CHAPTER III
METHODOLOGY

This chapter particularly discusses the methodology used in the research which included the explanation of the research design, procedure of the classroom action research, site and participants, techniques of collecting the data, and techniques of analyzing the data.

3.1 Research Design

This research is a classroom action research with a mixed method of qualitative and quantitative data analysis as its framework. The qualitative method deals with detail explanation of the implementation of the differentiated Instruction by starting from the planning stage, the implementation stage, and the observation, until the reflecting stage. Heigham and Croker (2009) stated that the qualitative method is intended to capture the phenomenon of teaching and learning in the classroom comprehensively particularly how the students' oral proficiency might be improved through implementing the Differentiated Instruction program.

In the planning stage, this research investigated the preparation of the instructional planning and design done by the teachers (Heigham and Croker, 2009). The planning stage is closely related to analyze and plan the teachers' instructional design. The documents of curriculum start from the Annual School Program, the Semester Program, the Monthly Program, until the lesson plans of each day were planned. More specifically, the curriculum of KTSP was observed and analyzed with the learning need analysis conducted by the teacher. This observation provides significant information of how the teaching plan is enacted. Then, in the stage of implementation, what have been planned in the planning stage was implemented.

After implementing, the stage of the research was the observation. In the stage of observation, it was seen whether what had been implemented was in relation of what had planned beforehand (Heigham and Croker, 2009). In

addition, in the stage of observation, this research analyzed what teaching and learning factor might be failing and what factors would be successful. Then, in the stage of Reflection, it was analyzed what should be improved in the next cycle so the teaching and students' learning process was even more effective. All of the stages were done in a set of cycles until the best practice was found and optimal students' learning achievement was achieved.

The main aspects that become the focus of analysis were: learning content, learning process, learning product, and learning environment (Tomlinson, 1995; Powell and Powell, 2004; Richards and Rodgers, 2001). It was seen how teachers tried to develop the students' language skills through implementing the Differentiated Instruction. This research discovered whether the Differentiated Instruction might improve the students' language skills or not. More specifically, it described how vary the students' learning profiles affects how the teachers differentiate the learning content, learning process, and learning product in the classroom.

In the meantime, for its quantitative data, this research implemented quasi-experimental design (single-group Interrupted time-series Design). The time series quasi experimental design leads the research to record pre-test and post-test during the teaching and learning cycles. As stated by Cresswell (2003) that single-group interrupted time- series design measures a single group both before and after the treatment. The focus was to record the pre test, post test, and progression during the teaching and learning process. The design of this study can be seen in the following schema:

Single-Group Interrupted Time-series Design						
O -	**O** -	**O** -	**X**	**O** -	**O** -	**o**
Pre-test	Pre-test	Pre-test	Treatments	Post test	Post test	Post test

Figure 3. 1 Single-Group Interrupted Time-Series Design (Cresswell 2003, p: 169)

This study was a classroom action research, which its procedure was done through implementing chronological 4 main stages: planning, experimenting/implementing/actuating, observing and reflecting.

The stages are well known as cycle of implementing action research (Kemmis and Taghart, 1986, cited in Croker and Heighem 2009, p: 115). The stage is shown in the following table:
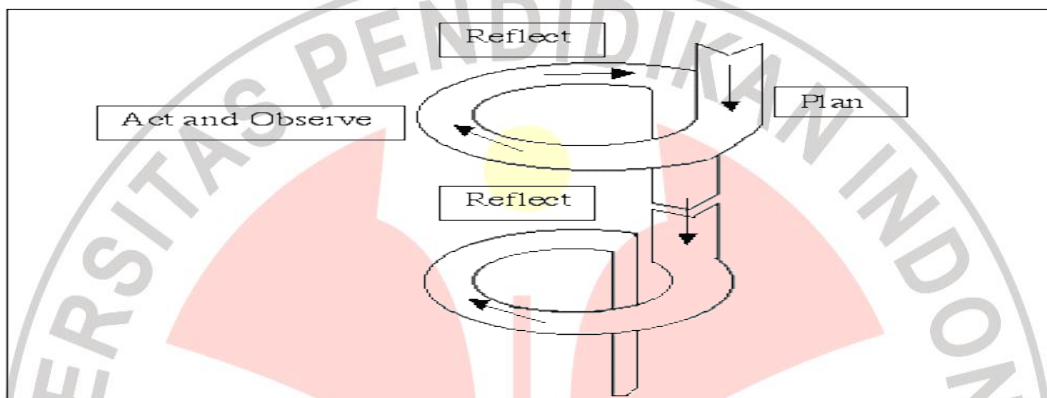

Figure 3.2 Action Research Cycle (McTaggart et.al, 1982, cited in Howden, 1998).

3.2 **Site and Participants of the Research**

This research involves 24 eighth graders of a junior high school in Sumedang. These respondents were in class B. The students were between fourteen and thirteen years old. They were categorized into two main groups: struggling learners and advanced learners which were based on the pre-test results designed for the Implementation of Differentiated Instruction. The description and different abilities of the two groups captured in the pre-test are discussed below. From the pre-test and observation it was found that mainly the students were categorized into two i.e. struggling learners and advance learners. The struggling learners had difficulties in pronouncing and spelling English words correctly. They were also lack of vocabulary. They were not confident enough and not able to read passage correctly. They had problems in comprehending the texts. They were also had problems in formulating sentence. In the meantime, the advance learners, from the pre-test it was found that they had already been able to comprehend texts better than the struggling learners. Even though they still had limited usage of

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43

vocabulary, they were able to predict several words and got the information by seeing and relating all the words with its context. They were also able to speak up in English confidently and good enough. For further explanation of who the students are, please see appendix E.

3.3 Teaching and Learning Cycles

3.3.1   Planning

In the stage of planning, there were several aspects that were analyzed i.e. the aspects of how the teacher designed curriculum, how the teacher clearly articulated what he or she wants students to know, understand, and able to do, how the teacher varied curriculum and instruction from simple to complex, and from concrete to abstract, how the teacher used a variety of materials other than standard text, how the teacher provided varying level of resources and materials and learning tasks, how the teacher adapted content. (Nafisah, 2012; Tomlinson, 2001; Tomlinson, 1995; Powell and Powell, 2004)

3.3.2   Experimenting/implementing

Experimenting stage was the stage of implementation of what have been planned The aspects that were analyzed at this stage were how the teacher used tiered lesson/activities of varying levels of challenge and curriculum compacting, how the teacher varied the pace of learning for varying learning needs (Nafisah, 2012; Tomlinson, 2001; Tomlinson, 1995; Powell and Powell, 2004)

3.3.3   Observing

In the stage of observing, both of teachers and observers analyzed and assessed all the aspect of teaching and students' learning process. Some field notes of how each student learnt was also written. To help the observers observe the students' learning and how the teacher gave and varied the instruction some questions in the observation sheet were listed and given to the observers. Moreover, in the stage of

observation, the observer analyzed the aspect of how the students explored the learning material and assignments, which had been varied and differentiated its challenge by the teacher. More specifically, the aspects were how the teacher varied learning tasks based on students' learning profile, how the teacher allowed the students to engage in independent study, how the teacher used interest centers/groups, how teacher used learning centers/groups, how the students chose the learning material, how the interaction happened in the classroom, how they worked well both of individually or in a group discussion (Nafisah, 2012; Tomlinson, 2001; Tomlinson, 1995; Powell and Powell, 2004)

3.3.4 Reflecting

In the stage of reflecting stage both of teacher and observers discussed what had been done by the students and teacher in the classroom: how the students achieve the learning goals, how the teacher gives product assignment that balance structure and choice, how teacher allows for a wide range of product alternatives, and how teacher provides opportunities for students product to be based upon the solving of real and relevant problems (Nafisah, 2012; Tomlinson, 2001, Tomlinson, 1995; Powell and Powell, 2004)

3.4. Data Collection techniques

The data were collected through several ways: observing the classroom, examining archival documents, interviewing the observers and the students, and computing the students' learning achievements.

3.4.1 Classroom Observation

To see how the students learn and how the teachers teach, classroom observation would be utilized. It is cited in Malik (2012) that observation is the conscious noticing and detailed examination of participants' behavior in a naturalistic setting. It is also explained by Rossman and Marshall (2006), that observation discovers complex interaction social setting more naturally and comprehensively. Moreover, Patton (Cowie, 2002, cited in Croker and Heigham, 2009, p: 168)

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45

stated that observation might reveal delicate and micro aspects that are difficult to discover by any other research procedure, since the observation might be more open, inductive, and holistic. It means that observation is the best method to do to get the real picture of what happens in the classroom. In the other words, the better understanding of what happens in the classroom might be achieved through doing observation. The advantage of observation also revealed by Wray et.al (1998, p: 187), that is observation seems easier and more flexible to do than any other research method but the data collected are comprehensive, massive, and holistic.

During the learning activity, the field note was taken. Some aspects were analyzed. The aspects listed in detail in appendix E. Since the researcher was also the participant of the research (participant-researcher), therefore, the observation was done while also implementing the method. To avoid data misinterpretation, it was invited some observers. The observers were qualified English teachers, since they have longer period of teaching experience, and they have already been accredited as professional English teachers.

3.4.2 Document Analysis

To get the data, this research examined archival documents i.e. instructional planning design such as the curriculum includes the Annual program, Semester program, Monthly program, and teacher' lesson plans. Besides, the teacher's instructional design documentation, this research also collected students' assignments and learning materials. The data from documentation would be synchronized to the data that have been collected from observation and interview.

More specifically, they would be analyzed whether what had been planned also be implemented well and worked well in the classroom or not. By documenting both students' teaching preparation and the students' work or assignment, it is expected that the detailed data would be captured. As proposed

by Barelson (1952, cited in Marshall and Rossman, 2006, p: 108), that is historically the content analysis is viewed as a natural way to get quantitative description of the content of various communication. This research would like to capture how the students; its learning quality includes its interaction, learning product and process might be improved through implementing the Differentiated Instruction. Thus, through implementing documentation, how the students learn and how the teachers teach would also be discovered through the documents. In the other words, the documents were also the data that can be analyzed.

3.4.3   Interview

To avoid misconception about what has been found in the document, this research utilized interview. According to Richards (cited in Heigham and Croker, 2009, p: 183), interview is actually aimed at exploring the people' experience and views, it means that through conducting interview how the students learnt, how teacher had implemented the Differentiated Instructions and its effect to the teachers' teaching and the students' learning might be revealed comprehensively. The interview session had been conducted by using open ended structure interview, since the interview session usually goes naturally like daily conversation, the interviewee i.e. the teachers might not be not be reluctant to tell the truth. It also provides a sense of reality, describing exactly what the informants feels, perceives, and how they behave (Burns, 1995; Marczyk and Festinger, 2005, Heigham & Croker, 2009).   Yet the implementation of the Differentiated Instruction was seen by some observers, it was good way to get the data through interviewing the observers and the students. The observers might compare the teaching and learning process in the classroom before and after implementing the Differentiated Instruction (Ibid).

3.4.4 Computing students' Learning achievement

To see the students' learning improvement, beside utilized observation, this research administered several tests. The students' learning achievements were scored. The reliability and validity of the scoring has been reached by involving two more teachers to observe and give points and score to the students' learning achievement. Even though, the two teachers did not give scores to all the students in each learning cycles because of their limited availability, but the teachers and the observers had similar views in assessing how the students learned. In essence, the students had been assessed and scored as they were.

3.5 Data Analysis

The data from observation, documents, and interviews were analyzed into several steps. The field-note, observation sheets, documentation, interview transcript were listed and decoded them into several categories. More specifically, since this research was conducted to find the information of what will happen when students learn with the Differentiated Instruction, therefore, the aspects that were assessed were about how the teacher differentiates the instruction and how the students responded to the implementation of the Differentiated Instruction.

Specifically for qualitative data such as teaching material, lesson plans, and classroom observation field note, the data were analyzed into four steps. The steps were defining the categories that would be investigated, identifying the categories, interpreting the categories, and presenting the data descriptively. In the meantime, the data from interviews were analyzed by conducting several steps. They were transcribing the participants' answers into the data sheets, categorizing the answers into some the criteria, synchronizing the answers with the document analysis, interpreting the categories into general conclusion. The data of the interview were retyped and identified, and then they were categorized and interpreted based on the related theories. The instruments of quantitative data analysis are listed in the following table:

N	Aspects that were assessed

o	Aspects	Categories
1	Teachers' point of view about planning a lesson	Teachers' understanding about Differentiated Instruction
		Teachers' techniques in planning a lesson plan
		Teachers' sources in planning a lesson
2	Instructional goals	Teachers 'understanding about students' learning needs
3	Objectives	The concept of objectives in Differentiated Instruction
		The techniques employed to formulate objectives from instructional goals for of Differentiated Instruction
		Language focus in the objectives
		Learning domains in the objectives
4	Activities	The implementation of Differentiated instruction in terms of product, process and learning content
		How the students respond to the differentiated Instruction, that is seen from the aspects of learning stages that they experience: Noticing, taking risks, and succeeding
		How teachers and students collaborate
5	Instructional Media	The concept of choosing instructional media for students' learning
		The techniques of using instructional media
6	Assessment	The concept of assessing students' achievement

Table 3.1 Teaching and Learning aspects that were assessed. Adapted from Rejeki. (Rejeki, 2009).

Then, Further research question focused on whether can the Differentiated Instruction improve the students' language skills or not. Therefore, various analytical techniques were also used to analyze the data. These included quantitative analysis using descriptive statistics as well as qualitative approaches that identify the key categories, theme, and concept of the implementation of Differentiated Instruction. The quantitative data analysis was done through calculating: gained score (scoring rubric), and dependent t-test.

Firstly, Gained score was calculated to see the students' learning result. The level of oral proficiency was listed in the following table:

No	Aspects	Level 1	Level 2	Level 3	Level 4	Level 5
1	Comprehension	Student cannot understand even simple conversation.	Student has great difficulty following what is said.	Student understands most of what is said at slower-than- normal	Student understands nearly everything at normal speed,	Student understand everyday conversation and normal classroom discussion without

			Student can comprehend only 'social conversation spoken'.	speed with repetitions.	although occasional repetition may be necessary	difficulty
2	Fluency	Speech is so halting and fragmentary as to make conversation virtually possible.	Speech usually hesitant: often forced into silence by language limitations.	Speech in everyday communication and classroom discussion is frequently disrupted by student's search for the correct manner of expression.	Speech in everyday communication and classroom discussion is generally fluent, with occasional lapses while the student searches for the correct manner of expression.	Speech in everyday conversation and in classroom discussion is fluent and effortless, approximating that of a native speaker
3	Vocabulary	Vocabulary limitations are so extreme as to make conversation virtually impossible.	Misuse of words and very limited vocabulary make comprehension quite difficult.	Frequently uses the wrong words; conversation somewhat limited because of inadequate vocabulary.	Occasionally uses inappropriate terms or must rephrase ideas because of inadequate vocabulary.	Use of vocabulary and idioms approximates that of a native speaker.
4	Pronunciation	Pronunciation problems so severe as to make speech virtually unintelligible	Very hard to understand because of pronunciation problems. Must frequently repeat in order to be understood	Pronunciation problems necessitate concentration on the part of the listener and occasionally lead to misunderstanding	Always intelligible, though one is conscious of a definite accent and occasional inappropriate intonation pattern.	Pronunciation and intonation approximate a native speaker's.

5	Grammar	Errors in grammar and word order so severe as to make speech virtually unintelligible	Grammar and word order errors make comprehension difficult. Must often rephrase or restrict what is said to basic patterns.	Makes frequent errors of grammar and word order which occasionally obscure meaning.	Occasionally makes grammatical or word order errors which do not obscure meaning	Grammatical usage and word order approximate a native speaker.

Table 3.2. Assessment Rubric. The Table was taken from Students Oral Language Observation Matrix (SOLOM) developed by San Jose California United School District)Thomson, 1997, p:176, cited from McKay, 2006,p:292).

Then for the gained score, the achievement of students' oral proficiency improvement in each cycles was listed and then seen the differentiation. The formula of gained score was listed in the following table:

The formula of the scoring is
S= Score
T = Total Points
S= T/25 X100
Main Gained Score (MGS) 1= Post test – pre test
First Gained Score (FGS) = Result of learning cycle 2 – Result of learning cycle 1
Second Gained Score (SGS) = Result of learning cycle 3- Result of learning cycle 2

Figure 3.3Gained Score Formula. Adapted from Coolidge (2000).

Secondly, t-test was calculated to know if there was a significant difference Here are the steps to calculate dependent t-test:

1. State the hypothesis, the null hypothesis is no difference between students' oral proficiency by implementing Differentiated Instruction and without implementing Differentiated Instruction, It means that:

   Ho : **μ1= μ2**

   The alternative hypothesis is that there is a difference with the classroom that implementing the Differentiated Instruction and the classroom that is not implementing the Differentiated Instruction.

   H1:**μ1 ≠ μ2**

   Select the level of significance. The level of significance is σ = 0.05

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51

2. Compute the t, the formula is:

$t = \dfrac{\mathcal{X}D}{SD/\sqrt{N}}$ $\mathcal{X}D = \dfrac{\sum D}{N}$	$\mathcal{X}D$ = mean of the difference score SD = Standard Deviation X = Score of Difference Score $\sum D$ = Sum of Difference score N = Number of sample

Figure 3.4 Dependent t-test Formula. Adapted from Coolidge (2000).

Then finally state the result (t). If it is less than value of the level significance (accept *Ho* or null hypothesis), or greater than value of the level significance (reject *Ho* or null hypothesis).

3.6 Schedule of the Research

No	Day and Date	The Steps of Research	Participants	Research Site
1	Monday, 15th of July 2013	Preliminary research (Identifying students' learning record both from documentation and previous teachers comment-Part 1)	a. English Teacher of 7th graders b. Some 7thgraders' teachers	A Junior High School
2	Tuesday, 16th of July 2013	(Identifying students' learning record both from documentation and previous teachers comments-Part 2)	Class 8 B	A Junior High School
3	Monday, 22nd of July 2013	Preliminary research (Interviewing the Students)	Class 8 B	A Junior High School
4	Tuesday,	Filling Questionnaire	Class 8 B	A Junior High

		(Analyzing students' prior knowledge, interest, learning style, and learning difficulties)		School
	23rd of July 2013			
5	Monday, 29th of July 2013	Pre-test (Reading Skills) Pre-test (Vocabulary Mastery)	Class 8 B	A Junior High School
6	Tuesday, 30th of July 2013	Pre-test (Speaking skills Part 1)	Class 8 B	A Junior High School
7	Monday, 19th of August 2013	Pre-test (Speaking skills Part 2)	Class 8 B	A Junior High School
8	Tuesday, 20th of August 2013	Pre-test Writing Skills	Class 8 B	A Junior High School
9	Monday, 26th of August 2013	Cycle 1 Meeting 1	Class 8 B	A Junior High School
10	Tuesday, 27th of August 2013	Cycle 1 Meeting 2	Class 8 B	A Junior High School
11	Monday, 2nd of September 2013	Cycle 2 Meeting 3	Class 8 B	A Junior High School
12	Tuesday, 3rd of September 2013	Cycle 2 Meeting 1	Class 8 B	A Junior High School
13	Monday, 9th of September 2013	Cycle 2 Meeting 2	Class 8 B	A Junior High School
14	Tuesday, 10th of September 2013	Cycle 2 Meeting 3	Class 8 B	A Junior High School
15	Monday, 16th of September 2013	Cycle 3 Meeting 1	Class 8 B	A Junior High School
16	Tuesday, 17th of September 2013	Cycle 3 Meeting 2	Class 8 B	A Junior High School
17	Monday, 23rd of	Cycle 3 Meeting 3	Class 8 B	A Junior High School

	September 2013			
18	Tuesday, 24th of September 2013	Post-test speaking skills	Class 8 B	A Junior High School
19	Monday, 30th of September 2013	Post- test speaking skills	Class 8 B	A Junior High School
20	Tuesday, 1st of October 2013	Post-test Speaking skills (Part 1)	Class 8 B	A Junior High School
21	Monday, 7th of October 2013	Post-test Speaking Skills (Part 2)	Class 8 B	A Junior High School
22	Tuesday, 8th of October 2013	Post-interviews	Class 8 B	A Junior High School

Table 3.3 Schedule of the Research