

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

The previous chapter has elaborated the theories relevant to this study. This chapter focuses on the methodological aspects of this study. It covers four main aspects namely Research Design, Data Resource and Participants of the Study, Data Collection, and Data Analysis.

#### **3.1 Research Design**

Regarding the research questions proposed, this study employed a qualitative method with explanatory case study as the research design due to several reasons. Firstly, this method attempts to provide a holistic description of a complex phenomenon (Malik & Hamied, 2014) as this study was intended to analyze, describe, and interpret the data in the form of test items in the teacher-made assessments using higher order thinking skills principles. The main goal of this inquiry-based research was to investigate implementation of higher order thinking skills assessments done by the teachers which was impossible to capture by quantification since it required direct description from the teachers who have direct experiences with the regulation. In this study, the researcher tended to maintain an emic perspective which analyzed the data inductively so that embedded meaning can emerge (Patton, 2002). In this case, teachers' assumptions about each principle of higher order thinking skills were investigated since it is believed that their understanding about the principles contributed to the way they construct the assessments.

Secondly, this study was derived from the researcher's curiosity about teachers' experience in implementing the new content in the Curriculum 2013. This study tried to give an explanation about a phenomenon through case study lenses as stated by Yin (2014) including why and how a phenomenon was done. In this case, it offered data related to what principles of higher order thinking identified in teachers' assessment as a set of decisions made by the teachers, why they were taken, and how they were implemented. In this explanatory case study research, endeavoring to answer how the

teachers implement higher order thinking principles in their assessments was done with a little control on behalf of researcher's involvement. The researcher collected the data through examining documents in the form of teacher-made assessments and discover reasons behind the teachers' decision to present such assessments thorough having interviews with the teachers.

### **The Case**

The case in this study was defined through similar structures within domain or issue. According to Winger et al., (2002), the case can be derived from the three same elements shared in a phenomenon namely: (1) domain of knowledge, (2) a group or community of people who share a common interest in the domain, and (3) a shared practice relative to the domain. The domain or issue in this study was the implementation of higher order thinking skills assessments as instructed in the Curriculum 2013 by English teachers. The case was delimited into specific teacher participants applying the Curriculum 2013 in their schools. Specifically, the teachers involved were considered to have prior experiences in integrating higher order thinking skills in their classrooms indicated from initial interview with the teachers. In practice, both of them have successfully presented numbers of higher order thinking questions in their assessments above the standard demanded by the government although the teachers have different social backgrounds and accessibilities to teachers' development. The aim for narrowing the participants was to focus on how teachers' experiences and considerations when designing higher order thinking assessment so that the teachers' prior knowledge about higher order thinking skills were significantly considered.

Regarding this, a similar case study with exploring teachers' experience and understanding about higher order thinking assessments has been conducted by Yusoff and Seman (2018). To capture a portrait of teachers' understanding, this study employed questionnaire to obtain a self-report from teachers regarding their understanding about higher order thinking. In addition, further investigation was done through having interview with the teachers in order to confirm and get a clear information about the teachers' understanding. However, this study applied document

accompanied by interview to explore teachers' experience in designing higher order thinking assessments.

### **3.2 Data Resources and Participants of the Study**

The data resources and participants involved in this study are explained in the following sub-sections:

#### **3.2.1 Data Resources**

The main resources of this research were assessments designed by two English teachers of eight grade in Junior High Schools. The assessments were constructed by the teachers in the form of test which consists of several types such as multiple choices, and short answer questions. Furthermore, among four skills (writing, reading, speaking, and listening) that are assessed in language learning, this study focused on the investigation of written teacher-made assessments assessing reading and writing skill. Limiting the language skills was done to get an-in depth exploration about components of teacher-made assessments that met the criteria of higher order thinking assessment.

There were two teacher-made assessments analyzed in this study. Mostly the teacher-made assessments are dominated by multiple choices. The first test constructed by Rosie consists of 45 questions divided into 40 questions of multiple choices and 5 questions of short answer. On the other hand, the second test designed by Sari covers 50 questions all in the form of multiple choices. These tests were utilized by the teachers to evaluate students' learning at the end of first semester 2018/2019 or known as mid-term exam. In other words, the tests can be categorized into summative assessments and high stakes since the tests have a high point value for the students' achievement.

#### **3.2.1 Participants of the Study**

This study involved two English teachers from different Junior High Schools in Bandung. As a case study, the selection of participants was done by considering several teachers' criteria. First, the English teachers already attended trainings, seminars, or workshops about higher order thinking skills especially in constructing higher order thinking-based assessments either programs held by the government,

school, or other institutions. In addition, the teachers also have been aware about the urgency of integrating thinking skills in learning process reflected by their efforts to select teaching strategies that may promote students' critical thinking in English classroom approved by their experiences in doing action research related to promoting students' thinking skills. By using pseudonyms, each of the participants' background is elaborated as below.

### **Participant 1: Rosie**

The first participant involved in this study was Rosie (55), a female English teacher in one of Public Junior High Schools in West Bandung Regency. The school where she worked was located in a suburb area around 22 Km from Bandung city. Most of the students in her school came from middle-class families which basically earning their incomes from farming and trading around the area. In this area, English was primarily taught in school in the first semester of junior high school level while in elementary school level the students were not exposed to English.

In the school, Rosie was regarded as one of senior teachers since she has been teaching for around thirty years in that school. Rosie was personally acknowledged as an outstanding teacher proven by several awards from *Dinas Pendidikan* and SEAMEO QITEP in Language. She has been familiar with the concept of critical thinking since 2015 when she joined a competition from SEAMEO QITEP in Language. Currently, in 2018, she won a grant from SEAMEO QITEP in Language to develop a learning strategy that can promote students' higher order thinking skills. She also actively joined English Teacher Association (*Musyawarah Guru Mata Pelajaran*) either in district level (*Lembang*) or in province level (*West Java*). For more than ten years, she has been chosen as a tutor teacher for teacher professional training program (*Program Latihan Profesi*) in *Universitas Pendidikan Indonesia*. In some occasions, she also participated in seminars and workshops held by English Education Department of *Universitas Pendidikan Indonesia*.

### **Participant 2: Sari**

Unlike Rosie who have been teaching for more than a half of her life, Sari (25) currently started her career as an English teacher since three years ago. A private junior

high school in Bandung Raya based on Islamic values was the school where she was teaching. It was a Junior High School which uses a combined curriculum, between the national curriculum, the Islamic curriculum and the Cambridge curriculum. Generally, the students in this school were those who lived in urban area and came from the middle high-class family. Most of elementary schools in the urban area allocated English in the classroom for two until six hours per week.

During her study in Universitas Pendidikan Indonesia (2012-2016), Sari has been familiar with the use of the Curriculum 2013 which focused on scientific approach while specifically the concept of higher order thinking has been understood by Sari since 2017. According to Sari, the school consistently and periodically conducted teachers' development program in order to equip the teachers with innovative learning strategies and trends in current education including the agenda of higher order thinking skills in the Curriculum 2013. In each semester, at least there were two programs of teacher development that should be attended by Sari as the teacher such as workshops, seminars, or focus group discussions. Besides joining the teacher development from her school, Sari also actively participated in English Teacher Association (*Musyawarah Guru Mata Pelajaran*) in Bandung. Regarding the implementation of higher order thinking in the school, Sari's performance was supervised by the School Curriculum Assessor which was done through weekly lesson plan report and monthly inspection to the classroom. A great concern of the school toward implementation of higher order thinking skills was also identified from the school regulation requiring teachers to integrate 40% of higher order thinking questions in their assessments.

### **3.3 Data Collection**

To collect the data, two research instruments were applied namely document gathering and interview with the teachers, each of them is be elaborated as follows.

#### **Documentation**

In this study, document analysis was considered as the main instrument to collect the data focusing on investigating teacher-made assessments regarding principles and characteristics of higher order thinking skills assessment in the teacher-made assessments. Document analysis was used to get information about the extent to

which the teacher-made assessments meet the criteria of higher order thinking principles. The documents here were produced by English teachers and used as the assessment to measure their students' achievement. Generally, the documents in a qualitative study is considered an artifact that is usually written with a purpose and presented in a certain style (Creswell, 2013) while the artefact in this study was limited to a written assessment.

After the documents were obtained, those were analyzed by referring to principles of higher order thinking assessment as proposed by Brookhart (2010). The researcher analyzed each test item in the teacher-made assessments to exactly know what and how principles of higher order thinking were realized in their assessments. To reveal the intended data, the analysis was guided by a rubric containing several points adopted from principles of higher order thinking assessment as presented in the table below.

Table 3. 1  
*Instrument for Document Analysis*

No	Assessment Aspects	Test Items							
		1	2	3	4	5	6	7	8
1	Question uses an interesting and multiple stimulus (picture, graphic, visualization, etc.)								
2	the stimulus is new material and able to encourage learners to read								
3	The stimulation is contextual with students' real life (Local culture, current social issues)								
4	The answer of the questions is implied in the stimuli								
5	The formulation of the questions uses commands that demand learners to associate one concept to other concepts								
6	Question measures the level of cognitive reasoning (to analyze, evaluate, and create)								
Skills Description									
The test assesses students' thinking levels that apply reasoning which can be indicated from several tasks:									

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a	analyzing :
	<ul style="list-style-type: none"> <li>• Making conclusion</li> <li>• Identifying main idea</li> <li>• Transferring</li> <li>• Associating</li> <li>• Comparing and contrasting</li> <li>• Summarizing</li> </ul>
b	evaluating
	<ul style="list-style-type: none"> <li>• Judging the value of materials</li> <li>• Giving reasons</li> <li>• Reflecting</li> </ul>
c	creating
	<ul style="list-style-type: none"> <li>• Finding alternative</li> <li>• Reorganizing existing materials</li> <li>• Planning a procedure</li> <li>• Generating solution</li> </ul>

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### **Interview**

The second instrument to collect the data was interview with the teachers. The interview has been defined as an interaction between the interviewer and the subject acting in relation to each other and reciprocally influencing each other (Creswell, 2013). Interview, in this study, was applied at overview stage and main data collection. The first interview session was conducted during 5<sup>th</sup> – 10<sup>th</sup> April 2019 aimed at obtaining an overview about teachers' background and ensuring that the teachers were eligible to be participants of the study indicated from their adequate understanding about higher order thinking skills. Questions for this interview were focused on teachers' understanding about concepts of higher order thinking skills in general (see table 3.2 point 1).

At further interviews conducted during 11<sup>th</sup> April – 28<sup>th</sup> June 2019, interview questions were valuable to dig information about teachers' experience in constructing higher order thinking-based assessment whether the processes were in line with experts' suggestions in the literature review and a guideline for designing higher order thinking assessment provided by The Ministry of Education and Culture (Widana, 2017) (see table 3.2 point 2 & 3). Besides, interview also functioned to confirm the

data obtained from document analysis so that the data can reveal teachers' opinion about higher order thinking assessments. In addition, semi-structured interview was applied in order to allow the researcher collected more information as needed in the study. The aims of using this type of interview, as stated by Creswell (2013), is to emerge perspective and opinions of the teacher-participants naturally.

There were some questions given to the teachers in order to reveal intended data for answering the research questions. In this case, the formulation of interview questions was categorized into three main points namely (1) teachers' knowledge about higher order thinking skills, (2) concept of higher order thinking assessment from teachers' perspective, and (3) teachers' experience in designing the assessment including the teachers' strategies and challenges in creating the tasks. By doing so, this enabled the researcher to check for the accuracy of the impressions obtained through document analysis. To make it clearer, the draft of interview guide used in this study is presented below.

Table 3. 2

*Questions for Interview with the Teachers*

<b>1. Teacher's Knowledge About Higher Order Thinking Skills</b>
<ul style="list-style-type: none"> <li>• What do you know about higher order thinking skills?</li> <li>• In your opinion, what skills are categorized as higher order thinking skills?</li> <li>• Do you think it is important to integrate higher order thinking skills in all subject including English? Why or why not?</li> </ul>
<b>2. Teacher's Opinion About the Concept of Higher Order Thinking Assessment</b>
<ul style="list-style-type: none"> <li>• In your opinion, what make higher order thinking assessment different from routine or traditional assessment?</li> <li>• How do you recognize role of introductory material in higher order thinking assessment?</li> <li>• Do you think higher order thinking questions is always more difficult rather than the lower order thinking questions?</li> </ul>



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- How do you choose materials for higher order thinking assessment?  
is there a specific criteria for that?
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### **3. Teacher's Experience in Designing the Assessment**

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- When do you start to integrate higher order thinking in your classroom, specifically in assessment?
  - What level of higher order thinking skills are mostly targeted in your assessments? Why?
  - Based on your experience, what is the most effective type of question or task for measuring higher order thinking questions? why?
  - What strategies do you apply in designing higher order thinking questions?
  - So far, what difficulties do you face in implementing higher order thinking assessment?
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### **3.4 Data Analysis**

After the data from two instruments have been obtained, the data analysis was then conducted to answer the research questions of this study. Qualitative descriptive analysis was employed as the main approach of this study since it was focused on describing to extent to which the teacher-made assessments fulfilled the principles and criteria of higher order thinking assessment and the teachers' ways to design the assessment as instructed in the Curriculum 2013. In addition, the investigation required detail description and interpretation about teachers' experience in constructing higher order thinking skills assessments.

#### **Document Analysis**

As the document in the form of teacher-made assessment have been collected, document analysis in the teacher-made assessment was conducted through several stages which are elaborated below.

1. Identifying the test items based on its types whether it is multiple choice, essay, or short brief questions. The tests type was determined by its characteristics as stated by Darling-Hammond (2017) that there are at least three types of questions namely selection, generation, and extended questions.
2. Checking and analyzing availability of the principles of higher order thinking skill assessment in the test items. This study investigated some principles of higher order thinking assessment carried out by the teachers in their assessments covering; Thinking complexity, availability of stimulation, novelty, and contextual topic in the test (Brookhart, 2010; Kemendikbud, 2017; Widana, 2017). In this stage, there were two main concerns of analysis with different approaches. The first one was checking the availability of each aspect in the observation checklist which was calculated then into percentage. In this stage, the researcher tended to retain etic perspective in which a set of criteria based on literatures was applied to be a guideline to assess the teacher-made assessments.
3. In further investigation, categorizing process was conducted to classify the test items based on the thinking levels. The test items carrying out the three higher levels (analyzing skill, evaluating skill, and creating skill) in Bloom's taxonomy were classified as higher order thinking test while the rests were classified as non-higher order thinking test. In addition, specification of each thinking level was determined by using verb vocabularies of cognitive skill as presented by several experts (Krathwohl & Anderson, 2010; Crowe, 2008) in order to analyze the depth of knowledge level in the Bloom's taxonomy level. The results for each level was then calculated on the percentage so that it was easier in making conclusion about the data. The data percentage is organized as follows.

Table 3. 3  
*Percentage of Thinking Skills in the Assessment*

Cognitive Skill	Number of Items	Percentage %
Knowing	.....	.....
Understanding	.....	.....
Applying	.....	.....
Analyzing	.....	.....
Evaluating	.....	.....
Creating	.....	.....
Amount	.....	100%

4. The next step was focused on describing the overall results of analysis in order to know appropriateness of the teacher-made assessment with the criteria of higher order thinking assessment. In the earlier stage, the researcher also should pay attention to the alignment of the test items with learning indicators and objectives as decided by the teacher. To do an analysis, the researcher focused on several components in test items including stimulation and instructions in the test to recognize higher order thinking skills. As an Indicator, thinking skills required from the test were identified through some verbs used in the instructions. The instrument (see Table 3) was utilized as a tool to reveal the intended information about the test items. The example of analysis can be seen below.

③ Write two paragraphs about yourself. Use the sentence parts and put the verbs in the correct forms – *-ing* or infinitive.

a My likes and dislikes  
 / like (watch) / on TV / also enjoy (play) / in my free time / However, / not like (...) ... very much  
 I like \_\_\_\_\_

**Example: Unit 3– Lesson 3 and 4 – Ex:2 – P. 20)**

② Read the text and choose the best title.

Our solar system and the universe ☐  
 Mars, our second home ☐  
 The story of humans in space ☐

The solar system is our small part of the universe. We have the sun at its centre, and there are eight planets in orbit around it. The third one from the sun is very special. It is our only home, and we call it Earth.  
 Our journey into space began long ago. In 1957, the Soviet Union launched the first satellite into

Americans Neil Armstrong and Edwin Aldrin to their famous walk on the moon. Since then, spacecraft have sent back pictures and information from all over the solar system – even far-away Neptune.  
 More recently, the world has learned to work together and share the huge costs of space exploration. There have already been several small

Figure 3. 1  
 Examples of Test Items in Teacher-made Assessments

Table 3. 4  
*Example of Document Analysis*

No	Assessment Aspects	Test Information	
		Availability	Notes
1	The stimulation is contextual with students' real life	V	<i>Students should write two paragraphs about themselves "what they like and do not like"; most importantly, they will relate their own information with the information provided in the text.</i>
2	The answer of the questions is implied in the stimuli	V	<i>Students should read the text carefully, then choose the best title for it according to their understanding. Thus, they conclude the theme of the text through examining it carefully.</i>
3	Question measures the level of cognitive reasoning (to analyze, evaluate, and create)	V	<i><b>Analyzing skill</b>-Students are encouraged to understand how components in a text relate to each other</i>

- At the last, the results of analysis was interpreted and calculated. The table adapted from (Arikunto, 2012) was applied to interpret the findings regarding the extent to which teacher-made assessment met the principles and criteria of higher order thinking skills. The overall results are tabulated in the percentage in order to make it easier for the researcher to explain the findings from analysis. The percentage of data will be elaborated as follows.

Table 3. 5  
*Overall Tabulated Data to Interpret Principles of Higher order Thinking in Teachers-made Assessments*

Percentage	Categorization
0-20%	small portion (Poor)
21-40%	less than half
41-60%	a half
61-80%	mostly
81-100%	almost all

### Interview

On the other hand, the data obtained from the interview as the second instrument in this study was made in the form of voice recordings. In the process of obtaining the data, the conversation between the researcher and the teachers were recorded and then saved as the proof of the teachers' experience in implementing higher order thinking assessment especially related to assessment aspect. Then, the recordings were transcribed, categorized and interpreted to answer the researcher's questions, especially related to responses from teachers toward their experience in designing higher order thinking-based assessment. In this stage, to reveal teachers' reasons and assumptions behind their decisions, emic perspective was used by the researcher to analyze the data so that it can elaborate how teachers applied and perceived those principles in their assessments. The analysis process was divided into some stages.

Having been attained, the data then was categorized into some categories, namely prior knowledge, experiences, and evaluation. Firstly, participants' prior knowledge related to higher order thinking skills and assessment were identified to make sure that the teachers already has initial understanding about general concept of higher order thinking skills through some programs from government or other institutions. This initial data were collected to be a foundation for the researcher to know where to start the investigation.

Further interview specifically investigated teachers' understanding about higher order thinking assessments. The teacher's understanding was compared to experts' statements about principles of higher order thinking skills including higher order thinking skills components which consist of stimulus, novelty, being contextual, and thinking complexity (Brookhart, 2010; Darling-Hammond, 2017; Widana, 2017). Lastly, the researcher investigated information about the participant's experience in designing higher order thinking assessment for their students. The interview questions also highlighted "reflection" dealing with some challenges likely encountered by the teachers in the process of designing higher order thinking assessment. During data analysis, the researcher keep discussing with the teacher participants to confirm several data revealed from document analysis.

