

CHAPTER III

RESEARCH METHOD

A. Research Design

This study employs a mixed-methods approach, specifically utilizing the Explanatory Sequential Design adapted from Creswell and Creswell (2018). In an explanatory sequential design, the researcher conducts the investigation in two distinct, consecutive phases. It begins with the collection and analysis of quantitative data in the first phase, followed by the collection and analysis of qualitative data in the second phase to help explain or elaborate on the initial quantitative results. The rationale for choosing this design is that the quantitative data provides a general understanding of the research problem (the students' test scores and error frequencies), while the qualitative data refines and explains those statistical results by exploring the participants' actual cognitive processes and experiences in depth.

In the first phase of this study, a quantitative approach is applied through a descriptive survey design using a diagnostic vocabulary test. It is important to note that this quantitative phase does not involve hypothesis testing (H_0 or H_a). Because the primary objective of this phase is strictly mapping and surveying the current state of students' abilities and pinpointing their specific difficulties in polysemous word comprehension, no variables are manipulated, and no correlational or causal inferences are made. Instead, the quantitative data is analyzed descriptively (using frequencies, percentages, and

mean scores) to establish a baseline profile of the students' lexical competence.

Following the quantitative phase, the qualitative phase was carried out to answer the second and third research question, which aimed to explore the difficulties faced by students and strategies used by students in understanding polysemous words. Qualitative data were collected through semi-structured interviews with selected students.

The integration of quantitative and qualitative data allowed this study to provide a comprehensive understanding of both students' comprehension of polysemous words and the strategies they employ while reading. By applying this mixed method design, the research captured not only the level of students' understanding but also their cognitive and strategic processes in dealing with polysemous words.

B. Research Setting

This research was conducted in the SMAN 1 Kec. Suliki. The research location was chosen because students in this context are required to develop English vocabulary knowledge to support receptive and productive language skills, such as listening, speaking, reading, and writing. As high school-level EFL learners, students are assumed to have been exposed to a wide range of English vocabulary, including words with multiple meanings, through classroom instruction and academic materials.

C. Population and Sample

1. Population

The population of this study comprises all Eleventh-Grade students at SMAN 1 Kec. Suliki during the academic year of 2025/2026. However, to ensure that the participants possess a sufficient vocabulary baseline to process complex semantic tasks, the target population is narrowed down to students enrolled in the Science Specialization (*Peminatan IPA: XI-F1, XI-F2, XI-F3, XI-F4, XI-F5*). This specific group is selected based on pedagogical recommendations from the English subject teachers, who identified these students as having a relatively higher proficiency and active engagement in English language tasks compared to other tracks. The total population of this science track consists of five parallel classes.

2. Sample

This study utilizes a combination of Purposive Sampling and Total Sampling (Census) techniques to determine the participants for both the try-out and the operational phases of the research.

Out of the five parallel science classes, one class consisting of 30 students (XI-F2) was selected to participate in the instrument try-out (*uji coba instrumen*). This try-out was essential to measure the validity and reliability of the diagnostic polysemy test before its official administration. The students involved in the try-out phase were completely excluded from the main research data collection.

Consequently, the remaining four parallel classes (Classes XI-F1, XI-F3, XI-F4, and XI-F5) with a total of 107 students were designated as the main sample for the quantitative phase of this study. Because the researcher included every single student from the remaining target population pool to ensure data maximum representation, Total Sampling was applied for this phase.

D. Data Sources

1. Research subjects

The research subjects of this study were students of 11 grade at SMAN 1 Suliki. The researcher selected one class to numbers as the try-out group for the pilot test. Meanwhile, the other classes were designated as the research sample for the actual data collection.

2. Research Informants

The research informants were selected students from the same class who participated in semi-structured interviews. The informants were chosen based on the results of the comprehension test to represent different levels of understanding.

E. Research Instruments

Based on Creswell's explanatory sequential mixed methods design, this study used two research instruments, namely a test and an interview. In this design, quantitative data are collected first, followed by qualitative data to explain the quantitative results.

1. Test

The test will be a reading comprehension test in the form of a mini test. It will be used to collect quantitative data to measure students' level understanding of polysemous words in reading texts. The test will consist of multiple-choice question that require students to determine the appropriate meaning of polysemous words based on context. The item will represent two types of polysemy, namely regular and irregular polysemy in order to examine students' ability to interpret different patterns of meaning extension.

The blue print of the test is presented in table below.

Table 3. 1
Blue Print of Pilot Test

No	Type	Indicator	Test Form	Number	Total
1.	Regular polysemy	Students are able to identify the meanings of polysemous words with regular patterns.	Multiple choice	1, 2, 3, 7, 8, 14, 19, 20, 21, 22, 23, 23, 25, 27, 29, 30, 31, 32, 35	19
2.	Irregular polysemy	Students are able to identify the meanings of polysemous words with irregular patterns.	Multiple choice	4, 5, 6, 9, 10, 11, 12, 13, 15, 16, 17, 18, 24, 26, 28, 33, 34	16

The test items were constructed based on various contexts containing polysemous words found throughout two English textbooks for eleventh-grade students, namely '*Bahasa Inggris for Change*' and '*Bahasa Inggris Tingkat Lanjut*'. The detailed information regarding the specific sentences, chapters, and page numbers from these textbooks can be seen in appendix 1.

Before the research instrument was used on the main subject, the researcher first conducted a pilot test of the instrument, a crucial step to ensure that the question prepared had a good level of readability and were able to measure student competencies accurately. The pilot test was conducted in class 11-F2 consisting of 30 students.

Based on the instrument trial conducted in class XI-F2, the researcher processed student score data to test the appropriateness of each test to determine the accuracy of each test item, and a reliability test to assess the overall consistency of the instrument. The detailed calculation process per student and per test number is included in appendix 2

Based on the result of this data analysis, a summary of the instrument's quality was obtained, presented in table 4.1 below

Table 3. 2
Status of Trial Result

Question Status	Question Number	Total
Valid	1, 2, 4, 5, 6, 7, 8, 9, 10, 15, 16, 17, 20, 23, 25, 29, 31, 35	18
Revised	3, 11, 12, 13, 18, 19, 21, 22, 27, 28	10
Invalid	14, 24, 26, 30, 32, 33, 34	7

Based on the table 4.1 above, the result of the validity test on all test items indicates varying instrument quality. From the calculation result using the product moment correlation formula, it was found that there were 10 test items that had a validity coefficient value bellow r_{Table} , but the correlation value did not show a negative number. For these 10 test items, the researcher took steps to revise or improve the language wording and the level of sentence clarity so that the instrument remained suitable for measuring students' abilities.

Meanwhile, for test items that produced a minus (negative) correlation value, this indication showed that the test was unable to differentiate student abilities accurately and had a false deceptive power. Therefore, the test items with negative results were declared invalid and were immediately removed from the list of research instruments without going through a revision process. See appendix 3

2. Interview

The interview was a semi-structured interview conducted to collect qualitative data. In line with Creswell's explanatory sequential approach, the interview was administered after the test to explain the quantitative findings. The interview aimed to explore the difficulties faced and the strategies employed by students in understanding polysemous words encountered in the test items.

F. Data Collection Technique

Grounded in Read's (2000) framework for diagnostic vocabulary assessment and Nation's (2013) theory of vocabulary depth, the data collection in this study was conducted sequentially following the two distinct phases of the Explanatory Sequential Design. The field activities are

1. Quantitative Data: Administering Test

The quantitative data collection was executed chronologically through the following systematic steps:

- a) Instrument Try-Out Phase: Before collecting the operational data, the researcher administered the draft polysemy test to the designated try-out class consisting of 30 students to evaluate item validity and reliability.
- b) Classroom Entry: Upon securing validation, the researcher entered the four main target classes (XI-F1, XI-F3, XI-F4, and XI-F5) during their scheduled English periods, gathering a total of 107 active students.

- c) Test Distribution: With the permission and presence of the classroom English teacher, the physical diagnostic multiple-choice sheets were distributed to all 107 participants.
 - d) Controlled Testing Session: The students were allocated exactly 60 minutes to complete the test independently. The researcher strictly monitored the room to ensure no digital translation tools were used, preserving the diagnostic purity of the data.
 - e) Data Collection and Grading: Once the time limit expired, all 107 answer sheets were collected immediately to be graded, sorted, and statistically processed to discover the error patterns.
2. Qualitative Phase: Conducting Follow-Up Interviews

After the quantitative test sheets were analyzed and specific error patterns were statistically mapped, the researcher returned to the field for the qualitative phase through the following steps:

- a) Purposive Informant Selection: Based on the diagnostic test results, the researcher purposefully selected a nested sample of 9 students to act as qualitative informants. To capture a multi-dimensional explanation of polysemous comprehension, a combination of *extreme case sampling* and *typical case sampling* was applied to divide the 9 informants into three distinct strata:
 - 1) High-Achieving Stratum (3 Students): Selected from the top 3 highest scores to investigate the cognitive strategies used by proficient students to successfully navigate polysemous shifts.

- 2) Low-Achieving Stratum (3 Students): Selected from the bottom 3 lowest scores to identify severe linguistic difficulties and comprehension breakdowns.
 - 3) Average-Achieving Stratum (3 Students): Selected from the middle-tier scores. Interestingly, these 3 specific students demonstrated good general English proficiency but specifically failed the polysemy items due to semantic misconceptions (misinterpreting the shifting words). Interviewing this group was critical to explain how polysemy causes hidden comprehension breakdowns even among generally capable learners.
- b) Scheduling and Consent: The researcher approached these 9 selected students individually during recess or after school hours, explaining the purpose of the interview and securing their verbal consent to participate.
 - c) Setting Up the Environment: The face-to-face interviews were conducted in a quiet and comfortable school setting (such as the school library and mushollah) to minimize anxiety and encourage open communication.
 - d) Stimulated Recall Interviewing: During the semi-structured sessions, the researcher presented the informants with their own corrected test sheets. The researcher pointed to their specific incorrect answers and asked open-ended questions (e.g., *Why did you choose this meaning?*) to prompt them to reconstruct their internal strategies.

- e) Audio Recording: Each interview session lasted approximately 10 to 15 minutes per student and was fully audio-recorded using a smartphone device to ensure an accurate verbatim transcription of the students' qualitative explanations students' ability to distinguish between different meanings of a single lexical item in a controlled linguistic context.

G. Data Trustworthiness

To ensure the trustworthiness of the data, a pilot test was conducted with a group of students outside the research sample. This trial was used to evaluate the clarity of the questions and the effectiveness of the multiple-choice options. Based on the results of this pilot test, the items were refined to ensure the data collected from the actual participants would be accurate and consistent.

For the qualitative data, credibility was ensured through a rigorous validation process adhering to Creswell and Creswell's (2018) qualitative quality standards.

First, prolonged engagement was established by spending an extended period of time at the research site and inside the classroom environment. Rather than merely entering the school to distribute the test and leaving immediately, the researcher spent adequate time engaging in active classroom observations and sustained interactions with the eleventh-grade students prior to the interviews. This prolonged presence was critical to build rapport, establish a climate of mutual trust, and ensure that the 9 selected informants

felt entirely comfortable and secure during the qualitative phase. Consequently, this minimized participant anxiety and encouraged them to provide open, honest, and naturalistic verbal explanations regarding their actual cognitive strategies.

Second, to strengthen credibility, method triangulation was employed by comparing the results of the diagnostic vocabulary test with the data obtained from the semi-structured interviews. This comparison aimed to examine the consistency between students' statistical test performance and their real-time verbal explanations, ensuring a comprehensive profile of their polysemous comprehension barriers.

H. Data Analysis Technique

1. Quantitative Data

The quantitative data obtained from the 107 diagnostic vocabulary test sheets were analyzed using Microsoft Excel. Since this phase was strictly diagnostic and non-hypothetical, the researcher employed descriptive statistics through the following rigorous procedures:

- a. **Binary Scoring:** The researcher evaluated each student's response sheet manually. Correct answers were assigned a score of 1, and incorrect answers were assigned a score of 0.
- b. **Score Transformation (Scale of 100):** To standardize the results, the raw scores out of the 28-item test were converted into a 100-point scale. For instance, a perfect score of 28 correct answers equates to 100. The formula utilized for this conversion was:

$$P = \left(\frac{f}{28} \right) \times 100$$

(Where P is the final percentage-based score, f is the frequency of correct answers achieved by an individual student, and 28 is the total number of test items).

c. Descriptive Statistical Measurements: To establish a comprehensive profile of the students' polysemous word abilities across the eleventh-grade science classes, the compiled scores were calculated using specific automated Excel functions:

- 1) Mean (X): The arithmetic average of the overall scores was computed using the =AVERAGE function to determine the general ability baseline.
- 2) Median (Me): The midpoint score of the data distribution was identified using the =MEDIAN function.
- 3) Mode (Mo): The most frequently occurring score among the 107 participants was determined using the =MODE function.
- 4) Highest and Lowest Scores: To define the absolute range of ability, the maximum score was extracted using the =MAX function, and the minimum score was extracted using the =MIN function.

2. Qualitative Data

The qualitative data gathered from the audio recordings of the 9 selected informants were analyzed using the qualitative data analysis model proposed by Miles, Huberman, and Saldaña (2014). The analysis was strictly focused on exploring the *specific difficulties* and *cognitive strategies* of the students, consisting of three concurrent flows of activity executed systematically as follows:

- a) Data Condensation: In this initial stage, the 9 audio interview recordings were transcribed verbatim. The researcher then conducted data condensation by selecting, focusing, and abstracting the raw transcripts. The researcher read through the text line-by-line and assigned specific codes to sentences where students explained their thinking processes. The coding process was targeted specifically to extract two core elements: the comprehension difficulties they faced and the lexical strategies they deployed. Irrelevant talk or filler words were discarded to ensure the condensed data remained tightly aligned with the qualitative research goals.
- b) Data Display: Once the data were condensed and coded, the researcher organized and assembled the information into systematic displays within Chapter 4. Rather than using matrices or tables, the data in this study were displayed using structured narrative text and bulleted categories. The researcher clustered the findings based on specific types of difficulties and strategies. Under each category, the data were

presented in bullet points, immediately followed by verbatim direct quotes from the students' interview transcripts. This narrative presentation was chosen to provide transparent, raw, and in-depth evidence of *how* the students experienced comprehension breakdowns and *what* specific strategies they used.

- c) Conclusion Drawing and Verification: In this final stage, the researcher drew clear, descriptive conclusions regarding *why* the students committed errors (their specific difficulties) and *how* they attempted to solve those polysemous items during the test (their strategic maneuvers). These emerging conclusions were continuously verified by cross-checking them against the bulleted themes and the original verbatim quotes to ensure that the final qualitative findings genuinely and accurately represented the cognitive realities of the students.