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Understanding Students' Critical Thinking Ability: A Comparative Case of Chinese and British Undergraduates

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Abstract

The purpose of this study was to investigate to what extent the language factor contributes to students' critical thinking abilities. The critical thinking (CT) skills and abilities of final year undergraduate students studying on the same program were tested using a modified Watson-Glaser Critical Thinking Appraisal questionnaire. The students were divided into two groups: a Chinese-educated group and native-speaking and British-educated one. The results indicated that the overall CT skills of the English-speaking students are higher than those of Chinese students and especially in certain aspects of the appraisal. It was also found that Chinese students performed better when completing the appraisal in their native language.

Key words: *Critical Thinking; Language factor; Chinese learners; International Learning;*

Introduction

With the increasing number of Chinese students studying abroad in western universities, there is a growing number of criticisms from western professors raising concerns about a lack of CT ability among Chinese students (Heng, 2016; Clark & Gieve, 2006; Paton, 2005). These concerns have been supported by some previous studies which suggest that students from Asia are generally weak in critical think-

ing, especially when compared to their counterparts in Anglophone countries (e.g. Atkinson, 1997; McBride et al., 2002; Turner, 2006). McBride *et al.* (2002) in their comparative study of pre-service teachers' dispositions towards critical thinking in the USA and China, attribute the lower scores obtained by the Chinese sample to the cultural system in China that discourages independence of thought.

Some studies, however, found that the concept of CT is not alien to Chinese students, and that they can demonstrate CT when teaching is effective (Dong, Anderson, Kim, & Li, 2008; Yang, 2016). This suggests that one's CT skills can be improved providing appropriate measures have been taken. In recent years, Chinese experts and scholars have thought that some Chinese college students suffer from „Speculative Absence” (Huang Yuanshen, 2010, pp. 11–16), which refers to students' lack of analytical, judgmental, reasoning and discriminatory skills. Some studies conducted by Chinese scholars also showed that Chinese students generally do not have positive dispositions towards CT (He, Zhang, & Zhao, 2006; Zhu, Feng, & Yan, 2005). However, these studies have been qualitative and have not focused on the factors accounting for this difference. By contrast, this study employs a quantitative approach to generate deeper understanding of the difference between two cohorts of students, those that have been educated mainly in the UK and one that has been mainly educated in China, studying in the same final year module at a UK university. Students from both groups were invited to participate in filling the simplified version of the Watson-Glaser Critical Thinking Appraisal questionnaire (WGCTA Form S; Watson, 1994). The questionnaire responses were analyzed to identify the differences in CT skills in the two groups, based on nationality and language proficiency.

Literature review: CT and culture

Norris (1985:40–45) describes CT as students' implementing everything they already know, and evaluating and changing their own opinions. In Fisher's (2011) opinion, CT involves a set of strategies to help students develop reflective analysis and evaluation of interpretations or explanations, including their own, to decide what to believe or what to do. However, many researchers maintain that there are varied conceptions and manifestations of CT and that they are shaped by diverse cultures (e.g. Atkinson, 1997; McGuire, 2007; Tan, 2017a, b). The word 'culture' here is taken to refer to a set of attitudes, values, beliefs, assumptions and behaviors shared by a group of people down the generations via symbols, language, rituals and material objects (Hofstede, 1991). Many researchers believe that culture is a key factor influencing individual CT skills (Pennycook 1996, Atkinson 1997, Canagarajah 2002). Atkinson (1997) claimed that CT is a unique western idea and

incompatible with Asian collectivist traditions, and stated that Chinese students in 'western' universities have difficulties with creative and innovative writing, and that they are reticent in class. He attributed this phenomenon to the influence of traditional Chinese culture on Chinese students and claimed that CT is culturally based, and specifically that Chinese culture is not conducive to the development of CT skills. Thus, Atkinson argued that CT is culture specific and a kind of social practice. Atkinson's argument has been echoed by a number of scholars such as Pennycook (1996) and Canagarajah (2002), who argue that CT is very much a western notion, and by Wan (2001), who argued that Chinese cultural values may well affect students' learning styles.

This cultural influence might have played a part in restricting Chinese students' full CT development in respect of argumentation and talking back over several generations. Regarding Chinese traditional culture, Confucian teaching, for instance, encourages good students to be self-reflective, rather than simply inquisitive. According to Confucius, the exemplary student does not challenge the teacher with words. Instead, the student should reflect on him/herself and practice the learned philosophy through action. Pondering on problems quietly is valued more highly than asking the teacher many questions in Confucian cultures. Another well-known Confucian saying from *The Analects of Confucius* is that: "A superior man is reserved in speech but expeditious in action". (Yudan 2006, p. 126)

Paton (2005) on the other hand, claimed that Chinese students' lack of CT in academic writing in English is due more to insufficient knowledge in the subject area and English language deficiency rather than being culturally driven.

Our study looks to test Paton's theory as there appears to be limited quantitative research with regard to this. It is thought this study makes two main contributions to the literature. Firstly, the study advances the literature on CT skills by considering the impact of language as a defining factor for the difference in student CT skills. Secondly, whilst previous studies have focused on using a qualitative approach to understanding CT, the present study looks quantitatively at the impact of language on CT skills. The findings from this study have implications for teaching and learning in higher education in general and for Chinese-educated students in UK higher education in particular.

Research Design

As discussed there are multi-dimensional factors which influence students' CT skills including culture, knowledge of the subject area, target language proficiency,

disposition and cognitive or ability aspects. Yet, the extent to which these factors have been examined in relation to CT vary and remain unclear in the literature. Thus, the objective of the current study is to explore whether there is a disparity in CT capability between Chinese and English-speaking students in a UK University and whether the language factor influences the CT ability of Chinese students in this context..

The study was conducted in a UK University. The module that forms the data source for the study was a final year compulsory module for the award of a Bachelor Degree in Accounting and Finance. The accounting and finance department at the university has over 3000 students from all over the world and some 200 faculty members. The programme, as with many courses in UK universities, has a sizeable number of international students of which Chinese students constitute a significant part. Many Chinese students join in the second year as direct entrants and some join in the final year as part of a joint degree arrangement with universities in China. The university in which the research was conducted has a long history of collaboration with its Chinese counterparts and recognizes that international students struggle to understand the educational system and cultural norms in the country, so it organizes a welcome and induction programme for its international cohort to ease their integration and help them settle into their new learning environment.

Data for the study was obtained through a survey which was administered to both the Chinese and British cohorts in the university. Survey is a well-established and popular method of data collection for investigation, where participants' perception can be collected for a large number of participants. It is reliable, faster and often cheaper compared to other methods of data collection. However, there are different understandings of how to appropriately measure CT and as a result there are several instruments used for measuring students' CT disposition, or CT skills, such as the California Critical Thinking Disposition Inventory (CCTDI) (Facione, et al., 2001), WGCTA Form S (Watson, 1994) and the California Critical Thinking Skills Test (CCTST, 2008; Facione, 2002), which are all designed in English with Eurocentric or Western-centric perspectives. Thus, judging Chinese students' CT skills using these measures could disadvantage Chinese students. Based on the view that the WGCTA has been refined and tested and can be viewed as being culturally neutral (Grosser & Lombard, 2008), WGCTA, which was originally designed as a psychometrically derived measure comprising of 40 items in five sub-tests that address the theoretical concept of CT and issues of practical applications, was chosen in this study.

The participants in the survey were 120 undergraduate students aged from 21 to 23, studying Accounting and Finance, 60 native English-speaking students and 60 native Chinese-speaking students. They were recruited with the help of several colleagues who offered to distribute the appraisal forms after their classes. Although 120 questionnaires were handed out because some students failed to follow the instructions in the first part, only 100 valid questionnaires (50 native English-speaking students and 50 native Chinese-speaking students, including 47 males and 53 females) were used in the final analysis.

Given the fact that the language barrier was assumed to be the focal factor which may influence Chinese students' responses, the appraisal was translated to provide both English and Chinese versions with identical content in this research. Chinese students were required to take the English version first, then to respond to the same questions in the translated Chinese version in order to examine their real CT ability by comparing the score of the two versions. This allowed us to explore the disparity between native Chinese and English speakers in CT capability and the factors affecting the CT ability of Chinese undergraduates.

The Instruments: measurements and variables

The study used the WGCTA questionnaire to measure students' CT. There are two parts in the survey. The first includes information on demographic characteristics (nationality, age, gender, majors) and the second part contains 40 questions in five sub-scales. The 'Inference' sub-scale focuses on the correctness or incorrectness of an expression. In the 'Recognition of Assumption' sub-scale, the respondent is asked to identify the presence or absence of an assumption in an expression. In the 'Deduction' sub-scale, the respondent is required to determine extracted or non-extracted results from a situation. The 'Interpretation' sub-scale, looks for the ability to interpret and clarify by specifying the extracted or non-extracted interpretations of biographies and finally, 'evaluation of argument' determines detection of strong and weak evidence. In the 'inference' section, they need to judge if a statement is true or false after they finished reading four statements of fact. In 'Recognition of Assumptions', the four statements are followed by the proposed assumptions. The participants need to decide whether the assumption was 'made' or 'not made'. The 'Deduction' section consists of four premises followed by a suggested conclusion. The participants should think whether this necessarily follows from the premises given. The 'Interpretation' section is composed of four short paragraphs, each followed by suggested conclusions. The participants need to judge whether each of the proposed conclusions logically, beyond reasonable doubt, follows from the information given in the paragraph. In the 'Evaluation of

Arguments' section the participants are required to distinguish if the arguments are strong or weak. WGCTA is scored only for correct responses.

For this study the researcher only had access to the students for a limited time for them to complete the appraisal. Consequently, a decision to modify the form was made as it may take the participants' longer to complete the whole WGCTA Form S, and as a result this could decrease the number of completed appraisals. Although it was not possible to pilot the changes, the instrument was modified in such a way as to not compromise the main objective of the instrument. The five sections were retained but the number of questions in each were reduced to 4 questions per section and a total of 20 questions (shown in the appendix) down from 40 in the original question, which had 8 questions per section. The participants completed the questionnaire in the presence of the researcher. Therefore, scores were determined as numbers of correct responses/20×100%.

Ethical considerations

Permission for this research was obtained from the UK university's Ethics Committee. All participants were briefed on the purpose of the study and were given a complete guarantee of confidentiality that the questionnaires would be kept in confidence and in the possession of the researcher. Participation was entirely optional; there was no penalty for non-participation, and there was the option of voluntary withdrawal from the study before the completion of the project. Data generated from the research was stored on a university authorized computer with password protection.

Findings and discussion

The results of the Appraisal of CT study are presented in Table 1 where the percentage-correct score in each of the 5 sections of the WGCTA are shown for each group of students. The contents in each row are the scores on the five sub-scales of questions. The first row corresponds to the English students tested with the English version questionnaire (EE), the second row are the Chinese students with English version (CE) and the last row represents the Chinese students with Chinese version of questionnaire (CC). It shows scores in CT skills in 5 individual aspects and it shows that the mean score on the EE, CE and CC are 60%, 51%, and 54% respectively.

There is a difference in scores between native English-speaking students and native Chinese speaking students (60% vs. 51%) when completing the English

version of the appraisal, corresponding to other research results that show the CT skills of Chinese students are lower than that of the English-speaking students (Pennycook 1996, Atkinson 1997, and Canagarajah 2002). However, there is also a score disparity for Chinese students when the same questionnaire is given in different languages (51% for English version and 54% for its translation in Chinese), indicating there is a contribution of the language factor to the CT skills of Chinese students.

Table 1. Scores of questionnaire under three test settings

	Inference	Assumption	Deduction	Arguments	Interpretation	Average
EE	51%	72%	63%	50%	63%	60%
CE	59%	47.5%	57%	34%	60%	51%
CC	55%	51%	62.5%	41%	58%	54%

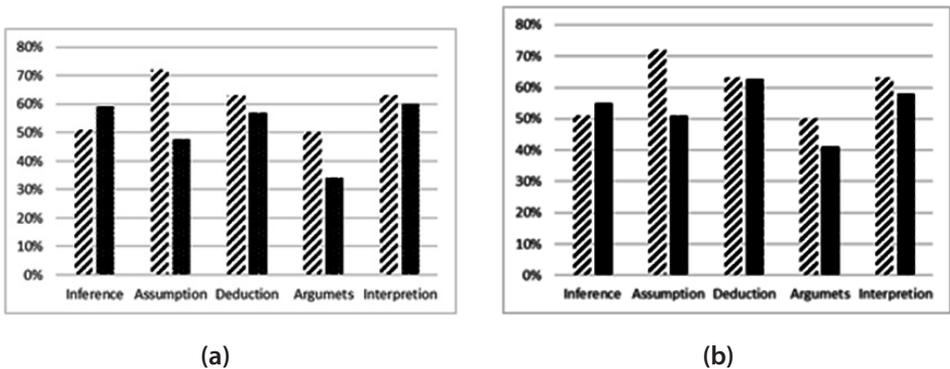


Figure 1. (a) CT skills of native speaking students (bars with striped fill) and their Chinese counterparts (bars with solid fill) when tested in English, and (b) CT skills of when both English and Chinese students are tested in the language of their own. Apparently the difference in (b) is less than that shown in (a)

To make comparison easier, the results have been illustrated as Figure 1, where the CT skills of both Chinese and English students using the test in English are shown in Fig.1(a). It is clearly seen the CT skills of English students (bars with striped fill) are higher than that of Chinese students (bars with solid fill). Similarly, the results of students tested in their own language, shown in Fig.1(b), clearly demonstrated better results. According to the “Average” column in Table 1, the critical skills of Chinese students are calculated as $(60-51)/60 = 15\%$ lower than

English students when both are tested in English, while this was reduced to 10% (calculated by $(60-54)/60$) when Chinese students are tested in Chinese. Therefore the language contribution to the CT skill test is calculated as $(15-10)/15 = 33\%$. This outcome confirms the previous research of Paton (2005) that Chinese students' lack of CT is due more to English language deficiency and it is not sensible to conclude that it is purely the Chinese culture that leads to the problems with CT in Chinese students.

It should be acknowledged that the Chinese education system may also have an effect on Chinese students' CT skills. In the national university Entrance Examination, unified examination papers are implemented and scores are based on standard answers, making the basic education system become a kind of "exam-oriented education". This is similar to the UK where students are expected to have completed Advanced Level qualifications or equivalent. However, the education mode of junior and senior school in China is more teacher-centered, where students memorize the teaching content and are focused on testing. In this kind of indoctrination and cramming style of learning, students passively receive knowledge without using their own judgment, so it is difficult for the Chinese students to develop argument and assumption abilities, whereas teaching in the UK tends to be more student-centered.

It is also worth noting that the CC mean score for inference ability was higher than that of the English groups (59 % vs 51 %). This seems to correlate with Turner's (2006) conclusion that Chinese students have been frequently found to be good at mathematics and other scientific subjects which require reasoning. It is well known that Chinese students are well trained in reasoning and calculation during their primary and secondary education. As reasoning is a CT skill this result supports the idea that language proficiency could be a determining factor when it comes to perceived CT skills.

Comparing the ability of deduction between the two studied groups, the present results indicate that the average score of English students is similar to that of the Chinese students when the paper is completed in Chinese i.e. EE vs CC is 63% vs 62.5%; it could be argued that this is not surprising as according to the Chinese "New Curriculum Standard", which is the basic programme document of the national curriculum and the basic norm and quality requirement of the national curriculum for basic education in China, Chinese students have experienced mathematical activities such as observation, experiment, conjecture and proof; with the expectation of increasing their ability in deductive reasoning.

Our research results indicate that even when the language factor was excluded there is still a gap between English and Chinese students in certain aspects of CT

skills, and especially in the subsections 'Evaluation of Arguments' and 'Recognition of Assumptions'. The results of this research show that the CT skill scores for EE and CCon these two subsections are 72% vs 51% and 50% vs 41% respectively. It could be argued that these outcomes reflect differences in the cultural contexts. Independent judgment is encouraged in western countries. As a result, this contributes to an active process of thinking, where many different viewpoints need to be considered, which contrasts, with Chinese society, where traditional collectivistic values still exert potent influences (Watkins & Biggs, 1996). In this cultural context, higher values are placed on respect for authority, conformity and social harmony, while diversity in opinions may not be well appreciated. When issues arise, Chinese people are encouraged to judge and act with reference to the perceptions and feelings of others (Gabrenya & Hwang, 1996). This argument has also been echoed by Wan (2001), who claimed that respect for authority and desire for conformity may well affect Chinese students' learning styles and way of thinking. Thus, he believes that students are accordingly expected to respect teachers and listen quietly and carefully in class and so consequently they seldom question their teachers. These assertions also align with Hofstede's (1991) well-known theory of cultural theory- power distance. In high power distance cultures like some Asian countries, hierarchical and inequality is accepted. Therefore, cultural difference could also contribute to the disparity in CT skills.

Conclusions

The effect of language in the evaluation of CT ability has been revealed quantitatively for the first time by this research and this study indicates that language is an important factor when determining CT skills. It is understood this was a small study undertaken within a limited timescale. Ideally the full WGCTA Form Sappraisal form would have been used, or the reduced version piloted, but regardless of these limitations the study does highlight areas where Chinese students differ in CT ability to UK students. It can be seen that in some areas the Chinese students' CT skills are potentially stronger than, or equal to, UK students' skills which we believe can be explained by educational and possible cultural differences.

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