

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

This chapter describes some methodological aspects of the study the method that was used in order to answer the research questions stated in Chapter I. The chapter includes research design, research setting and participants, data collection, research procedures, and data analysis.

#### **3.1 Research Design**

The study employed a qualitative descriptive method. The descriptive method was conducted to describe the data during the research and then tabulated them in some ways. According to Travers (1978, cited in Adanza (1995:39), descriptive method describes as “the nature of situation as it exists at the time of the study and to explore the causes of particular phenomena”. This qualitative descriptive method seemed suitable to present the results of this study and interpret the facts that found in this study (Gay, 1987) due to there was no interference or treatment given by the teacher before teaching and learning process conducted or it was done in natural setting.

#### **3.2 Research Setting and Participants**

The study was conducted in one of public junior high schools in Bandung at the academic year 2010-2011. This school has been selected as *RSBI* School since 2007. The participants of this study were 2 science teachers and 1 math teacher, and five classes of grade 9<sup>th</sup> students. There were some reasons why this school was chosen. First, this school was a place where some of *UPI* students, include the

researcher, conducted their teaching practicum. Second, this school was one of the favorite schools in West Java and has been awarded an A for its accreditation.

In order to be more focused, a random sampling was used to determine the participants that involved in this study. According to Neuman (2000), sampling is defined as a part of population that is involved in a research to represent characteristics of a population. Furthermore, Mugo (2008) states that a random sampling is obtained by choosing elementary units in searching a way that each unit in the population has an equal chance of being selected. In this case, 97 students of five classes were involved as participants in the questionnaire, 25 of them were chosen randomly as samples in interview session in order to generalize the characteristics of the population to all students of grade 9 in one of junior high schools in Bandung.

### **3.3 Data Collection**

To collect the data, this study employed three instruments that covered classroom observation, questionnaire and interview. Classroom observation was used to find out in what situation the teachers use English during the teaching and learning process of sciences and math classes. Questionnaire and interview were conducted in order to find out the teachers and students perception related to the use of English in teaching and learning process and the implementation of *RSBI* program in their school. The use of these data collections were aimed to enhance confidence in the ensuing findings is called triangulation, as suggested by Bryman (2004). Each data collection method was described as follows:

### 3.3.1 Classroom Observation

One of the instruments employed to get data in this study was conducting classroom observation. Cartwright (1997) defines observation as a process to see, to observe, to examine, and also to record systematically actions to get certain purposes. She also summarizes three important purposes or areas where systematic classroom observation has been widely which include: (1) description of instructional practices; (2) investigation of instructional inequities for different groups of students; and (3) improvement of teachers' classroom instruction based on feedback from individual classroom or school profiles.

Related to classroom observation, it is very important to do direct observation if a researcher wants to enrich his or her understanding about teaching and learning language and need to spend time looking in the classroom (Nunan, 1989). Thus, conducting classroom observation in this study seemed appropriate since the data from observation were addressed to investigate the implementation of the use of English through teaching and learning activities in three main aspects; pre teaching, while teaching, and post teaching done by sciences and math teachers and also students.

Subsequently, the observation sheet was prepared to get the specific data focusing on teaching and learning process through three phases of teaching; pre-teaching, while teaching, and post teaching. Those phases were observed because teachers tend to do these phases in teaching learning process. Related to teaching phases in teaching and learning process, Ur (1996) gives her suggestion about appropriate learning process as follows:

In the classroom teacher should promote three learning processes by the use of appropriate teaching acts which are presenting and explaining new material, comprehensible and available for learning, giving practice of knowledge, and testing to check what has been mastered and what still needs to be learned (1996).

In order to get an accurate data from classroom observation, three classroom observation forms were employed. Each form was developed based on the characteristics of each subject; physics, biology, and math classes.

In physics subjects, one of learning models that is reasoning and problem solving developed by Krulik & Rudnick (1996) were chosen. This model suggested five steps; (1) Reading and thinking (identifying facts and problems, visualizing the situation, describing the setting problem), (2) exploration and planning (information organization, making table, graphic, and pictures), (3) selecting the strategy (examining the problems/doing experiment), (4) finding the results (estimation, using computation skill), (5) reflection (correcting the results, finding alternative ways in solving problems, generalizing the concept, discussing and formulating the problems) (Krulik & Rudnick, 1996). The classroom observation sheet can be seen in table 1 as follows:

**Table 1**

**Classroom observation sheet for Physics**

The Aspects of Observation	Yes	No	Note
<p><b>I. Pre- Teaching (Introduction)</b></p> <ol style="list-style-type: none"> <li>1. Teacher greets students in English</li> <li>2. Students respond the teacher in English</li> <li>3. Teacher conditions the students in order to attract students' attention in English</li> <li>4. Teacher reviews the previous materials and ask the students in English (apperception)</li> <li>5. Teacher states new topic in English</li> </ol>			
<p><b>II. While-Teaching (Core Activity)</b></p> <ol style="list-style-type: none"> <li>1. Teacher asks some questions to know students' prior knowledge about the new topic in English</li> <li>2. Teacher introduces terms or expressions related to materials in English (Such as potential energy, mechanical energy, electric, heat, etc)</li> <li>3. Teacher uses media in English (such as whiteboard, power point or LCD) to help the students more understand the materials delivered</li> <li>4. Teacher explains the concept of the materials (definition, characteristics, formula, etc) in English in order to have the same perception</li> <li>5. Teacher provides some information and illustration about the materials in English</li> <li>6. Teacher and students discuss the materials in English</li> <li>7. Teacher gives the students some exercises related to the materials and explains how to solve the exercises in English</li> <li>8. Teacher and students discuss the exercises in English</li> <li>9. Teacher asks students to do other exercises related to the materials in English</li> <li>10. Students do the exercises in English</li> <li>11. Teacher guides and helps students in doing the exercises in English</li> </ol>			

12. Teacher and students discuss together to find out and check the answers of the exercises in English			
<b>III. Post-Teaching (Closing)</b> <ol style="list-style-type: none"> <li>1. Teacher asks students to conclude the materials in English</li> <li>2. Teacher does evaluation by giving some questions to the students related to the materials in English (reinforcement)</li> <li>3. Students respond the questions in English</li> <li>4. Students ask some questions related to not understandable materials in English</li> <li>5. Teacher gives homework to the students and announce the next lesson in English</li> </ol>			

(Adopted from Krulik & Rudnick, 1996 & Mulyasa, 2005)

In learning the concepts of biology, three steps which are developed by Lawson (1988) seemed suitable. The first step is exploration. In this step the teacher guides students to identify new issues or phenomenon and submit any information related to the phenomenon. Second step is elaboration. Here, the teacher introduces the new terms and its concepts such as definition, functions, parts, process, etc that can be found by students in learning sources such as textbooks, films, internet, etc. And the last step is application. In this step, the students are expected to be able to apply the new concept/ information given to other contexts in their daily life. Related to these steps, the classroom observation sheet was developed that can be seen in the following table 2:

**Table 2**

**Classroom observation sheet for biology teacher**

The Aspects of Observation	Yes	No	Note
<p><b>I. Pre- Teaching (Set Induction)</b></p> <ol style="list-style-type: none"> <li>1. Teacher greets students in English</li> <li>2. Students responds the teacher in English</li> <li>3. Teacher condition the class in order to attract students' attention</li> <li>4. Teacher reviews the previous materials and ask the students in English (apperception)</li> <li>5. Teacher introduces a new topic in English</li> <li>6. Teacher states the aims of a new topic in English</li> </ol>			
<p><b>II. While-Teaching (Main Activity)</b></p> <ol style="list-style-type: none"> <li>1. Teacher asks some questions to know students' prior knowledge about the new topic</li> <li>2. Teacher explains the definition of the new topic in English</li> <li>3. Teacher and students discuss the definition of the new topic in English in order to have the same perception</li> <li>4. Teacher uses media in English (such as whiteboard, power point or LCD) to help the students more understand the materials delivered</li> <li>5. Teacher asks students to explain the definition of some terms or expressions related to the materials in English (such as excretion system, reproduction system in plants, prokaryote cell, natural phenomenon, etc)</li> <li>6. Students respond the teacher in English</li> <li>7. Teacher asks students to mention the characteristics of some terms related to materials in English (such as excretion system, reproduction system in plants, prokaryote cell, natural phenomenon, etc)</li> <li>8. Students respond the teacher in English</li> <li>9. Teacher asks students to explain the process of some terms related to materials in English (such as excretion system, reproduction system in plants, prokaryote cell, natural</li> </ol>			

<p>phenomenon, etc)</p> <ol style="list-style-type: none"> <li>10. Students respond the teacher in English</li> <li>11. Teacher asks students to explain the parts of some terms related to materials in English (such as excretion system, reproduction system in plants, prokaryote cell, etc)</li> <li>12. Students respond the teacher in English</li> <li>13. Teacher asks students to mention the function of the terms related to materials in English (such as excretion system, reproduction system in plants, natural phenomenon, etc)</li> <li>14. Students respond the teacher in English</li> <li>15. Teacher translates her/his English in delivering and discussing the materials</li> <li>16. Teacher asks students to do assignment or exercises in English</li> <li>17. Students do the assignment or exercises in English</li> <li>18. Teacher and students discuss the assignment or exercises in English</li> </ol>			
<p><b>III. Post-Teaching (Closure)</b></p> <ol style="list-style-type: none"> <li>1. Teacher collects students' assignment or exercises in English</li> <li>2. Teacher asks students to conclude the materials in English</li> <li>3. Students conclude the materials in English</li> <li>4. Teacher does evaluation by giving students some questions regarding today's materials in English</li> <li>5. Students respond the teacher's questions in English</li> <li>6. Students ask some questions related to not understandable materials in English</li> <li>7. Teacher gives homework and announce the next lesson in English</li> <li>8. Teacher ends the class in English</li> </ol>			

(Adopted from Lawson, 1988)

Furthermore, in developing the activities in Math classroom, Joyce, Bruce, and Weil (1992) design some models that are applied for learning math. Besides the models of problem solving, cooperative and contextual learning, there is also a model of Guided discovery. In this model, teachers should formulate the problems



related to the objectives of the materials, ask students to arrange, organize, process, solve, and analyze the problems through the exercises, ask students to estimate the results, check the students' results, and provide additional exercises to check and evaluate the students' understanding. The classroom observation sheet can be seen in the following table 3:

**Table 3**  
**Classroom Observation Sheet for Math Teacher**

The Aspects of Observation	Yes	No	Note
<b>I. Pre- Teaching (Introduction)</b> <ol style="list-style-type: none"> <li>1. Teacher greets students in English</li> <li>2. Students respond the teacher in English</li> <li>3. Teacher conditions the students in order to attract students' attention</li> <li>4. Teacher reviews the previous materials and ask the students in English (apperception)</li> <li>5. Teacher announces the new topic and states the aims in English</li> </ol>			
<b>II. While-Teaching (Core Activity)</b> <ol style="list-style-type: none"> <li>1. Teacher asks some questions to know students' prior knowledge about the new topic</li> <li>2. Teacher introduces terms or expressions related to materials in English (Such as triangle, circle, indices, etc)</li> <li>3. Teacher explains the concept of the materials (definition, characteristics, formula, steps, etc) in English</li> <li>4. Teacher uses media in English (such as whiteboard, power point or LCD) to help the students more understand the materials delivered</li> <li>5. Teacher discusses the concept and other information related to the materials by asking some questions in English</li> <li>6. Students respond the teacher in English</li> </ol>			

<ul style="list-style-type: none"> <li>7. Teacher gives some math problems as examples and explains how to solve the problems in English</li> <li>8. Teacher and students work together to solve the problems of the materials in English</li> <li>9. Teacher gives the students exercises related to the materials in English</li> <li>10. Students do the exercises in English</li> <li>11. Teacher guides and helps students in doing the exercises or assignment in English</li> <li>12. Teacher and students discuss together to find out and check the answers of the exercises in English</li> </ul>			
<p><b>III. Post-Teaching (Closing)</b></p> <ul style="list-style-type: none"> <li>1. Teacher and students conclude today's materials in English</li> <li>2. Teacher does evaluation by giving some questions to the students related to the materials in English (reinforcement)</li> <li>3. Students respond the questions in English</li> <li>4. Students ask some questions related to not understandable materials in English</li> <li>5. Teacher gives homework to the students and announce the next lesson in English</li> </ul>			

(Adopted from Joyce, Bruce, and Weil, 1992)

The notes of what was said by the teachers and students in the interactive setting (Yin, 2003: 92) were taken. To support the notes during observation, any words produced by the teachers and their interaction with their students during teaching and learning process run in the classroom was taken by using tape recorder.

### 3.3.2 Questionnaires

In this study, the next instrument that was used to collect data was questionnaire. Best (1991), points out that “administering questionnaires personally to groups of individuals have a number of advantages”. Best (1991) also adds that some of the advantages for the researcher are to establish report, explain the purpose of the study, and explain the meaning of items that may not be clear.

The questionnaires were administered to 2 teachers of natural sciences and 1 math teacher and also 97 students of 9<sup>th</sup> grade in *RSBI* class. The questionnaire contains three main criteria; the general view of English as a subject, the perceptions of English as a medium of instruction in sciences and math classes, and teachers’ opinion about *RSBI*. For students, the questions or statements of the questionnaires were divided also into three main criteria; (1) the general view of English as a subject, (2) the perceptions of English as a medium of instruction in sciences and math classes, and (3) students’ opinion related to their status as *RSBI* students. In this questionnaire, there were 14 items for teachers and 11 items for students and all of them were written in *bahasa Indonesia* (see appendix B).

In this study, the Likert scale questionnaire was used. The reason to use this scale was because the method is simple, versatile, and reliable (Dornyei, 2003). The Likert scale consists of five points; strongly agree (SA), agree (A), undecided (UD), disagree (DA), and strongly disagree (SDA) with the same interval so that the scores were 5, 4, 3, 2, and 1.

### 3.3.3 Interview

Another method of data collection was interview. Interviews on the students and teachers were used as one of the sources of data. According to Knupfer (2007), “Interview provides an opportunity to follow a line of questioning to obtain more in-depth information”. Through interview technique, the researcher may stimulate the subject to greater insight into the researcher own experience; therefore the study that uses the interview technique will get more comprehensible information for the study (Best, 1991).

The interviews were addressed to 3 teachers and 25 students from each class of 9<sup>th</sup> grade in order to find out teachers’ and students’ opinions or perceptions related to the use of English in teaching and learning process in sciences and math classes and also their feelings in running bilingual or international class.

Interview in this study also plays an important role to enable the research to check the honesty and the accuracy and to verify or refute the impression from the previous technique (Freakel and Wallen, 2006).

Semi structured and open minded interview were applied in answering the second and the third research questions. According to Fontana and Frey (2000) semi structured is a kind of interview whose schedule was arranged, but somehow there will be improvisation when needed to adjust the sequence of the questions to be asked and add questions based on the context of participants’ responses. Semi structured is used because the researcher has general idea where the interview should go and what should come out of it (Nunan, 1992).

The questions were categorized into seven categories: (1) the Students' and teachers' opinion of English, (2) students' English score, (3) the effectiveness of using English as medium of instruction in sciences and math class, (4) the frequency of using English by the teachers, (5) the feeling of being bilingual class, (6) the important of using English as a medium of instruction, and (7) the readiness of the school in running *RSBI* program. The seven questions were followed by subsequent questions which were in conversation, and those were used to clarify the results from questionnaires and classroom observation. The interviews were also recorded by using tape recorder. Thus, all of the recorded interviewees' contribution were transcribed and analyzed. After that, the results were matched and contrasted to the relevant theories in chapter II.

#### **3.4 Procedure of the study**

The procedure of this study was started by doing classroom observations. During each class observation, the researcher sat beside one of students in front of the class to observe the teaching and learning process and also taking notes. After class, the researcher asked the teachers for some clarifications related to what they had done while teaching activities. Classroom observation was aimed to see the teachers' and students' role in running their duty in international class through the use of English in teaching learning activities. After collecting data from observation, the questionnaires were developed based on the research questions in order to find out perceptions or opinions of using English in teaching learning process. Then, the results of questionnaires gave contribution to find out students' and teachers' perceptions or opinions of using English in math and science classes.

Interview was the last technique to find out students' and teachers' perceptions regarding the use of English in sciences and math classes.

### **3.5 Data Analysis**

Data analysis was a continuing part of data collection when the data have been gathered that organizing what is there into patterns, categories, and basic descriptive units (Patton ,1994; Ismail, 2009). In this case, the data were analyzed through qualitative data analysis. It was conducted after data from classroom observation form, questionnaire, and interview transcriptions were available. All data were explained and elaborated descriptively by using words and numbers.

For the analysis of classroom observation, this study employed three classroom observation forms developed based on learning models specific of each subject in order to see implementation of English used by science and math teachers and teacher talk in each of learning activities through teacher tasks introduced by Brown (2001). Brown (2001) and Moskowitz (1971, 1976) introduces the guidelines that help look into teachers as initiators of interaction in the classroom through 26 types of teacher tasks adapted from the work of known as the FLINT (Foreign Language Interaction) model to explain the tasks of teacher lecturing in the EFL classroom. The categories of teacher talk can be seen in the following table 3.2.

**Table 3.2****Teacher Talk categories in EFL setting**

No.	Tasks/code	No.	Task/code
1.	Accepting (Acc)	14.	Correct Mistakes (CM)
2.	Discussing (Dis)	15.	Order (Ord)
3.	Praising (Pra)	16.	Request (Req)
4.	Encouraging (Enc)	17.	Giving Direction (GD)
5.	Conforming (Con)	18.	Directing Drills (DD)
6.	Joking (Jok)	19.	Criticizing (cri)
7.	Making fun (MF)	20.	Rejection (Rej)
8.	Explaining (Exp)	21.	Anger (ang)
9.	Clarifying (Cla)	22.	Smile (Smi)
10.	Repeating Words (RW)	23.	Silence (Sil)
11.	Display Question (DQ)	24.	Monolog (Mon)
12.	giving information (gi)	25.	Borrowing (Bor)
13.	referential question (rq)	26.	Translation in L1(t11)

(Adapted from Brown, 2001 and Moskowitz, 1971, 1976) in Foreign Language Interaction Analysis (FLINT) system

The data from classroom observation sheet was then analyzed by finding the percentage of frequency in teacher talk and also identify the most types of teacher talks used by teachers in EFL setting since English is used in classroom activities as a medium of instruction in sciences and math subjects.

To see the frequency of major five types of teacher talk, this study employed the categorization system as follows:

**Table 3.3**

**Major five types of teacher talk**

Rank	All Teachers	
	Talk Types	Turns
1.		
2.		
3.		
4.		
5.		

(Developed by Shim, 2006)

Moreover, the data from questionnaires and interview were analyzed to answer the research questions concerning with teachers' and students' perceptions of using English as a medium of instruction in teaching and learning sciences and math. The questionnaires and interview were addressed to the teachers and students.



The analysis of interview data was started by transcribing the data verbatim. In this process, the name of participants was replaced with teacher or student X. Then, the second transcriptions were read carefully.

In analyzing the data collected from the questionnaires, calculation of the percentage of each response was determined based on the frequency by using the following formula:

$$P = \frac{f_o}{n} \times 100\%$$

(Developed by Riduwan, 2009)

Note:

P = Percentage

f<sub>o</sub> = Frequency of students' and teachers' answers

n = Number of samples

In the following step, the results from questionnaire were categorized by looking the criteria below:

Statements	Strongly Agree	Agree	Uncertain	Disagree	Strongly disagree

(Developed by Haris, 2007)

In this process, the data were marked, coded, and categorized.

The data about students' and teachers' perceptions on the use of English as a medium of instruction were categorized into positive and negative perceptions.