Chapter 3

Research Method

Research Design

The researcher adopted the descriptive analytical method of research to carry out this study. The descriptive method means "any research that describes a setting or events in numerical terms" (Brown & Rodgers, 2002, p. 118). The researcher adopted this type of research as the study seeks to answer the research question mentioned previously, that is, to what extent the LOTS and HOTS are available in the National Exam of English subject of 2013/2014 academic year.

The researcher applied descriptive analytical method of research by searching for emerging patterns within and across the 20 test packages of the National Exam of English subject of 2013/2014 academic year under Barrett taxonomy. After classifying the question items into particular level of comprehension by Barrett taxonomy, the researcher later categorized the items into the appropriate level of thinking
skills, whether each item belonged to lower order thinking skills (LOTS) or higher order thinking skills (HOTS).

The design is illustrated in the following diagram:
HOTS & LOTS in ENE for Senior High School students of 2013 - 2014 academic year

Research Question:
To what extent are the lower order thinking skills (LOTS) and higher order thinking skills (HOTS) required in the questions in the ENE of 2013/2014 academic year in the light of suggested criteria?

Criteria of evaluation

Barrett Taxonomy

content analysis

20 test packages of English National Exam in 2013 - 2014

HOTS & LOTS

Figure 3.1 The Research Design
The researcher conducted the following procedures:

1. Building the criteria of the evaluation in the form of coding scheme through reviewing the literature related to analysis of comprehension questions under Barrett Taxonomy and Lower Order Thinking Skills as well as Higher Order Thinking Skills.

2. Consulting some specialists to verify the tool.

3. Modifying the tool according to the experts’ comments.


5. Analyzing the data in the form of frequencies and percentages and organizing it through tables.
The procedures are visualized in the following diagram:

![Diagram](image)

**Figure 3.2 The Research Procedure**

**Objects**

Because this study is a descriptive study which aims to investigate to what extent LOTS and HOTS are required in the National Exam items of English Subject for Senior High School Students of 2013-2014 academic year, the objects of the study were the twenty packages of test items of English...
National Exam for Senior High School Students of 2013-2014 academic year in each of which are 50 multiple-choice test items with four alternatives supplied in each item.

**Sources of Data and Data**

The qualitative data were collected and used in this research. The sources of data were the twenty packages of the English National Exam for Senior High School students of 2013-2014 academic year. Qualitative data were taken from 50 test items comprising 15 listening and 35 reading comprehension questions of each test package which accumulated into 1,000 test items in total.

**Instruments**

The major instrument in conducting this study is the researcher herself. She developed a tool called categorical content analysis. Murray (2009, p. 51) uses the term ‘categorical content analysis’ to refer to a method of data analysis that identifies categories by selecting utterances from a text, which are then classified and grouped together.
Content analysis was used as the research tool in this study. Hsieh & Shannon (2005, p. 1278) define content analysis as "a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns". Along with this definition, content analysis is considered to be "an approach of empirical, methodological controlled analysis of texts within their context of communication, following content analytic rules and step by step models, without rash quantification" (Marier, 2000, p. 2).

From these definitions, it is obvious that qualitative content analysis emphasizes an integrated view of speech/texts and their specific contexts. Qualitative content analysis goes beyond merely counting words or extracting objective content from texts to examine meanings, themes, and patterns that may be manifested or latent in a particular text. It allows researchers to understand social reality in a subjective but scientific manner (Weber: 1990).

Consequently, to achieve the study purpose, a content analysis card was used to collect, describe and analyze data regarding the availability of LOTS and HOTS in the listening and reading exercises of the English National Exam for Senior
High School students in 2013-2014 academic year in the light of the suggested checklist in the analysis card.

The researcher reviewed variant sources to build the criteria for evaluation. These criteria were the elements of the analysis card. The analysis covered all the questions in the National Exam of English Subjects for Senior High School students in 2013-2014 academic year.

To ensure the validity of the content analysis card, it was shown to some experts so that the researcher could benefit from their comments and suggestions for further modifications. The list of the criteria was checked to examine:

1. The comprehensiveness of the domains needed for the analysis,
2. The relevance of the items to the domains, and
3. The clarity and linguistic correctness of the criteria.

Afterwards, the experts assured the suitability of the criteria included in the checklist for evaluating the availability of LOTS and HOTS in the National Exam of English Subjects for Senior High School students in 2013-2014 academic year. Having confirmed the final version of the checklist, the writer divided the number of coded points into five categories i.e.;
literal, reorganization, inferential, evaluation, and appreciation as shown in Table 3.1.

Table 3.1
The Number of Coded Points in each Domain of the Analysis Card

<table>
<thead>
<tr>
<th>No.</th>
<th>Domains</th>
<th>Number of coded points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Literal comprehension</td>
<td>12</td>
</tr>
<tr>
<td>2.</td>
<td>Reorganization comprehension</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>Inferential comprehension</td>
<td>8</td>
</tr>
<tr>
<td>4.</td>
<td>Evaluation comprehension</td>
<td>5</td>
</tr>
<tr>
<td>5.</td>
<td>Appreciation comprehension</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>33</td>
</tr>
</tbody>
</table>

The number of coded points in this table refers to the Quick Reference Outline of Barrett Taxonomy presented in Table 2.2. It reveals that the domain of Literal Comprehension consists of recognition comprehension comprising six points and recall comprehension comprising six points which add up to twelve points. The second domain, Reorganization
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Comprehension, consists of four points, while Inferential Comprehension domain consists of eight points. Evaluation Comprehension consists of five points and Appreciation Comprehension comprises four points.

The elaboration of each point in the Table 3.1 is presented as follows:

1. Literal Comprehension: Literal comprehension focuses on ideas and information which are explicitly stated in the selection. Purposes for reading and teacher’s questions designed to elicit responses at this level may range from simple to complex. A simple task in literal comprehension may be the recognition or recall of a single fact or incident. A more complex task might be the recognition or recall or a series of facts or the sequencing of incidents in a reading selection. (Or these tasks may be related to an exercise which may itself be considered as a reading selection).

Purposes and questions at this level may have the following characteristics:

1.1 Recognition

Recognition requires the student to locate or identify ideas or information explicitly stated in the reading selection itself or in exercises which use the explicit
ideas and information presented in the reading selection.

1.2 Recall

Recall requires the student to produce from memory ideas and information explicitly stated in the reading selection.

2. Reorganization: Reorganization requires the student to analyze, synthesize, and/ or organize ideas or information explicitly stated in the selection. To produce the desired thought product, the reader may utilize the statements of the author verbatim or he or she may paraphrase or translate the author’s statements.

3. Inferential Comprehension: Inferential comprehension is demonstrated by the student when he or she uses the ideas and information explicitly stated in the selection, his or her intuition, and his or her personal experience as a basis for conjectures and hypotheses. Inferences drawn by the student may be either convergent or divergent in nature and the student may be asked to verbalize the rationale underlying his or her inferences. In general, then, inferential comprehension is stimulated by purposes for reading and teachers’ questions which demand thinking
and imagination that go beyond the printed page. (Personal experience is interpreted to include formal learning experiences, as well as those things which the reader has personally experienced in a first-hand situation. Prior knowledge, regardless of where this knowledge came from, is an integral part of inference. The crucial factor distinguishing inference questions from recognition and recall questions is that their answers are not explicitly stated but must be inferred.)

4. Evaluation: Purposes for reading and teacher’s questions, in this instance, require responses by the student which indicate that he or she has made an evaluative judgment by comparing ideas presented in the selection with external criteria provided by the teacher, other authorities, or other written sources, or with internal criteria provided by the reader’s experiences, knowledge, or values. In essence evaluation deals with judgment and focuses on qualities of accuracy, acceptability, desirability, worth, or probability of occurrence. (Evaluative judgment is the key to this category.) Evaluative thinking may be demonstrated by asking the student to make the following judgments as shown in Appendix.
5. Appreciation: Appreciation involves all the previously cited cognitive dimensions of reading, for it deals with the psychological and aesthetic impact of the selection on the reader. Appreciation calls for the student to be emotionally and aesthetically sensitive to the work and to have a reaction to the worth of its psychological and artistic elements. Appreciation includes both the knowledge of and the emotional response to literary techniques, forms, styles, and structures.

Data Collection

The researcher collected qualitative data from test items, analyzed them, and attempted to interpret the analysis. It was descriptive and exploratory in nature. Descriptive statistics allows the researcher to describe the data and examine relationships between variables that provide information about conditions, situations, and events that occur in the present.

To gather all information needed, the researcher collected all suitable documents that are available. Efferin, Darmadji, and Tan (2004) state that documentation is one of the ways in collecting data by analyzing the notes and
documents that are available. The documents collected in this research were the coding sheet of comprehension questions analysis, the twenty test packages of English National Exam for Senior High School in the 2013/2014 academic year that are obtained from schools, and the table of specifications listed in Education National Standard Organization Regulation No. 0019/P/BSNP/XI/2012, a document which is publicly available on the Internet.

**Data Analysis**

The data were analyzed using Barrett Taxonomy and focused on the classification of questions asked. The question items asking students’ LOTS and HOTS were identified and put into several categories within the content analysis card. Sentences and concepts that make up questions in exam papers are discoverable using content analysis method.

The categorical content analysis is more concerned with logical analysis because it is extremely dependent on the logical understanding and view of the analysts on the categorization process. The analysis is between the test items of English National Examination for Senior High School with
the questions’ levels of comprehension based on Barrett Taxonomy and the Model of Lower Order Thinking Skills as well as Higher Order Thinking Skills.

To analyze the test items, the researcher used a coding sheet to classify the test items of English National Examination for Senior High School in the 2013/2014 academic year into the questions’ levels of comprehension. In the process of developing the coding sheet, the form was drafted by the researcher and commented on by the experts. The form addressed the relationship between the test items and the questions’ levels of comprehension based on Barrett Taxonomy and the Model of Lower Order Thinking Skills as well as Higher Order Thinking Skills.

The following stages were followed in the analysis of the examination questions. First of all, the selected examination paper samples were sorted by assigning numbers from 1 to 20 to the papers. Then, 1,000 questions within the papers were dealt with one by one, and they were determined to which level of thinking skills under Barrett’s Taxonomy they belonged.
Trustworthiness

Building trustworthiness in this study was conducted through the help of inter-rater reliability. It is meant to assure that the result of the study is reliable and excludes any bias or the researcher’s subjectivity. Reliability can be perceived from internal or external perspectives. Brown and Rodgers (2002, p. 241) point out that internal reliability is “the degree to which we can expect consistent results if the data for the study were re-analyzed by another researcher”. Meanwhile, the external reliability is defined as “the degree to which we can expect consistent results if the study was repeated”.

Thus, to achieve this, the researcher invited three raters to code the qualitative data into various categories, i.e. levels of comprehension and thinking skills. The first rater is a prolific writer and an expert in educational field and the rest are Senior High School teachers who pursue their postgraduate education at Widya Mandala Catholic University. The writer chose them due to their expertise and experience in teaching English.

A total of 20 test packages of English National Exam for Science major of Senior High School students were selected. A sample of test package was randomly chosen to be
analyzed by the raters independent from one another. The researcher provided the raters with the criteria prepared for evaluating the levels of comprehension questions that have been reviewed by experts. Question terms in the question base like *who, what, where, when, how, express, define, summarize, compare, plan, arrange, distinguish, show, conclude, find*, etc. have been taken into account in determining the question levels. She discussed later with them how to conduct the analysis.