

CHAPTER III

RESEARCH METHOD

3.1 Research Method

The method used in this research is descriptive exploratory method, where the approach taken towards the object under study is a qualitative approach. This research uses descriptive method, because the data to be collected are not numbers, but rather the results of interviews, field notes and documents. This is done because the phenomena will be discussed in a complex and holistic. Therefore, this research uses test and interviews to match the empirical reality of the prevailing theories using descriptive methods. "Descriptive research is research that seeks to describe a symptom, event, incident that occur in the present." (Sujana and Ibrahim, 1989:65)

This research was conducted to obtain in-depth information about the learning obstacles experienced by students, the results of the analysis of learning obstacles will be used as a guideline in designing instructional materials that according to the three components of didactical design research (DDR).

3.2 Purposive Sampling

The purposive samples of this research are students of three state junior high schools of different clusters in Bandung.

3.3 Research Procedures

The research procedure is divided into three major phases, namely: the preparation phase, the implementation phase, and the final phase, described as follows:

3.3.1 The Preparation Phase

There are five steps in the preparation phase, they are:

1. Conducting library research to formulate the problem;
2. Preparing the proposal to be submitted on proposal seminar;
3. Preparing the research instruments such as questions and interview outlines;

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4. Conducting the revision and validation of the research instruments;
5. Conducting the permits to perform research related to the parties;

3.3.2 The Implementation Phase

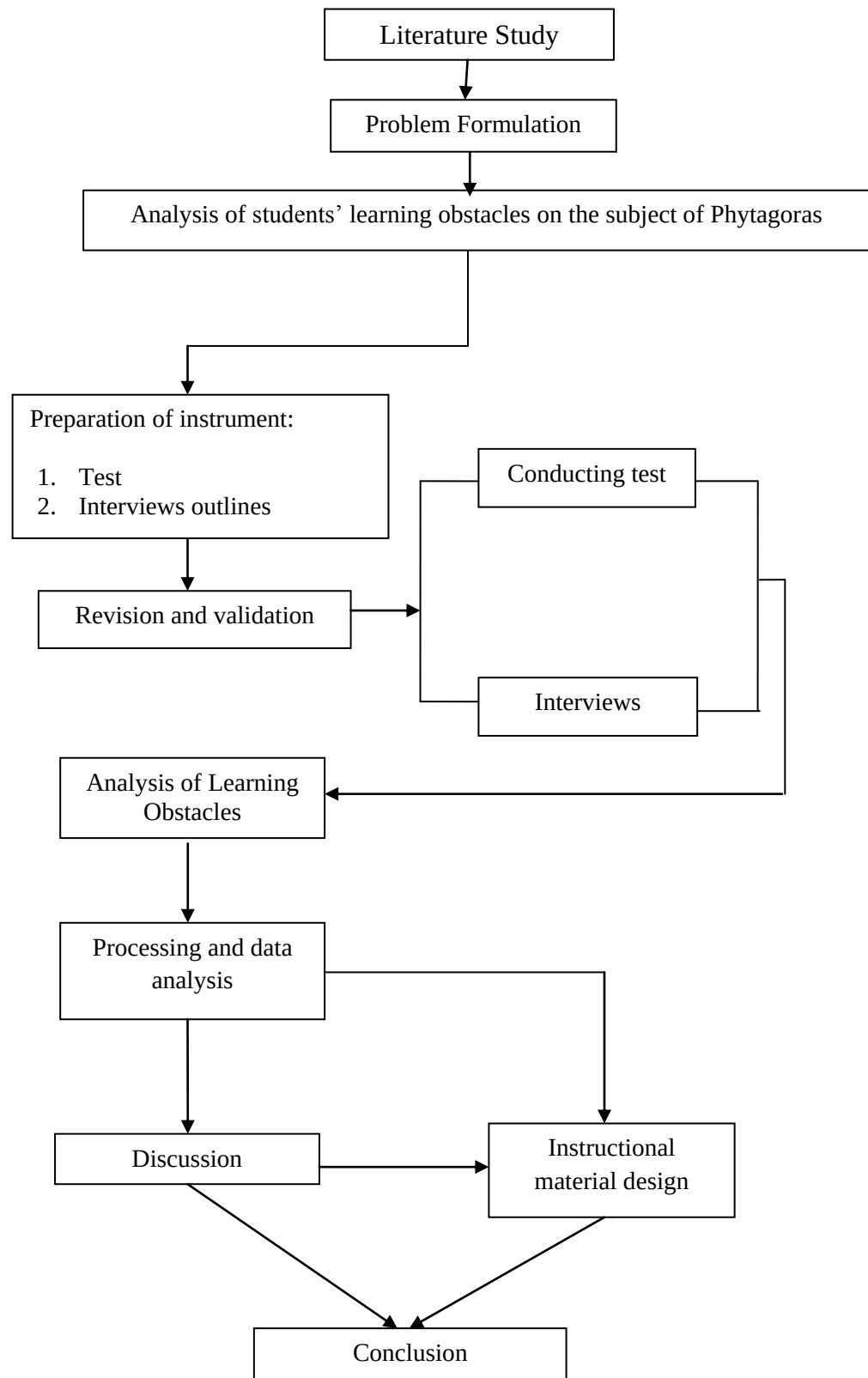
There are six steps in the implementation phase, they are:

1. Giving tests to the research samples (students that will be given the test have obtained learning about Pythagorean concept and have been told in advance what subject matters will be tested);
2. Conducting interviews with students and teachers to obtain in-depth information about possible learning obstacles in students;
3. Analyzing students' answers to the questions given;
4. Analyzing learning obstacles based on the test results and the interviews;
5. Planning an anticipation of didactical, anticipation of pedagogical, and anticipation of didactical and pedagogical.
6. Designing an appropriate instructional material with the three components of didactical design research.

3.3.3 The Final Phase

There are three steps in the final phase, they are:

1. Processing the data that has been obtained from the implementation of the research;
2. Drawing conclusions based on the discussion of the research results;
3. Preparing of research results in the form of a thesis.



Picture 3.1 The Chart of Research Plan

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3.4 Research Instrument

Research instrument is an instrument used to obtain the information needed in the research. Arikunto (2002:136) stated that: "The instrument is a tool or a research facility used by researchers to collect data in order to work more easily and better results, in terms of more accurate, are comprehensive and systematic so that it will be more easily processed."

3.4.1 The Data Collection Technique

The data was collected using tests instruments and interviews.

3.4.1.1 Test

The test is an instrument used to collect primary data in the form of a six-question essay tests (*can be seen in attachment 3*). The tests are described on the following explanation:

3.4.1.1.1 The Characteristic of Problem One

Communication skills can be seen in how students express or explain problem solving; of course this should be supported by the adequate understanding of the concept of the right triangles and the Pythagorean theorem. In this case students were asked to investigate whether the three sides of triangles are the Pythagorean triple or not along with the explanations. The important things to answer this problem are the knowledge of what is the definition of Pythagorean triple and investigate how the sides of a triangle can be called as a Pythagorean triple. This will bring the students to the knowledge of the characteristics of a right triangle, such as the characteristics of the hypotenuse or the longest side of triangle.

3.4.1.1.2 The Characteristic of Problem Two

Basically this problem is just a matter of repeating of Pythagorean theorem, but there were many students that could not answer this problem correctly. Students are required to write down the Pythagorean formula of a right triangle is known in the problem. The obstacles experienced by students is derived from the

image of a right triangle is slightly different from a right triangle they usually see. Not a few students who assume that the Pythagorean formula involving only a, b and c (as in the textbook), the less of variation in right triangle name makes students glued to the formula of $c^2 = a^2 + b^2$ so that when the name of the given is different, student were confused in determining the Pythagorean formula. Likewise with a right triangle shape which are often given in books or often done by students is less varied make students tend to change by turning, tilting, matching the right triangle picture in the problem to compare to the one they learned.

3.4.1.1.3 The Characteristic of Problem Three

In the third problem, it is given enough information for students to do the next step to solve the problem, but it is required the knowledge of algebra, such as the term of variables and coefficients, as well as algebraic operations. This problem is made to show the students' understanding Pythagorean theorem that is connected with algebra.

3.4.1.1.4 The Characteristic of Problem Four

The fourth problem is slightly more complicated than the previous problem, since it involved algebra and geometry knowledge. The knowledge of geometry in question is knowledge of plane as: characteristics of square and the area of square. In this problem was not given any instructions that this problem can be solved by the Pythagorean theorem, so a lot of students who completed using the formula of the area of square.

3.4.1.1.5 The Characteristic of Problem Five

This problem involves geometry knowledge, which is the trapezoidal plane. But not only involve the plane, this problem would also like to see the extent to which students were able to see the possibility of solving problems by constructing another plane in a trapezoidal plane so that in the end the students

can use the Pythagorean theorem. It is needed the knowledge of trapezoid circumference formula and the comparison of special angel-based right triangle.

3.4.1.1.6 The Characteristic of Problem Six

This problem requires a mastery of the comparison of special angel-based right triangles with angle based. But unfortunately when the problem was tested, many students failed to do a visual representation, which led students to the wrong problem solving and answers. Students also less of thorough and did not read the questions carefully. In addition, students also tend not to work on the question in the form of word problems.

3.4.1.2 Interview

This research uses unstructured interviews as the primary data source, which the researcher do not use a structured interview guide to collect data systematically, but the researcher prepared the interview outlines that will be asked. This interview will be documented in a sound recording and photos. Because this is not a structured interview, the questions from the interviewer will flow according to the condition of the interview, the biased question can be seen after the interview. The questions that biased or ambiguous are discarded so as not to affect the validity of the data.

In the early stages, researcher will spend more time listening to what the respondent and not directly ask the problems studied in the research, this is done so that respondents feel comfortable and answered the questions honestly. Once researcher knows the situation of the respondent, then prepare more questions related to respondents' answers before and will be directed to the issues addressed in the research.

The steps of the interview to be conducted are as follows:

- i. Researcher prepares the interview outlines to be asked.
- ii. Researcher determines the respondent that will be interviewed.
- iii. Researcher determines the interview schedule according to the condition of the respondent.

- iv. Researcher put interview results into an interim report.
- v. Researcher analyzes the results obtained from the initial interview.
- vi. Researcher plan the follow-up that will be done based on the results of the initial interviews that will be directed to the interview about students' learning obstacles.

3.5 Data Analysis Procedure

3.5.1 Data Analysis Technique

Bogdan (in Sugiyono, 2010) stated “Data analysis is the process of systematically searching and arranging the interview transcripts, field note, and other materials that you accumulate to increase your own understanding of them and to enable you to present what you have discovered to others” So all of the data obtained through interviews and documentation, arranged, organized, sorted systematically to increase the understanding of the studied problems then passed on to others. Data Analysis of this research is the analysis of the model used by Miles and Huberman, namely:

3.5.1.1 Data Reduction

In qualitative research, data and information received quite a lot, from time to time of data collection, the data obtained was getting more and more complicated. Therefore it is necessary to discard unimportant data, then select and focus on the data that are important in connection with the problem under study. In the data reduction phase, the sample will be categorized in certain aspects, making a visible pattern to the focus of attention of researcher.

3.5.1.2 Presentation of Data

Presentation of data in qualitative research can be form of reviews, charts, graphs or other. This is done to simplify the researcher to conduct an analysis and comprehension of the data obtained. With the presentation of data can be seen the relation of each category, see the common thread that is made into a theory that

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are still hypothetical. This hypothesis should be tested first before it becomes a standard theory.

3.5.1.3 Conclusion Withdrawal

Inferences will be made when the initial conclusion is proven valid and reliable. This conclusion must have strong evidence and expect a new finding that has not been studied previously.

3.5.2 Data Analysis Plan

Data analysis was performed during and after data collection continues over the triangulation technique is expected to produce a specific pattern of relationships which will generate new theory.

3.5.3 Validation Method

3.5.3.1 Credibility Test

Credibility test is conducted to increase confidence/credibility of the data. Credibility test is done in the following ways:

i. Increase the persistence

Researcher examines and observes carefully the data, in order to obtain accurate data.

ii. Negative case analysis

Researcher look for the contrary data to the findings obtained. If no data is negative /contradictory, the findings can be said to be true.

iii. Using reference material

These references include documents, records or evidence that could explain the findings of the study, so the data obtained more convincing.

iv. Conduct member check

Checking the data back to the subject under study, so there is no misinterpretation of the answer or data provided by the subject.

3.5.3.2 Transferability Test

Transferability test is conducted by readers of research results. When readers understand the purpose of the research and were able to give an overview of the results of these studies with detail and clear, it can be said that research meet the standards of transferability. Sanafiah Faisal (in Sugiyono: 1990)

3.5.3.3 Dependability test

This test is done by the supervisor, to see the whole process of the study conducted by researchers is true, not merely data manipulation. This process is not only seen from the results of the study, but conducted since researchers decide what problems to be studied until the conclusion of the study.

3.5.3.4 Confirmability Test

Tests conducted after the results of the study concluded, the test is conducted by people who are experts, such as examiners.