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NEEDS ASSESSMENT REPORT ADOPTING A MIXED-METHOD DESIGN: CHINESE POSTGRADUATES' IMPRESSIONS OF CRITICAL THINKING APPROACH IN RESEARCH METHOD COURSE

Li-Wei Wei[i]
PhD. Lecturer,
Department of General Education,
Chinese International College,
Dhurakij Pundit University,
Thailand

Abstract:
In the contemporary milieu of academia and quotidian endeavors, the faculty of critical thinking is recognized as an essential and irreplaceable aptitude for each individual. Over the course of recent decades, the subject of critical thinking has garnered substantial attention across the sphere of higher education, with Chinese students being no exception. The present investigation seeks to elucidate the exigencies evaluation of international Chinese postgraduate students' perceptions pertaining to the incorporation of critical thinking methodologies within research methods coursework, in conjunction with their requisites and expectations for the inculcation of critical thinking proficiencies as an integral constituent of the academic writing curriculum. This empirical inquiry, employing a mixed-methods approach, drew upon the Critical Thinking Disposition Inventory (CTDI) as its primary instrument. A total of 147 Chinese international college master's students voluntarily partook in the study. The resultant data revealed that the understanding of critical thinking abilities among the overseas Chinese postgraduate population was marked by ambiguity and perplexity. Such a phenomenon can be attributed to the influence of the traditional Chinese educational system, which engenders a prevalent indifference towards critical thinking competencies among the majority of the international Chinese postgraduate demographic. To address the exigency of bolstering their scholastic achievements and enhancing their thesis-writing efficacy through more analytical and critical means, the Chinese postgraduate respondents underscored the imperative to amalgamate critical thinking skills into their research methods coursework.

Keywords: Chinese postgraduates, critical thinking approach, needs assessment, research method course

[i] Correspondence: email liwei.wei@dpu.ac.th

1. Introduction

1.1 Background and Problem Statement

Socrates' conception of critical thinking (CT) remains to intrigue cognitive scholars and educationalists (Lapina, 2018; Paul & Elder, 2015). The CT method takes the learner individual's competency to interpret, analyze, evaluate, rationalize, and scrutinize data (Buchanan, 2016). The CT tactic, per Watson-Glaser (2010), involves recognizing an issue, analyzing facts and evidence, and questioning the source of information. That is to say, the CT approach employs information and observations whose veracity has been verified (Marabini, 2021). The CT offers adequate cognitive skills and environmental consciousness (Martin, 2016). It is a mode of thought that seeks proof to justify one's conduct and convictions (Meltzoff & Cooper, 2018; Raikou et al., 2017). Moreover, this mode of thinking allows the individual to control over their own mental structures, permitting them to be moulded according to their own intellectual levels (Paul & Elder, 2019; Mahajan & Singh, 2017). Since these CT-related experts have demonstrated incredible efforts to assess the impact of CT on an individual's personal academic learning, Asian students have been criticized for their lack of critical thinking skills in both academic setting and employment context following their graduation (Onen, 2021; Nauman, 2017; Febriana et al., 2017). Expressed in different words, students may not be offered an equal chance to acquire CT skills unless it is prioritized as a vital element of teacher-led course instruction. To fulfil societal needs, higher education institutions must not only equip students with the required information and technical capabilities but also install in them a sensation of professionalism and desired social attitudes, particularly in Asian civilizations (Braga, 2019; Dirgantara et al., 2018; Orgoványi-Gajdos, 2016). To add value to the learning process academically, international and domestic development, and the advancement of their disciplines, student individuals will be expected to acquire a broad range of skills (Connolly et al., 2022; Garapati & Padmaja, 2020; Estes et al., 2017).

Upon additional consideration, the effects of students' critical thinking capacity on academic achievement have been much more transparently approachable over the last several decades (Abrami et al., 2015). In particular with respect, Pu (2017) highlighted that owing to cultural and institutional contexts, Asian students appear to be scanty of the critical thinking abilities demanded for academic matters such as thesis writing and involvement in public discussion. Various International published studies have documented that Chinese students studying abroad, specifically in Southeast Asian, exhibit little or finite critical thinking skills (Hitchcock, 2017). Merely expressed, the prominence of the capacity to think critically of Chinese students who study internationally has garnered up much greater recognition and huge exposure (Li & Ren, 2020; Sun, 2017). In 2010, the World Economic Forum (WEF) reportedly released a research article mostly on the five major requisite skills by 2025, encompassing analytical thinking, critical thinking, active learning, and learning techniques (Su, 2020). Organizations sense that employees' critical thinking abilities necessitate being immensely reinforced (Heng, 2018). In the context of social and interpersonal life, it is

apparent that critical thinking skills are broadly perceived as decisive for potential performance and ultimate prosperity in the near future.

Within recent decades, Chinese institutions increasingly positioned a clearer concentration on the creation and execution of analytical and practical thinking education for university students, offering courses to elucidate critical thinking knowledge and expertise, but somehow the pedagogical effectiveness is indeed not desirable (Chen, 2017; Zhu, 2016; Dong, 2015). As a consequence of rigorous training and experience in critical thinking programs, Chinese students experience difficulty developing conscious, rational thinking and logical reasoning behaviour patterns. On the other side, Chinese students perform effectively while teachers stimulate critical thinking. As presented with authentic real-world learning and life problems, individuals often behave instinctively and spontaneously in line with their intuitive reasoning and thinking tendencies (Halpern & Dunn, 2021). This seems to be due to the reality that scholastic practices may be formed all across the primary and secondary education years (Ruminski & Hanks, 2020), which implies that certain institutions can instruct individuals towards critical thinking (Jiang, 2020; Wang, 2019; Chen, 2017). Critical thinking education should indeed initiate in primary and middle school education, but the intention of a university critical thinking course becomes to primarily enhance the students' critical thinking skills (Din, 2020; Nasution, 2019). Regrettably, the impediments and unsolved concerns required to undertake critical thinking training throughout much of the course may persist to a certain extent. Basic academic training and education embracing complete test-focused assessment, which might be interconnected back to the conventional cramming-based education system in China (Raphals, 2022; Zhou, 2016; Kim, 2015), could render it challenging for lecturers to foster critical thinking in the classrooms.

Over and above that, exam-focused, survival-competitive education serves as the foundation of China's education at all levels from a context of teaching and learning (Zhu, 2020; Han et al., 2013). The student generation remains adept at answering queries on a variety of board competitive examinations, but they have acquired insufficient guidance in critical thinking abilities that empower them to be innovative whether they opt to study locally or overseas (Chen & Wang, 2018; Yang & Chen, 2017). In accordance with various studies (Wilberding, 2021; Sanacore, 2021; Lu, 2018; Wang, 2016), the absence of a competent input-based critical thinking discipline in the classroom for the collective betterment of Chinese students constitutes the most serious concern that restricts Chinese students' scholarly talents and ended up causing academic quality deficiencies. Together in nutshell, it is tremendously imperative with critical thinking guidance to accentuate the significance of real-world learning settings and to redefine the conservative instructional paradigm (Chen & Wang, 2018; Lu, 2018; Wang, 2016). Before offering training in critical thinking alongside relevant academic tasks, it is vital to investigate the demands and assess the critical thinking capacities of both Chinese students and lecturers. Overall, learning occurs not just in the classroom, where students are instructed by academic professionals, but also outside of the classroom, when they engage in activities that demand diligence and critical thinking (Wilberding, 2021; Sanacore, 2021).

1.2 Research Objectives

In light of considerations regarding the effects of critical thinking abilities on Chinese postgraduates' study for a research method course, the predominant objective of this study was to assess the extent proficiency of critical thinking among Chinese postgraduates prior to the implementation of the research methods course, with the aim of establishing a baseline for gauging subsequent instructional efficacy. Additionally, the author tended to investigate the perceptions of Chinese postgraduates regarding the critical thinking instruction integrated into their research methods course, as informed by a needs assessment, to better understand the perceived relevance and value of the course content. Last but not least, the current study would desire to examine the degree to which Chinese postgraduates perceive the critical thinking instruction imparted within their research methods course as germane and applicable to both their academic pursuits and professional trajectories, in order to evaluate the practical significance of the course content.

1.3 Research Questions

Chinese postgraduates who study abroad may be able to sharpen their critical thinking abilities after adding critical thinking teaching into a graduate-level research method course. To do this, the researcher performed a course needs evaluation of merging critical thinking instruction into a course on research methodology from the perspective of Chinese postgraduate students. Thus, the research questions that dictated the concentration of the current investigation were formed in consideration of these issues:

1) What is the current actual level of Chinese postgraduates' critical thinking prior to research method course development?
2) How do Chinese postgraduates perceive the critical thinking instruction included in their research method course based on the needs assessment?
3) To what extent do Chinese postgraduates feel that the critical thinking instruction received in their research method course is relevant and applicable to their academic and professional career?

1.4 Significance of the Study

This article proposes a framework for building and incorporating critical thinking instruction into a research method course, with a focus on the significance of performing a needs assessment from the perspectives of Chinese postgraduate learners. On the other hand, this research results may serve and stand to gain the course lecturer throughout constructing and refining the research method course by including critical thinking training to enable Chinese postgraduate students to apply the critical thinking skills they acquire to address academic matters and issues (Jackson, 2021; Haber, 2020; Hadjianastasis, 2017). Investigations on the critical thinking abilities of Chinese college students, notably those individuals studying overseas, could still be in their infancy development from a realistic point of view. For Chinese postgraduate students to tackle real-world challenges competently, logically, and methodically, critical thinking skills

instruction, including evaluation activity or method, could be indispensable. This research may even be utilized to support course instructors in developing a better understanding of how to advise Chinese overseas students in other cultures to form their opinions in a more critical manner. The positive and supportive comments made by students on the instruction of incorporated critical thinking may be advantageous and invaluable in the future.

2. Literature Review

2.1 Notion of Needs Analysis

The notion of needs analysis pertains to the method of discovering and evaluating the needs, desires, and prerequisites of a certain group or person while the needs encompass desires, intentions, expectations, justifications, deficits, and restrictions (Davis, 2021; Harland, 2020). Learners' requirements and preferences are collected, analyzed, and then courses are chosen based on the results (Kováiková, 2015; Sieglová, 2019). Basically, these needs-based assessments are motivated by their own conditions. Schuler et al. (2019) indicate that learners could be required to develop survival skills; that is to state, it would be urgent to implement educational programs and curricula that meet the needs of potential students, particularly for postgraduate studies. In order to design a curriculum, the needs analysis primarily seeks to assess the instructional requirements for the intended course material (Rose & Sookraj, 2015; Rashidi & Kehtarfard, 2014). When analyzing the unique requirements of students, we experience the concept "needs analysis," which once denoted anything further. In the early phases of ESP (1960s and 1970s), a needs analysis was conducted to evaluate student communication requirements and instructional goals (Dan & Dan, 2018; Liu, 2015). Since the intent of a needs analysis is to determine what individuals need, the components associated with it have evolved significantly (Otilia, 2015).

2.2 Perceived and Actual Needs

As indicated by the variety of needs categorizations, the academic community maintains a variety of viewpoints about the idea of needs assessment. In the next part, the researcher would analyze the definitions of numerous criteria laid out by different experts in the area.

2.2.1 Categorizations of Diverse Needs

The distinction between perceived and experienced needs was made by Berwick and Johnson (1989). The perceived needs of a learner individual are objectives formed from the experiences of other learners. He believed that specialists' evaluations of other individuals' educational deficits constituted perceived requirements. As a result of instructors' or educational institutions' external assessments of learners' language needs, stated needs were often seen as regular, objective, and authentic. A person's perceived needs are those they sense they desire. There was an evident link amongst attitudes,

perceptions, expectancies, and feelings of need. These represent the aspirations and wants of the learners.

2.2.2 Determining and Learning Needs

These are the particular needs that Hutchinson and Waters have highlighted (1987). All of those are instances of objective requirements. Assess the situation's needs, lacks, and wants. Hutchinson and Waters (1987) assert that "necessities" are success criteria. These data collecting techniques are efficient and practical. As a teacher, you must prioritize your pupils' needs. By comparing current knowledge to needs, "gaps" are revealed. Any institution may opt to instruct (or not). That how "actual proficiency" of individuals varies from their "target proficiency" (Hutchinson and Waters, 1987) Hutchinson and Waters (1987) underline the prerequisites for targets. Desire and needs are identically synonymous. Hutchinson and Waters interpret the phrase "wants" (1987). Students have subjective desires, whereas teachers possess objective requirements. Occasionally, designer expectations and learner intentions seem incompatible. Berwick and Johnson (1987) provide a definition of the term wants, referring to that every learner should indeed comprehend their post-training targets. Hutchinson and Waters (1987) advocate designing a route around its beginning and conclusion points. Lengthy, boring, and out-of-date instructional materials may lead students to lose interest, while interested students may learn more effectively. The evaluation of learning environments, prior knowledge, and skills by Hutchinson and Waters gives valuable insight into learning requirements. It illustrates that aims and learning are crucial, as well as the significance of the technique.

According to Hutchinson and Waters (1987), educators could perhaps count just on projected outcomes; they must therefore consider the path's prerequisites, possibilities, and limitations. Concerns about how to go from where you are now (lacks) to where you want to be (needs) increase all across the learning process. A student may be interested in a subject or position, yet find instructional contents that are overly lengthy, dull, or out of date to be uninspiring. Learning should be enjoyable, beneficial, manageable, and productive. It would be intrigued by learning but appear short in understanding. In reality, Hutchinson and Waters' concepts of "learning requirements" and "learning needs" have demonstrated efficacy. Thereby further, the learner's needs should always be evaluated on an ongoing basis. Course developers may regard the learner's motivation, educational atmosphere, and previous skills and knowledge. The objectives and learning requirements of Hutchinson and Water (1987) seem to serve as likewise somewhat distinct from product-aligned and process-pitched demands. Product-aligned requirements primarily would be preoccupied with academic demands that have been situation-specific and result-intended, while process-pitched needs are concerned with the whole process.

2.3 Critical Thinking Capabilities

Competencies in critical thinking encompass thoughtful consideration of what to do and what to accept as reality (Doan & Dan, 2018; Kováiková, 2015). Critical thinking entails the process of examining and determining whether to embrace anything by judging it with discretion. In addition, critical thinking skills would perhaps not be preserved, but be strengthened via consistent practice. From lower-order to higher-order thinking skills, critical thinking is constructed of numerous interrelated thinking components, including Clarity, accuracy, rationality, thoroughness, significance, fairness, depth, breadth, and precision, being prerequisites for critical thinking (Erkens et al., 2018; Cobbinah, 2017). To guarantee that the conclusion obtained via the application of critical thinking remains valid and understandable, it is imperative to adhere to the aforementioned standards. In addition to exploration, interpretation, and assessment, critical thinking comprises additional core activities (Onen, 2021; Masaeid, 2020). A systematical probe is conducted to unearth relevant evidence or identify sufficient relevant information to resolve the pertinent issues (Masaeid, 2020; Erkens et al., 2018). In order to arrive at a well-supported conclusion regarding a particular issue, it is imperative to engage in a systematic inquiry that allows for the identification of relevant evidence. It is of paramount importance to acknowledge that interpretation constitutes a crucial aspect of critical thinking. Interpretation, as defined by various scholars including Kaeppel (2021) and McMullin (2018), involves the determination of the significance of the data collected. It is imperative that the interpretation derived is both sensible and logically consistent. The systematic study and examination of evidence necessitate the formulation of a conclusion that is firmly grounded in the facts that have been gathered and are in accordance with logical reasoning. The interdependence between research and interpretation is widely acknowledged. Yet, the conclusion arrived at by a critical thinker is a synthesis of both perspectives. A critical thinker, who operates within a rational framework, must possess an in-depth cognizance of the dangers, remedies, and answers associated with the problem or issue under examination (Miller & Tucker, 2015). Participation in the activities of investigation, interpretation, and assessment constitutes the hallmark of critical thinking and represents the essence of this cognitive process.

2.4 Significant Role of Critical Thinking in Academic Research Method

The research method course contains an in-depth assessment of qualitative, quantitative, and combined methodologies and conveys knowledge of the respective qualities and drawbacks. For postgraduate students to acquire the competencies necessary upon performing research, an understanding of research techniques becomes crucial. In education, the combination of critical thinking, research technique, and needs analysis creates a synergistic instructional strategy. This integration may improve one's capacity to discover reputable sources precisely, collect and assess information methodically, analyze outcomes logically, and deliver well-supported arguments based on perceptive analysis (Gochitashvili & Bashvili, 2021; Anwar et al., 2017; Bennett, 2013). Critical thinking would be perhaps an integral competence throughout academia, facilitating

objective analysis, reasonable conclusions, and effective problem-solving, which emphasizes why critical thinking skill seems indeed a substantial component of research capacity, assuring the validity and dependability of data (Nagari et al., 2018; Lee, 2015). In addition, the primary objective of academic research is to generate innovative thoughts, views, and arguments. The graduate researcher gathers important information from a variety of sources, such as articles, books, and other materials, and formulates an educated position within the current scholarly conversation. The research procedure should therefore be not constrained to gathering data, information, facts, or evidence and piecing it together to generate a report. Conversely, it represents an inquiry-based approach whereby the investigator posits questions and secures solutions via vigorous critical thought and introspective evaluation (Todd et al., 2021; Sirajudin, 2019; Nagari et al., 2018). Thereby further, the research procedure becomes cyclical and dynamic, involving ongoing modification and reflection (Todd et al., 2021; Wahyuningsih & Satyananda, 2018). To put it succinctly, the researcher reinterprets ideas, acquires new data if applicable, and reevaluates and alters the study question, subject, or approach. Researching is an incrementally iterative process that demands ongoing self-reflection and refinement (Gochitashvili & Bashvili, 2021; Nagari et al., 2018).

Under this scenario, conducting a learners' needs analysis for a research methodology course could prove to be a significant aspect of the instructional process. This involves determining the distinct requirements and cognitive styles of the students, which supports the personalization of the instructional and learning approach to fulfill the needs of each student individually (Erkens et al., 2018; Cobbinah, 2017). Such an analysis may dramatically improve the effectiveness of the educational encounter by assuring that the teaching methods and materials adhere to the specific learning inclinations and needs of the students (Harland, 2020; Sieglová, 2019). This could lead to a more productive, profitable and effective learning outcome. By implementing a learners' needs analysis, the academic experience may be tailored to the various learning styles and demands of the students, hence potentially optimizing their academic achievement in the possibility.

3. Material and Methods

3.1 Participants

The current study was conducted with a sample of one hundred forty-seven (N=147) first-year postgraduate individuals, hailing from a single Thailand-based Chinese International College, who volunteered to participate in this research endeavor. These participants were of Chinese nationality, with a gender distribution that consisted of 67 males (45.6%) and 80 females (54.4%). As a prerequisite for their enrollment in the research method course administered by the graduate program, these postgraduates were solicited to take part in this study. In terms of their academic field of postgraduate degrees, the participants were enrolled in Master of Business Administration (MBA, N=50, 34%), Master of Education Management (MEDM, N=69, 47%), Master of

Communication Arts (MCA, N=21, 14.2%), and Master of Fine Arts (MFA, N=7, 4.8%) programs. The demographic information of these participants is presented in Table 1, which provides a detailed breakdown.

Table 3.1: Breakdown of the Demographic Specifics of the Respondents

Demographics	Frequency (N)	Percentage (%)
Gender		
Male	67	45.6%
Female	80	54.4%
Total	147	100%
Academic Fields		
MBA	50	34%
MEDM	69	47%
MCA	21	14.2%
MFA	7	4.8%
Total	147	100%

Note: MBA: Master of Business Administration; MEDM: Master of Education Management; MCA: Master of Communication Arts; MFA: Master of Fine Arts

3.2 Research Instrument

3.2.1 Critical Thinking Disposition Inventory (CTDI)

This investigation sought to look into the perceptions of Chinese postgraduate college students on the critical thinking training contained in a research methodology course. Thereby further, the Critical Thinking Disposition Inventory (CTDI) in English was implemented to evaluate the capacity for critical thought of Chinese international college master's degree students prior to the establishment of a research technique course during the initial phase in the present study design. The CTDI incorporates 18 items and three subscales: a systematic analysis, thinking inside the box, and thinking further than the box. Each question is graded on a 5-point Likert scale ranging from 1 (never), 2 (rarely), 3 (sometimes), 4 (often), and 5 (always) (always). The CTDI scale's reliability and validity were verified with 44% of variance documented (Hwang et al., 2010). Overall and subscale Cronbach's alpha values and intra-class correlation coefficients were more than 0.8, indicating a satisfactory degree of dependability. The CTDI is a reliable instrument to gauge critical thinking dispositions in academic contexts based on these results.

3.2.2 Semi-Structured Interview

Using a semi-structured approach, interviews were conducted with a total of thirty-eight respondents. Participants who consented to be questioned again after finishing the disposition of critical thinking were considered. To tackle the second research question, the researcher devised a set of interview questions in order to acquire deeper insight into how these students valued their critical thinking skills and the significance of the research methodology course. Below are some instances of pressing questions that were posed during the interview:

1) On the basis of your prior knowledge and education, how would you rate your critical thinking skills and abilities?
2) Based on your responses to the first question, how would you characterize the critical thinking capabilities of Chinese students as a whole?
3) If critical thinking skills/abilities include tasks like problem identification, analysis, reasoning, judgment, application, and comprehension, how do you think the critical thinking instruction in a research method course might best serve your needs and expectations for conducting research and writing a thesis?

Interview validity refers to the correspondence between interview questions and particular competencies. To guarantee optimum validity, it is essential that there be a one-to-one relationship between the interview questions posed and underlying capability. In terms of the reliability and validity of the semi-structured interview, the researcher finalized the semi-structured interview questions for the current study using an analysis of content validation and item objective congruence (IOC). IOC scores were calculated based on the equation (Yahia, 2022; Gavlvin, 2017) that follows:

$$\text{IOC} = \frac{\sum R}{N}$$

IOC = Item-Objective Congruence Index
R = Point given by specialists
ΣR = Total points of each specialist
N = Number of specialists

The IOC points are divided into three grading scales based on the items' consistency and conformity. All experts as well as the external raters were required to select one of the following three responses as the issued grade: *+1 = Congruent with clear understanding; 0 = Uncertain or not sure whether item related to the study; -1 = Not understand or not congruent or related to this study*. In the present study, three experts with a solid educational background in the domain of language education and assessment scored the interview questions using item objective congruence (IOC) criteria. The IOC value indicates the interview questions' relevance to the research subjects and accuracy. The three experts' average IOC value was over 0.75, suggesting that the complete collection of interview questions was acceptable and credible. This means that the data acquired via these interviews may be deemed of good quality and can be utilized to give valuable insights into the study issue being examined.

3.3 Data Collection and Analysis

The statistical data were collected during October and November of 2022. The researcher managed to reach out to two groups of master's degree students enrolled in research method courses offered by the graduate program at Chinese international college affiliated with a Thai university, soliciting the assistance of their course instructors in disseminating the critical thinking disposition inventory survey to Chinese

undergraduates. All 147 respondents' replies were compiled. In the meanwhile, 38 students who expressed interest in participating were requested to engage in 15- to 20-minute interviews individually. Individual participants' remarks would be recorded in Chinese, and the interviews' replies would be translated from Chinese to English for qualitative data transcription in order to conduct theme coding analysis. The majority of the information was gathered using a CTDI survey and semi-structured online interviews. Frequency and percentage analyses, which are often used in quantitative research, were applied to the data in this study. Quantitative studies were utilized to determine how participants perceived their ability to think critically. On the other hand, qualitative data collected from verbatim interview transcriptions emphasized crucial components of a practical research techniques course that involves a critical thinking approach, as experienced by Chinese graduate students. Quantitative and qualitative data were included so that Chinese master's degree students and course designers may discuss the fulfillment of requirements for critical thinking training inside a research methodology course.

4. Results and Discussion

4.1 Deficiency of Critical Thinking Abilities amongst Chinese Postgraduates

The SPSS version 25.0 software program was implemented to conduct a quantitative analysis of the 18 responses supplied by each participant to the items comprising the critical thinking disposition inventory scale. In Table 4.1, the outcomes of each item are shown with the item mean score (X), the standard deviation (SD), and the interpretation of CTDI tendency level across the entire set of items, accompanied by the average score for each categorical variable. Table 4.1 highlights the response to the first research question, "What is the current actual level of Chinese postgraduates' critical thinking knowledge prior to research methods course development" The Chinese college postgraduates who participated in the present research reported an overall critical thinking disposition inventory mean score of 2.86 (X=2.86, low tendency level of CDTI). In addition, according to the categorical variables of the CTDI, such as systematic analysis, thinking within the box, and thinking outside the box, postgraduate participants exhibited a substantial degree of negative critical thinking abilities. This was certainly relevant for postgraduates' systematic analysis (X=2.54, items 1-5) and thinking outside the box (X=2.18, items 14-18). On the other hand, the results of the research demonstrated a high average mean score (X = 3.86, items 6-13) for postgraduates' thinking within the box. In a reverse way of comparison, this categorical variable represents individuals' inadequacy and reluctance to apply their knowledge of critical thinking across the entirety of the academic scenario.

Table 4.1: An Overview of Responses to CTDI from Participants

	N	Mean	SD	Level
Categorical Variable I: Systematic Analysis (item 1 to 5)				
1. I am a person with logical thinking	147	2.13	0.55	Low
2. I am good at solving problems	147	2.25	0.73	Low
3. I can easily organize my thoughts	147	3.02	0.54	Low
4. I appreciate myself as a person who has comprehensive and precise thoughts	147	3.12	0.85	Low
5. While facing a problem, my peers are used to asking for my opinion in their decision-making because I am objectively analyzing the problem	147	2.20	0.75	Low
Average		**2.54**		
Categorical Variable II: Thinking within the box (item 6 to 13)				
6. I only look for the truths which would support my opinions rather than those that would reject my opinions	147	3.78	0.87	Moderate High
7. I enjoy discovering the truth in many issues	147	3.25	0.72	Low
8. During a team discussion, if someone's argument had been denied by others, the person would have a right to express their argument	147	3.56	0.65	Moderate
9. Everyone has the right to address their opinions, but I just agree with what they say	147	3.92	0.94	Moderate High
10. I pretend to be a logical person although I am not	147	3.74	0.88	Moderate High
11. Continuing education activities are a waste of time	147	3.33	0.63	Low
12. If possible, I try to avoid reading	147	4.43	0.91	High
13. Decisions made by authority (teacher) are always right	147	4.85	0.52	High
Average		**3.86**		
Categorical Variable III: Thinking outside the box (item 14 to 18)				
14. I have a strong desire for knowledge	147	2.15	0.57	Low
15. I am satisfied that I can understand others' ideas	147	3.07	0.71	Low
16. I expect to face the challenge of peers' care	147	2.26	0.59	Low
17. It is interesting to solve tough problems	147	1.67	0.49	Low
18. I like to know how things work out	147	1.78	0.46	Low
Average		**2.18**		
Average means of CTDI based on three categorical variables (2.54+3.86+2.18)/3		**2.86**		

4.2 Nebulous Perception of Critical Thinking Skills Amongst Chinese Postgraduates

To respond to the second research query, "How do Chinese postgraduates perceive the critical thinking instruction included in their research method course based on the needs assessment." Initial categorization of the data from interviews with Chinese postgraduates was centered on their comprehension or knowledge of their ability to think critically and their awareness of the substance of critical thinking skills. Table 4.2 provides examples of the perceptions of Chinese postgraduates evaluating their critical thinking skills (abilities) derived from past learning or academic experiences.

Table 4.2: Typical Insights of Chinese Postgraduates on Critical Thinking Functionality

Chinese Postgraduates' Response Excerpts from Interview Question 1	
Interview Question 1: On the basis of your prior knowledge and education, how would you rate your critical thinking skills and abilities?	
S2	*"It was not always easy for me to understand the fundamentals of analytical thinking."*
S4	*"I must admit that, until recently, I had a naive conception of what "critical thinking" included."*
S5	*"Occasionally, I admit to myself that I still have trouble defining critical thinking."*
S11	*"Though I liked to think of myself as a critical thinker, I realized that I frequently simply agreed with people without giving it any thought."*
S12	*"Critical thinking, in my view, professed to be analytical but, in practice, we...What I mean is that they often did not examine the beliefs held by others around them."*
S13	*"We agreed that, under the Chinese educational system, critical thinking included looking for other viewpoints or data to verify an argument's veracity, but we seldom challenged or debated against it."*
S24	*"Although most Chinese students do not often question further, I consider that part of thinking critically is seeking out a range of perspectives or evidence to back up what you already know."*
S26	*"In my opinion, critical thinking is looking for and evaluating many points of view and pieces of evidence to build up a body of knowledge. Perhaps that's conclusive evidence, and further inquiry is unnecessary."*

Initially, based on the abovementioned interview excerpts Chinese postgraduates remained dubious about their understanding of critical thinking competencies while being familiar with the term. A number of the other participants reported that critical thinking sounded to be conducted in an unbiased manner, but they were inclined simply to concur with or adopt the conclusions of others without sufficient thought. Some postgraduates acknowledged that critical thinking required looking for other perspectives or truths in order to validate the accuracy of information without disagreeing or criticizing it.

4.3 Deplorable Critical Thinking Competencies amongst Chinese Postgraduates

By contrast, the interview study results revealed that postgraduate respondents lacked critical thinking abilities due to their test-centered school system and need to memorize. In addition, further postgraduate respondents claimed that Chinese students consistently adhere to their teachers' guidelines, which are drawn from the authorities' standard system. Furthermore, a substantial proportion of postgraduate students commented that the critical thinking skills of Chinese students were possibly constrained or discontinued to grow shortly after high school as a consequence of the instructional methods of test-oriented study preparation, which could have the potential to be perceived stereotypically, thereby aggravated the preconceived notion of Chinese learners as automated machines devoid of innovative communication, respectively, thirst for knowledge, and analytical abilities. Table 4.3 displays a sampling of participant remarks.

Table 4.3: Remarks by Postgraduates Concerning the General Critical Thinking Capabilities of Chinese Students

Chinese Postgraduates' Response Excerpts from Interview Question 2	
Interview Question 2: Based on your responses to the first question, how would you characterize the critical thinking capabilities of Chinese students as a whole?	
S1	*"My impression is that first-year Chinese university students lack critical thinking abilities since their education system emphasizes rote memorization from elementary school through college."*
S2	*"Chinese students lacked critical thinking skills as a result of the country's education system, which placed an emphasis on rote memorization rather than higher-order thinking."*
S4	*"However, our educational system's overemphasis on standardized testing and memorization may be to blame for the lack of critical thinking among Chinese students."*
S5	*"As a result of the way the authorities in China have historically done things, Chinese students unconsciously adhere to their instructors' orders."*
S8	*"Chinese students are renowned for their obedient nature. Given the country's established political structure, you know."*
S15	*"In China, learners perpetually comply with the commands of their instructors simply because they believe in the cultural system from which those instructions originated."*
S16	*"Study-for-the-exam higher education, which could be interpreted as conventional, could transform Chinese students into uncreative, non-independent drones incapable of improving their critical thinking skills through their senior year of high school."*
S19	*"There is a danger that China's teenagers would become unimaginative robots if they receive education solely how to conquer exams, which has been criticized as an unfortunate form of stereotype."*
S24	*"Chinese customary study methods prioritize memorizing and reciting material for examinations…can render students into emotionless machines who fail to nurture their imagination or analytical skills."*

4.3 Research Method Coursework: Cram-Free, Analysis-Centered, Apply-Oriented

Ultimately, this investigation discovered that Chinese postgraduates envision acquiring more than merely how to regurgitate information from the teacher or memorize a list of facts while critical thinking is drilled into them as a component of a prerequisite for research method course. According to the remarks of those who participated in the study, the previously mentioned skills would be beneficial for collecting insightful expertise and information from the research method course as seen from the perspective of Chinese postgraduates. Examples of input from participants can be seen in Table 4.4.

Table 4.4: Postgraduates' Positions Regarding Critical Thinking in a Research Methods Course

Chinese Postgraduates' Response Excerpts from Interview Question 3	
Interview Question 3: If critical thinking skills/abilities include tasks like problem identification, analysis, reasoning, judgment, application, and comprehension, how do you think the critical thinking instruction in a research method course might best serve your needs and expectations for conducting research and writing a thesis?	
S1	*"I aim to acquire skills or competencies that will enable me to appropriately recognize difficulties and break down large problems into smaller ones so that students may better comprehend the material."*
S3	*"Coursework in critical analysis in research methodology, hmm...I'd want to learn some strategies for analyzing issues and addressing them in ways that students are able to comprehend."*
S5	*"I intend to improve my ability to apply, comprehend...learning to correctly categorize and analyze events."*

S7	*"No more cramming, but perhaps we'll learn how to critically and creatively use what we find in this research process course."*
S11	*"I'd rather not have to remember anything, but I presume we learn to synthesize and critically analyze new knowledge in this research methods course."*
S13	*"Instead of cramming for assessments, I'm looking forward to having significant discussions across academic languages with our professor in the hopes that he or she will educate us how to put into practice what we've learned in a way that's both critical and creative...while we are able to apply the knowledge into our research project."*
S17	*"Don't bother cramming for the test; instead, let's see if we can apply what we've learned in this research methods class to real-world research-based situations and possibly even come up with a few innovative concepts on our own."*
S25	*"My expectation is that the professor teaching our research methods course will demonstrate to us how to academically apply what we've learned in class to practical study cases and encourage us to think outside the proverbial box when considering potential solutions."*

5. Conclusion and Discussion

The overarching objective of the present study was to ascertain the level of critical thinking capabilities among Chinese postgraduate students so that instructors could incorporate a critical-thinking approach into their research methods classroom instruction. As viewed as a whole, the findings of this particular mixed-methods investigation propose that it would be beneficial to deepen our understanding of the causes why Chinese international college postgraduates frequently exhibit a low-level capacity for critical thinking, particularly regarding China's customary educational framework or academic study habits. The study-for-tests model exerts an immensely reverse effect on how inefficiently or limited Chinese students acquire critical thinking abilities. This conclusion appears in accordance with the findings of other research, which indicate that Asian students lack insight into what critical thinking abilities are or why they deserve consideration (Hood, 2020; Li & Ren, 2020; Jiang, 2020; Kusumstuti et al., 2019; Ghaemi & Mirsaeed, 2017). Furthermore, the overview of Chinese postgraduates' opinions on the critical thinking deposition inventory displayed that a shortage of speculation remains a prevalent issue among Chinese students, based on the CTDI's items 12: if possible, I avoid reading (X = 4.43), 13: decisions made by authority (teacher) are always right (X=4.85), item 17: it is interesting to solve difficult problems (X = 1.67), and item 18: I like to know how things work out (X = 1.78, below the 2-point seldom level of response in Likert scale). Chinese learners feel insufficient and untrained with analytical abilities, which includes an upfront academic scenario, which potentially includes paying full attention to lectures without thereby rendering or contributing individual assertions, a deficiency of disagreement, an absence of functioning automatically in thoughts, and inordinate disarray in explanation, which ends up resulting in an insufficient capacity to advance to an eligible spectrum of specialization and interferes with Chinese students' academic development and nation-building continuities.

Furthermore, the results of this study reveal that Chinese postgraduates are optimistic and sanguine about acquiring critical thinking abilities as an integral part of instructive course training, which allows them to wrestle with intrinsic subject matter knowledge without exorbitant memorization; alternatively, they desire to gain knowledge about how to accurately and efficiently pinpoint problems and analyze problems by distinguishing them out. Notably, through integrating critical thinking training into research methodology course, Chinese postgraduates exist far more inclined to adapt and apply subject knowledge to real-world research-oriented circumstances and to be empowered to express themselves in a more inventive and productive path. In its entirety, it would be apparent that an urgent requirement for targeted professional development for educators in the area of critical thinking skills which comprises a theoretical underpinning, validation of the basic tenets of critical thinking, tangible proof and empirical evidence that instructors may utilize to deeper understand the concept of critical thinking within a broader context and apply it in instructional settings for learner individual in particular (Onen, 2021; Masaeid, 2020; Erkens et al., 2018; Cobbinah, 2017). As a final note, if instructors acquire a comprehensive grasp of critical thinking, they will not only be able to impart the idea to students, but additionally should be capable of effectively employing it to lend a rationale and framework to practically every aspect they undertake as educators and learners across every academic atmosphere.

Conflict of Interest Statement

The author declares no conflicts of interest.

About the Author(s)

Primary Author's Designation: Dr. Li-Wei (Henry) Wei holds the esteemed position of a full-time Doctoral Pedagogue at the distinguished Chinese International College situated within the eminent Dhurakij Pundit University. In addition, he serves as a part-time lecturer at the renowned Chulalongkorn University Language Institute. Dr. Wei's research pursuits encompass an extensive array of subjects, incorporating the fields of English as a Second Language (ESL) and English as a Foreign Language (EFL) composition, English for Specific Purposes (ESP), language education studies, collocational analysis, educational psychology, and beyond. As a prominent Thai-Chinese academic affiliated with DPU Thailand, Dr. Li-Wei Wei has authored numerous erudite publications and is presently engaged in further research endeavors, with the objective of attaining a promotion to the prestigious rank of Assistant Professor.

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