Cultivating Foreign Language Learners' Critical Thinking Skills in a Flipped Model

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Abstract

Despite a shift of learning approaches to the flipped model and rich studies on CT skills, there lack some attempts of training CT skills in this new way of learning. This study adopted a quasi-experiment design to test the effect of cultivating foreign language learners' critical thinking in a flipped model. Research findings showed a significant increase in students' CT skills in the experiment group, especially in three key component sub-skills, analysis, inference and deduction. Pedagogical implications were offered as to the way of explicitly training students' CT skills.

Key words: Critical thinking; Flipped model; CCTST; Language class

1. INTRODUCTION

Critical thinking (CT) is a term that hasn't received the widely recognized definitions and around this term, different researchers give various definitions from different perspectives. Despite the differences in defining CT, there are two kinds of definitions, one regarding CT as a set of skills and the other regarding CT as disposition. CT disposition is concerned with recognizing the need of a certain kind of CT skills as well as a willingness to apply this skill by making mental efforts (Halpern, 1997). CT skills are considered by Ennis and Norris (1989) as a series of skills related to the efforts one has made consciously when he makes decisions concerning what should be believed and what should be done by concentrating his attention on it. Mainly, CT skills include the skills in metacognition, logically evaluating information sources, solving problems and selecting appropriate strategies or solutions (Ennis, 1987).

CT skills are critical in ensuring the success of college education and college education should pay much attention to the skills students can gain in their studies, especially CT skills (Willingham, 2008). Apart from the academic success, CT skills also empowers students in their future career and social life as a member contributing to the society (Dwyer, 2017; Dwyer, Hogan & Stewart, 2014). In spite of the recognized importance of CT skills, studies showed that some students do not have access to CT skills training and they are not as strong as they are required in the development of CT skills in their college education (Arum & Roksa, 2011; McLaughlin et al, 2014). In China, there also exists the phenomenon that Chinese college students haven't been empowered with the necessary CT skills they should have (Huang, 1998; Huang, 2010).

A growing recognition has arisen that college courses should be dedicated to the improvement and training of CT skills. Studies have confirmed that CT can be taught to students although which way is a proper approach to CT training is still in discussion (Abrami et al, 2015; Abrami at al, 2008). Some studies have explored the ways of fostering CT (Ennis & Norris, 1989; Tehrani & Razali, 2018), yet there lack attempts to cultivate CT in the context of learning approaches reforms, especially in the flipped classroom. The flipped classroom is learner-driven and is considered beneficial in enhancing the development of CT skills (Kong, 2015). How to improve learners'

CT skills in this new context is still under exploration. Therefore, this study explores the way of cultivating foreign language learners' CT skills in a flipped model.

2. LITERATURE REVIEW

2.1 CT skills Cultivation

Since CT skills cannot be acquired naturally without any training focusing on them (Alnofaie, 2013) and the previous studies (Abrami et al, 2015; Abrami at al, 2008) have proved it is possible and applicable to teach them, researchers have made persistent efforts to explore the ways of training CT skills. Yet there is still no consensus as to which way is more proper and potential to teach CT skills.

There are two lines of cultivating CT skills, that is, implicit way and explicit way. The implicit way refers to the embedded model. In this model, students are taught CT skills implicitly and there is little relevant training or scaffolding for the teachers of those courses CT skills training is embedded in. This model has been confirmed to be helpful in empowering students with CT skills and disposition (Huber & Kuncel, 2016). However, this conclusion has been challenged due to its failure in poor search procedures (Dwyer, 2017). Apart from this point, one problem in the embedded model is teachers' insufficient storage of CT skills which are quite necessary for those teachers to master (Kadir, 2017; Angeli & Valanides, 2009).

Another line of cultivating CT skills is to explicitly teach CT skills in classrooms (McCormick et al., 2015; Dwyer, 2014). Although some studies have proved the effectiveness of explicitly training CT skills, there is no definite agreement as to how explicitly CT training should be carried out (Abrami et al., 2008). CT skills may be taught as the only instruction in the course and they may also be trained in courses integrating the course content and explicit CT skills training. Despite the degree of being explicit of CT skills training, studies found the CT instruction is successful when students are engaged in active learning instead of passive learning in CT skills training (McCormick et al., 2015).

2.2 Flipped classroom

Flipped classrooms pay attention to high-quality in-class activities by moving the study of the course content from the classroom to the place outside the classroom. That means the content taught in the classroom traditionally is flipped to after-class guided self-study and the traditional homework is converted into high-quality in-class activities guided by the instructor (Lage et al., 2000).

Much research has studied the potential of flipped learning and compared the flipped learning and traditional face-to-face learning and instruction. Flipped learning is more effective in enhancing learning results (Bernard et al., 2014).

Although explicit CT skills training is beneficial in CT training, yet the degree of being explicit in CT training, especially in the context of learning model reforms, that is, in a flipped model, hasn't been fully explored. This study approached CT skills training in language learning classroom in a flipped model.

3. METHODS

This research studied the effect of CT skills training in the flipped model in foreign language classrooms. Two research questions guiding this quasi-experiment are as follows:

RQ1: Did the flipped model have any influence on CT skills of the participants in the intervention group?

RQ2: If yes, how did the two groups, the experiment group and the control group differ in their CT skills after the intervention was over?

Participants

The participants in the study were chosen through a convenient sampling on a voluntary basis. In total, 140 non-English freshmen in two classes agreed take part in this program and they were informed of their freedom to withdraw in any stage of this study. In each of the two classes, there were 70 students and they were also assured of the irrelevance of this research and their scores for this course. During the research, all the participants were enrolled in the compulsory course, College English. And all of them hadn't received any kind of CT skills training.

The two classes of the participants were in two intact class and one of them was the experiment group and the other the control group. In the experiment group, a flipped model of CT skills training was adopted and in the control group there was no any kind of conscious CT skills-target training. In the two classes, the instructor is the same and students use the same textbooks. One important difference lies in the way CT skills were treated.

Table 1
Demographic information of the experiment group and control group

Groups	N	Nfemale (%)	Nmale (%)	Mean age
Intervention	70	36 (51.4 %)	34 (49.6 %)	17.9 (SD=1.41)
Control	70	31 (44.3 %)	39 (55.7 %)	(SD=1.25)

3.2 Instruments

3.2.1 Critical Thinking Skills

In this study, CT skills are assessed in a Chinese version of California Critical Thinking Skills Test (CCTST) (Facione & Facione, 1998). This Chinese version of CCTST has been modified and validated by Luo & Yang (2002). The CCTST is designed based on CT compositions in the Delhi report and has five sub-scales, scales of analysis, evaluation, inference, induction and deduction. In total, there are 34 items in the scale and the participants are required to finish the whole scale within 45 minutes.

One item weighs one mark and the total score is 34 marks. Two sub-skills, induction and deduction are tested in the 34 items and some of those focus on one particular skill of the three key skills, analysis, evaluation and inference. Chinese version of CCTST were used before and after the intervention to test the participants CT skills.

3.2.2 Language Proficiency

In this study, the participants' foreign language proficiency is assessed through their English scores in College Entrance Exam. College Entrance Exam is a national standard test to be taken by all applicants to be admitted to college in China and bears good reliability and validity. There are different kinds of exercises in English test to assess test-takers' listening, reading and writing. The total score of this test is 150 marks and there was no significant difference in the participants' English score between the experiment group and the control group. The average score of the test is 128.3 marks in the experiment group and 127.6 marks in the control group (p>.05).

3.2.3 Procedures

The study lasted for 16 weeks in both control group and experiment group. In the experiment group, for the first 6 weeks, the instructor shared the lectures in the class QQ group's files and students can choose to download the lectures or learn online. Those lectures will be finished by the participants in after-class time within this six-week period. The lectures center on some CT key principles, such as introduction of logical fallacies, telling the differences between deductive and inductive arguments, evaluating deductive and inductive arguments with analogy and generalization, and so on. The second period lasts 10 weeks, covering five topic discussion units, with each unit lasting for two weeks. In this stage, the instructor chose the topics for group discussion and in every discussion unit, the participants used different CT skills to be engaged in the discussion and practice those skills under the instructor's guidance in the classroom settings.

3.2.4 Data Collection And Analysis

The participants language proficiency was assessed in the pretest in terms of English scores in the National Entrance Exam to find whether there was a significant difference by adopting T-tests between the two groups. Chinese version of CCTDI was administered in the pre-test and posttest to assess the participants' CT skills. T-tests were used to examine whether the participants' CT skills have a significant improvement in the experiment group, compared with the control group.

4. RESULTS

4.1 Comparison of English Scores and CCTDI Scores of the Experiment Group and the Control Group in the Pre-Test

The two groups, the two groups had very similar English scores and the average scores in the experiment group and the control group are 128.3 marks (SD=7.25) and 127.7 marks (SD=7.89) respectively (p>.05). In independent samples t-tests, no significant difference in English proficiency between the two groups has been found. As to CCTDI, the total scores of the CT skills in the two groups were 14.15 marks and 14.70 marks in the experiment and control group respectively and there was no significant difference between them (p>.05). The results of the subscales are similar to those in the general scale, with no significant difference between the two groups (p>.05).

4.2 Comparison of CCTDI Scores of the Experiment Group and the Control Group in the Post-Test

After the experiment was over, the two groups' CT skills were assessed again. The total scores in CCTDI Chinese version in the two groups were 17.2 marks and 14.8 marks respectively and Independent samples t-tests of the two groups showed there was significant difference (p=.003). In the data of sub-scales, three key component sub-skills, analysis, inference and deduction displayed the significant difference, with p value being .02, .001 and .000 respectively. T-test results demonstrated the other subskills haven't shown significant difference between the two groups.

5. DISCUSSIONS

This research adopted a flipped model designed to enhance language learners' CT skills in foreign language classrooms in a China context. The findings showed the effectiveness of this model and the participants in the experiment group have significantly improved their CT skills compared with those in the control group, especially the three sub-skills, analysis, inference and deduction.

This study has confirmed that the flipped model is effective in explicitly enhancing language learners' CT skills in language classrooms. In the flipped model, language learners finished the lectures focusing on CT skills outside the classroom after class. In this way, they had more time and opportunities to practice CT skills in the classroom discussions. If the instructor created more opportunities for students to have dialogues among them and give them access to the authentic and situated examples, students got more chance to be successful in their CT skills improvement under the instructor's guidance (Abrami et al, 2015).

This research also showed the complexity of CT skill training since although some of the sub-skills of CT skills in the experiment group have been improved significantly, some sub-skills, such as evaluation and induction haven't changed significantly. The training of CT skills is highly situated and Chinese students always try to avoid giving their evaluation and judgements, especially in face-to-face group discussions. Therefore, it is reasonable students' evaluation skill hasn't been enhanced in this research.

6. CONCLUSIONS

This research has proved the effectiveness of training CT skills in a flipped model. Setting CT skills training in a flipped context is an efficient way to improve the development of students' CT skills. In the experiment group, the participants' sub-skills of CT skills, such as analysis, inference and deduction have successfully improved in this flipped model. This study has implications in the pedagogical field in CT skills training. For example, the instructor had better offer more opportunities for students to have group discussions in order to practice the CT principles they have learned and a flipped course design is a good choice to achieve this.

Despite the benefits of this model, there are also limitations of the study. The quasi-experiment design makes it difficult for the researchers and instructors to get a deeper understanding of how this model achieves the aim of training students' CT skills. The future study may have more qualitative attempts to have a more comprehensive picture of the explicit training of CT skills in a flipped model.

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