survey revealed 75.7% of the teachers used a questioning approach in teaching English. In terms of student performance, 54.1% were satisfied that their students were responsive even to "challenging questions". 60.7% felt their students were given adequate time to think and discuss. However, this finding was not congruent with the observation of the classroom recordings. In most observed lessons, particularly G8RR, G4RR, G7S, students were given little or no time to think, reflect and discuss. The lessons were driven by repetitive drillings, translations, and exercises. Therefore, students were much more disengaged and passive in learning.

The focus group discussions further confirmed that questioning played a significant role in their teaching for instruction, teaching reading and engagement. The main purposes of asking questions seemed to assist teaching the language rather than conduce thinking. Camila (Group 3) summarised in this way, *"I ask many questions in a lesson, but they mainly serve the purposes of instruction, and focus less on developing students' thinking abilities."*

We were particularly interested in how teachers used the strategy of student-generated questions in class. Most rural or suburban teachers, tended to see the benefits of inviting students to make questions as monitoring teaching or students' learning. Daphne, Brian, Betty were such examples, as illustrated here:

> *Students generating questions is used for correcting mistakes in my class. If one student asks a question, another student answers it. The rest, whether they hear the question or they answer it, will learn.*
>
> (Daphne, Group 3)

Somehow, other experienced teachers also admitted with honesty that this very useful strategy was mostly used in open lessons.

> *Autonomous questioning is common in my teaching. It is more often to be used in open lessons or competition lessons. Occasionally, it is used in my daily teaching depending on the class ability level.*
>
> (Emily, Group 6)

The reported constraints or challenges for students asking questions are mainly attributed to "inadequate linguistic skills" and "lack of confidence" of their students. Only rural teachers partly ascribe their students' reluctance of questioning to "traditional culture", which indicates the influence of Confucius view towards authority (Wang, 2013). One particular challenge was to do with teachers' own knowledge, as evidenced by this quote: *"I have no particular knowledge about questioning."* (Francis, Group 3). This was seen as concerns about teacher qualification according to Eva (Group 2).

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Result 3 "Creative homework"

The survey found assigning "creative homework" was distinctively divisive with half and half in agreement and disagreement. The focus group discussions revealed another clear tendency that the more urban the teachers were, the more creative homework they assigned, as evidenced in this quote from an urban teacher: *"Copying words is definitely one kind of homework. Another major type is reading illustrated books … Other homework may include singing English songs, telling English stories or performing a play etc."* (Eva, Group 2). Whereas, in rural areas, typical homework included *"… e.g., copying words and doing exercises. If there are content nouns, students may be asked to match with a picture."* (Ella, Group 1).

Finding 4.5 Good practices

The focus group discussions demonstrated that there were some good practices shared by some participants in each group as a result of implementation of the curriculum and training provided.

Two examples from focus group discussions were shown below.

> *In primary schools, even though reading materials are not particularly difficult, after a reading comprehension or by the end of a story, we often deliberately leave out some key information, not allowing students to read the whole text. Instead, halfway through their reading, we encourage them to guess the end. I believe this way may help develop their creative thinking.*
>
> (Daisy, Group 1)

> *In one lesson, I took two school bags to class, one light, one heavy. I asked my pupils which one they would like to open. All of them were curious about the heavy one. In the bag were some stationeries, toys, and dirty clothes. We studied every item one by one then judged which should be put back in a 'schoolbag', which by definition should only contain relevant items to study ...The pupils were very interested in the lesson. I think it helped them develop a kind of critical thinking as well.*
>
> (Fanny, Group 6)

Finding 5: Generally low to mixed levels of teachers' self-efficacy of developing thinking ability through EFL teaching

The survey results suggest that the teachers' opinions regarding their self-efficacy in understanding and implementing thinking-related abilities were divided. In the focus group discussions, teachers commonly faced problems in understanding sub-concepts such as metacognition and self-efficacy. Other concepts that they found challenging included critical thinking, reflective thinking, and cognitive skills. In terms of practice, some teachers believed they were using approaches such as discourse analysis and questioning in

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teaching while their discussions suggested their understanding of the concepts were oversimplified, inaccurate, and the use had not been adequate. All the findings and results indicate that the sampled Hubei English teachers exhibit a generally low to mixed levels of self-efficacy in developing thinking ability through EFL teaching. Self-efficacy is important as it is reflective of their classroom practice and to what extent they promote learner achievement and have attained job satisfaction (Alibakhshi et al., 2020). It is also a significant factor that predicts changes in classrooms such as the change described by Li that included the use of new technology in computer assisted teaching (Li et al., 2019).

Result 1: Regional disparities in self-efficacy

The means scores displayed in Figure 14 clearly show a trend of higher self-efficacy levels in the more developed areas as compared to the less advantaged areas.

Self-efficacy by Region Means

Mean

	Region				
	Urban	County and Suburban	Township	Remote Rural	Total
11. I know how to develop students' thinking ability through teaching English.	3.54	3.42	3.36	3.26	3.41
26. R_I have little knowledge of metacognition myself.	2.75	2.68	2.64	2.63	2.68
27.R_I don't know how metacognition can be used to develop students' thinking in my teaching.	2.55	2.53	2.48	2.51	2.52
29. R_I know little about self-efficacy.	3.10	3.06	3.02	3.03	3.05
30. R_I know little about how to develop students' self-efficacy through teaching English.	2.88	2.86	2.81	2.82	2.85
15. I have a clear idea of what critical thinking means in English teaching.	3.46	3.27	3.25	3.21	3.32
18. R_I have little knowledge of discourse analysis in teaching English.	3.48	3.38	3.26	3.21	3.35
19. R_I have little knowledge of different types of questions.	3.23	3.14	3.02	3.01	3.11

Figure 14 Self-efficacy by region means

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5 Conclusions

Hubei English teachers acknowledge the importance of developing thinking ability. However, thinking ability remains mostly an abstract concept and its existence within the curriculum has so far had limited impact on teaching practice in school English lessons. Teachers' awareness has been further challenged by the limited English language abilities of young learners, their own low levels of self-efficacy, and inadequate support and training in relation to core competencies prescribed in both 2017 and 2022 English Standards.

The limited impact on practice is at least in part caused by inadequate conceptual understanding of thinking ability and its sub-skills. Teachers' understanding remains largely limited to simplistic views of an unstructured connection between cognitive skills and other thinking skills such as critical, creative and reflective thinking. This limited view further constrains a holistic connection between developing thinking ability and all aspects of English teaching.

Therefore, even though Hubei English teachers have shown an awareness of the need to incorporate cognitive skills in their teaching plans, consistently successful integration has not yet been established in the pedagogies. Their teaching largely focuses on language knowledge and basic thinking activities rather than intentionally structured higher-order thinking activities. An incomplete grasp of possible strategies such as questioning, discourse analysis, process writing, intercultural study, and the use of homework has contributed to imbalanced and uneven classroom practice.

Disparities between urban and rural areas has exacerbated the disproportionate development of thinking in these teachers' classrooms. The urban teachers benefit from more resources, e.g. training opportunities, which enhance their conceptual understanding and in turn increases their self-efficacy in classroom practice. In contrast, teachers from the rural areas have been hampered by limited resources, resulting a lower level of self-efficacy and a tendency to be less receptive to the idea of developing thinking abilities in the EFL classroom. To address these challenges, we suggest a holistic approach to pedagogical practice in the development of thinking abilities through EFL teaching, and therefore also within the teachers' CPD. This holistic approach can be guided by a conceptional framework of thinking abilities, usable as both a reference and as a training tool. The following section is dedicated explaining how the research described in this report led the authors to create the Thinking Abilities Framework.

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6 Consideration of Gender Equality

The project members at both ISLI UoR and HIES comprised a balanced team, with four females and three males. The survey and focus groups however highlighted the gender disparity seen among teaching staff in Chinese Primary and Junior education. Female English teachers dominate, so from the start there was a conscious effort to include as many male teachers as possible during data collection, while timing research activities so that they were equally as convenient for both males and females to respond to. The project actively sought a balance to address the disparity. On a number of occasions, China partner HIES acknowledged the importance of achieving gender balance in relation to data collection and actively sought to achieve greater male representation. We designed the research tools to strive for a balanced mix of participants for the focus groups regardless of age, gender and teaching experience through offering the survey online, and through selection when recruiting for focus groups and pilot training.

The large survey, the focus groups and the training gave us good access and engagement overall. While the research data achieved diversity in age, teaching experience and also school profile, we still faced challenges to balance staff gender ratios due to the real imbalance in schools, especially at primary level. Questionnaire responses were 8.4% male and 91.6% female, while for data where we could exert an amount of control we achieved 17.1% male attendance in the focus groups (six males and 29 females), and 25% male attendance in the piloting training (three males and nine females).

The research focused on disaggregating gender data, examining its correlation with practice and belief through regression tests in SPSS. Gender did not significantly predict practice or belief in either the questionnaire or the focus groups, and differences in the way male and female teachers perceive the integration of thinking skills in the English language curriculum were not disclosed. Professional development was a shared priority for both male and female teachers.

During briefings when preparing for focus group discussions and piloting training, facilitators were reminded that EDI is to be borne in mind at all times, so that questioning or topic coverage did not stray into unwanted areas such as cliched gender roles in society.

This projects data reveals known gender disparities in Chinese education, emphasising the challenge of gender inclusivity in data collection, and reflecting a global challenge. Yet the results suggest that gender-related factors do not significantly impact independent variables of practice and belief. Our results have not shown any obvious differences in the way male and female teachers perceived the integration of thinking skills in their teaching and both genders equally value professional development. The fact that most teachers are keen to professionalise further is important on the larger scale as well as for individuals. Not only does a more professional teaching workforce lead to better perception of schools and better results, it results in more respect for teachers in general, which in this case naturally leads to having more women regarded as experts.

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We are hopeful that this research project has raised awareness of existing inequalities in Chinese basic education, i.e. teachers tend to be disproportionally female while the disproportion tends to be less among leaders of basic education. The Framework is designed to empower all teachers due to its fair access for all parties, especially since it will be freely available online. The Framework further professionalises the English language teacher profession by helping to clarify what is expected in terms of the teaching of Thinking Skills, and saving on planning time within busy schedules. We therefore hope that this empowerment will simultaneously help make the teaching profession more attractive to men, while making leadership positions in the field more open to women.

While the researchers are satisfied that efforts to include male teachers in the activities paid off, and the results have not highlighted any gender-specific attitudes to professionalising, there is room for further research into the attitudes of the recommended next steps: the delivery and reception of CPD training. We would hope that male and female teachers will contribute with equal agency in the trainer role as well as participant role within CPD training.

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7 Creation of the Thinking Abilities Framework

In the context of the 2022 English Standards, this project adopts an integrative approach of tripartite dimensions, i.e. disposition, knowledge, and skill, as identified in the literature review. Each dimension has a role within the Framework. The following offers further explanation of the three dimensions specifically pertaining to young learners' EFL education.

Disposition

In young learners' education, fostering cognitive dispositions such as trust, curiosity, and reflection, is essential for facilitating integrative skill mobilisation and critical thinking (Lipman, 1985; Simister, 2007). The development of critical thinking skills requires a state of readiness, including knowledge of reasoning and a willingness to challenge established beliefs and a quest for truth (Fisher, 2005). Additionally, in the context of learning a foreign language, being open to judgment and evaluation assumes a vital disposition (Black, 2008). The Thinking Abilities Framework incorporates thinking characteristics and personality traits within the *disposition* dimension, with the primary objectives at different learning stages encompassing: being inquisitive and imaginative (Level 1); focused and confident (Level 2); open-minded and rational (Level 3).

Knowledge

Within the context of EFL, the knowledge dimension specifically relates to English language proficiency and cultural understanding. This necessitates phonological and morphological development at primary level and syntactic and semantic development at junior level. These aspects assume a crucial role in shaping students' conceptual development, influencing their cognitive representation of the world and their thinking abilities (Bjorklund & Causey, 2017; Szűcs & Goswami, 2007). Furthermore, specific knowledge areas such as questioning skills, discourse analysis, and basic knowledge of facts, opinions, emotions/ feelings, and judgements (Li & Liu, 2021) are vital for fostering thinking ability. Throughout the Framework the levels of language proficiency and cultural understanding are implicit since these are covered elsewhere in the 2022 curriculum guidance.

Skills (Cognitive and Thinking Skills)

The review of literature has established that cognitive skills serve as the foundational basis for thinking skills. Intricately intertwined, the two processes represent two complementary aspects of cognitive functioning. The most widely acknowledged cognitive framework is arguably the revised Blooms cognitive domain taxonomy (Anderson & Krathwohl, 2001). This taxonomy has been recognised as a valuable tool for classroom teaching in education. Numerous studies (for example, Assaly & Smadi, 2015; Irvine, 2017; Köksal & Ulum, 2018) have highlighted its usefulness in teaching and learning as well as student outcomes. However, there are debates regarding the order of skills in the framework, for instance *understanding*, often seen as a lower order skill, is argued by some to be a higher order skill, as it results from thinking rather than being a process itself (Ritchhart et al., 2011). This project considers understanding a dynamic and iterative process that spans both the foundation and higher order levels of thinking. Foundational *understanding* aims

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to acquire and process information while higher-order *understanding* is an enhanced insight for utilising information.

Thinking skills are distinguished by different modes of thinking such as critical, creative and reflective thinking, each with distinct features and purposes. Critical thinking involves developing an open-minded disposition and questioning skills, thereby employing logical reasoning in analysis to make good decisions. Similarly, Creative thinking, characterised by open-mindedness, entails generating new ideas and applying critical thinking for value evaluation (Fisher, 2005; Jesson, 2012) to achieve deep learning and problem solving (Padget, 2012).

This research looks at reflective thinking from both the Chinese and 'Western' perspectives, i.e. that which tends to get communicated through English. The Chinese perspective emphasises self-reflection and transformation in the context (Li, 2015). The Western cognitive psychology views reflection as a metacognitive process that utilises cognitive and emotional skills to regulate thinking and learning through reflection on oneself, tasks and strategies (Anderson & Krathwohl, 2001; Schraw & Moshman, 1995; Tarricone, 2011). Metacognition, along with the use of strategy and knowledge, influences higher-level cognitive aspects in young learners and contributes to improved functioning and self-regulation (Bjorklund & Causey, 2017; Fisher, 1998; Goswami & Bryant, 2007). Thus, developing metacognition is a major goal in young learners' education and an important component of the proposed skill in the resulting framework.

Levels and Stages of the Thinking Abilities Framework

Classifying the thinking levels of the Framework (Appendix 1) requires a division between school grades 3-4; 5-6; 7-9, and this incorporates Piaget's Concrete Operational Stage (7-11 years) and the Formal Operational Stage (11-15 years) (Piaget, 1952) with a focus on language teaching in EFL classrooms. Level Objectives are defined, classified in terms of dimension and level. The classification captures the maturation process of abstract thinking which suggests a progression of mastering meta-language, abstract concepts in the English subject and the development of dual thinking modes, i.e., Chinese and Western ways of thinking. In this sense, the levels within this framework progress horizontally in line with different age groups.

The Framework sets out skills at the foundational thinking stage and the higher-order thinking stages. Foundational thinking skills serve purposes for acquiring, processing and utilising knowledge, including cognitive skills such as perceiving, understanding, and applying. The two most important thinking skills at this stage are questioning skill and logical reasoning skill. In contrast, higher-order thinking skills containing analysing, evaluating, creating and reflecting, which are necessary for decision making, innovation, personal growth and transformation. These are some very important learning skills in primary and secondary education as they lay groundwork for further development. It is important to note that 'understanding' and 'application' can span both the foundational and higher-order levels, depending on whether aspects of creation are involved, as can be seen under the Level Objectives column.

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8 Implications and Recommendations

The findings and conclusions of the primary research illustrates that implementing an educational initiative in classrooms requires significant follow-up work. If a new curriculum expects teachers to implement its proposals regarding core competency such as thinking ability within the English subject, it is essential to provide immediate and consistent support, including sufficient fit-for-purpose teacher training. To address this, some recommendations are outlined below.

Recommendation 1: The tripartite dimensional Thinking Abilities Framework

We recommend the Thinking Abilities Framework as can be found in Appendix 1 to teachers for lesson planning, classroom teaching and monitoring students' progression in the development of thinking. The Framework should be used in conjunction with the indicators of level objectives in Appendix 3. Perhaps most importantly, teachers are encouraged to share use of the Framework, and teacher trainers are encouraged to develop CPD training based on it. The Framework as published is a first version, and in time the authors may make incremental adjustments or improvements as it gets used within our own training programmes. Other users are welcome to make their own adaptations to fit their circumstance.

Recommendation 2: A holistic approach to teacher development

We recommend a holistic approach to teacher development in order to fully implement thinking ability teaching within the English subject. This approach should involve professional development training to transform teachers' awareness, knowledge and beliefs into pedagogical practice considering changes from the "onion model" outer layer of *environment* moving towards the centre of *mission* along the stages of changes in *behaviour*, *competencies*, *belief*, and *identity* (Korthagen, 2004).

First, teachers should establish a mindset that promotes the development of thinking ability in the context of EFL. Second, teachers should be guided by the conceptual framework in Appendix 1 for a full understanding of thinking's constitutional concepts and functions. They should then apply the recommended pedagogies that align with the Framework, something which can be experimented with between training sessions, and ideally colleagues, mentors or superiors would be monitoring the application of the Framework.

A combination of online and in-person training is recommended to facilitate knowledge transfer reinforced by the face-to-face experience. Some possible topics for teachers CPD courses can be found in Appendix 4.

Recommendation 3: An integrated pedagogical approach to developing thinking ability in the EFL subject

Teaching EFL provides a valuable opportunity for students to enhance thinking disposition by introducing them to different languages, cultures and thinking modes. Despite their limited language ability, young learners possess natural curiosity which can be effectively harnessed to develop questioning skills and ultimately foster critical and creative thinking.

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Thus, we recommend the following pedagogical approaches to implementing the proposed framework.

1. A general active learning approach.

   This approach is supposed to tackle the misconception of young learners' limited language abilities to develop thinking abilities. It is important to recognise that "learning and thinking should go hand in hand - students should be guided to acquire, retrieve and organise language and cultural knowledge in understanding-oriented activities in order to make connections between different types of knowledge" (MoE, 2022:11). This statement delivers a message that developing thinking in an English class means to engage students in learning activities for effective results. It aligns with the conclusions of Ritchhart et al. (2011), that the development of thinking is a process for *engagement*, *understanding* and *independence*. From our perspective, only when thinking becomes an inevitable part of meaningful and purposeful learning will learners be engaged. To do so, it requires a move away from a more traditional deductive teaching to a student-centred approach. It highlights that classroom teaching should be based on tasks/activities (MoE, 2022) or hypothetical problems to solve through techniques such as group work, projects, and discussions, and through integrated skills practice in all aspects of teaching, i.e., listening, speaking, reading, writing, and English language knowledge.

2. An intercultural approach.

   This approach aims to cultivate thinking dispositions by engaging students in a comparative analysis of Chinese and the Western cultures. Through comparison and contrast, and reflection, students can develop in-box and out-box perspectives (Kim & Lee, 2020). It is crucial to acknowledge the interconnectedness of culture, thinking, and language, and recognise how language may mediate between the other two. Therefore, contrastive views between the two cultures and languages should be consciously used in teaching to avoid the negative transfer from the mother tongue and gain a better understanding of the textual differences in the two languages (Wang & Liu, 2021).

3. A questioning approach.

   This approach aligns with a broader concept of dialogic pedagogy (White, 2016). It views education as inherently dialogic, with meanings constructed through classroom dialogues. Within these dialogues, it is important for teachers to ask good, clear, open and constructive questions and provide constructive feedback to develop critical thinking (Neenan, 2009; Paul & Elder, 2007; Salmon & Barrera, 2021). For young learners, it is vital that they know how to ask questions and what good questions they should ask (Fisher, 2005). Hypothetical or real problems to solve can be incorporated into this approach to enhance its effectiveness and make it more meaningful, and to remove the tendency to use questioning only for classroom management.

4. A neuroscience-based memory approach.

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This approach is fundamental to knowledge development and ultimately thinking (Willingham, 2017). It is essential that teachers should have the awareness of a multi-sensory approach, to make full use of memory strategies in instruction, and to develop a robust foundation of language knowledge, especially phonological knowledge and spelling for young learners, to encourage language fluency and accuracy (Goswami & Bryant, 2007).

5. Staged approaches to teaching reading and writing.

   Writing and reading, and the teaching of both skills areas, are the primary approaches to developing thinking. The three writing approaches, i.e. process-writing; creative writing; and product writing should be considered corresponding to the teaching objectives at different learning stages. Initially, writing instruction should focus on teaching discourse techniques to develop logical thinking, a foundation for critical thinking. The teaching of reading should be carefully staged to suit different educational levels. In primary education, priority should be given to illustrated books/stories using a questioning approach during instructions. In junior schools, techniques such as jigsaw-reading and SQ3R should be considered, along with introducing preliminary knowledge of discourse analysis. In addition, delayed retrieval such as writing summaries, getting key words, and completing diagrams can be employed to improve overall reading comprehensive ability (Thiede & Bruin, 2018).

6. A success criteria approach to the development of reflective thinking/metacognition and self-efficacy.

   An effective approach to the development of reflective thinking and self-efficacy involves a specific tool called “success criteria”, popularly adopted in British primary and secondary schools. This tool usually consists of graphic table outlining specific objectives for a specific topic across subjects. Different schools may use alternative terms to refer to the same concept. In writing lessons, some use “marking ladders” while others use “checklists” that assign students specific criteria for peer or self-assessment. Provided with explicit written criteria, learners are encouraged to actively and interactively take responsibility for their own learning.

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9 For the Future

Many of the thinking concepts and their connections to teaching EFL are still being explored, and there is much that remains to be tested and understood. Future research can concentrate on examining the proposed pedagogies to assess their impact and effectiveness. Attention can further focus on EFL teaching at the senior level in China and incorporate the 2017 English Standards to develop a senior framework. Due to the limited space within the current project, emotion and its impact on thinking and decision making are only lightly touched on, therefore this can be a focus of future research. Methodologically, the survey questionnaire used in this study was the first of its kind to investigate the broad topic of developing thinking abilities through EFL teaching; comparable empirical studies if undertaken would be encouraged to further verify its validity and reliability, and build upon its success.

Most importantly, the authors welcome experimental use of the Thinking Abilities Framework, and look forward to feedback on its practical usefulness, so that we can produce improved versions in future.

This research project has demonstrated a desire to closely connect research and practice in the school EFL sector, and showcased the benefits of an international joint effort by all parties, not just researchers themselves but the teachers and schools who contributed.

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