

Impact of Jigsaw Cooperative Learning Technique on Enhancing Kuwait English Language Student-teachers' Speaking Skills

DOI: 10.15804/tner.2020.61.3.10

Abstract:

This quasi-experiment examined the impact of the jigsaw cooperative learning technique on enhancing the speaking skill of Kuwaiti student-teachers of English. In the first semester of 2019/2020, 40 female students enrolled in a Conversation Course were divided equally into control and experimental groups based on an oral presentation task (pre-test). Data was assessed through a speaking skill competency rubric (vocabulary, accuracy, fluency, and pronunciation). The post-test results indicated statistically significant differences between the means of the participants in favor of the experimental group. A pre-post experiment questionnaire was also administered to identify students' attitudes towards the jigsaw technique. SPSS program was used for data analysis. The t-test results showed a positive attitude of the experimental group towards cooperative learning and the jigsaw technique. It is recommended to use the jigsaw technique to improve students' speaking skills.

Key words: *Cooperative Learning, Jigsaw Technique, English Student-teachers, Speaking Skill, Kuwait*

Introduction

Speaking is an important skill for students of English needing to engage in different interactive activities. Students are expected not only to communicate

with others but also to be able to share the information obtained with other speakers. Nunan (1991, p. 23) defines speaking as the “ability to express oneself in the situation, or the activity to report acts, or situation in precise words or the ability to converse or to express a sequence of ideas fluently”. Thus, to be a good language speaker, it is necessary to reach an acceptable level of accuracy and fluency (Kao & Craigie, 2010). This can be achieved by providing language students with opportunities that promote their interaction (Brown, 2007). However, this is challenging for language students who are reluctant to take part in interactive speaking classroom activities due to their low language proficiency (Chen & Chang, 2009). Ur (1996, p.121) explains that “learners are often inhibited about trying to say things in a foreign language in the classroom: worried about making mistakes, fearful of criticism or losing face, or simply shy of the attention that their speech attracts”. Such issues can make language students silent or speak less when language teachers dominate the speaking activities which lead to a teacher-centered classroom (Pappamihiel, 2002), as students are dealt with as passive learners (Ning, 2011). Without doubt this negatively affects students’ confidence to participate (Gomleksiz, 2007). Yet, the teacher-centered model has shifted to a learner-centered model (Nunan, 1988). This shift has a positive impact on language students’ speaking skill and classroom participation (Kao & Craigie, 2010). However, students are still reluctant to participate as they find it difficult to speak and express themselves (Rashedi, 2017). Thus, to benefit from this shift in learning, it is necessary to adopt an alternative model to promote student speaking other than traditional speaking instruction. Based on research, cooperative learning with its varied techniques including jigsaw is a promising alternative to achieve the expected speaking proficiency (Ning, 2011). Ahmed & Bedri (2017) investigated the effects of cooperative learning on undergraduate learners’ oral skills in Khartoum. The experimental group showed improvement in their speaking performance. They were more motivated, less reluctant, and had a positive attitude towards cooperative learning activities. Cooperative learning has been found to be an effective learning strategy which improves students’ attitudes towards learning (Salvin, 1995).

Problem of Research

Speaking is an important language skill that needs to be mastered to reflect students’ abilities to use the language proficiently. This is even more important for English language student-teachers who need to communicate and express

themselves fluently and professionally as future language teachers. At Kuwait University, the purpose of the Conversation Course is to provide student-teachers with opportunities to speak and use the language productively and accurately. However, many English language student-teachers are not able to communicate fluently and easily. This creates a barrier which inevitably reduces effective interaction and negatively affects their future teaching performance. This study aims to examine the impact of jigsaw as a cooperative learning technique on enhancing the speaking skill of English language student-teachers with a focus on fluency, accuracy, use of vocabulary, and correct pronunciation.

Research Questions

The study attempts to answer the following questions and tests the related null hypotheses:

- 1) What is the impact of the jigsaw technique on Kuwaiti female English language student-teachers' appropriate practice of vocabulary, accuracy, fluency and pronunciation during speaking tasks?
- 2) What are the attitudes of the participants regarding the jigsaw technique?

The study tests the following null hypotheses at the significance level of $p=0.05$:

- 1) There are no statistically significant differences in the mean scores of control and experimental groups on the oral proficiency test.
- 2) There are no statistically significant differences in the mean scores of the participants' attitude based on the pre-post experiment results.

Research Focus

Cooperative learning has several techniques that foster students' interaction, one of which is jigsaw. Brown (2007) explains that the jigsaw technique is a form of information gap that encourages students to cooperate and share the needed piece of information to fill in the gap and complete the task. This encourages social interaction among the group members (Salvin, 1995). According to Gregory and Chapman (2007) jigsaw encourages a shared responsibility model of learning with a focus on the inter and intra-personal skills of the students which are valuable to the learning process. Social skills will be gained as students are encouraged to listen to each other and exchange their thoughts aloud (Johnson & Johnson, 2002). This eventually will help to develop students' language skills.

Several studies have been conducted to test the impact of jigsaw on students speaking skills. Erfiani and Neno (2018) explored the effect of jigsaw on improving students' vocabulary ability at Timor University in Indonesia. They found that the jigsaw technique improved students' vocabulary and their interaction with their teacher and other students. Rimani Nikou, Alavinia, Karimzadeh (2013) conducted an experimental study on 32 female students and found out that there was a statistically significant difference in the mean scores in favor of the experimental group's speaking ability as they outperformed the control group and obtained a higher average score. Lin (2010) investigated the perspectives of Taiwanese teachers and students towards the use of jigsaw technique in first-year university level English classrooms. The results showed it had significantly contributed to the experimental group. Regardless of whether participants expressed positive or negative opinions, both groups expressed their willingness to continue adopting jigsaw in their future English classes. In addition, the jigsaw technique has been found to have a positive impact on improving English Language students' participation and enthusiasm (Mengduo & Xiaoling, 2010), and students' academic achievement (Evcim & İpek, 2013).

Methodology of Research

General Background of Research

This quasi-experimental study aimed to examine the impact of the jigsaw cooperative learning technique on enhancing the speaking skill of Kuwaiti student-teachers of English.

Sample of Research

The sample consisted of 40 female Kuwaiti student-teachers of English enrolled in a Conversation for the Language Teachers Course in the first semester of 2019/2020. They were in their second year of study at the College of Education at Kuwait university. They were divided equally into two groups, control and experimental. The participants were homogeneous with regard to age, ranging from 19 to 20 years old, gender, mother tongue (Arabic), exposure to English and educational and cultural background. However, they were heterogenous with respect to their language proficiency. The purpose of the study was explained to the experimental group, and their consent to take part in it was obtained.

Instrument and Procedures

Instrument

Two research instruments were used. The first was a speaking test used as a pre-post-test with three tasks (presenting an educational game, commenting on an educational YouTube video, and presenting a teaching technique) to measure their English-speaking performance. A speaking skill competency rubric was developed to measure the quality of performance based on four criteria: vocabulary, accuracy, fluency, and pronunciation with a four-rating scale of fair, adequate, good, and excellent. To establish the reliability of the first instrument, it was checked through a test-retest method. The test was administered twice with a pilot group of 20 students within a span of 7 days to calculate the correlation coefficient between the two sets of scores, which was found to be 0.96, which is an acceptable value. In addition, inter-rater reliability which is the degree of agreement between the two test-retest scores was checked. The correlation coefficients obtained for the two scores were 0.911 and 0.915 which indicated high inter-rater reliabilities. Thus, the test was reliable and valid as a research tool.

The second instrument was an eight item attitude questionnaire on a 3-point-Likert scale ranging from 1 „agree”, to 3 „disagree” which was developed by the researcher based on reviewing relevant literature. It was used to identify students' attitude on the use of cooperative learning. Means, standard deviations, and t-test were calculated and analyzed using SPSS program. The validity of the questionnaire was verified by 4 faculty members from the College of Education at Kuwait University. The questionnaire reliability coefficient of Cronbach's alpha was 0.87, with a mean of 3.76 and a standard deviation of 1.27, which was suitable for the study.

Procedures

The participants were divided into two groups, control and experimental. They were introduced to the same speaking topics and had a six-week treatment period with 18 hours of speaking classes, each of which lasted one hour. The control group attended classes following the traditional method of teaching and received instructions on assigned topics to prepare at home, and their participation was through making oral presentations and taking part in class discussions. Students were given the opportunity to ask questions and get answers from their professor (the researcher) and their classmates. The experimental group was introduced to the jigsaw technique and how to participate accordingly. Students were divided into five groups of four students each with different speaking skill levels based on

their previous speaking test results. For the first 20 minutes of class time, students with the same segment of the discussed topic had to join the expert group to discuss the topic in details. For the second 20 minutes, they rejoin their jigsaw groups to share their in-depth ideas with their group members. In the last 20 minutes of class, the jigsaw groups shared the results of their experience orally with their other classmates. This guaranteed that the entire class took part in the oral activities related to the discussed topic. The researcher's role was to monitor and assess students during class time to ensure that all students were participating. The researcher assessed students based on their choice of relevant vocabulary, accuracy, fluency, and pronunciation. Student were allocated 5 minutes to give an oral presentation in front of their classmates in the next class meeting. Both groups responded to the questionnaire before and after the experiment to find out their attitudes towards the jigsaw technique and its impact on enhancing their speaking skill.

Data Analysis

Pretest-posttest method was applied to analyze the study results. Data analysis was run by using SPSS (25.0) and the significance level of $p = 0.05$ was adopted. Mean scores, and standard deviations were calculated. A t-test was conducted to evaluate the impact of jigsaw on enhancing the speaking performance of the experimental group as compared with the performance of the control group. As well, the t-test was used to compare the pre-post questionnaire results.

Research Results and Discussion

This section provides answers to the two research questions raised and the related null hypotheses.

The First Research Question

Light will be shed on the first question: (what is the impact of the jigsaw technique on Kuwaiti female English language student-teachers' appropriate practice of vocabulary, accuracy, fluency and pronunciation during speaking tasks?) and the null hypothesis is: "there are no statistically significant differences in the mean scores of the control and experimental groups on oral proficiency test. Table 1 presents the pre-test results of the control and the experimental groups".

As seen in Table 1, the mean scores were of similar levels in both groups. There were no statistically significant differences in the performance of the student-teachers in both groups as the values were greater than the statistical significance level $p = 0.05$. This meant that both groups demonstrated similar levels

Table 1. Pre-tests of the Control and Experimental Groups

Speaking Competencies	Groups	Mean	Stand. Dev.	T	df	Sig. (2-tailed)
Vocabulary (use of variety of relevant vocabulary and expressions)	Control	2.725	0.694	0.363	38	0.971
	Experimental	2.743	0.754			
Accuracy (correct use of grammatical rules)	Control	2.850	1.197	0.328	38	0.794
	Experimental	2.773	0.975			
Fluency (fluent and smooth speaking)	Control	2.467	0.764	0.434	38	0.977
	Experimental	2.474	0.969			
Pronunciation (correct pronunciation and intonation)	Control	3.797	1.062	1.495	38	0.395
	Experimental	3.402	1.148			

of their English language speaking competencies with reference to their use of vocabulary, correct grammar, fluency, and correct pronunciation. Thus, there was no group favored over the other.

Results of Testing the Null Hypothesis of the first study:

The study null hypothesis is as follows: there are no statistically significant differences in the mean scores of the control and experimental groups on oral proficiency test. To find out the impact of the jigsaw technique on the experimental group compared to the control group, the null hypothesis was tested. Table 2 represents the post-test results.

Table 2. Post-test Results of the Control and Experimental Groups

Speaking Competencies	Groups	Mean	Stand. Dev.	T	df	Sig. (2-tailed)
Vocabulary (use of variety of relevant vocabulary and expressions)	Control	2.488	0.584	3.231	38	0.002*
	Experimental	2.842	0.628			
Accuracy (correct use of grammatical rules)	Control	2.219	0.948	4.454	38	0.000*
	Experimental	3.096	1.161			
Fluency (fluent and smooth speaking)	Control	2.249	0.683	2.198	38	0.029*
	Experimental	2.552	0.819			
Pronunciation (correct pronunciation and intonation)	Control	3.579	1.089	2.300	38	0.024*
	Experimental	3.978	1.020			

Table (2) shows that the post-test mean scores of the experimental group were far better than those of the control group. The post-test revealed that the application of the jigsaw technique had improved the speaking competencies of the experimental group in their use of vocabulary, correct grammar, fluency, and correct pronunciation. Notably, the significance levels of the experimental group variables in the four speaking skill competencies were less than the significance level $p=0.05$, which meant that there were statistically significant differences attributed to the learning method, i.e. the jigsaw. Thus, the null hypothesis was rejected.

The Second Research Question:

The following section provides answers to the second research question and the related null hypothesis which is as follows: “what are the attitudes of the participants regarding the jigsaw technique?” and the null hypothesis is “there are no statistically significant differences in the mean scores of the participants’ attitudes based on the pre-post experiment results”. Table 3 presents the mean scores and standard deviations of both the control and experimental groups in the pre-post experiment questionnaire results to find out their attitudes towards the jigsaw technique.

Table 3. Control and Experimental Groups Pre-Post Questionnaire Results

Questionnaire Items	Pre-test				Post-test			
	Control		Experimental		Control		Experimental	
	Mean	Stand. Dev.	Mean	Stand. Dev.	Mean	Stand. Dev.	Mean	Stand. Dev.
1) Cooperative Learning makes learning easier	2.386	0.651	2.427	0.598	2.471	0.746	3.542	1.090
2) Cooperative Learning enhances class participation	2.068	0.938	2.047	1.140	2.450	0.827	3.970	0.968
3) Cooperative Learning enhances good working relationships.	2.0293	0.778	2.506	0.790	2.837	1.164	3.768	1.143
4) Students who work together achieve more than when they work alone	2.469	1.215	2.538	1.023	2.615	0.660	3.835	1.134
5) Jigsaw technique helped in gaining vocabulary	2.257	0.964	2.704	0.533	2.478	0.613	3.683	0.960
6) Jigsaw technique helped in using correct grammatical rules	2.624	1.118	2.970	1.998	2.355	0.805	3.852	1.113

7) Jigsaw technique helped in speaking fluently and smoothly	2.773	0.975	2.854	1.196	2.630	0.740	2.998	1.188
8) Jigsaw technique helped in improving my pronunciation	2.405	1.148	2.973	1.062	2.295	0.700	3.957	1.020

Table 3 showed that the mean scores of both the control and experimental groups were of similar level in their responses to the pre-experiment questionnaire. The data suggested that both groups were similar in their attitudes towards the jigsaw technique before starting the experiments. However, the mean scores of the experimental group were higher than those of the control group in the post-experiment questionnaire, which indicated that student-teachers in the experimental group benefited from the jigsaw technique in enhancing their speaking skill competencies and outperformed the control group.

Results of Testing the Second Study's Null Hypothesis:

The study null hypothesis is as follows: there are no statistically significant differences in the mean scores of the participants' attitude based on the pre-post experiment results. To determine if there was a significant statistical difference between student-teachers in the control and experimental groups, a t-test was conducted at both levels i.e., pre- and post- experiment questionnaires. The results obtained enabled us to test the null hypothesis of the second research question. Tables (4 and 5) present the pre-post experiment questionnaire results using the t-test.

Table 4. Pre-Experiment Students' Attitudes Questionnaire Results

Group	Number of Participants	Mean	Stand. Dev.	T	df	Sig. (2-tailed)
Control	20	2.384	1.582	1.684	38	0.582
Experimental	20	2.536	0.876			

Table 4 showed that there were no statistically significant differences in the attitudes of the two groups towards the jigsaw before carrying out the experiments. The significance level of the pre-experiment result 0.582 was higher than the significance level $p=0.05$. It can be judged that the two groups were at similar level of attitudes towards cooperative learning and the jigsaw technique before conducting the experiment.

Table 5. Post-Experiment Students' Attitudes Questionnaire Results

Group	Number of Participants	Mean	Stand. Dev.	T	df	Sig. (2-tailed)
Control Group	20	2.521	1.324	1.963	38	0.026*
Experimental	20	3.882	0.568			

Table 5 showed that there were statistically significant differences with reference to the post-experiment questionnaire in favor the experimental group. The mean score of the experimental group was 3.882 with a standard deviation of 0.568, while the mean score of the control group was 2.521, with a standard deviation of 1.324. This suggested that the experimental group benefited from learning using the jigsaw technique compared with the control group students who were taught by traditional teaching method. Notably, the significance level of the post experiment 0.026 was less than the significance level $\alpha=0.05$. Thus, the null hypothesis was rejected.

Conclusion

This study was conducted to examine the impact of jigsaw cooperative learning technique on enhancing the speaking skill of Kuwaiti English language student-teachers. The statistical analysis of the pre-test scores indicated that the control and experimental groups showed equivalent levels of their speaking performance. However, the post-test results confirmed that there was a significant increase in the speaking performance of the experimental group at the significance level of $\alpha=0.05$, and that was seen in their increased speaking abilities. The participants were able to speak fluently and accurately with correct use of vocabulary, and correct pronunciation. Such results were in accordance with those of Erfiani and Neno (2018) and Rimani Nikou, Alavinia, and Karimzadeh (2013) as their participants showed improvement in their vocabulary ability and interaction with their teachers and classmates. In addition, their social skills with their classmates became better and they gained self-confidence to speak in front of the class as indicated by Salvin (1995), Johnson & Johnson (2002), and Gregory and Chapman (2007). The findings contradicted with those of Rashedi (2017) and Gomleksiz (2007) who concluded that their students were reluctant to participate as they found difficulty in speaking and expressing themselves. Thus, the first study null hypothesis was rejected.

In addition, the post-test questionnaire results show that the experimental group had positive attitudes towards the jigsaw technique compared with their pre-test results which were similar to the control group in the pre-test. This supports the findings of Mengduo and Xiaoling (2010) that the jigsaw technique had a positive impact on improving English Language students' participation and enthusiasm. However, the control group scored similar results in the pre-posttest as they did not experience learning with the jigsaw technique. Thus, the second null hypothesis was rejected as well.

Finally, the results of this study indicated the advisability of applying the jigsaw technique to enhance the speaking skill of English language student-teachers. The study drew attention to the importance of speaking as a fundamental skill of the English language. The findings supported what the literature indicated about the effectiveness of using cooperative learning and the jigsaw technique in developing the speaking skill.

Based on the study findings, three important recommendations are highlighted:

1. Language teachers at university level and public schools should employ this technique to teach the speaking skill because it is more effective than traditional teaching methods.
2. Workshops and training sessions should be held about how to apply the cooperative learning and the jigsaw technique.
3. Future studies should be conducted to identify the effectiveness of the jigsaw technique in teaching other language skills, such as reading and writing.

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Acknowledgement

I would like to thank the participants in this study for taking part and making this study possible.

2021 New
E|Educational
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**Social
Pedagogy**



Hu Lianqing
China, United Kingdom

Ismail Adelo
United Kingdom

Kathryn Last
United Kingdom

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

DOI: 10.15804/tner.2020.61.3.11

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

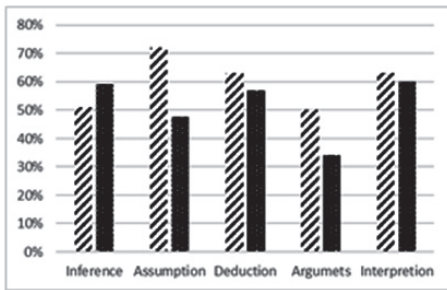
The results of the Appraisal of CT study are presented in Table 1 where the percentage-correct score in each of the 5 sections of the WGCTA are shown for each group of students. The contents in each row are the scores on the five sub-scales of questions. The first row corresponds to the English students 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

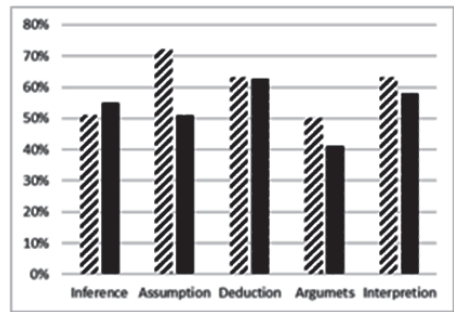
version of the appraisal, corresponding to other research results that show the CT skills of Chinese students are lower than that of the English-speaking students (Pennycook 1996, Atkinson 1997, and Canagarajah 2002). However, there is also a score disparity for Chinese students when the same questionnaire 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%



(a)



(b)

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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