Group Investigation in a College English Program at a Chinese University: A Case Study

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Abstract

This study investigated the application and the effect of Group Investigation (GI), a technique of Cooperative Learning (CL), in the College English Program in a Chinese University. A qualitative case study method was used to understand the GI system used by Chinese instructors as well as the achievements acquired and challenges met by the participants. Three instructors and fifteen second-year-undergraduates taking a course titled Sources of European Culture participated. Interviews, observations, and documents were used to collect the data. Data analysis showed Chinese instructors applied a GI technique similar to that discussed by Johnson and Johnson (1999); however, GI in the Chinese context demanded more effort from the teacher for designing tasks and providing help in modelling uses of English and in preparing visual, especially PowerPoint, presentations. Although participants used their mother tongue at some stages, their autonomy over English learning was activated, and horizons in the course content were broadened.

Keywords: cooperative learning, group investigation; College English program; critical thinking; teaching methods; case study.

Resumen

Este estudio investiga la aplicación y efecto de la Investigación Grupal (IG), una técnica de aprendizaje cooperativo en el College English Program en una universidad china. Un método cualitativo de estudio de caso fue usado para comprender el sistema IG usado por los profesores chinos al mismo tiempo que los logros alcanzados y los desafíos encontrados por los participantes. Tres profesores y quince estudiantes de segundo año de pregrado, participaron en un curso llamado Fuentes de Cultura Europea. Para la recolección de información se usaron entrevistas, observaciones y documentos. El análisis de los datos evidenció que los profesores utilizaban IG similar al discutido por Johnson and Johnson (1999); sin embargo, en el contexto chino, el IG demandó mayor esfuerzo por parte de los profesores en el diseño de las tareas y en la entrega de ayuda ya sea a través de presentaciones en Power Point o de usos modelados del Inglés. A pesar de que los participantes usaron en ocasiones su lengua materna, su autonomía para el aprendizaje del Inglés se activó y se ampliaron los horizontes en los contenidos del curso.

Palabras Clave: aprendizaje cooperativo, investigación grupal, english program, pensamiento crítico, métodos de enseñanza, estudio de caso.

Introduction

The College English Program in China has been in operation at the tertiary level for over 30 years. Since implementation of the College English program, the teaching and learning of English has been mainly focused on reading and writing. With the trend of globalization, emphasizing listening and speaking of English with the help of a computer has been continually reformed for the past six years, as required by the Chinese Ministry of Education, which has set a new objective for the College English Program:

> The objective of College English is to develop students' ability to use English in a well-rounded way, especially in listening and speaking, so that in their future studies and careers as well as social interactions they will be able to communicate effectively, and at the same time enhance their ability to study independently and improve their general cultural awareness so as to meet the needs of China's social development and international exchanges.
> (Ministry of Education, 2007, p. 25)

To accomplish this goal, College English teachers have applied various CL approaches to involve students in English learning. First, those approaches involved as many students as possible in large classes; but, most importantly, interaction in a CL situation is basically characterized by positive goal interdependence with individual accountability (Johnson and Johnson, 1994, 1998).

This paper aims to address the GI system in two second-year college English classes and to explore the challenges encountered and achievements acquired with a CL approach in a Chinese university context.

Literature review

According to Johnson and Johnson (1998), Cooperative Learning refers to a group of instructional methods in which small groups of students work together and aid each other in completing academic tasks. According to Tan (2006), an extensive body of research has accumulated in the field of cooperative learning in many countries such as the USA, the UK, Australia, and Israel. The systematic procedures for using CL, and its many apparent virtues, have been documented. Specifically, Slavin (1982) has classified instructional techniques of CL mainly as Student Team-Achievement Divisions (STAD), Team-Game-Tournaments (TGT), Team-Assisted Individualization (TAI), Cooperative Integrated Reading and Composition (CIRC), Jigsaw, Learning Together, and Group Investigation (GI). When discussing the three basic ways that students can interact with each other as they learn (competitive, individualistic, and cooperative), Johnson and Johnson (1998) listed the four advantages of CL suggested by research: achieve more; be more positive about school, subject areas, and teachers or professors; be more positive about each other; be more effective interpersonally. In addition, Sharan and Sharan (1999) emphasized and elaborated the role of the instructor in GI.

Nevertheless, Asian countries have lagged behind both in the application and research in this field. Only in recent years can it be seen that "Asian countries such as Singapore and Malaysia are at an initial stage of learning about the possibilities and problems of implementing cooperative learning in their educational systems" (Tan, 2006, p. 65).

Researchers (Holt, 1993; Jacobs & McCafferty, 2006; Jacobs & Goh, 2007) argued that the integration of CL into second language classrooms is considered likely to facilitate optimum development of a learner's ability to communicate in the target language because it provides increased opportunities for comprehensible input, real-life experience of language use, and positive peer interaction. Research has also found that CL structures generated substantially more language output from Chinese tertiary EFL learners than unstructured group work and whole-class lecturing (Jacobs and McCafferty op. cit.; Ning 2007). However, the GI system in language classes in China and its efficacy have not been sufficiently studied. Thus, this research aims to provide a detailed discussion of the GI activity, which is supposed to enhance students' cooperation and English learning applied in College English classes. The following research questions provide the specific focus for the study:

1. What is the GI system used by the instructors in the sample university?
2. What are the challenges the participants confronted in the process of GI?
3. What have the participants achieved in this activity?

Methodology

A qualitative inquiry paradigm was utilized for this study. Since the study aims to raise consciousness about Cooperative Learning and Group Investigation, this paradigm helped the researchers discover new data and analyze them for meaning based on the teaching activity explored through the experiences of the participants.

Researchers used a case study methodology in order to give "an intensive, holistic description and analysis of a single instance, phenomenon, or social unit" (Merriam, 1998, p. 27). The particular social unit in this study comprised two second year classes in a College English program in a Chinese University located in a large city in northwest China. A purposeful sample of 15 participants from those two classes was chosen since "the logic and power of purposeful sampling … leads to selecting information-rich cases for study in depth" (Glesne, 2011, p. 44, in Patton, 2002, p. 46). Interviews, observations, students' reflexive journals, and other documents provided data.

During the progress of the course, two out of five groups were interviewed as a pilot to the study, before their class presentations, which generated broad categories. Five post-presentation interviews were carried out to obtain additional information. Both rounds of interviews were done in small focus groups. These interviews aimed to determine participants' views on the Group Investigation activity utilized in the course. In addition, two instructors of the classes were interviewed when the GI activities were finished in order to provide data for triangulation with the participants'

performance in the activity. Five observations were conducted during the teacher-tutoring sessions and two two-hour observations were audio recorded during the students' class presentations. Thirty nine student reflexive diaries were collected after the class presentation. Two teachers' and 39 students' evaluation sheets were collected on the student presentation activity (See Appendix A).

These data were analyzed through repeated reading, simple color coding, and unitization of data to determine themes and categories that emerged. With constant comparison among those data sources, researchers found a set of student perceptions of this Group Investigation activity. The credibility of this qualitative inquiry (Guba and Lincoln, 1985) was ensured by researchers' prolonged engagement and persistent observation, as they were involved with the instructors and students for a full semester and did seven formal observations of the classes. Prior to the semester beginning, researchers talked with the two instructors to make sure they would use the same procedures during the presentation activity. Well before the data collection, researchers had drawn a detailed research plan including sub-research questions, data they sought to collect, analysis procedures, and results to expect; they attempted to make sure each step of the research was credible and dependable. Interview questions and guided questions (Appendix B) for participants' reflexive diaries were also discussed among the researchers in order to triangulate the resulting information. In addition to observations, interviews, and participants' reflexive diaries, documents including evaluation sheets from both the instructors and the participants were also collected to use for comparison and triangulation of the data and results.

Rich descriptive data were collected in this study from purposeful sampling to serve the purpose of transferability. An audit trail of the process of the analysis and the careful description of the findings in the study show the research to be reliable.

Context of the study

As part of the reform mentioned in the introduction, instead of the traditional Comprehensive English, many universities have been providing a set of advanced courses for second year undergraduates such as News English, Academic Writing, American Culture, Business English, etc. to cater to students with increasing English proficiency. In the studied university, all second year students could choose from 10 English courses to earn their second year College English program credits. The Group Investigation activity is one of the major activities used by most of the second-year College English program teachers to encourage students to be actively involved in English learning. In the courses studied, instructors provided broad topics related to the course for students to choose from, and students worked in small groups after class on their specific sub-topics. Students should have experienced information searching, group discussing, teacher tutoring, and rehearsing before they presented their reports in 15-20 minute class presentations. During the class presentation, students were required to fill in an evaluation survey about other groups' work in order to gain their score on this activity. This activity usually took 5-6 weeks from assigning the

topics until the final presentation. Two classes from the course Origins of European Culture were chosen for the present study. There were 19 and 20 students in Class 1 and 2 respectively. Rather than use random sampling from the small total student number, fifteen students were purposefully chosen from those two classes to be participants in this study in order to have as balanced representation of urban/rural high school background and gender as possible. Participants' presentation groups were the same as the focus groups in the interviews as shown in **Table 1:**

Table 1. Focus groups' profiles

	Gender	Region	English
Group 1: participants 1-3	All males	2 rural 1 urban	1 passed CET-4 1 passed CET-6 1 failed CET-4
Group 2: participants 4-5	All males	1 rural 1 urban	All passed CET-6
Group 3: participants 6-9	1 female 3 males	1 rural 3 urban	1 passed CET-4 3 passed CET-6
Group 4: participants 10-12	All females	1 rural 2 urban	All passed CET-6
Group 5: participants 13-15	All males	All urban	1 passed CET-4 2 passed CET-6

Data analysis and findings

The research questions of the present study put forward three pilot categories: GIsystem, achievements, and challenges. With these three pilot categories in mind, researchers found the following themes while coding from the interviews, observations, and documents: instructors' guidance in topic decision; convenience in communicating with familiar group members; Chinese in information sources; benefits from sorting the materials; chance to practice English; and the positive and negative description of using a PowerPoint Presentation.

Thereafter, the data was organized around these themes, and they were analyzed in turn with reference to the participants' and teachers' own explanations and analytic commentaries; through an analysis of these explanations and commentaries, the key features of the GI system emerged, students' achievements presented themselves, and the challenges were demonstrated. The thematic organization mirrored and made transparent to readers the processes of data analysis that were central to this study; it also ensured that all assertions in the account were accounted for and clearly grounded in the data from which they emerged.

1. Instructor's guidance in topic decision

In instructor interviews, both instructors, C and P, mentioned that students needed guidance in choosing the broad topics for investigation. They and the students suggested that the teacher's guidance assured the smooth going of the GI. For one thing, European culture was a new topic for the Chinese students; it was not an easy task for them to choose an appropriate topic in this field. For another, the participants' interviews indicated that they would like to accept the instructor's advice, which echoed the traditional Chinese student character to abide the teacher.

Excerpt 1

C: *While I asked students what their interested topics were, they said they knew little about the field of study and would like me to give them some guidance. So, I talked with other colleagues, and decided several broad research topics for students to choose from.* (Instructor Interview, line 5)

Excerpt 2

Participant 4: *We are not familiar with European culture and we did not know what to do, and do not have much time to think about it, so when our instructor gave us 3 broad topics, we just chose one from them.* (Participant Interview 6, page 1, line 9).

Due to the limitations on the subjects and on their study schedules, all of the participants preferred guidance from the instructor at the very beginning of doing the group investigation.

2. Convenience in communicating with familiar group members

When interviewed about the way to form their small groups, 12 out of 15 participants agreed to stay with familiar group members as mentioned by Participant 3:

Excerpt 3:

Participant 3: *If we worked with unfamiliar people or people from a different major, there would be a problem of communication. … You may not know the person's ability. If each group member did one part of the research, you were not sure about his character or his attitudes towards this assignment. In case this person was not serious about the work, it would not be well done.* (Participant Interview 2, page 1, line 16).

Students worried about the conflicts in discussing their topics with unfamiliar members and the difficulty in contacting them; so, they considered the distance from their classmates and the accountability for the task into consideration. Contrary to those worries, however, other participants explained a different idea:

Excerpt 4

Participant 7: *If not familiar, it may be efficient to discuss. … We could decide a place to discuss and probably meet at Kangqiao (the main dining hall). Everyone has had some ideas and we came together*

and communicated and put forward a general plan and left. It's highly efficient. …We would be off the subject now and then if very familiar to each other. (Participant Interview 2, page 3, line 3-5).

Participants showed variable opinions about choosing group members, but most of them generally preferred familiar students as their group members because of convenience.

3. Chinese in information sources

Data analysis showed that Internet, library, and textbook were the major information sources for the students. All of them used Baidu, a Chinese search engine. Five also used Google, and three used the University library. Participants 6, 7 and 13 mentioned using part of their textbook. Most students admitted using Chinese in much of their work although a few mentioned using English. Participant 10 said "*I have entered an English data base of our library, but just a few times. Still I have to search the information in Chinese, and then translate. It's indeed a bit difficult to do English reading in this field.*" (Participant Interview 3, page 4, line 17). Although 10 of the 15 participants have passed the Master's Degree level English exam, CET-6, as well as the Bachelor's Degree level CET-4, most of them preferred reading in Chinese, translating into English, and later reporting in English. The fact that the subject is new to them could be one reason for the initial Chinese usage, the lack of English sources another; however, researchers assumed that the additional time needed for researching and reading English and, perhaps, students' study schedules or laziness would mainly account for the reason why they chose to use Chinese first.

4. Benefits from sorting the materials.

All of the students talked about information searching and sorting positively although several used "troublesome" to describe the process. Data coding showed most of the students have learned how to sort materials, and some recognize the importance of doing so. Still others have found the information search procedures have helped them expand their vision both of the topic and the course, and helped them organize the information they have learned in the course.

Excerpt 5

Participant 13*: It's difficult to collect and sort the materials, esp. sort the data. So much information. I did a PPT first, and then, added new information according to the PPT. I searched again when I felt something missing or I felt I needed more information*. (Participant Interview 4, page 2, line 30).

Excerpt 6

Participant 3: *The whole process is a reducing and simplifying one. We kept reducing some plot of the story and focused on the main conflict*. (Reflective Diary, p 3, line 12)

Excerpt 7

Participant 12: *I was amazed at my team members' strong ability to outline*

and summarize the information. They could conclude the key points from the sea of information and display them logically. (Reflective Diary, p 12, line 6-7) Most of the participants showed that they had done a fairly active job in data sorting, making it the most beneficial part of the research project according to their thinking about this activity.

5. The chance to practice English

As participant 10 said in the interview: "*Doing presentation is sure to help practice speaking English in Public. There is not much chance usually.*"(Participant Interview 3, page 4, line 5). In the pilot interviews, participants expressed a high possibility of using Chinese in their after-class discussions, which cast a shadow on the practice of English in this activity. In post-interviews it was found that participants discussed their topic in the GI mostly in Chinese as mentioned earlier. When they were asked their opinions about using Chinese in this activity in post-interviews, they didn't see that as a serious situation. They stated that they believed it was efficient to discuss in Chinese but also regarded the GI as a good chance to practice English (Participant Interview 7, page 2; Participant Interview 3, page 4).

Generally, 14 of the participants suggested that this activity provided them a good chance to practice English and a good chance to arouse their interest in learning English. The only student who had a contrasting opinion had not passed the CET-4 exam, which may account for the student's failure to communicate easily in English. Data mining in the documents for this activity (Student and Teacher Evaluations) reported that 14 of 39 students could not present orally in public without using a script. Participants' answers to the question "Why did you have to read the script instead of speaking in the presentation?" in the post-interviews showed that two basic situations existed: three participants said their English proficiency was not high enough to meet the task of presentation; all of the others stated that they hadn't done enough work before the presentation (Participant Interview7, page 3; Participant Interview 5, page 3).

6. The positive and negative description of using a PPT

Because computer technology has become widespread in the tertiary educational context in China, participants in the present research were required to present their research topic with the help of Power Point (PPT) to show visual displays of the spoken information. Although most of the groups could accomplish the task of making a PPT, and they also claimed an improvement in the skill of making a PPT, three negative sub-themes still emerged concerning using Power Point: unclear background, long scripts on one page, and the inconsistent PPT style of each speaker in a group. When instructor C tutored Group 4, she used the term "*colorful*" to indicate the need of refining the background of the PPT (Teacher Tutor 1, page 1, line 13), which related to the words "*ambiguous*" or "*unclear*" used by students discussing the background design of their PPTs in their evaluation sheets.

As another modern technology, video clips were sometimes used to attract the audience during in the presentation, but how to use them remained a dilemma. One Student Evaluation Sheet (SES) 2 read "*using some piece of movie to attract students*" and SES 6 wrote "*There is a video program; the content is abundant, impressive*." On the contrary, when evaluating the video clips used by the same group mentioned above, SES 3, 5, 8 and 17 commented that there were too many video clips, and they were not practical for illustrating the central topic.

Discussion

1. GI system

As a review of CL, Sharan, Y. and Sharan, S. (1999) explained that students formed small interest groups, planned and implemented their investigation, synthesized information to produce a final product, and participated in the class presentation using the GI technique. Data analysis showed a similar procedure in the Chinese context. In the instructor interviews, both instructors described the stages of this activity as the following: grouping; deciding topics; searching and sorting information; group discussing; preparing a PPT; rehearsing; presenting their findings; evaluating others' presentations.

However, a big difference exists between the GI discussed by Sharan, S. (1994) and the GI utilized by the two Chinese instructors: the GI in China was carried out outside class due to the limit of class hours in the Chinese context, which might not guarantee that all the procedures expected by the instructors were experienced by the students. In addition, the group work outside of class relied upon autonomous group learning, i.e., without the presence of the instructor. "Rehearsing" in Group 5 was sacrificed in the name of a busy schedule (Participant Interview 4).

The required three small group discussions were reduced to one by Group 1 because of scheduling difficulties (Participant Interview 5). The focus of both the instructor and the students was put on the final stage during the class presentation, while researchers regarded the stage of "rehearsing" in GI, rather than the presentation itself, as especially critical in the language learning course. As seen, the students naturally chose to use Chinese in the after-class discussions, which is unavoidable in the Chinese context without supervision. However, the rehearsal appeared to be the rare occasion in which students were forced to use English with their peers. Discussions pertaining to content choosing and information sorting helped participants understand the logic of their topics; whereas, in the rehearsal, the goal to achieve a high evaluation from the teacher and their peers motivated students to polish their language and to refine their ways of speaking in public. Thus, this motivation and English practice was considered by the researchers as the most important stage for this CL activity applied in the language learning field. The interaction hypothesis (Hatch 1978a; Long 1981) emphasizes the role of the learner in social interaction, especially how he or she is able to exert agency over language input, and only the changes in input that resulted

from negotiation were thought to lead to acquisition. Therefore, according to the hypothesis, students would achieve more than smooth speech in the final presentation from this stage; they would also increase language through negotiation. Group 3 and 4 reporting "rehearsed several times" (Participant interview 7, 8) and, according to their peers and instructor as shown on the Evaluation Sheets, they showed a more positive attitude toward English learning than other groups, and they were evaluated as having spoken "*fluent English*".

2. Achievements

Without exception, the present study proved the broad advantages suggested by Johnson and Johnson (1998). More specifically, among the six themes, "Convenience in communicating with familiar group members" would not overtly suggest any benefits of the activity. However, the project showed that students had more chances to talk about the topic and even about the entire course and European culture, which added to their improvement in course learning as shown in data analysis. Similarly, Liang (2004) discussed the benefits of GI among Chinese immigrant students in a Canadian high school who improved their learning of the course content.

In each case, the GI activity gave students the chance to try to locate what they needed in a sea of information and put those elements in a logical order through performing a real-life categorization and prioritization task. This activity could contribute to their way of thinking, especially critical thinking, which

is generally regarded as an ability of purposeful and self-regulating judgment (APA, 1990). In the information processing, participants experienced inducing, deducing, reducing and adding information (Excerpt 5-7); they also had to negotiate and to accept or defend opinions in their discussions. Those activities had much to do with developing their critical thinking. Furthermore, as discussed earlier for this case, the students' interest in western culture was aroused, and a positive attitude towards English learning was nurtured through this cooperative learning. Although they used Chinese in the after-class activities, they still believed the GI project afforded a good chance to practice English, especially a chance to use English actively and purposefully.

3. Challenges

As the theme "Chinese in information sources" implied, using Chinese both in information sources and in small group discussions has become the most serious challenge in the Chinese context (Excerpt 8-11). Data exploration into the participant interviews on the reasons of using the mother tongue indicated that for one thing, the topics pertaining to European culture were complex and profound, and, for another, participants did not have the appropriate lexicon to support their reading or group discussion of the information.. In the era of the Internet, the varieties of information sources required strong ability in information searching and sorting. Without the help of their mother tongue, the students would float superficially in the data, and their discussions would

eventually lose interest. Therefore, given current Chinese conditions for research and data access and of the students' English levels, using English should not be the priority in their research and discussion even though the purpose of discussing a topic concerning western culture would necessarily add to students' use of English. Because using their mother tongue was practically unavoidable in this non-English context, a stage during which students have to apply their English must be designed.

Under the situation of applying computer technology required by the Chinese Ministry of Education (College English Teaching Requirements, 2007), the "rehearsal" fits this need. This activity could be either carried out in a Multimedia Network Classroom in the students' auto-study period under the supervision of an instructor who does not interfere, or be recorded by the students themselves as part of their tasks to be graded. Thus, the rehearsal presents an excellent environment for learning and practicing English in GI Chinese context. Sharan, S. and Sharan, Y (1999) had listed the role of the instructor in the six stages of GI, but in the present study, the biggest part of the GI was conducted outside class. The limited face-to-face GI supervision of the instructor necessarily reduced the role of the instructor in the entire project and with the student groups in their efforts; so, in this case, the function of the activity became vital to its success. Thus the design of the rehearsal appears to be highly relevant to the students' language learning, as well as to the successful completion of the project.

Furthermore, to ensure the success of the task in this situation, the role of the instructor has to be reinforced. For one thing, with most parts of the activity done outside class, they had to come up with a rigid plan and explanation for each task, which would be the prerequisite for success; otherwise, some procedures would be skipped in the excuse of a busy schedule or other reasons. In addition, instructors had to be ready to provide students with guidance on how to present their findings properly with the help of a PPT, which in some cases also showed a need for operational instructions to be explained to the students.

The other problem discovered in the GI project by the students was that most of their reports were evaluated as too general by either the instructor or their peers (the words "too general" or "void" appeared 26 times together in Teacher Tutoring observations and Students' Evaluation Sheets). Leading the discussion to a more specific direction regarding the topic and presentation could be a challenge both for the students and the instructor since language and available lexicon are obstacles. Two issues emerged from the data: (1) Chinese sophomores lacked the ability to perform autonomously when faced with a group research problem; (2) they needed guidance in academic English. To accomplish the task of GI in EFL in China, instructors must prepare both language and topic very clearly and, specifically, provide the sources of the information and the research method. According to the data, all of these were missing in this project. Finally, it appears that there could be both a technology problem and an academic one regarding the preparation and use of visual media,

especially the PPT. Comments such as "vague background," "long scripts," "inconsistent style of PPT," and "improper use of video clips" were obtained either from Student Evaluation Sheets or from the Teacher Tutoring observations. "Vague background" could be solved by lectures on how to use the software and prepare an attractive, consistent and persuasive PPT presentation before or together with the assignment of the GI. The other three themes showed that audience did not grasp the key points from viewing the PPTs, and they discussed the relationship between the key points and supporting materials. Interviews (Participant Interview 4, 5) showed that Groups 1 and 5 divided their tasks after deciding their topic and combined them together just before the presentation. They lacked cooperation with each other in presenting consistency in their PPT ; this agrees with Liang's findings (2004) that reported Chinese immigrant students in a Canadian high school "wanted to complete the task rather than spend time reasoning about why they were doing the work in a particular way and discussing different opinions" during the action discourse of group work.

Conclusion

This study was undertaken to localize the practice of CL technique-- Group Investigation among Chinese EFL learners--and to investigate, with a qualitative case study, its effectiveness. The study also sought to explore the achievements and the challenges that participants met and acquired in this activity. The limitations are apparent in terms of the present study's representation of population, the questions used in the interviews, and the teaching styles of the two instructors. Specifically, the difference in the elements of participants' critical thinking and English levels before and after the activity have not been explored; participants' improvements in English and ability to think critically are areas for further research. However, it is hoped that findings from this small-scale but in-depth investigation of GI sheds light on the application of cooperative learning methods in a Chinese English-learning context, as well as having application in other EFL university contexts. The results obtained can be considered as illuminating guidelines first and foremost for language teachers; the findings can also be helpful to EFL teachers either involved in CL practice or aiming to implement CL to maximize its benefits in classrooms.

Acknowledgements

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Appendix A: Student and teacher evaluation sheet

	Theme and logic	Fluency	Accuracy	Interaction	PPT	Cooperation	Total
Group1 score							
Merits and shortcomings(or limitation of group1)							
Group 2 score							
Merits and shortcomings of group 2							
Group 3 score							
Merits and shortcomings of group 3							
Group 4 score							
Merits and shortcomings of group 4							
Group 5 score							
Merits and shortcomings of group 5							

Appendix B: Guided questions for reflexive diary

1. What did you do in your group investigation?

2. What were your findings in your investigation?

3. What were the problems you had encountered in this activity?

4. What did you learn from your group members?

5. What did you learn from other groups?

6. What were the problems found in other students that you would avoid in your future study?

7. On which aspect may this activity help you in your course study? Why?

8. How could this activity be improved or what are the limitations of this activity?