CHAPTER III
RESEARCH METHODOLOGY

This chapter elaborates the details of research methodology applied in this research. It basically covers four main groups of information. Those include research design, participants and research site, data collection, and data analysis.

3.1 Research Design

In order to achieve the research purpose in revealing the current quality of senior high school students' metacognition in EFL writing, this research was conducted by following the procedure of a triangulation design of mixed-methods research. The aforementioned research design is considered appropriate for this research because it could facilitate the collection of more complete self-reported data from students about their metacognition in EFL writing, both in quantitative and qualitative form (Fraenkel & Wallen, 2009). As implied in the name of the selected design, the two forms of data were used in this research for the purpose of triangulation. In data analysis stage, various types of information in the two sets of data were compared, until similarities and differences were found to be further used as the basis for drawing some interpretations about students' metacognition in EFL writing (Gay, Mills, & Airasian, 2009).

To be more detailed, conforming to a principle of the triangulation mixed-methods design, the emphasis in the analysis process was given equally to both quantitative and qualitative data (Ivankova & Creswell, 2009). Therefore, practically, the analysis of both data sets was conducted separately resulting in qualitatively developed themes and quantitatively determined themes. Once the separate analysis was done, both sets of themes were then compared to create the converged interpretation. When the matched themes were found, quantitatively determined themes supported by the percentages of students' responses to the questionnaire items were used to give precision to the qualitatively developed themes. Alternatively, qualitatively developed themes were used to give more elaboration to the quantitatively developed themes.

In some unique cases when the themes of quantitative and qualitative data were contrasting from one another, the interpretation was made by critically considering some contextual factors and reviewing the related literature. As an example, quantitative data revealed that students could not perform any strategies for time planning. On the other hand, according to qualitative data it was found that students made use of Google Translate application to translate their text from Indonesian language into English, just so they could finish the writing task as quickly as possible. To deal with these two different themes with the same category i.e. time planning skills, the researcher critically considered the reason behind the decision of students for using an online translation application by relating to the related theory. This consideration finally came to a conclusion that the students probably have not been used to writing a text directly in English, which further implies that process approach has not been consistently applied during their learning of EFL writing.

3.2 Participants and Research Site

The second section of this chapter contains the description of the participants involved and some contextual factors surrounding the research site. Moreover, some justifications for selecting the research participants and site are also provided. The two types of information can be traced in the following sub-sections.

3.2.1 Participants

The participants of this research were 39 students grade XI who were enrolled in a senior high school located in one of Indonesian regions. The students from one class of the math-science program and one class of the social-science program, who were actively going through the learning process of EFL writing in their second semester, were selected to represent the population of grade XI. The school level of the participants in this research was specified according to the core competence of the current curriculum, i.e. Curriculum 2013, in the area of writing skills. This core competence expects students grade XI to gain writing proficiency in terms of effective strategies and creativities to experiment with language by

which they can express their ideas through the independent text production (Indonesian Ministry of Education, 2014). Considering the compulsorily required competence, it can be assumed that the students grade XI have been exposed to some experiences of learning as well as practicing writing knowledge and skills. Thus, they are regarded as the appropriate participants who are capable of self-reporting the information about their metacognition in EFL writing, as expected for the purpose of this research.

3.2.2 Research site

The research site where the research took place was a senior high school located in one of Indonesian regions. In relation to the purpose of the current research, the school was selected as the research site for it is the first high school in a particular Indonesian region, which has been appointed by Indonesian Ministry of Education to implement a pilot program of Curriculum 2013. This school has implemented the curriculum for 3 consecutive semesters by the early 2015 as officially stated in a formal document issued by Balitbang Kemdikbud (2015) No. 022/H/KR/2015, and therefore is allowed to continue the curriculum implementation in 2016. The appointment of the selected high school to continuously implement the pilot curriculum implies that this school has been considered to have more experience in implementing Curriculum 2013 than the other schools in the same region do. Therefore, it is believed that the students learning in the selected school are able to provide more information related to the components of metacognition in EFL writing, which they have acquired through metacognition-based learning process under Curriculum 2013.

3.3 Data Collection

This section provides the information related to data collection carried out in this research. To provide more specific information, this section is followed by several sub-sections elucidating the types of the collected data, the instruments used to collect the data, and technical procedures to use the instruments in collecting the expected data. Those sub-sections are represented by the following

sub-headings: Types of data, Research instruments, and Procedure of data collection.

3.3.1 Types of data

In line with the triangulation mixed-methods design applied in this research, both quantitative and qualitative data were used to collect the necessary information related to students' metacognition in EFL writing. Quantitative data were in the form of percentages of students' responses to the questions in the 4-point Likert-type questionnaires and checklist questionnaires, which furthermore determined the codes, categories, and themes about metacognitive knowledge and self-regulation skills of the students in EFL writing. Meanwhile, qualitative data derived from open-response questionnaires were presented directly in codes, categories, and themes which were also related to students' metacognitive knowledge and self-regulation skills in EFL writing.

3.3.2 Research instruments

In achieving its purpose of assessing students' writing metacognition, this research gathered data mainly by using self-report instruments, a type of measurement tool which is commonly used to assess the components of metacognitive knowledge as suggested by Hacker et al. (2009). The self-report instruments used in this research came in three types of questionnaires, namely metacognitive knowledge, self-regulation questionnaires and open-response questionnaire. In order to achieve the purpose of this research, those questionnaires were designed as domain specific self-report questionnaires which contain the items created to assess students' metacognition particularly in the area of EFL writing (Sarac & Karakelle, 2012). More specifically, in order to answer the first research question asking about students' metacognitive knowledge in writing, metacognitive knowledge and open-response questionnaires were used as the assessment tools. Then, to provide the answer for the second research question, self-regulation questionnaire and some items of open-response questionnaire were used to collect the data about students' ways of using their metacognitive knowledge to perform self-regulation in EFL writing.

The three types of self-report instrument used in this research (i.e. metacognitive knowledge, self-regulation, and open-response questionnaires) are categorized as the measurement tools for off-line method of metacognitive assessment, which are usually used to collect data either before and after the task assignment (Veenman et al., 2006). The decision for using off-line method of assessment in the current research is made because unlike the on-line method, its tools are considered to be more practical for students to use in reporting the metacognition-related information. To be more precise, compared to off-line method, on-line method such as think-aloud protocol, which is assigned during the process of completing a task may be less effective and efficient in the practice of data collection for this research (Schellings & Van Hout-Wolters, 2011).

In relation to this research, since the participants are senior high school students who are new to on-line method of metacognitive assessment, there is a possibility that they may not be able to verbally communicate what they were thinking during writing process accurately. That is especially because completing the writing task itself has already been challenging for students, thus thinking while reporting about how and why they make decisions throughout the writing process may be even more difficult for the students to handle (Veenman, 2011). Additionally, besides a think-aloud protocol, systematic observation as a part of on-line methods of metacognitive assessment is also considered to be inappropriate for the current research. The reason is because this method needs to be conducted with only a few students being intensely controlled and observed when they process their writing. This requirement is quite difficult and might take a lot of time to realize because the participants can only be approached in the school setting (Desoete, 2008; Sarac & Karakelle, 2012).

Furthermore, ensuring the data quality, the self-report questionnaires were selected to be used in this research considering that they are reliable to collect the expected data which contain the first-hand experiences told directly by students who are involved in the learning process of EFL writing (Oscarson, 2013). Then, in terms of fairness and practicality of their assignment, those questionnaires are chosen so that the actual data collection process would be conducted more efficiently with all students having the equal chance to report the expected

information at the same time (Akturk & Sahin, 2011). To get the better picture of the self-report questionnaires which selection has been justified in the previous paragraphs, the details of each questionnaire as well as the ways they are combined to collect the data which are supportive to one another, are given in the following sub-sections.

3.3.2.1 Metacognitive knowledge questionnaire

As the first type of self-report questionnaire used in this research, metacognitive knowledge questionnaire was administered to the students to obtain the information about their metacognitive knowledge in terms of declarative knowledge, procedural knowledge and conditional knowledge. To be more specific, a metacognitive knowledge questionnaire contains the statements by which the students report the components of metacognitive knowledge, they have already possessed in the area of EFL writing. The questionnaire also includes 4-point Likert response alternatives which represent the degree of students' agreement towards the listed statements, i.e. strongly disagree, disagree, agree, strongly agree. Such format was selected for the questionnaire because the information of metacognitive knowledge is considered as the accumulated knowledge acquired through the previous learning experience, which the students need to personally put into degrees to determine its accuracy. For instance, because the senior high school students are certain that they have been interested in learning English writing since they were in middle school, they can state through the metacognitive knowledge questionnaire that they agree or strongly agree about the fact that they have a positive attitude towards English writing.

Metacognitive knowledge questionnaire used in this research contains 30 items which were addressed to ask students about the components of their metacognitive knowledge in EFL writing. Of all 30 items, 19 items were adapted from the questionnaire used for the research on metacognitive knowledge in second language writing conducted by Kim (2013), while the rest 11 items were newly created. Both adapted and created items presented in the questionnaire were designed based on the theory about metacognition in writing suggested by Harris et al. (2010) which can be traced in chapter II of this thesis. Once the items used

to assess students' metacognitive knowledge were determined**,** the new questionnaire was piloted by administering it to the other students grade XI who were not involved as the actual participants in the research. Afterwards, the questionnaire was then tested statistically in terms of validity and reliability. Guaranteed by the test results, the new metacognitive knowledge questionnaire was finally used in this research. Details about the adaptation and creation process of questionnaire items along with its result in the form of a new questionnaire presented in both English and Indonesian version, as well as the proof of questionnaire validity and reliability are all provided in Appendix 1.

To be more specific about the formulation of questionnaire items, its process began with the items adaptation. To carry out the adaptation process, initially 19 out of 45 items listed in the model questionnaire used in the research by Kim (2013) were selected. Compared to the other 26 excluded items, 19 selected items of the model questionnaire were considered to have more appropriate idea and sentence structure which can be used to be adapted for asking students about their specific components of metacognitive knowledge in EFL writing. Those selected items are the item number 42, 9, 16, 45, 44, 14, 7, 18, 2, 8, 20, 10, 13, 19, 20, 22, 26, 5, and 32 of the model questionnaire.

Still about items adaptation, 11 out of 19 items of the model questionnaire were modified in terms of sentence structure to assess students' declarative knowledge about person knowledge, task knowledge, and strategy knowledge. In terms of person knowledge, 3 items selected from the model questionnaire which include item number 42, 9, and 16 were modified and presented in the new questionnaire as item number 3, 4, and 5 to assess students' awareness of writing proficiency, i.e. level of proficiency, strengths and weaknesses. The other 2 items consisting of the item number 45 and 44 were also adapted, especially to assess students' person knowledge in terms of writing motivation, i.e. eagerness to learn writing and writing goals and were further presented as the item number 6 and 7 in the new questionnaire.

In relation to task knowledge as the second sub-component of declarative knowledge, 3 items of the model questionnaire namely item number 14, 7, and 18 were adapted to ask students about their knowledge of genre characteristics

encompassing purposes of text, writing topics and generic structure of text. These three questionnaire items were then provided in the new questionnaire as the item number 8, 9, and 11. In addition to those three items, task knowledge of students, especially in terms of task requirements was also assessed by selecting 1 item, i.e. item number 2 of the model questionnaire, to be adapted and represented as item number 13 in the new questionnaire. Additionally, for assessing students' strategy knowledge, 2 original items, namely item number 8 and 20 were adapted to create item number 15 and 17 which were used to assess students' knowledge about planning and revising respectively.

The rest 8 out of 19 modified items were used to investigate students' procedural knowledge and conditional knowledge. For assessing procedural knowledge, there are 6 original items used to asses students' knowledge of how to carry out planning, drafting and revising strategies during writing. Precisely, 2 original items, i.e. number 10 and 13 were used to assess students' planning strategies, 1 item labeled as item number 19 intended to assess student's drafting strategies, and 3 items including item number 20, 22, and 26 which were selected to assess students' revising strategies. The total of 6 items of the model questionnaire assessing students' procedural knowledge was presented in the new questionnaire as the item number 18, 19, 20, 21, 22, and 23. Finally, for conditional knowledge, 2 original items consisted of item number 5 and 23 were adapted to ask students about their knowledge of time planning as a strategy to fulfill a task requirement, and problem-solving strategies to deal with the limited vocabulary mastery during writing. In the new questionnaire, these two items were provided with a slightly different sentence structure as the item number 24 and 27.

Moreover, other than the adapted items, metacognitive knowledge questionnaire used in this research also contains some newly-created items which were also designed based on the components of metacognitive knowledge in writing explained by Harris et al. (2010). Out of 11 newly-created items, 3 of them which were presented in the new questionnaire as the item number 1, 2, and 14. These items were used to assess students' attitude, self-efficacy, and environmental preferences, which are included in person knowledge as a part of

declarative knowledge. Furthermore, 2 items including the item number 10 and 12 were intended to ask about students' task knowledge of the types of information needed by the readers in various genres of English text, and the types of grammatical features along with the way to use them for composing English texts. For strategy knowledge, there is only 1 newly-created item listed as the item number 16 in the new questionnaire which specifically asks students about their knowledge of drafting. Eventually, 4 created items positioned as the item number 25, 26, 29, and 30 were used to ask the information about conditional knowledge to control the number of words, accuracy of generic structure, accuracy of grammatical structure, text organization, and environmental structuring.

In addition to the items formulation, the new metacognitive knowledge questionnaire was also created through the format adaptation. The 6-point Likert response alternatives used in the original questionnaire was modified to be 4-point Likert response alternatives in the new one with the consideration that the fewer options for students to choose the easier it would be for them in reporting the information about their metacognition. Particularly, because the questionnaire format does not have a mid-point, students would not be led to provide ambiguous or less honest answers by choosing the mid-point (neutral) degree. Therefore, determining students' tendency of agreement towards the statements would be easier for the researcher. Additionally, as pointed out by Tsang (2012), the questionnaire containing 4-point Likert response alternatives is indeed allowed to be used as either there is or there is not a mid-point (neutral) does not affect the reliability and validity of the questionnaire.

3.3.2.2 Self-regulation questionnaire

The second type of self-report instrument used for data collection in this research was a self-regulation questionnaire. The format of this questionnaire follows the design of Metacognitive Awareness Inventory (MAI) by Schraw and Dennison (1994) which uses the checklist format. Initially, the inventory contains a list of statements and True or False alternative to let students reflect on their awareness of their metacognitive knowledge and self-regulation in learning. However, for the purpose of data collection in this research, the adaptation

process was carried out on the initial questionnaire by modifying its items and format, so that the questionnaire would help students immediately report what self-regulation skills they performed during the process of completing a writing task.

Regarding the adaptation process of self-regulation questionnaire items (see Appendix 2), 21 out of 52 items listed in the model questionnaire, which were used to address the information about self-regulation skills were selected based on the components of self-regulation in writing suggested by Harris et al. (2010). In order to collect the information about students' ability in performing planning strategies, 8 items from the model questionnaire were adapted by rephrasing the statements about self-regulation in learning so that they are more related to the application of self-regulation in EFL writing. Specifically, the item number 6, 45, 4, 23, 22, 41, and 37 from the model questionnaire were represented in the new questionnaire as the item number 1, 2, 3, 5, 6, 12, and 13 which were used to respectively assess students' ability in performing general planning of writing, time planning, self-selecting models, seeking information, organizing and transforming visualization into written text. Additionally, the item number 8 taken from the model questionnaire which was used to ask students, whether they set the learning goals was represented by 4 items asking students, whether they set specific writing goals in the new questionnaire. These items were labeled as the item number 7, 8, 9, and 10 and were addressed to ask students, whether they determined the purpose, generic structure, linguistic features and grammatical structure of the text before they begin writing.

Furthermore, to gather the data about students' skill in performing monitoring strategies, 7 items of the model questionnaire were adapted. Specifically, item number 34 and 1 were adapted and presented as item number 16 and 17 in the new questionnaire to assess students' ability to perform self-monitoring. Item number 49 and 21 of the model questionnaire were also adapted, especially to assess students' ability in reviewing records and revising. As a unique case, because item number 2 and 11 from the model questionnaire could communicate the same idea about self-assistance, they were then merged into one item positioned as the item number 20 in the new questionnaire. Additionally,

original item number 25 asking about whether students seek social assistance was represented in the new questionnaire by the item number 22 and 23 as the two items were used to specifically find out the exact source of students' social assistance which was either their teacher or peers.

In addition, as a means of collecting data about students' ways of using metacognitive knowledge to perform evaluating strategies, the accumulated idea brought by item number 7, 36, and 24 were reproduced to be 2 items in the new questionnaire. These two items consist of the item number 24 and 25 which were respectively used to reveal if students are used to self-evaluating their strengths and weaknesses after conducting a writing process. Last but not least, item number 18, 38, and 49 were converted into one item listed as the last item in the new questionnaire which has the purpose of discovering whether students self-evaluate by thinking of the possible efforts they need to make for their improvement in EFL writing.

Other than the adapted items, the questionnaire also contains 5 newly-created items to complete the components of self-regulation which have not been represented by the adapted items. These newly-created items consist of the item number 4, 11, 14, 15 and 21 in the new questionnaire. They were particularly addressed to ask whether students conducted environmental structuring and record keeping strategy as the means of performing planning skill, and also carried out drafting process, self-verbalizing and self-consequating as the strategies to perform monitoring skill.

In addition to the item modification, the model questionnaire format was also reformed by replacing the True or False alternative with the Yes or No alternative. This new alternative is considered more effective for it could assist students in reporting whether they performed certain self-regulation skills listed in the questionnaire items, during the completion of the writing task which was given before the questionnaire was administered. For more details of how self-regulation questionnaire items and format are adapted and also verified in terms of validity and reliability, please check out the information in Appendix 2.

Supporting the use of self-regulation questionnaire, the writing task in this research also takes an important role as the instrument which helps students to

effectively reflect on their self-regulation skills in writing. This task requires the students to write a report text containing no more than 200 words, under the topic of biological objects within 30 minutes, with the appropriate genre-related characteristics. Right after the task was completed, students reported the way they made use of their metacognitive knowledge when they were performing self-regulation skills during the actual writing task, by completing the self-regulation questionnaire. The aforementioned procedure of administering the questionnaire after completing a writing task has also been applied in two related studies on metacognitive awareness in EFL writing which was conducted by Maftoon (2014) and the use of metacognitive knowledge in essay writing carried out by Surat (2014).

3.3.2.3 Open-response questionnaire

In addition to the previously mentioned self-report questionnaires which were used to record the data about metacognitive components separately, open-response questionnaire was also administered to the students for the purpose of data enrichment and verification. Actually, open-response questionnaire in this research was used as the alternative to the interview protocol, which as an off-line metacognitive assessment tool is considered beneficial for stimulating students to give more elaboration on every detail of metacognitive components (Heigham & Croker, 2009; Sarac & Karakelle, 2012). Serving the same function as an interview protocol, open-response questionnaire contains a list of questions requiring students to explain the components of metacognitive knowledge and self-regulation they currently possess in EFL writing.

In this research, the questions in an open-response questionnaire were developed based on the metacognitive components which were also addressed in the previous two self-report questionnaires. Specifically, question number 1, 2, 3, 4, 5, and 6 were addressed to find out the information about students' declarative knowledge in terms of person knowledge, particularly to reveal students' attitude towards writing, self-efficacy, awareness of writing proficiency in terms of strengths, awareness of writing proficiency in terms of weaknesses, writing motivation related to the eagerness of learning writing, and writing motivation

supported by personal goals of learning writing. Furthermore, to find out about students' task knowledge as a part of declarative knowledge, question number 7 and 8 were used to let students elaborate about their knowledge of task-related requirements and genre-characteristics. The information about the last sub-component of declarative knowledge, strategy knowledge, was gathered by using question number 9 which asks students regarding their knowledge of compositional skills.

The second component of metacognitive knowledge, procedural knowledge of students was also assessed using question number 9. Moreover, since this question requires the students to describe and explain the steps they usually take to complete a writing task, it was not only used to gather the information about students' strategy knowledge and procedural knowledge, but also about students' skills in employing planning, monitoring, and evaluating strategies to regulate their thinking process during writing. Similar to question number 9, question number 10 was also used to collect more than one type of information as by asking students to share what they do to deal with task-related requirements, they would reveal the information about their conditional knowledge, and skills in planning and monitoring their thinking process during the completion of a writing task. Other than by using question number 10, conditional knowledge of students also could be revealed by means of question number 11 asking about their knowledge of way to perform environmental structuring, and question number 12 asking about writing problems along with the strategies to solve them.

Finally, to specifically gather the information about students skills in self-regulation during the process of writing, question number 13 consisting 4 specific questions were addressed in the open-response questionnaire. Those 4 questions were used to ask students regarding their skills of performing planning, monitoring, and evaluating strategies. More specifically, question number 13 a, 13 b, 13 c, and 13 d were used to respectively ask students, whether they could perform the strategy for time planning, controlling the number of words, controlling genre characteristics, and environmental structuring.

3.3.3 Procedure of data collection

In order to collect both quantitative and qualitative data, this research conducted metacognitive assessment before and after completing a writing task (Veenman et al., 2006; Akturk & Sahin, 2011). In its practice, before-task metacognitive assessment was carried out by administering metacognitive knowledge questionnaires to the selected students of grade XI. Afterwards, the students were asked to complete a writing task requiring them to write a report text consisting of at least 200 words under the topic of biological objects within 30 minutes. The complete writing task presented in English and Indonesian language can be checked in Appendix 4. Once the task was completed, the after-task assessment was directed by asking the students to fill a checklist questionnaire as a means of reporting self-regulation skills they have employed during the process of completing the writing task.

Some time after the students had finished self-reporting activity using self-regulation questionnaires, some students were asked to fill in open-response questionnaires. To be more specific, since the data collection was conducted in two different classes, 3 students of each class were given the open-response questionnaires outside the classroom context. Particularly, to make sure that the students who were assigned with open-response questionnaires accurately reported their self-regulation skills, the researcher asked the selected students to write down a description about the steps and strategies they performed during the writing process soon after they completed self-regulation questionnaires.

3.4 Data Analysis

In this section, provided is the information about procedural details of the process of data analysis. Considering the application of triangulation mixed-methods design in this research, which allows separate analysis for each quantitative and qualitative data before the final analysis, this section is divided into three sub-sections. Those are: Quantitative data analysis, Qualitative data analysis, and Mixed-methods data analysis.

3.4.1 Quantitative data analysis

Quantitative data containing the information related to students' metacognitive knowledge and self-regulation components in EFL writing were analyzed by means of descriptive statistics. Particularly, since both of metacognitive knowledge and self-regulation questionnaires used are considered as the survey tools, Gay et al. (2009) suggest the frequency of students' responses to the questionnaire items to be counted. Moreover, according to Boone & Boone (2012), since the purpose of the questionnaire administration is to compare students' responses towards the Likert-type items which represent the discrete component of metacognitive knowledge and self-regulation, the data are best analyzed in terms of variability thus result in frequencies. Once the counting was done, the frequency of students' responses was turned into percentages through the calculation of response frequency on each questionnaire item divided by the total of 39 students, then multiplied by 100. The calculation formula is illustrated in the following figure.

$$\text{Percentage} = \left(\frac{Frequency\ of\ Responses}{39} \times 100\right)$$

Figure 3.1 Formula of Students' Responses Percentage

Soon after the percentages of students' responses to each questionnaire item had been calculated, the description and interpretation were developed based on the pre-determined codes and categories of metacognition in EFL writing.

Technically, there are three steps of descriptive statistics computation used for analyzing students' responses to the items of both metacognitive knowledge and self-regulation questionnaires in this research. The first step for quantitative data analysis was counting the frequency of students' responses to the statements listed in the questionnaire based on the available response alternatives of the agreement. Practically, the number of responses representing strongly disagree, disagree, agree, and strongly disagree to the questionnaire items was counted. The second step of data analysis was converting the frequency of students' responses to the questionnaire items into the form of percentage by means of a formula

presented in Figure 3.1. Finally, the last step taken to perform for quantitative data analysis was describing the percentages of students' responses about the components of metacognition in EFL writing. The results of quantitative data analysis can be fully accessed in section 1 and 2 of Appendix 5.

3.4.2 Qualitative data analysis

As suggested by Denscombe (2007), the qualitative data analysis procedure performed in this research includes the following steps: preparation of the data, familiarity with the data, interpreting the data (developing codes, categories and concepts), verifying the data, and representing the data.

3.4.2.1 Preparation of the data

As the first step of data analysis, the open-response questionnaires which have been filled by the students were copied, so that the original version can be secured to prevent the loss of data. Afterwards, students' answers recorded in the questionnaires were typed and saved in Microsoft Word format. Particularly, during typing, those answers were grouped in tables based on the specific questionnaire item they respond to. Thus the data would be easier to locate for the latter stage of data analysis.

3.4.2.2 Familiarity with the data

In the second step, to get familiar with the main content of the data, all students' responses to the questionnaire items were read several times. The reading was firstly done by looking for general information about metacognitive components possessed and could be performed by the students. Afterwards, students' responses to each item of the questionnaire were compared with one another to see the potential interrelationship among the collected information. Finally, the reading was done more thoroughly while noting down the specific meaning each line of textual data could provide in contribution to answering the research questions.

3.4.2.3 Interpreting the data

Once become familiar with the data after multiple-reading, data interpretation was conducted by means of an analytic induction to perform a coding procedure (see section 3 of Appendix 5). The analysis involved the process of continuously developing codes and categories related to students' writing metacognition in EFL writing, from students' responses to the open-response questionnaire items until no more new patterns of information emerge out of them (Cohen, Manion, & Morrison, 2007; Heigham & Croker, 2009b). In the practical manner, firstly the codes were developed from the important information related to metacognitive knowledge and self-regulation in EFL writing found in all sets of qualitative data from open-response questionnaires. Those codes labeling each piece of information were further grouped into several categories, either taken from the existing categories of metacognition or purely derived from data, according to the similarities in the idea they try to communicate. The relationship between codes and categories further developed several themes about the phenomenon under investigation, which further could be regarded as research findings. On the simple way, the steps of the data interpretation process went through the following order.

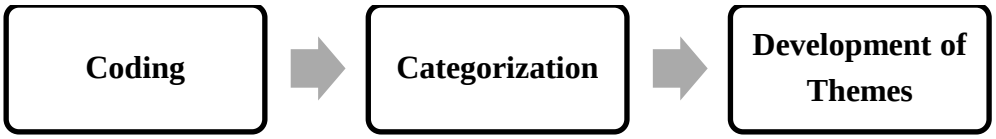

Figure 3.2 Steps of Interpreting Data

3.4.2.4 Verifying the data

Furthermore, with the purpose of providing the trustworthy research findings, the analysis results were verified in terms of validity through data triangulation and member-checking. This verification effort was firstly performed by cross-checking the codes, categories, and themes developed from each open-response questionnaire. When the analysis results had been obtained from the triangulation process, member-checking was done by informing the research participants about the results of data analysis so that they can confirm the interpretation accuracy (Bodgan & Biklen, 1992; Creswell, 2009; Heigham &

Croker, 2009). In addition to data triangulation and member-checking, audit trail was also performed particularly to make sure that every procedure of this research has been performed well and regarded to be reliable according to the research methodology. To conduct the audit trail, every single event, procedure and other specific details during the research process which had been documented in the research diary was traced back to better remember and understand what things happened in the field have contributed to data interpretation.

3.4.2.5 Representing the data

Finally, the last step of data analysis conducted in this research is representing the data in the most accessible way to the readers. To do so, the relationship among major codes, categories, and themes was presented in the diagrams (see Appendix 6) to support the elaboration of research findings in the next chapter. More than that, some excerpts of students' answers to open-response questionnaires were presented in tables with the intention of providing supporting evidence for the informed findings. The presentation of qualitative data excerpts can be traced in the next chapter, specifically in the section elaborating the findings of this research.

3.4.3 Mixed-methods data analysis

To conduct the final analysis, following the procedure of a triangulation mixed-methods research design, which is also known as QUAN – QUAL mixed-methods design (Gay et al., 2009), the themes developed from both qualitative and quantitative data were compared simultaneously. In its practice, the predetermined categories and themes derived from theories of metacognitive knowledge and self-regulation components, which have been used as the basis to analyze both qualitative and quantitative data, were determined as the frameworks of data analysis. The frameworks of analysis were designed based on the related literature on the components of metacognition, which are related to the concept of writing recommended by Harris et al. (2009; 2010).

By using the frameworks of analysis, both quantitative and qualitative themes were juxtaposed in the table. Those themes were then compared in terms of their similarities and differences in explaining students metacognitive components about EFL writing. When the similarities were found, both themes could support each other to draw a unified interpretation about the particular metacognitive component. In contrast, when the differences were found between the quantitative and qualitative themes, the best action taken in this research was critically considering the contextual factors and reviewing the related literature to finally generate the appropriate conclusion about the findings. For more details, the mixed-methods data analysis process on metacognitive components can be traced in section 4 of Appendix 5.