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ORIGINAL ARTICLE



# Chinese expert teachers' critical thinking strategies for professional growth

Wei Liao <sup>a</sup>, Miao Liu <sup>a</sup>, Zhaoxuan Wang <sup>b</sup> and Kongji Qin <sup>c</sup>

<sup>a</sup>Center for Teacher Education Research, Key Research Institute of Ministry of Education, Beijing Normal University, Beijing, China; <sup>b</sup>Faculty of Education, University of Macau, Macau, China; <sup>c</sup>Department of Teaching and Learning, New York University, New York, NY, USA

## ABSTRACT

This qualitative case study examines how Chinese expert teachers use critical thinking strategies to seek opportunities for professional growth. Taking a practice-oriented perspective, we conceptualise teachers' critical thinking as a series of strategies for improving instructional practice, school engagement, and social service in situated contexts. Through thematic analysis of interviews with six Chinese expert teachers, we identified three critical thinking strategies that played an important role in the teachers' professional growth: (a) justifying pedagogical decisions to enact high-quality instructional practice; (b) extending school norms to develop democratic relationships with colleagues; and (c) addressing critical reform issues to make contributions to the society. This study adds to the literature an integrative, practical, and context-specific conceptualisation of teachers' critical thinking. It also suggests implications for teachers, school administrators, and teacher educators to leverage critical thinking as a guiding force to advance teachers' professional growth.

## ARTICLE HISTORY

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## KEYWORDS

Critical thinking; teacher professional growth; expert teacher; teacher education

## Introduction

Facing the drastically changing and increasingly complex world, education systems across the globe have been refocusing their goals from developing students' subject matter knowledge and skills to developing students' competencies that are deemed essential to their future career and lives. Critical thinking has been identified as one of those core competencies and has gained much traction in educational policy, research and practice worldwide (Organisation for Economic Co-operation and Development (OECD) 2019). A rich body of research has documented the crucial roles of critical thinking in advancing human development, especially the development of school students (Lai 2011, Facione 2015, Paul and Elder 2019). However, research on the influence of critical thinking on teachers' work, lives, and professional growth remains limited (Foster and Fleenor 2019). In theory, if teachers experience the benefits of critical thinking themselves, they would be more invested in developing their students' critical thinking abilities and dispositions.

In this study we examined how teachers' critical thinking strategies influence their professional growth. More specifically, drawing on interview data collected in a qualitative case study of six Chinese expert teachers, we explored the relationships between critical thinking and teachers' professional growth. We intentionally use professional growth rather than professional development because professional growth highlights the nonlinearity and inevitability of teacher changes resulted from both teachers' self-initiated efforts and external forces (Taylor 2020).

## Literature review

### *Understanding critical thinking*

The existing literature has produced several consensual insights about critical thinking. First, critical thinking is a goal-directed and careful type of thinking. After comparing nineteen definitions of critical thinking, Ennis (2016) concluded that, 'Though the words used are different and the amount of detail varies from one definition to another ... they seem to be just different ways of cutting the same conceptual pie.' (p. 9). The same 'conceptual pie' is that critical thinking is a special type of thinking with two distinctive features: (a) directed towards a goal (e.g. forming a judgement); and (b) careful (e.g. evidence-supported, reasoned).

Second, from a compositional perspective, critical thinking has two interrelated dimensions: ability and disposition (Paul and Elder 2019). The ability dimension refers to a series of higher-order cognitive skills, such as questioning, analysing, evaluating, judging, among others (Hitchcock 2018). Compared to the abilities, critical thinking dispositions are more deep-seated and stable traits, characters, and mindsets that support a person to think critically (Facione 2015). Several dispositions have been commonly identified as indispensable components of critical thinking, such as open-mindedness, inquisitiveness, the propensity to seek reason, systematicity, among others (Lai 2011). The ability and dispositional dimension of critical thinking are interdependent and can mutually reinforce each other (Paul and Elder 2019).

Third, a few studies began to adopt a practice-oriented perspective to understand critical thinking (e.g. Davies and Barnett 2015, Paul and Elder 2019). From this perspective, critical thinking is viewed as a series of observable, imitable, and actionable practices undergirded by the abilities and dispositions mentioned above. For instance, Paul and Elder (2019) proposed a list of such practices that a critical thinker usually present, such as asking vital questions, gathering and assessing relevant information, drawing well-reasoned conclusions, and communicating effectively with others. The practice-oriented perspective has special advantages in guiding people to critically engage with their work and lives for improvement (Davies and Barnett 2015). As the work of teachers is highly practical and context-specific, we adopted the practice-oriented perspective to understand how a group of Chinese expert teachers enact and leverage critical thinking to improve their professional work.

### *Critical thinking and teachers' professional growth*

A growing but still small number of studies have investigated the links between critical thinking and teachers' professional growth. Conducted across a range of education contexts, these studies have found that critical thinking can positively influence teachers' personal qualities, teaching practices, and continuing learning and development. For instance, Egmir and Ocak's (2020) study in Turkey examined the relationships between teachers' critical thinking and their reflective thinking abilities. Their study found a strong correlation between these two qualities of teachers. Yuan *et al.*'s (2022) review of 25 empirical studies conducted in 15 different countries showed that teachers' critical thinking abilities helped deepen their understanding of content knowledge, change their teaching approach from the banking models of instruction to empowering pedagogy, and develop their professional identity from an information giver to a critical facilitator. Drawing on survey data collected from 67 Iranian teachers, Birjandi and Bagherkazemi (2010) found that the teachers' levels of critical thinking were positively correlated with the teachers' overall scores on a teacher success scale developed by the researchers. As Elder (2005) put it, 'Critical thinking, rightly understood, is not one of many possible "angles" for professional development. Rather, it should be the guiding force behind any and all professional development' (p. 39).

Recently, an emerging line of research began to focus on the roles of socio-cultural factors in shaping teachers' views of critical thinking and its relationships to their professional growth (Chen and Wen 2019, Tan 2020, Zou and Lee 2021). For instance, Tan (2020) investigated 16 Chinese teacher leaders' perspectives of the relationship between critical thinking, schooling, and culture.

These teacher leaders reported that developing teachers' critical thinking is often influenced by the larger social and educational factors, such as the high-stakes testing system and the traditional pedagogical approaches that emphasise the centrality of textbooks in teaching and didactic teaching approaches. This growing body of literature has been foregrounding a knowledge base for understanding the relationships between critical thinking and teachers' professional growth in particular socio-cultural circumstances.

## Conceptual framework

Drawing upon the literature reviewed above, we developed a conceptual framework (Figure 1) for generating and analysing the research data for the present study. This framework consists of three major propositions that respectively operationalise teachers' professional growth, highlight the role of critical thinking in advancing teachers' professional growth, and identify other factors that impact teachers' professional growth.

First, the framework views teachers' professional growth as an ongoing process of improving three interrelated domains of professional competencies, including instructional practice, school engagement, and social service. Teachers' work includes but is not confined to the classroom. Many studies (e.g. Kennedy 2010, Paine *et al.* 2016) have highlighted the institutional and social dimensions of teaching. Informed by this body of work, we broadened the construct of teachers' professional growth to include the improvement of teachers' competencies respectively for instructional practice, school engagement, and social service.

Second, the conceptual framework posits that critical thinking is a guiding force that drives and sustains teachers' professional growth (Elder 2005). Traditionally, critical thinking is understood as a complex composite of cognitive abilities and dispositions. But recent years, as influenced by critical theories and action sciences, the studies on critical thinking are shifting their focus from unpacking compositional elements of critical thinking to identifying and fostering actionable critical thinking strategies that individuals can employ to make positive changes to themselves, others, and their communities (Davies and Barnett 2015, Paul and Elder 2019). Informed by this body of literature, our conceptual framework views critical thinking as a series of practical strategies

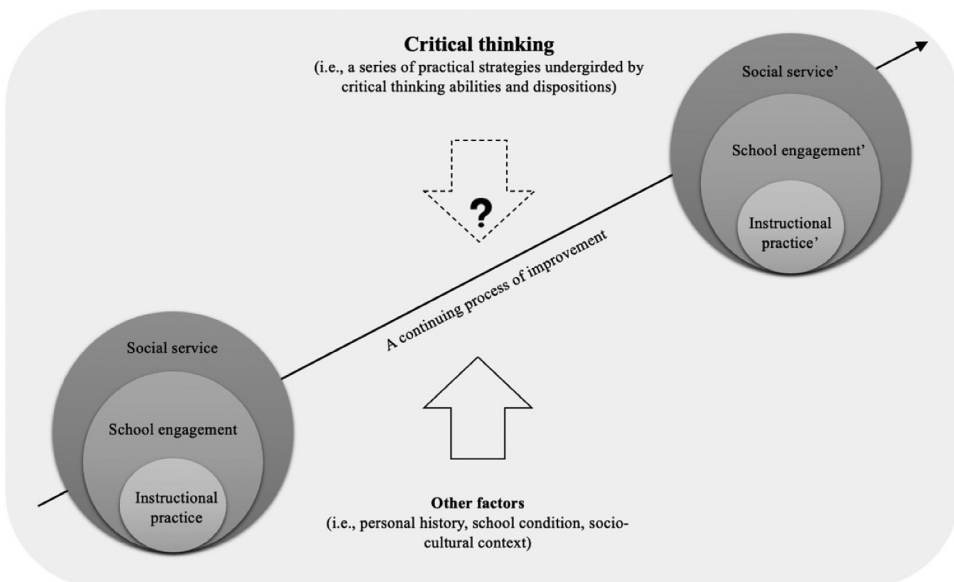


Figure 1. Conceptual framework.

that can help advance teachers' professional growth in their situated contexts. We intentionally keep critical thinking loosely defined to explore Chinese expert teachers' context-specific critical thinking strategies which are scantily reported in the literature.

Third, previous studies have identified several other factors that can impact teachers' professional growth (e.g. Avalos 2011). These factors include teachers' personal backgrounds, school conditions (e.g. school culture, administrative structure), and socio-cultural contexts (e.g. traditional belief, reform discourse). We included these factors in this conceptual framework to inform our research design, data generation, and data analysis.

## Research methodology

Our analysis drew on data collected from a qualitative case study of six Chinese expert teachers. We adopted a case study design because, as methodologist Robert Yin (2014) argues, the case study methodology is particularly suitable for studies that aim at exploring 'why' and 'how' questions regarding a certain social phenomenon.

## Participants

We recruited six expert teachers from various regions in China as the participants. The teachers were members of a national professional development programme initiated by China's Ministry of Education – *Developing Expert Teachers to Become Professional Leaders* (名师领航, *Mingshi Linghang*) (Ministry of Education 2018). The primary goal of *Mingshi Linghang* was to support the country's most outstanding teachers to develop further to become professional leaders in regional and national education reform. A total of 127 expert teachers participated in this national professional development programme; the teachers were recommended to the Ministry of Education by their respective provincial Department of Education. All these teachers meet the following criteria: (a) having demonstrated outstanding teaching performance; (b) holding the distinguished-level professional title or the Special-Grade Teacher Award<sup>1</sup>; (c) having received provincial or national levels of professional awards (Ministry of Education 2018). The first author had the chance to work with six of these expert teachers in a professional development (PD) session on critical reading that the first author offered as part of the *Mingshi Linghang* curriculum. In the PD session, the first author noticed that the six teachers displayed strong critical thinking practices, such as asking 'why' questions, and actively seeking new approaches to addressing persistent problems in education. Given this reason and the important roles that expert teachers play in educational practice, research, and reform (Goodwyn 2017), we invited the six teachers to participate in this study to deepen our understanding of the relationships between critical thinking and teachers' professional growth in the Chinese context. They all agreed to participate on a voluntary basis. We started the research project upon the participants' informed consent. Table 1 lists the relevant backgrounds of the six expert teachers.

## Data generation

Guided by the conceptual framework, we conducted three semi-structured interviews with each participant. Each interview lasted one to two hours. In the first round of interviews, we focused on understanding the trajectories of the participants' professional growth, their family backgrounds, personal interests, and their schools, which allowed us to situate our understanding of their professional growth within the broader social, educational contexts. The second interview focused on understanding the participants' perspectives on the major factors contributing to their professional growth. In particular, we probed the participants' perceptions of critical thinking, self-evaluations of their critical thinking practices, and the ways in which their critical

**Table 1.** Participants' backgrounds.

Name (pseudonym)	Province/ region	School level	Subject	Years of teaching (as of 2021)	Professional title	Professional awards	
						Special- Grade Teacher Award	Other selective awards (level)
Pan	Chongqing	Secondary	Maths	31	Distinguished	No	First-tier book award in basic education (provincial)
Zhao	Shaanxi	Elementary	Maths	32	Distinguished	Yes	First-tier paper award in educational research (national)
Xie	Yunnan	Elementary	Chinese	31	Senior	Yes	First-tier award in primary school Chinese reading teaching contest (provincial)
Zhang	Gansu	Elementary	Chinese	31	Distinguished	Yes	Special prize of the first classic poetry teaching contest (national)
Zheng	Hong Kong	Elementary	Chinese	33	n/a	n/a	Chief Executive's Award for Teaching Excellence (provincial/regional)
Tan	Hong Kong	Elementary	Special education	23	n/a	n/a	Chief Executive's Award for Teaching Excellence (provincial/regional)

Note: China's professional title system and the Special-Grade Teacher Award do not apply to teachers in the Hong Kong Special Administrative Region of the People's Republic of China (henceforth Hong Kong). However, the two Hong Kong teachers (i.e. Zheng and Tan) both received the Chief Executive's Award for Teaching Excellence (CEATE), the highest teacher award in Hong Kong, which indicated that Zheng and Tan could be seen as top-performing and expert teachers in the context of Hong Kong. See more information about CEATE at <https://www.ate.gov.hk/english/index.html>.

thinking practices influenced their professional growth. After the first two rounds of interviews, we inductively analysed the interview data, and identified several preliminary themes regarding how critical thinking practices shaped their professional growth. Using those themes and the conceptual framework as references, we conducted the third interview with each participant, focusing on how critical thinking had shaped their instructional practice, school engagement, and social service.

### Data analysis

We first conducted verbatim transcriptions of the interviews. Then, we used a combination of inductive and deductive coding to analyse the interview transcripts. This step resulted in initial codes about each participant's critical thinking and professional growth. We also identified preliminary themes of how the critical thinking codes and professional growth codes were connected for each participant. Next, we conducted a cross-participant analysis (Yin 2014) to identify common themes across the six participants. Finally, we refined the identified common themes through (a) member checking with the participants; (b) seeking the participants' additional insights regarding our interpretations through interviews; and (c) consulting with 'critical friend' scholars about our data interpretation. Table 2 provides an overview of the final themes and sub-themes of the research findings and the corresponding evidential paths of inference.

**Table 2.** Themes of research findings and evidential paths of inference.

Dimensions	Themes	Sub-themes	Pan	Zhao	Xie	Zhang	Zheng	Tan	Count
Instructional practice	Justifying pedagogical decisions to enact high-quality instructional practice	Comparing different references to plan instructional practice	√	×	√	×	√	×	3
		Drawing on relevant theories and research to inform instructional practice	×	√	√	√	√	√	5
		Using trial-and-error to explore new ways of instructional practice	√	×	×	√	√	√	4
School engagement	Extending school norms to develop democratic relationships with colleagues	Learning from fellow teachers to improve schooling practices	√	√	×	×	√	√	4
		Leveraging professional capital to negotiate with school administrators	×	×	√	√	√	×	3
Social service	Addressing critical reform issues to make contributions to the society	Aligning schooling practices to regional/national reform initiatives	√	√	×	√	√	×	4
		Providing tailored support to teachers in other schools	×	√	×	√	×	√	3

## Findings

Our analysis found that the Chinese expert teachers in our study articulated three major types of critical thinking strategies in advancing their professional growth: (1) justifying pedagogical decisions to enact high-quality instructional practice; (2) extending school norms to develop democratic relationships with colleagues; (3) addressing critical reform issues to make contributions to the society.

### *Justifying pedagogical decisions to enact high-quality instructional practice*

#### *Comparing different references to plan instructional practice*

Half of the teachers reported that their critical thinking skills allowed them to critically evaluate pre-packaged instructional ideas and to develop their instructional practices sensitive to their local instructional contexts and responsive to their students' needs. When presented with pre-packaged instructional guides such as teachers' guidebooks, they always asked whether the teaching plans included in such guidebooks were suitable for their classrooms and students, as illustrated in the interview we conducted with Xie, an elementary school teacher of Chinese from Yunnan province.

I could still teach an ordinary lesson if I followed the teachers' guidebook that my school gave to us, just like how other teachers did. But I was always wondering if there was a different or better way to teach my students. So, I purchased books with various lesson plans for my subject and grade. By comparing those lesson plans, I realized that there were many different methods for teaching the same topic, much richer than the ones presented in our teachers' guidebook. I also probed the rationales behind each instructional method and asked why one method might be more appropriate than another for teaching my students.

Xie's comment indicated that she took a critical stance towards pre-packaged instructional guidance. Instead of blindly taking up such guidance, she critically evaluated the strengths and weakness of the methods and adopted the ones more appropriate for her students. This critical stance was also evident in the professional work of Zheng, an elementary school teacher of Chinese from Hong Kong. She commented that she compared different educational philosophies to inform



her instructional ideas. For Zheng, Western and Chinese philosophies had their respective strengths and limitations; she adopted an eclectic approach by integrating Western and Chinese philosophies to guide her teaching and made necessary adaptations to meet the needs in the local educational contexts. For instance, in her teaching, she combined character strengths – ideas from Western positive psychological studies – with several traditional Chinese concepts, such as benevolence, righteousness, courtesy, wisdom, and faith underscored in Confucianism.

The two examples, along with several others in our data, illustrated that comparing, one of the core critical thinking abilities, supported the teachers in noticing, analysing, and adapting different instructional ideas. It also helped them identify and develop more contextually appropriate instructional approaches to meet the needs of their students better.

### *Drawing on relevant theories and research to inform instructional practice*

Five participants reported that critical thinking had led them to use theories and research to inform their instructional practices. For instance, Zhao, an elementary school teacher of mathematics from Shaanxi province, consciously drew on educational theories and research, particularly the notion of visualising learning, to inform his mathematics teaching. Visualising learning is a concept developed by Liu Zhuoyuan, a leading Chinese scholar on thinking visualisation. In the interviews, Zhao commented that Liu's (2014) practical model for visualising student thinking, along with the research in cognition and brain sciences, inspired him to apply this theory in his classroom. Zhao said that his school asked teachers to embody 'mental education (心智教育)' in every classroom. Mental education focused on developing both the heart and the mind of every student. At the beginning, Zhao was worried that mental education might be too general and abstract to be actualised at the classroom level. After reading Liu's research, he applied Liu's model of thinking visualisation into his teaching of mental education. He broke down the notion of mental education into several dimensions, collected data for each dimension, and then visualised them using Liu's model. Thus, he established a hands-on framework for monitoring, visualising, evaluating, and improving his instructional practice while also managed to align his teaching with the school's overall educational approach.

Similarly, Xie used Dewey's (1915) scholarship on the school-society relationship to justify her intentional incorporation of authentic materials into teaching. Tan, an elementary school special education teacher from Hong Kong, drew on Gardner's (2006) theory of multiple intelligences to explain her belief that students with special needs and the other students should be treated equally because they all are individuals with full dignity and unique values. Zheng hinged on the theory of holistic education (全人教育) to develop her Hong Kong students' understandings of both the Chinese and western cultures (Liu 2004).

These examples reflected the participating teachers' strong propensity to seek reasons behind the educational phenomena they experienced, which motivated them to actively engage with educational theories and research to inform their professional work. Such practices deepened their understandings of teaching and education and allowed them to make theory-informed and evidence-based pedagogical decisions.

### *Using trial-and-error to explore new ways of instructional practice*

Four of the six participating expert teachers reported that critical thinking had led them to use a trial-and-error approach to keep pursuing new ways of teaching. Guided by such an experimental spirit and practice, these teachers kept improving their instructional approaches. For instance, Zheng, a Chinese teacher in one elementary school in Hong Kong, shared that when she learned a relatively new teaching approach called drama-based pedagogy in Australia, she hoped to apply it to her instructional practice. In her effort of taking up this pedagogy, Zheng took into account the different teaching conditions between Hong Kong and Australia. Zheng reasoned that the class size in Hong Kong was significantly larger than that in Australian classrooms. If she directly transplanted the Australian model of drama-based pedagogy to her classroom in Hong Kong, it would be



neither feasible nor effective. Therefore, she initiated several cycles of lesson study, a form of collaborative learning widely practiced among teachers in Hong Kong and other East Asian regions, to explore effective approaches to adapting the drama-based pedagogy into the instructional contexts in Hong Kong. With the support of her fellow teachers, Zheng eventually crafted an adapted version of drama-based pedagogy that effectively catered to the large class size, drew on Chinese cultural elements to make the drama-making and learning more culturally responsive to her students, and connected the contents of drama-based pedagogy to the educational tests in Hong Kong.

Similarly, Zhang, an elementary school teacher of Chinese from Gansu province, experimented various approaches to teaching Chinese writing for years. In the beginning years of her teaching career, Zhang did not allow parents to get involved in their children's learning of Chinese writing because she worried that might undermine her authority as a teacher. But eventually she realised that she was the only reader of her students' writings, which seemed to have caused the students' low level of motivation for writing. With this realisation, she asked her students to read each other's writings in small groups. Surprisingly, this small pedagogical move motivated the students to engage in writing activities. Affirmed by the positive change, Zhang then invited the students' parents, good friends, and other teachers to read and share feedback on the students' writings, which significantly improved the students' motivation for writing and their writing performance because the students felt that their work and ideas were read, valued, and cared. As a result of the pedagogical exploration, Zhang compiled her students' writings, along with her comments and teaching reflections, into a book and published it with the title *My Children, You Are Free Writers* (孩子, 你是自由的作家).

These examples showed that the teachers embodied a strong experimental spirit, which was central to their efforts for keeping exploring more innovative, engaging, and context-sensitive instructional approaches to meet the needs of their students. The teachers' exploratory efforts had led to their mastery of new pedagogical strategies (e.g. drama-based pedagogy) and positive impact on student learning (e.g. increased interests in writing).

## **Extending school norms to develop democratic relationships with colleagues**

### **Learning from fellow teachers to improve schooling practices**

In terms of school engagement, four teachers reported that critical thinking had led them to develop an equal, dialogic, and collaborative mentality when engaging with teacher colleagues. As experienced and outstanding teachers in their respective schools, these teachers said they always reminded themselves to be humble and respect other teachers. Zheng, for instance, intentionally repositioned herself from a 'mentor' – an authoritative role with great power in the Chinese context – to a 'co-inquirer' when mentoring student teachers in her school. She explained,

Every teacher is an independent mind, regardless of their experiences or titles. We all have our own strengths and limitations. I value the chance to communicate with young teachers. They have many new and great ideas. I could learn a lot from them and I really appreciate it. Because of this [i.e., equal relationship with junior teachers], I was able to generate many new and inspiring ideas through our candid and dynamic conversations.

Once, Zheng observed a first-year teacher's lesson on 'The Golden Bird and the Silver Bird (金鸟和银鸟).' This is a story about a man who does not realise that the silver bird he already has is equally or even more valuable than a golden bird he wishes to have until the silver bird finally leaves him. This story has been widely used in the Chinese context to teach students the importance of cherishing what they already have. The young teacher used a timeline to visualise the rises and falls of the character's mood. She also used a video that went well with the spirit of

the story. Zheng said she was so impressed by those new ideas and materials that she later integrated them into her own teaching after making some adaptations, which had enhanced her students' learning interests.

In contrast, Zhao said he was a stubborn person before. As a senior teacher and vice principal in his school, Zhao originally thought that his ideas were perfect, other teachers must follow his directions, and he always chose not to consider other teachers' thoughts or suggestions. With such a bureaucratic mentality, Zhao often ran into challenges in his efforts at leading reform initiatives in his school. Through critically reflecting on his beliefs, attitudes, and behaviours in leadership practices, Zhao realised that the self-absorbed and even a little authoritarian approach he originally took would not work because teachers felt that their ideas were not valued and their voices did not matter. Zhao eventually changed his way of dealing with collegial relationships. He learned that initiating sincere and multi-lateral dialogues with different teachers was quite effective, because such an approach could not only broaden his scope and angles of thinking, but more importantly it enhanced teachers' engagement with and support to school-wide reform endeavours.

These and other examples in the data reflected another important critical thinking ability and disposition the teachers possessed: the respect for and willingness to entertain the viewpoints of others, especially the ones with less experiences or lower positions in the same school community. The teachers' increasing awareness of and attentiveness to others had eventually led them to establish equal, dialogic, and collaborative relationships with their teacher colleagues.

### *Leveraging professional capital to negotiate with school administrators*

Half of the teacher participants reported that their critical thinking had empowered them to leverage their professional capital to negotiate with their superiors in the schools for change. By drawing on their professional judgements, experiences, and expertise, these teachers positioned themselves as equal to their superiors (e.g. principals, more senior teachers). Zhang's declining of her principal's request was a telling example. Zhang demonstrated outstanding teaching performance and outcomes in her first few years of teaching. Her principal noticed this and once asked her to represent the school to attend a teaching contest organised by the local authority. Embedded in the educational and cultural traditions, the teaching contest is a widely-used approach to advancing teachers' professional growth in China. Earning prizes in teaching contests can factor importantly into a teacher's professional promotion and getting other benefits at work. Therefore, in order to win in such competitions, teachers who enter the competition would spend a significant amount of time on preparing and repeatedly rehearsing their lesson, often with the same group of students, for perfection. Such practice has been normalised and widely practiced in many schools. Zhang's principal also asked her to do so, but Zhang firmly declined because it contradicted her belief that teaching should be authentic and sincere communications between teachers and their students. She reasoned,

It [a rehearsed lesson for teaching contests] is so fake. I felt very sorry for the students every time when I saw them being used as an instrument in a teaching "show." If a teacher asks students to rehearse the same lesson over and over again, it actually signals a message to the students: their time doesn't matter. If every teacher does so, that will ruin the students. The students, deep in their hearts, will no longer respect knowledge and teachers.

Zhang certainly paid a price for her disobedience to the principal's directive: losing several learning opportunities and resources. However, Zhang said she did not regret because she followed the basic principles of education in her heart (i.e. caring about students' feelings and needs) and maintained the professional integrity she strived to preserve.

Similarly, in her long-term efforts at promoting and practicing holistic education in her school, Zheng faced a wide range of doubts and resistance. Zheng said, the senior administrators and parents always asked for better test scores, regardless of whatever fancy pedagogical theories and

methods the teachers were advocating. Bearing this reality in mind, Zheng took several measures in her actualisation of holistic education in the school. First of all, she ensured that the students could perform satisfactorily on the standardised test scores, because she said this was a prerequisite for reforming teaching within the existing education system. Second, she integrated small pedagogical moves aligned with the idea of holistic education into her existing teaching practices step by step because she believed that no reform could be realised overnight. Third, she collected various and many types of evidence about the impact that the holistic approach to education had brought to students. Zheng said, ‘That’s what I did in the past twenty years. I used evidence and proved to them [i.e. senior administrators and parents] that holistic education does work.’

As evidenced in these examples, the expert teachers in our study displayed another important ability and disposition of critical thinking: questioning, especially when facing the pressure from school stakeholders who were at more senior or powerful positions. The spirit and practice of questioning seemed to be rooted in the teachers’ clear vision of and strong commitment to quality education. Their questioning spirit and practice also enabled them to challenge institutional norms, identify the room for further improvement, and challenge the authorities even at the risk of receiving criticisms or losing benefits.

### ***Addressing critical reform issues to make contributions to the society***

#### ***Aligning schooling practices to regional/national reform initiatives***

Four teachers reported that critical thinking had increased their sensitivity to education reform initiatives outside of their schools. Schooling practices are closely connected to and influenced by educational, political, and social contexts in which the schools are situated. In the context of China, the impact of those contextual factors on schools is even greater due to China’s centralised education systems and collectivism-oriented cultures. Over the past few decades, China’s Ministry of Education has initiated a series of educational reforms to enhance educational equity and quality. The teachers in our study were able to recognise the existence and importance of those reform initiatives and actively gauge their professional work according to those initiatives.

Zhao’s effort to develop school-based curricula was an illustrative example. In recent years, one of the education reform initiatives focused on diversifying school-based curricula to meet the needs of the local school communities. Due to his sensitivity to education reform and active learning of related policy changes, Zhao quickly initiated a project to develop school-based curricula. However, when Zhao attempted to seek his colleagues’ collaboration on this project, they showed little interest because they did not seem to recognise the necessity and long-term benefits of developing school-based curricula. In the hope of persuading his colleagues, Zhao said the following,

Why do we need school-based curricula? What is the relationship between the national curricula and school-based curricula? Let me draw an analogy. We all have two mothers: one is our biological mother, and the other is our motherland. The national curricula are like our motherland, representing the country’s will. As for school-based curricula, they are like our biological mothers and have a special meaning of family. We should have both and keep a good balance between them.

Even though Zhao’s ‘mother’ metaphor and his claim about the relationship between national and school-level curricular were debatable, it was apparent that Zhao quickly noticed an emerging direction of nation-wide education reform, recognised the necessity and potential benefits of adjusting within-school practices accordingly, and put this idea into action.

Zheng presented similar thoughts and actions. Zheng started teaching in a primary school in Hong Kong in 1988. She said Hong Kong’s education was relatively static before the millennium. But since the beginning of the new century, education and the society in Hong Kong had been changing drastically. One major change was that the criteria for evaluating student performance and school effectiveness have been shifted from developing students’ cognitive abilities and knowledge to fostering a more holistic set of student competencies. In the awake of the new evaluation

criteria, Zheng sensed increasing pressure and urgency to change the ways that she and her colleagues taught students. Therefore, starting in 2003, Zheng began to lead other teachers in her school to take a range of measures to reform their instructional practices so that they could be more aligned with the new direction of educational development in Hong Kong, such as diversifying curricular contents, democratising instructional methods, and developing competency-oriented evaluation schemes.

In short, most of these Chinese expert teachers presented a high level of sensibility to the changing educational contexts. Their sensitivity drove them to take new initiatives to keep abreast of educational and social trends, which further led them to become ground-level pioneers in education reform, leading other teachers to improve their practices and their schools.

### *Providing tailored support to teachers in other schools*

Because of these teachers' professional status and reputation, they were often invited by local educational agencies to provide professional support to teachers in other schools, especially those located in disadvantaged regions, as part of the government's efforts at addressing education disparities between different regions. As influenced by China's hierarchical education governance culture, expert teachers tend to position themselves or to be positioned as authoritative experts that other teachers should look up to. However, three teachers in our study – Zhao, Zhang, and Tan – took issues with such condescending positioning and was cautious about the situatedness of teaching when supporting teachers in other schools. For instance, sponsored by the Shaanxi Province Department of Education, Zhao established a Master Teacher Studio (MTS) on Primary School Mathematics Education in 2019. MTS is a new form of teacher learning community recently emerging in China. In an MTS, an expert teacher leads a group of teachers from different regions in a province to conduct teaching research, develop curricular resources, and provide professional support to teachers in underdeveloped regions. As an MTS host, Zhao was frequently invited to provide various types of professional support to teachers in other schools, such as giving a talk, delivering a model lesson, and serving as referees for teaching contests. Zhao seemed very conscious of the differences between his own school, a well-resourced and high-performing primary school in a prefectural city, and many other schools he visited. Zhao said he would do some 'homework' beforehand to tailor his support to be fitting the context of the school he was going to visit. Zhao said,

Last week, I gave a talk on how to facilitate students' self-directed learning (自主学习) in another school because they were planning to do a school-based teaching research on this topic. When I was preparing my slides, I called the school's principal and several teachers to learn about their understandings of learning and self-directed learning, and what circumstances in their school had supported or hindered their students' self-directed learning. Later, I adjusted the contents of my talk according to their answers and questions.

Zhang reported similar experiences and perspectives. During the COVID-19 pandemic in 2020, Zhang served as a consultant for designing an online professional development programme for about 13,000 rural teachers in eight counties in her home province Gansu. The project was sponsored by Gansu Province Department of Education as part of the efforts for alleviating educational poverty (教育脱贫). The initial curriculum was focused on enhancing the teachers' subject matter knowledge, teaching methods, and technology use. Zhang said, 'we cannot use the same contents and approaches as we did with teachers working in well-developed city schools. They [the targeted rural teachers in the project] are so different.' She further explained that many rural teachers in the targeted counties could not speak fluent *Putonghua* or the standard Chinese – the official language required in most Chinese classrooms. This reality was a major factor that compromised the effectiveness of those teachers' teaching and their own learning. Therefore, following Zhang's suggestion, the project enriched the curriculum with a series of courses on improving the targeted teachers' *Putonghua* skills.

As illustrated above, the teachers in our study demonstrated a strong disposition of sensitivity to the contexts when working with other teachers. Such a disposition drove the teachers to actively seek out relevant information to understand their new working contexts and tailor their professional services accordingly, which reflected the strong flexibility of these teachers. With their strong sensitivity and flexibility, these teachers were able to provide contextually appropriate support to teachers in different school contexts and finally advanced the reform of education at school, regional, and provincial levels.

## Discussion and implications

This study makes important contributions to the research on teachers' professional growth by examining the roles that critical thinking plays in the professional lives of six Chinese expert teachers. First, this study sheds light on the important roles that critical thinking plays in teachers' professional growth. Our analyses identified a range of critical thinking strategies that the teachers had used in their daily practices. In principle, these strategies are aligned with the general critical thinking abilities and dispositions that previous studies have identified (Lai 2011, Hitchcock 2018, Paul and Elder 2019). Additionally, these strategies together constitute an integrative, practice-based, and action-oriented conceptualisation of critical thinking for teachers. The elaboration of a general, complex, and abstract concept (e.g. critical thinking) into specific, operational, and concrete practices (e.g. a series of critical thinking strategies used by teachers) reflect what Abbott (2004) calls the fractal mode of knowledge production in social sciences. In this model, the knowledge mainly develops through incremental accumulations of nuanced and context-specific understandings of general social phenomena.

Second, this study strengthens the empirical evidence base that undergirds the relationships between critical thinking and teachers' professional growth. In particular, our study explored how critical thinking advanced the teachers' professional growth in the context of China and with a group of nationally recognised expert teachers – both topics are underexplored in the existing literature. Our analysis showed that the Chinese expert teachers in this study explored and enacted pedagogical practices that were more appropriate and sensitive to the educational contexts in which they worked. This finding lends support to previous studies which found that critical thinking had enhanced teachers' professional knowledge, skills, and dispositions for teaching (Egmir and Ocak 2020, Yuan *et al.* 2022). Another finding of this study was that critical thinking along with critical reflection allowed the Chinese expert teachers to establish dialogic, equal, and democratic relationships with their colleagues. This finding echoed with Birjandi and Bagherkazemi's (2010) study which found how critical thinking advanced a group of Iranian teachers' professional success, including their interpersonal relationships in schools. In addition, we also found that critical thinking supported the Chinese expert teachers in making professional contributions beyond their schools. This finding was less reported in previous studies, perhaps because most teachers in many contexts mainly work and seek professional growth within their schools. Nevertheless, the experiences of the Chinese expert teachers in our study show that teachers have the potential to make contributions beyond schools, such as advancing regional and national educational reforms, and critical thinking can support teachers in undertaking such new leadership roles and effecting positive impact at the classroom, school, and society level (Nguyen *et al.* 2020).

Third, the findings from our study resonate with those from recent research (e.g. Chen and Wen 2019, Tan 2020, Zou and Lee 2021), which show that teachers' critical thinking strategies are deeply situated in their social, cultural, and educational contexts. In the face of several contextual challenges such as respecting for authorities and face culture (Zou and Lee 2021), the teachers in this study considered using specific critical thinking strategies to justify their pedagogical decisions, challenge school administrators' directives, and exert their influences on educational practices beyond their schools. In a society where teachers' personal and practical wisdom is emphasised over educational theory and research, using theories and research to inform pedagogical decisions

would be viewed as dogmatic thinking but not critical thinking. In a society where school governance structure and culture are more flattened and democratic, disagreeing with superior administrators would be a common practice but not critical thinking. In a society where teachers have frequent and intensive engagement with communities and the society, teachers from different schools supporting or collaborating with each other would be a normalised practice but not a transformative effort that entails a heavy dose of critical thinking. These are not groundless speculations but are substantiated by a robust line of studies on comparative and international education (Lun *et al.* 2010, Tan 2020). Therefore, this study calls for a context-sensitive, responsive, and compatible approach to understanding and enacting critical thinking in teachers' work and efforts for professional growth.

This study has several practical implications for teachers, school administrators, and teacher educators. First, teachers should be supported to understand the important roles that critical thinking plays in their professional growth. The critical thinking strategies identified in this study can serve as a point of departure for developing teachers' critical thinking abilities and dispositions to improve their instructional practice, school engagement, and social service. Guided by the general spirit of critical thinking, teachers could also be supported to actively explore contextually appropriate and effective critical thinking strategies to advance their professional growth. Second, school administrators should design professional learning opportunities to support teachers' development and enactment of critical thinking, such as providing teacher training on how to make, justify, and articulate pedagogical decisions; fostering dialogic, collaborative, and collegial workplace cultures; and creating opportunities for teachers to participate in and make contributions to schools and local communities. Third, teacher educators should consider critical thinking as a core teacher competency and highlight it in their programmatic goals, curricular design, and teacher preparation practices (Lorencova *et al.* 2019). Although our study did not aim to answer the question about how these teachers' critical thinking abilities, dispositions, and practices developed over time, a topic that deserves another full-length paper to unpack carefully and thoroughly, our findings does provide empirical evidence of the roles that critical thinking plays in teachers' professional growth. Such understandings should be used to inform teacher preparation practices.

Our study also points to two promising lines of inquiry for future studies. First, individuals' retrospective narratives are not accurate enough. That was why we did not distinguish the roles that critical thinking played in influencing these teachers' professional growth at different phases of their career trajectories. Future studies can focus on teachers at a particular career phase and closely examine the specific roles that critical thinking plays in influencing the teachers' work, life, and growth in that particular phase. Second, this study did not sort out the net contribution of critical thinking to teachers' professional growth. Thus, another needed line of research is to use quantitative methods to explore the relative importance of critical thinking, as compared to other contributory factors, in advancing teachers' professional growth. Facing a fast-changing world and uncertain times ahead, we hope the findings of this qualitative case study can serve as a point of departure for future research to deepen our understandings of the complex and important relationships between teachers' critical thinking and their professional growth.

## Note

1. The Chinese government uses a professional title system to guide primary and secondary school teachers' career development. The system consists of five levels, including the third-level (三级), second-level (二级), first-level (一级), senior-level (高级), and distinguished-level (正高级), from low to high. Professional titles are tightly related to teachers' work performance, salary and benefits, and resources and opportunities for further development. The Special-Grade Award is an honour awarded to extraordinarily high-performing elementary and secondary school teachers. Only a few teachers can earn the distinguished-level title or Special-Grade Teacher Award. Therefore, teachers with the distinguished-level title and the Special-Class Teacher Award are considered expert teachers in the Chinese context because they are at the top of the system and possess a variety of professional expertise.



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## ORCID

Wei Liao  <http://orcid.org/0000-0001-9987-3546>

Miao Liu  <http://orcid.org/0000-0002-1765-1411>

Zhaoxuan Wang  <http://orcid.org/0000-0003-4954-4941>

Kongji Qin  <http://orcid.org/0000-0003-0490-9986>

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