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Student interaction in the implementation of the jigsaw technique in language teaching

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CHAPTER 4

RESEARCH METHOD

In this chapter the nature of the study is presented. Ethical considerations follow. The design of the study comes afterward. An elaborate section concerning data collection is presented following the study design section. The data analysis procedure section ends the main body of this chapter. A summary section completes the whole chapter.

4.1 Nature of the Study

Qualitative methodology is one that is most generally employed to produce descriptive data about people's world and their observable behavior (Freebody, 2003 quoting Taylor & Bogdan, 1984). Furthermore, one significant tradition or variant of the qualitative methodology is symbolic interactionism (Cohen, Manion & Morrison, 2007). Symbolic interactionism sees meaning as social products which are formed through activities of interacting people (Blumer, 1985 in Berg, 2004). Symbolic interactionists emphasize the nature of interaction, the dynamic activities taking place between or among people. Symbolic interaction, pointed out further by Cohen et al. (2007) focuses on individuals as constructors of their own actions, the process of negotiation and the social context. Our study therefore belongs to symbolic interactionism of a qualitative research tradition.

4.2 Ethical Considerations

Most authors discussing qualitative research address the significance of ethical considerations (see Cohen et al., 2007; Creswell, 2003; Fraenkel & Wallen, 2006; Parsons & Brown, 2002). Principally the researcher has an obligation to respect the rights of privacy, freedom, needs, and values of the informants. The following safeguards are employed to protect our informants' rights: (1) the research objectives, contents and procedures were revealed, (2) the informants were informed of the data collection devices and activities (3) a consent seeking the approval to proceed with the study was obtained from the informants, (4) the informants were given the chance to remain anonymous, (5) the transcribed data and reports were made available to the key informants, and (6) all data

were kept confidential. All the safeguards were revealed to the students on the very first meeting of the semester program especially when the course outline was verbally clarified.

4.3 Research Design

The overall design of the study is aimed at answering the research questions mentioned in Chapter 1. No intervention or special treatment is provided in the intact class used (further discussion on this investigated class is in [4.4.11.1]); the main point is not to intervene in the language process but to obtain detailed information on what actually occurs in student interaction. The use of an intact, on-going language class has its significance – so that it is applicable later for classroom teachers (to this, Brown & Rodgers, 2002 point out the use of regular classrooms as something in fashion and relevancy to improving education for the foreseeable future).

Put simply, in this qualitatively driven-study, there is no manipulation. We do not create a special setting of the investigated class for the research, what the teacher will teach, and how the teacher will teach as this is the characteristic of experimental research design which is not the concern of the present study.

4.4 Data Collection

This section is sequenced to constitute two phases of data collection. The first phase covers the theoretical data collection issues on the natural setting, the subject and key informants selection, and the research instruments. The second deals with practically more technical preparation for the cooperative learning instruction. The second phase is primarily intended to reveal issues which make this study different and which remedy our pilot studies. Besides, it is also intended to ascertain that the data elicitation method or technique, Gass & Mackey (2007) argue, yields the targeted interaction.

4.4.1 Setting

Classroom processes, as claimed by Delamont (1976), can only be understood if their context is understood by studying the stage setting. This section is therefore provided to describe the classroom setting before presenting the subjects of the study.

The natural setting was, as implied in [4.3], determined to be a regular class – more specifically, it was a regular one at the English Department of Teacher Training Faculty of a university in Surabaya, Indonesia where English is taught as a foreign language. The

study was carried out in a classroom which was physically the ordinary one with a chair and a table for the teacher and about 30 chairs easily moved to enable the students to form small groups.

4.4.2 Subjects and Key Informants

The subjects involved were the students registered in one of the three parallel Reading 2 classes. They were, more specifically, semester 3 university students taking Reading 2 course – a 4-credit-bearing subject – as one of the skill subjects offered in the odd semester of 2008/2009 academic year lasting about 5 months. They officially started the semester program on August 11, 2008 and ended it on December 20, 2008. The subjects participated voluntarily in this study.

The subjects consisted of 3 male and 18 female students. One of them was a student from another department, i.e., physics department. She was in fact a senior physics teacher who joined the class to learn the English language. Being a student who could not be put in a group of similar learners, she was excluded from the key informant group.

Of the 21 subjects who agreed to participate in the study, 5 were selected as the key informants. These 5 students who were engaged in small group discussion were selected for closer analysis. They were selected by implementing ‘purposive sampling’ – which is frequently used in a qualitative research (Cohen et al., 2007; Creswell, 2003; Fraenkel & Wallen, 2006). The key informants were chosen on purpose to ensure that the sample was uniquely suited to the intent of the study. They belonged to a heterogeneous group of male-female students possessing high-, middle- and low-achievement. To be more specific, one key informant identified as KI1 (standing for Key Informant 1) was a male student who was a high-achiever. The other four were female. Among these four key informants, one identified as KI2 was a high-achiever, two of them identified as KI3 and KI4 were middle-achievers, and one identified as KI5 was a low-achiever (see [4.4.6] for more discussion). This special key informant group was chosen also by considering the sociometric method (also see [4.4.6]).

The key informants were primarily involved in four main data collection sessions when they were discussing in their expert team in four successive regular class sessions of Jigsaw which is, as previously reviewed in [2.6], characterized by its expert teams and home teams. They became the focus of investigation to answer our research questions. Nevertheless, the key informants were not told that they became the ones until they were

shown the rough transcripts of their discussion. Naturalistic data were consequently ensured; the results of this study could be interpreted as reflecting peer discussion which may have been the key informants' typical performance in everyday classroom work. Moreover, at the same time one particular research bias at the stage of data gathering – the Hawthorne effect (Cohen et al., 2007; Gass & Mackey, 2007) – was eliminated as the study did not change the behavior of the key informants due to their feelings of pleasure about being included in the study. When the key informants were involved in the rough transcription checking (elaborated later in [4.5]), they were reassured that pseudonyms would be used in place of their names in the transcripts.

4.4.3 Research Instruments

Based on the research questions or to capture the data on student interaction, observation – claimed by Gass & Mackey (2007) as one of the most commonly employed instruments in classroom research – was used.

Based on observation types classified by Cohen et al. (2007) who refer to Cooper & Schindler (2001), the observation in this study was overt as we told the students our being a teacher doing a research in the respective class. The observation was also an indirect one for it required recording devices. Eventually, it was also a non-participant observation as we excluded ourselves completely during the recording of the student group work in the main data collection sessions (see [4.4.11] for further description).

The audio recordings were more specifically employed to obtain the students' verbal interaction in the group work. All group works through out the semester program were recorded; nevertheless, as stated previously in [4.4.2], merely the ones of the key informants were taken as the main data. The students were not told which recording was chosen for the research data. The purpose of the early recordings was to make the students get used to the presence of audio recorders – an attempt to eventually get more naturalistic data. In fact, indicated in the students' responses to the question posed at the end of the semester – if the recorder negatively influenced them – was that the students, as time went by, forgot that they were being taped; none really cared much about the matter to begin with. Technically, one student in each group discussion was instructed to start recording as soon as the group began to do the group task, and to continue recording without stopping until they completely finished the task.

Secondary Instruments

Other data collection method included interview, stimulated recall, and the students' worksheets. The various observational instruments employed were intended to yield the expected data to answer the research questions and more particularly to provide opportunities for cross-checking – implicitly indicating an attempt to increase the reliability of this research.

In this study, a semi-structured interview was used. The interview with the key informants on a one-to-one basis was intended to reveal something which could be related to student interaction. It was sufficiently open-ended to enable some contents to be reordered, expansions made, and further probing undertaken. The interview was performed outside the classroom sessions after the rough transcripts were produced. It was about a month after the main data collection took place. A-month-after interview was meant to allow enough time for us to prepare the rough transcripts and questions for clarification of certain parts of the transcribed data and at the same time it was intended not to be so long that the informants forgot the essential points. The interviews were audio-taped to obtain a more permanent record of the data to be kept. The data obtained from the interview were not the main data to analyse; they were, again as previously mentioned, intended to provide supplementary data as a cross-check, or for comparison and contrast in the data analysis and/or discussion of the findings.

Stimulated recall defined by Freeman (1998:94) as “use of previously recorded or transcribed data to prompt responses from participants on actions, feelings, thoughts, attitudes, beliefs, following events or activities being researched” was similarly used to get supplement data. The rough transcripts were similarly provided to the respective key informants about a month after the main data collection and they were requested to hand in a small note revealing how they thought they helped and got assisted by their friends in the group discussion.

The individual students' worksheets (elaborated later in [4.4.9]) were collected after the students finished with the assigned task in the group work. They were more particularly expected to, as previously mentioned, provide opportunities for cross-checking. When analyzing Data 2, Turn 22, as an illustration, we firstly thought that the utterance in that turn could be coded as a simple assertion and also an extended explanation. However, when the individual worksheet was referred to, we could then coded more convincingly that it was not an extended explanation because the respective

student was just reading what was written in the worksheet. More reliable data were then obtained.

Gaies (1985) reasons that peer involvement program in language learning must be thoughtfully planned and carefully structured to yield a success. Similarly claimed by Long (1990) is that it is not sufficient merely to physically place students in small groups but that care needs to be taken concerning the size, manner of formation, structure and composition of the groups used, and over the activities performed in them.

4.4.4 Cooperative Learning Techniques Implemented

As mentioned in Chapter 2, the cooperative learning techniques implemented in the classroom where the data of this study are collected include Learning Together and Jigsaw.

The four elements of Learning Together (see [2.5.5]) were partially implemented. One of the groupings – cooperative base group – was not adopted since a base group which would last a year was not needed for this study which lasted for a semester. However, the heterogeneous grouping was maintained (more discussion on the grouping is in [4.4.6]). The term ‘Learning Together’ did not appear in the course outline distributed to the students. Instead, the term ‘non-Jigsaw’ was used for practicality reasons so that the students were not confused – Jigsaw is also ‘a sort of learning together’ to laymen.

With regard to the implementation of Jigsaw, the students in the investigated Reading class were put in small groups. They worked in 2 teams: home teams and expert teams. They were asked to study in the expert team with the aim to master the sub-material provided by the teacher. They were then required to share their ‘expertise’ or to teach what they had learned in the expert team to the other members in their home team. Moreover they were also required to learn the other sub-materials from their peers. More details on the implementation of Jigsaw in this study – among others, how many students there were in each team, how each team was composed, what materials the students studied – are found in the subsequent sections.

4.4.5 Group Size

In this study, groups of primarily 4-5 students were formed to facilitate group discussion and to create opportunities for a larger number of interactions compared with smaller groups. The groups were as small as possible, but still large enough to form a

satisfactory basis for the group task namely comprehending a text. This group size consideration was also meant to ascertain maximal interaction to obtain the data.

This group size was maintained primarily on cooperative learning sessions where students were put into groups to carry out the group task. Five cooperative learning groups were formed in the class investigated. Four groups consisted of 4 students per group; only one group consisted of 5 students. This group size was then related to the preparation of four equal sub-parts of a whole text – matching the characteristics of Jigsaw.

As the research question centers on the interaction among high-, middle- and low-achievers, another methodological preparation will have to be ensuring the availability of high-, middle- and low-achievers in the group. This then leads us to the next section of data collection: group composition.

4.4.6 Group Composition

This study took into consideration the sociometric method (suggested by Stanford & Raork, 1974 in Jaques, 2000) as the basis for group composition in order to make groups cohesive – the students knew at least one student in the group and realized that they were peers.

Each student was given a piece of paper to write his or her name in the upper left-hand corner. Then as a response to “Write 3 names of your classmates whom you would like to work with in group”, each listed three names (one student was absent; as the result, her name was not even mentioned by any students). The paper of which the content was promised to be kept ‘confidential’ was then handed in. The information on the paper was used to assign students into groups containing at least one fellow student for whom they expressed preference.

Another consideration taken in composing the student groups is heterogeneity with respect to ability. The scores of the students’ Integrated Course in semester 1 were used as the basis to form the groups. Their Integrated Course score was considered to be the most representative as it constituted the ones of the four language skills and language components evaluation. It was ‘only-a-year-ago’ score thus it was still valid to be considered. Combining the sociometric method and heterogeneity consideration, the groups formed were, as far as possible, composed in accordance with the students’ own choices – at least one peer was a liked one – and keeping high-, middle-, low-achieving

student composition (the example of how a cohesive and heterogeneous group is formed appears in Appendix 13).

Eventually, three group formations as the result of the sociometric as well as heterogeneity consideration were obtained to be used for the whole semester. The first group formation was used for the non-Jigsaw sessions on the first half of the semester. The second one was used for the Jigsaw sessions. The third one was for the non-Jigsaw sessions on the second half of the semester (merely the second group formation is revealed in Appendix 9 as this one is essential for this study – indicating the grouping used in the main data collection). Further discussion on the second group composition for the main data collection follows.

The second group formation which was used for the Jigsaw sessions was the ‘home team’ formation. Totally, there were five home teams formed: four home teams had 4 members per team; one had 5 members. When the expert teams were formed, a different group size occurred (this is the consequence of having 21 students in the class which cannot be formed into ‘nice’ 4-member groups for both the home teams and expert teams). Three expert teams had 5 members per team and one expert team had 6 members. Since this last expert team was considered to be quite big, two parallel expert teams were formed hence resulting in two 3-member expert teams. There were then five expert teams formed.

Implicitly, all home teams were formed based on both sociometric and heterogeneity considerations. As it was hard to reconsider the sociometric method which had been employed to get the three group formations, the expert teams were initially formed based on heterogeneity consideration only. To check the cohesiveness of the expert teams formed, we made use of a simple questionnaire requesting the students to express their preference in working with the other expert team members assigned. Each student got a form to fill out and wrote the answer to the question saying “How do you like working with ...?” They referred to the table of expert teams (Appendix 9) to find their group mates’ names. Their preference was indicated by their choice of 1, 2, 3, or 4 to mean ‘not at all’, ‘a little’, ‘some’, and ‘very much’ respectively. They were ensured that their answers would be kept confidential (the preference form is attached in Appendix 11).

By simple calculation, it was found that the cohesiveness score for Expert Team 1 was 2.95, Expert Team 2 was 3.1, Expert Team 3 was 3.2, and Expert Teams 4 and 5 were 2.3 each. As the highest score showing the highest cohesiveness went to Expert Team 3,

this expert team was then opted as the key informant team – hence the purposive sampling was employed.

As one of the research question aims to investigate how the interaction is influenced by the students' roles, the issue of role assigning needs discussing – thus the focus of the next section.

4.4.7 Role Assigning

In this study, the assigned roles were *captain*, *secretary*, *time keeper*, and *speaker*. The reason of choosing these four roles was firstly to match the number of the students in the groups formed. The second reason was to provide familiar terms for the students to keep their roles. Eventually, it was to adapt to the nature of a language class – leaving the role of, e.g., *material manager*, a typical role in a science class, not a language class.

When assigned as a captain, the respective student coordinated the group work, made certain every one contributed and kept the group on task. As a secretary, the student kept notes on important information appearing in the discussion. The job of a time keeper was to keep track of time and to remind the group how much time was left. The speaker was assigned to report what the group had discussed, and the speaker might report without any note or with the note that had been written by the secretary. For the groups having 5 members, one additional role assigned was *encourager*. The encourager's share was to look for individual contributions that deserved praise and to reward those contributions with positive comments. Implied is that the three roles kept from our pilot studies included *captain*, *secretary*, and *time keeper*. The new ones were *speaker* and *encourager*.

The role assigning in this study was facilitated by a set of role tags prepared for each group. In every group work, each student had a role tag on which a brief description of the role was written. When the non-Jigsaw sessions took place, the students were free to determine their own role among the members in the group. Nevertheless, when they attended Jigsaw sessions, their roles were predetermined (see Appendix 9).

Revealed in Table 4.1 is the rotated role for each key informant (except Key Informant 4). As only four sessions were determined to be used for the main data collection, only 4 roles could be rotated equally to 4 students. This left no chance for one student to get all rotated roles. The non-rotated role was determined to be *encourager*. As there was only one low achiever (Key Informant 5) in the key informant group, this

encourager role was not given to her. It was randomly given to Key Informant 4, one of the middle achievers.

Table 4.1 Predetermined Roles for Key Informants

	Data 1	Data 2	Data 3	Data 4
Key Informant 1	Secretary	Captain	Speaker	Time keeper
Key Informant 2	Captain	Speaker	Time keeper	Secretary
Key Informant 3	Time keeper	Secretary	Captain	Speaker
Key Informant 4	Encourager	Encourager	Encourager	Encourager
Key Informant 5	Speaker	Time keeper	Secretary	Captain

When the data were collected, the above plan was executed only during the collection of Data 2 and 4. When Data 1 were collected, Key Informants 1 and 3 were absent. The roles were taken by the other 2 students ‘automatically’ (the students themselves decided so without the teacher’s interference). Key Informant 4 was the encourager (the assigned role) and time keeper (the ‘additional’ role); Key informant 5 was the speaker (the assigned role) and secretary (the ‘additional’ role). When Data 3 were collected, Key Informant 4 was absent. Her role was ‘automatically’ taken by Key Informant 4 who became the encourager (the assigned role) and secretary (the ‘additional’ role). Table 4.1 has then been modified into a ‘new’ one which appears in Table 4.2:

Table 4.2 Roles Executed by Key Informants

	Data 1	Data 2	Data 3	Data 4
Key Informant 1	- (absent)	captain	speaker	time keeper
Key Informant 2	captain	speaker	time keeper	secretary
Key Informant 3	- (absent)	secretary	captain	speaker
Key Informant 4	encourager & <i>time keeper</i>	encourager	encourager & <i>secretary</i>	encourager
Key Informant 5	speaker & <i>secretary</i>	time keeper	- (absent)	captain

Four technical issues related to data collection have been presented. The other five issues to cover consist of reading materials discussed in the class, task structure, model of group work, and procedure of data collection.

4.4.8 Materials

Aronson (2008) reminds teachers that the materials for Jigsaw have their special characteristics – they must be divided into equal segments for the students to share; some have to be created from various resources; others can, on the other hand, simply be reproduced from existing texts. In this particular section, we will then deal with the

materials preparation – obtaining and developing the appropriate instructional materials especially for the Jigsaw sessions.

Before the semester program started, the instructional materials were prepared. Initially, the course book used for the regular reading instruction was examined. It was actually a ‘book’ of compiled expository reading materials – called Reading 2 Compiled Materials – which were used for the second time at the department where the data were collected. Some reading texts that could be used for Jigsaw were selected. The chosen texts were adapted to suit the particular characteristics of Jigsaw, i.e., to have equal segments for each expert team to discuss. Some sentences were therefore added, dropped, shortened, or rephrased. Some other reading materials from other sources were also taken and modified to similarly fulfill the characteristics of Jigsaw. After all reading texts prepared for the Jigsaw sessions were selected, each text was then divided into four equal parts. The first part labeled Part A was the material for Expert Team 1. The second, third and fourth labeled Part B, Part C and Part D were the materials for Expert Teams 2, 3, and 4 respectively.

The next thing done was ‘tidying’ the compiled materials. The other texts in the compiled materials – the ones not chosen for the Jigsaw sessions – were rearranged and classified into 3 sorts: (1) the ones for the model group work, (2) the ones for the non-Jigsaw or Learning Together sessions, and (3) the ones for the teacher-directed sessions (of all the materials, merely the materials used for the main data collection are attached in Appendix 10).

Another issue quite related to materials preparation is the student task to yield the expected data to answer the research question with regard to the types of information the students use to understand a text. As this will be quite an extensive discussion, it deserves another separate section.

4.4.9 Task Structure

A major concern in designing approaches to cooperative learning is the degree to which student interaction is structured. It is important that the procedures to follow during group work are well-prepared to promote student interaction to include mutual exchange of ideas, explanations, inferences, conclusions, and/or other high-level discourse – simply stated, to ensure students’ face-to-face interaction, one of the essential components of cooperative learning.

Ogle's (1986) K-W-L teaching model (henceforth, Ogle's K-W-L) which is modified is used to accommodate both high- and low-cooperation group tasks or "well-structured" and "ill-structured" tasks – using Cohen's (1994) terms. The classroom use of Ogle's K-W-L (Appendix 1) requires a teacher to activate the students' prior knowledge by asking them what they already **know** (the 'K' part). Then the students set goals specifying what they **want** to learn (the 'W' part) before they start reading the text. Having read the text, the students discuss what they have **learned** (the 'L' part). The text is therefore discussed based on the students' own goal setting.

Ogle's K-W-L is modified in various forms exemplified in the students' worksheets (Appendices 2-5 and 7-8). Primarily the modified K-W-L worksheets are of two types: individual and group worksheets. The individual worksheet, as its name suggests, is for each student to fill before the group discussion. The group worksheet is intended for the student who gets the 'secretary' role to fill with the help of all group members. This group worksheet can then be used by the student who gets the 'speaker' role to report the end result of group discussion (this group worksheet or reporter form is in fact prepared to take into consideration what Cohen (1994) argues as a result of his classroom observations namely that there is a greater incidence of student interaction when they use the reporter form than when the groups do not use it).

In this study, the 'K' part in Ogle's K-W-L appears in the individual worksheets (Appendices 2 and 7) and is modified by asking the students to write what they **know** (**K**) or what they think they **know** (**K**). Besides, the students are also asked to write what they think they will **know** after reading the text. They refer only to the title of the text to deal with the 'K' part. This is done before the whole text is read. This initial phase of pre-reading is carried out to activate the students' background knowledge. At the same time it is also intended to stimulate and generate curiosity about the topic to be covered. The aim is not to lead the students to certain topics for the study; rather, it is to enhance their involvement in the topic by uncovering and stimulating curiosity.

In this study, the 'W' part in Ogle's K-W-L is also modified (see again Appendices 2 and 7). The students are asked to write what they **want** to know or **want** to check (**W**) later in the group discussion. In order that the discussion does not come up with only well-structured tasks or only low cooperation task, the students are asked to cover not only the issues related to factual information, but also the ones related to main idea(s) and the ones related to inferences (implied information) – the discussion is then expected to come up

with high cooperation tasks. A special section “I don’t understand the following parts” is added to give the students a chance to list the parts they want to ask or discuss in the discussion section. After individual completion of the ‘W’ part, the students go on with the group discussion. In this particular discussion section, the students are expected to assist and get assisted.

The ‘L’ part is modified into another worksheet. The idea is actually the same as the original ‘L’ in Ogle’s K-W-L. It is modified to match the characteristics of Jigsaw – what each knows and what is to be shared to others. It is represented in the other worksheet named S-E worksheet (Appendix 3). As a group, the students are to complete the worksheet intended to reveal the end result of the expert team discussion. The students are asked to determine what they will **share (S)** to the other students in the home team and they are also asked to put the **evidence (E)** to assist them in explaining more or elaborating the to-be-shared information. The last part to complete in the S-E worksheet is question making. The students are required to prepare some comprehension questions to be used later in the home team to check if their team members have understood the main points of their presentation.

With regard to the task for home team discussion, the students are guided with an individual worksheet, the K worksheet (Appendix 4). The students individually take notes on the main ideas, inferences and factual information of the other parts of the text from their home team members’ sharing. Following this individual work, the students were assisted with a group worksheet, another K worksheet (Appendix 5) to decide what they as a team will keep for the quiz or for the report to the teacher. The last part to complete is question making – the task similar to the one in the S-E worksheet previously elaborated. Specifically, the home team is required to prepare comprehension questions that they predict will appear on the quiz.

To help familiarize the students with the task structure elaborated above, more particularly with how they are expected to proceed with the task which also includes how to work in a group using the modified K-W-L worksheets, special sessions are allocated for models of group work.

4.4.10 Models of Group Work

Most educators (like Blatchford et al., 2003; Dörnyei, 1997; Graves, 1994; Jaques, 2000; Mercer, 1995/2000; Tinzmann et al., 1990; Wohl & Klein-Wohl, 1994) talking

about group work similarly point to the need to provide models of group work when teachers expect the students to work well in their group. In this study one of the reasons to allocate some sessions for models of group work is then that merely placing students in a learning group and expecting them to cooperate effectively may not lead to effective group work. There are two other reasons. The task which is specially structured in the various worksheets to work on (as elaborated in [4.4.9]) requires that the students are familiarized with the designed task before the data are collected. The third reason is that it is expected, as mentioned in [4.4], to remedy the problem of our pilot studies.

Four out of 28 regular sessions of the semester course (Appendix 6) were then allocated for models of group work. They were regular class sessions 5-7 of the first half of the semester. Another session, i.e., session 2 on the second half of the semester was also allocated for model group work of Jigsaw. Prior to the main section of model group work, some time of session 5 was spent on team building activity intended for the establishment of the 'will' to cooperate (teambuilding activities are team-based activities that help teammates get acquainted, develop mutual support and build a team identity).

In the model section, the students were modeled with the specific steps in the cooperative learning processes, with specific emphasis on how to discuss responses, to give feedback to one another and to ensure that one got the correct understanding of the text being learned. The model group work was then obviously headed for the management of peer-group learning or the practice of interpersonal social skills – ensuring one particular essential component of cooperative learning. “Read lines 2-5. Finished? OK, from those lines I conclude ‘The house style “Queen Anne” does not have any relation with Queen Anne’. Am I correct?” was one typical example revealed in one of the model discussion.

A group work technique – the fishbowl (Jaques, 2000) – was applied for the purpose of modeling group work on sessions 5-7. Principally, one model group was put in the middle of the class, while the other students assigned to be the observers sat surrounding the group. Each member in the model group was assigned a different role: *captain*, *secretary*, *time keeper*, and *speaker*. Each was given a K-W-L worksheet (Appendix 7) and a text to discuss. They were given only 1 group worksheet, the K-E worksheet (Appendix 8). Put simply, the model group was provided with 4 individual worksheets and, to ensure resource interdependence, only 1 group worksheet. The reading task directions and procedures (as indicated in the worksheets) were in fact intended to ensure

face-to-face interaction – another essential component of cooperative learning (see [2.5.3]). Meanwhile, the observers were divided into 2 groups. Half of them – the first observer group – monitored the model group discussion for the use of the expressions and the language in general, the social or team work skills and jotted down any breakdown in the flow of the discussion and its causes. The other half – the second observer group – paid attention to how the model students did their tasks based on the roles assigned to them. Both observer groups were provided with a note consisting of guiding questions for observation (the notes for the observer groups are attached in Appendix 11). The two notes implicitly indicate that another essential component – group processing was introduced. Besides the notes, the observers were also provided with the text discussed in the model group to assist them in their observation. The model session began when the model group discussed a text while the observers did their task by referring to the observing notes. The teacher-led feed back section was then performed. The observing groups reported their findings. The teacher eventually summed up by drawing the students' attention to the essentials of group discussion.

As mentioned in the previous paragraph, sessions 5-7 were allocated for modeling group work. On session 5, the teacher joined the model group becoming one of the group members. She took the role of *captain* – intending to give a model of group work while she was also a model member – a sort of encouragement before the students really worked on their own. On sessions 6 and 7, the teacher joined the observers with the expectation that the model group could really get the chance to perform the group task on their own.

The model group work previously described was for the non-Jigsaw technique. As this study was related to the Jigsaw implementation, further model group work was allocated for Jigsaw. After the first session of the second half of the semester in which an introduction to Jigsaw was provided to the students, the students got a model of a Jigsaw class on the following session – to be exact on the second session of the second half of the semester, or 2 sessions prior to the main data collection (see Appendix 6). The students were placed in their expert teams and they again discussed the respective text they had read in session 12 of the first half of the semester. As this was only a review section and the expert team discussion was in fact similar to the group discussion when Learning Together was implemented, it was done briefly. The students were then asked to form their home teams. To show how home team discussion was conducted or how the

‘expertise’ was expected to be shared, only one home team was chosen. The other four home teams became the observers. The ‘fishbowl’ technique was used again.

It is therefore obvious from the above description about modeling group work that it was in sessions 5-7 on the first half of the semester and session 2 on the second half of the semester when the three essential components of cooperative learning – face-to-face interaction, interpersonal skills and group processing – were introduced and informally taught.

4.4.11 Procedure of Data Collection

With the preparation elaborated above especially in [4.4.3] - [4.4.10], we now focus on the data collection. Firstly, related to the overall procedure of data collection in the semester program, the course outline of the investigated class is elaborated. Secondly, the procedure to collect the main data is presented.

4.4.11.1 Reading Course Access

After the permission to take the data was granted by the Head of the Department where the data were determined to be collected, the coordinator of the Reading 2 course was contacted to get another permission to use one of the three parallel classes for the data collection. The next step taken was to select the class. Eventually the chosen Reading 2 course which was scheduled Wednesdays and Fridays was taught by implementing the specifically designed course outline (Appendix 6).

The course outline was designed to implement not only a whole class teacher-directed or traditional approach but also two sorts of cooperative learning techniques: Learning Together and Jigsaw. As a consequence, the instructional technique and method of assessment in this investigated class were different from the ones employed in the other two parallel classes. However, the course objectives and materials were maintained. Briefly stated, the chosen class did not use the course outline prepared by the team teaching of Reading 2 course.

Based on the academic calendar of the odd semester of 2008/2009, there were totally 28 sessions in this class. Below is the description to reveal the overall procedure of data collection.

On the very first session, the students were initially informed that they would be learning in a teacher-centered mode as well as student-centered mode of instruction – that they would learn as a whole big group and also in small groups. Afterwards, a

questionnaire was administered to see the students' entry behavior. The sociometric method for group composition was also carried out (see [4.4.6] for the details). Permission to conduct a study was then asked. They were informed that their group work would be recorded. The permission was granted. The other planned activities for the first session were then carried out more convincingly. The course outline was shared. At the time the course outline was shared, Positive Interdependence and Individual Accountability were introduced since the method of assessment in the course outline was also informed to the students. The New Learning Paradigm was revealed.

On sessions 2-3 the class had a reading class which was teacher-directed. After they had the triggering questions, the students were asked to read the text silently. The text discussion was conventionally teacher-fronted. On session 4, the K-W-L reading technique was introduced and directly employed. To be more specific, each student on session 4 was provided with the K-W-L material (Appendix 1) which was read and discussed. Then a reading text was discussed by referring to the modified worksheet (Appendix 7). The session was intended to familiarize the students with the reading task employing the modified worksheet.

Sessions 5-7 were primarily for modeling group work (as the details have been presented in [4.4.10], they are not elaborated here).

On sessions 8-12 the students worked in cooperative learning groups implementing Learning Together. When they were in their cooperative learning groups, their group work was all recorded, but they were not informed that the recordings were not included for the research. As mentioned in [4.4.3], this was done to make the students get used to the presence of audio recorders for the sake of the main data collection on the second half of the semester later. On session 10, the student group work was scheduled to be scored. The individual quiz was administered. On session 11, one essential component of cooperative learning, i.e., group processing was incorporated. The students were asked to reflect on how the group discussion went on – identifying three things the group was doing well and one thing that needed improving.

On all sessions 8-12 (the Learning Together sessions or the non-Jigsaw sessions), when the students discussed the reading material in small groups, they were provided with the worksheets (Appendices 7 and 8). They were reminded of the model group work conducted in the previous sessions 5-7. Each group was also facilitated with the guidance to perform the reading task (Appendix 11).

The reading task started with the completion of the 'K' part to activate the students' prior knowledge before they discussed the text in the group. As an example, in a session when the reading text entitled "Indoor Pollution" was discussed, they were asked "What comes to your mind when you hear INDOOR POLLUTION?" (the title was written on the white board). When similarly asked "What do you know or what do you think you know about indoor pollution?", the students then wrote their answer on the space provided below "WHAT I (THINK) I **K**NOW (**K**)" in the worksheet. Besides, they also wrote what they thought they would **know** after reading the text later. Some randomly selected students' answers were discussed and feedback provided. The students then continued working in their own cooperative learning groups.

Initially the students read the text individually twice. The first reading was done without stopping. The second reading was done to complete the 'W' part. They wrote what they **wanted** to know or **wanted** to check (**W**) later in the group discussion. They wrote the main idea and the implied information they found, and they also noted down some factual information they thought was important to keep. They also took notes on something they would ask to and discuss with their friends. They wrote them in the worksheet on the section "I don't understand the following parts". After individual completion of the 'W' part, the students continued with the group discussion (it is in this particular discussion section that the idea of cooperative learning was highlighted). The students learned from one another – assisting and getting assisted. They then completed the 'L' part writing what they had learnt after the group discussion. They went on with the Group Worksheet completion which was intended to reveal the result of the group discussion. Completing the Group Worksheet also meant finishing the task of making comprehension questions that might appear on the quiz or that were important to keep as a group work report (each group was asked to collect their group worksheet to the teacher; this was done to ensure they really worked on the reading task assigned).

As previously mentioned, sessions 8-12 were allocated for the students to work in cooperative learning groups where Learning Together was employed. However, session 12 was a bit different. This 'special' session was designed for the sake of the later session for the model Jigsaw. The students were put in their home teams by referring to the grouping table (Appendix 9), but they were not yet introduced to the term 'home team'. On this session, the preference form was distributed to the students to check the cohesiveness of the expert teams formed (see [4.4.6]). Afterwards, teambuilding activities to establish the

'will' to cooperate were carried out. After the teambuilding activities, the actual reading class began. The students started working in groups. The materials for each team were not the same; four different sets of materials were used in this one session.

On sessions 13-14 the class had a reading class which was teacher-directed. Similar to sessions 2-3, the sessions started with the pre-reading activities. Some triggering questions were posed and some answers were discussed. Silent reading followed. The text discussion which was conventionally teacher-fronted was then performed.

On the first session of the second half of the semester, the students' mid-semester test result was given feedback. Subsequently, the introduction to the Jigsaw technique of learning was given. The students were also reminded of the five essential components of cooperative learning.

Session 2 was primarily for modeling a Jigsaw class (see [4.4.10]). On session 3 the Jigsaw class was implemented fully (no model Jigsaw was provided). Both sessions 2 and 3 were allocated to familiarize the students with the procedure as well as to introduce the nature of Jigsaw. The subsequent sessions 4-7 were the Jigsaw sessions for the main data collection (the detailed description is available in the next section [4.4.11.2]).

On sessions 8-9 the class again had a conventional reading class which was teacher-directed. The class activities were similar to the ones on sessions 2-3 and 13-14 of the first half of the semester.

On sessions 10-13, the students worked in small groups using Learning Together. As the new group formation was implemented, team building activities were again carried out to establish the 'will' to cooperate. The regular class activities were similar to the ones on sessions 8-12 of the first half of the semester.

On the last session (session 14 of the second half of the semester) which was actually allocated for a Learning Together session, there was no reading activity. The class time was primarily spent on feedback. The students were asked about the class they joined. Some students were asked to orally reveal how they felt being in the investigated Reading 2 class. Another written feedback was obtained by asking the students to complete an end-of-semester-questionnaire – the analysis of which was not reported in this thesis. The students were given a note of thanks for their participation.

When the students were engaged in their group work – on sessions 8-12 (excluding session 10) of the first half of the semester, and on sessions 7 and 10-13 of the second half of the semester – the class teacher (the researcher herself) came to the groups making sure

they did the task and sometimes asked higher-order questions, and extended the students' thinking on the task. She avoided hovering over the groups and giving them detailed directions and extensive information while they were at work. In short, the teacher reduced the role as transmitter of information – interrupting only when necessary giving opportunities for groups to work maximally based on their capability. On session 10 of the first half of the semester, the teacher however withdrew completely from the student group discussion as an individual quiz was scheduled to be administered. The students were expected to work more seriously for the quiz. Similarly, on sessions 4-7 of the second half of the semester, the teacher withdrew completely from the student group discussion. The primary reason was that it was the time for the main data collection of this research which was aimed to investigate student interaction without the teacher.

4.4.11.2 Main Data Collection Procedure

As implied in [4.4.11.1], 6 sessions were allocated for the implementation of Jigsaw. The first two sessions were 'spared', as mentioned previously, to familiarize the students with Jigsaw so that the time could be used more efficiently when the main data collection took place. Students knew which home team and expert team they belonged to and how they were supposed to move from one to the other group. Similar to the other group work sessions, all group work on these two sessions was recorded in order that the students were accustomed to having a recorder nearby – to get more naturalistic data. The remaining four Jigsaw class sessions were used for the main data collection. The group discussion on these particular sessions was carried out by the students without the teacher's presence (only the key informants' discussion in their expert team was taken as the data to answer the research questions).

The typical 100 minute-session when the main data collection occurred was sequenced as follows: preparation, brief teacher-directed section, student group work and quiz. The preparation section was allocated for about 10 minutes. After class attendance taking, the students were reminded of the principles underlying cooperative learning. A typical encouraging reminder was "Well, each student has his or her contribution in the group work. When you ask questions, it means you help others explain thus indirectly help your friends learn more." Moreover, the students were reminded about the positive interdependence – helping one another so that at last the group members could do well on the quiz. They were also reminded about the individual accountability; the scoring system

or the method of assessment was informed again. The brief teacher-directed section was performed for the completion of the 'K' part of the individual worksheet (Appendix 2). The title of the text was written on the white board, and a typical question 'What comes to your mind when you hear the word(s) ...?' was asked to the students. The students were then involved in the group work allocated for about 75 minutes. In the last 10-15 minute-section, the students did the quiz individually.

As the main data collection should not fail, the students were, as usual, reminded to start recording as soon as they began performing the group task and to continue recording until they totally finished. To be more specific, the recording started right after the 'K' part completion or the section of the brief whole-class teacher-directed and ended with the quiz administration.

In their group work, the students were engaged in the home team and expert team discussion – the characteristics of Jigsaw. In the 40-minute expert team section, they first discussed the small portion of the reading text. Expert Team 1 discussed Part A of the whole text; Expert Team 2 Part B; Expert Team 3 Part C; Expert Team 4 Part D. Then in the 30-minute home team section, they learned the whole text from one another.

In the expert team discussion, the students initially performed the silent reading intended to make the students more prepared for the group discussion or to avoid the group discussion from falling flat as a result of inadequate preparation by the students. Each then completed the 'W' part in the individual worksheet. The expert team discussion started afterwards. The last section of the expert team discussion was spent on completing the group worksheet and also preparing the questions to be taken to the home team (Appendix 3). Implicitly, the beginning section of a Jigsaw class was similar to the one of a Learning Together class (detailed previously in [4.4.11.1]). When there was still time, the individual rehearsal was done to provide the opportunities to the students to rehearse verbally what they were going to share to the home team members later. As assistance in the expert team discussion, each group is provided with the guidance which looks like the following:

GUIDE FOR EXPERT TEAM DISCUSSION	
Step 1:	the 'K' part completion
Step 2:	about 30 minutes for the 'W' part
	about 5 minutes for Individual reading
	about 5 minutes for Individual completion of
	WHAT I W ANT TO KNOW OR CHECK (W) related to (a) main idea(s)/
	purpose(s) of the text, (b) inferences (implied information), and (c) factual
	information
	about 20 minutes for expert team discussion
Step 3:	about 10 minutes for Group Worksheet completion (including question formulating)
Step 4:	individual rehearsal (when time permits)
Total:	± 40 minutes

In the home team discussion, the students shared their expertise in turns. Each was assigned to share in about 7 minutes what he or she had obtained in the expert team. Expert 1 (the expert of Part A) started sharing his or her expertise. Meanwhile, the other home team members – those who were not the expert of Part A or those who became the experts of the other parts of the text, namely Experts 2, 3, and 4 – completed their individual worksheet (Appendix 4). Expert 1 then questioned the other home team members to check comprehension to ensure the other members followed him or her. Then it was time for Expert 2 (the expert of Part B) to share his or her expertise. The same procedure was repeated until Expert 4 got his or her turn. Eventually, the home team members completed another group worksheet (Appendix 5). The two tasks to complete included (1) the group decision on what to keep for the quiz or for the report to the teacher, and (2) the question formulation – predicting what would appear on the quiz. As an aid for the students in their discussion, each group is provided with the guidance to perform the group task in their home team (Appendix 11).

4.5 Data Analysis Procedure

Since the aim of this study is related to the investigation of student interaction and since the data generated by the research methods employed in this study are in the form of student verbal interaction, one particular data analysis procedure used in this study is the one proposed by ten Have (1999) whose idea is also revealed in Freebody (2003) as follows:

1. Create mechanical recordings of some kind.
2. Create a transcript and check the transcript for accuracy against the recording.
3. Select episodes or exchanges (or 'unit of analysis' – the term used by other methodologists like Berg, 2004; Fraenkel & Wallen, 2006; Peck, 1988, or 'features of

- analysis' as used by Gass, Mackey & Ross-Feldman, 2005).
4. Make sense of the episodes.
 5. Use the details of talk in interaction and the researcher's members knowledge to provide explanation of the episodes.
 6. Elaborate the hearings or investigation and look for what follows in subsequent apparent hearings.
 7. Compare the explanations with the ones of other phenomena in the setting or from other setting.

The student interaction was audio-recorded. After the data were obtained, they were transcribed – resulting in the rough transcripts of student interaction. Provided with the rough transcripts produced, the key informants were requested to listen to the tapes while following along on the transcripts and identified the speakers for all sequences. This was intended to ensure that the verbal utterances were attributed to the appropriate key informants. The audio-taped data were replayed numerous times until accurate written transcripts were produced. The next essential thing carried out was focused on the polished data – labeled Data 1, Data 2, Data 3, and Data 4 (Appendix 12), namely the four transcripts of student verbal interaction while the reading task in the expert team was performed.

With regard to the process of analyzing the polished data, in this study a set of codes was defined before the actual analysis begins (Ellis & Barkhuizen, 2005). Guided by a set of predefined, expected themes or 'concepts' defined as "experiences, ideas, attitudes or feelings identified in the data" (Ellis & Barkhuizen, 2005:266), we continue to investigate keeping in mind that changes may, Ellis & Barkhuizen (2005) further claim, be made once the analysis gets underway.

To be more particular, the transcribed data were initially macro-coded to deal with the selection of episodes by using three predefined concepts. These predefined concepts include (1) content (Sinclair & Brazil's (1982) subject matter, Ellis's (1997) core goals, or Hogan, Nastasi & Pressley's (1999) knowledge construction), (2) organization (Sinclair & Brazil's (1982) organization aspect of lessons, Ellis's (1997) framework goals, Hogan et al.'s (1999) logistical mode of group discussion, or Blatchford et al.'s (2006) metagroup talk), and (3) social or off-task (Sinclair & Brazil's (1982) disciplinary element, or Ellis's (1997) social goals) (see Chapter 5 for further details of this classification).

Following the macro analysis is the micro analysis. It is performed to further analyse the episodes found. The first micro interaction analysis that this present study employs basically takes into consideration the common three-part sequence of classroom discourse. In short, the analysis was performed to investigate the IRF (Initiation-Response-Feedback) moves guided by the first micro analysis categories (elaborated in Chapter 5).

Following the IRF analysis in the transcribed data was the second micro analysis for further analysis so that the data could be explained more. The sequence of the second micro-analysis was not pre-determined (Glaser & Strauss, 1967; Strauss & Corbin, 1990) but it rather came out through interaction with the data. Furthermore, as argued by Ellis & Barkhuizen (2005) referring to Miles & Huberman (1994) that researchers do not start their analysis with absolutely no idea of what to look for, the second micro analysis was commenced by adapting a set of codes from earlier studies as a start list since these would probably be revised as the analysis progressed.

Insightful ideas which become the start list for the second micro analysis in this study is primarily obtained from Lim's (2000) or Lim & Jacob (2001) whose scaffolding categories are student-centered (see Chapter 5 for further details of these categories).

The details found in the transcripts and the researcher's knowledge were used to provide the explanation for further discussion. The supplementary data obtained from the interview, stimulated recall, and modified K-W-L student worksheets were used, as previously mentioned in [4.4.3], in order to provide opportunities for cross-checking the findings.

Three coders were involved in this study. The first coder was the researcher; the second and third coders were two colleagues. The first and second coders were involved in the macro coding and the first micro coding. The first and third coders were involved in the second micro coding. The related theories and the guiding interaction analysis classification and categories were provided to the second and third coders. The expectation is that all coders had similar theoretical background and perception for the data analysis. At this point, inter-coder reliability was ensured by using a simple percentage agreement. Where there was disagreement in the coding, discussion was held to arrive at unanimous decisions.

4.6 Summary

The chapter has presented five major issues related to the research method of this study. The first three issues cover the nature of the study, the ethical considerations taken, and the design of the study. The last two issues include the data collection and data analysis procedure. As for the data collection, the chapter has presented the setting, the subjects and key informants of the study, and the research instruments used to collect the data. It has also presented more technical issues for the data collection covering the cooperative learning techniques implemented, group size, group composition, role assigning, materials, task structure, models of group work, and the procedure of data collection. These parts somehow reveal that this present study benefits from some of the problems found in the pilot studies. Finally the chapter has displayed the procedure taken in analyzing the data – from the macro to micro analyses so that the transcribed data become more manageable to analyse. In the next chapter, the interaction analysis classification and categories which are used to code the data, structurally and functionally, are presented with the illustrations from the data.

