

CHAPTER III

METHODOLOGY

The research as result of study use research method. The research do by collecting the data, analysis data carefully, clearly, systematically, and can be responsible.

A. Research Method

Research method is very important in doing research, it is for getting reliable fact of information. This research is descriptive method. According to Best Descriptive research is concerned with: conditions or relationships that exist; practices that prevail; beliefs, points of views, or attitudes that are held; processes that are going on; effects that are being felt; or trends that are developing. At times, descriptive research is concerned with how what is or what exists is related to some preceding event that has influenced or affected a present condition or event. (Cohen et al. 2007).

While, kind of the research is content analysis. According to Cohen et al. (2007) content analysis is a technique that enables researchers to study human behavior in an indirect way, through analysis of their communications. It is just what its name implies: the analysis of the usually, but not necessarily, written contents of a communication. Textbooks, essays, newspapers, novels, magazines, articles, cookbooks, songs, political speeches, advertisements, pictures, the contents of virtually any types of communication can be analyzed.

This research use descriptive method to know alignment between Indonesia National Examination and Cambridge International Examination IGCSE level. Content analysis was used in this research for analyze each test items of Indonesia National Examination and Cambridge International Examination IGCSE level. By content analysis, researcher able to know level

of alignment between Indonesia National Examination and Cambridge International Examination IGCSE level.

This research is to analyze the alignment between National Examination and Cambridge International Examination in cognitive process dimension and knowledge dimension by Porter Alignment Index method (Porter, 2002). This research method has used by Edward (2010), Polikoff and Porter (2014), and Liu and Fulmer (2008).

B. Research Subject

Research subject in this research means as target of research. The researcher placed Indonesia National Examination and Cambridge International Examination IGCSE level as target to analysis of alignment both of Examinations. Alignment between Indonesia National Examination and Cambridge International Examination IGCSE level in which level both of them have alignment. Cambridge International Examination as a benchmark International can be used for comparison in Indonesia National Examination to improving the quality of test both of them.

C. Research Procedure

1. Preparation Stage

This stage is literature study about Indonesia National Examination and Cambridge International Examination IGCSE level. Then, collect Indonesia National Examination and Cambridge International Examination IGCSE level questions year 2011, 2012, and 2013.

2. Implementation Stage

The first time in this stage is the researcher analysis of content, cognitive process dimension, and knowledge dimension of each test-items. Then, after all of finished in analyzing the researcher propose the result of analysis to five judgments. Next part, the researcher make table of

percentage of content, cognitive process dimension, and knowledge dimension of each test-items every year. The researcher make matrix of Indonesia National Examination and Cambridge International Examination. The last in this stage is make analysis of alignment by Porter Alignment Index.

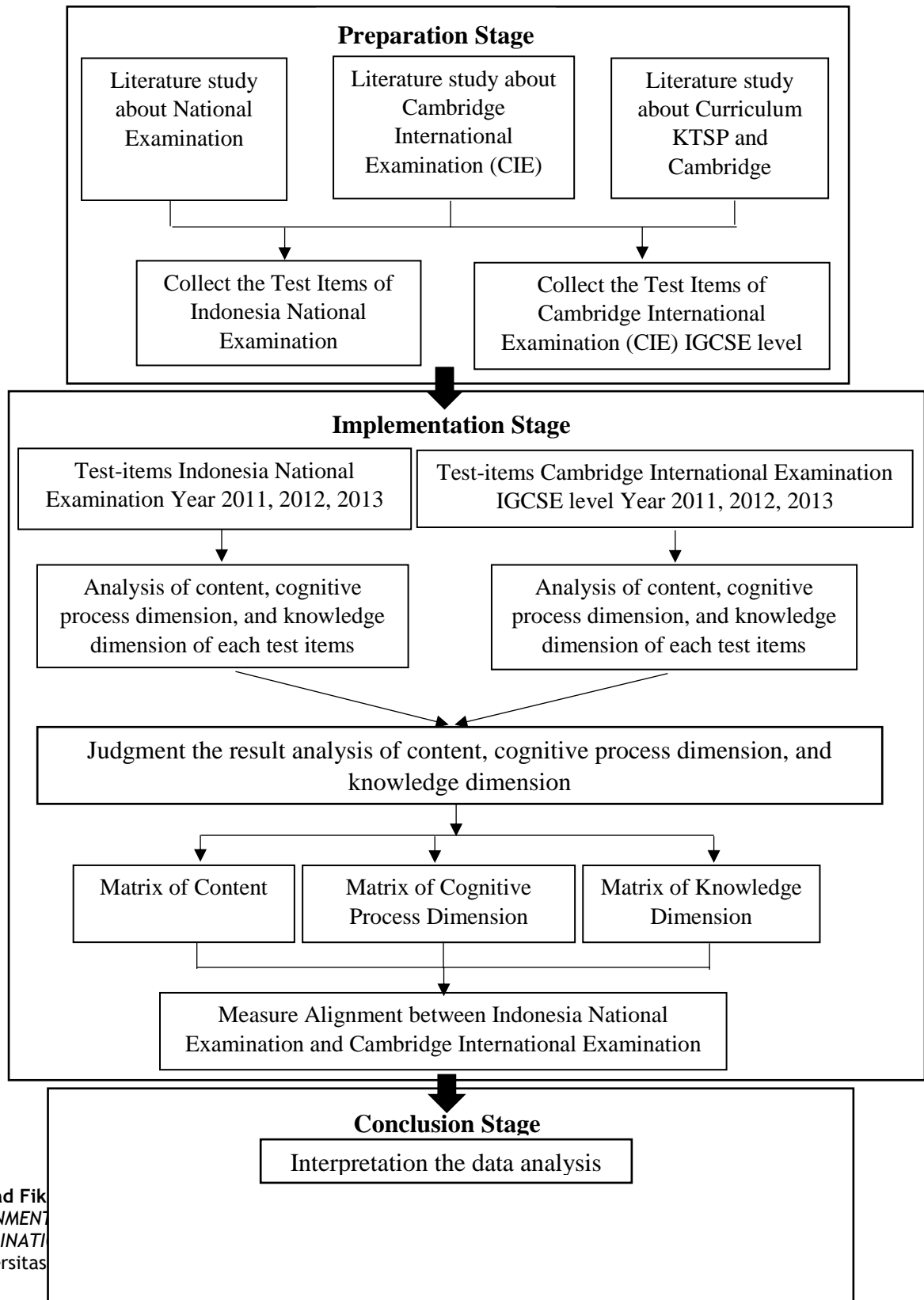
3. Conclusion stage

In this stage, the researcher make interpretation the data analysis with graph and table. Then, researcher think finding result and make discussion based on findings. Next, give a conclusion. The last of this stage, researcher make report of the research.

Briefly, the research procedure illustrated in Figure 3.1

D. Instrument

Instrument that used in this research is document analysis sheet. The document analysis sheet used for make easy in analysis scope of content, cognitive process dimension, and knowledge dimension of Indonesia National Examination and Cambridge International Examination IGCSE level test items. The document analysis sheet helpful to classify the result of document analysis. Document analysis sheet contain table that consist some column. The column that contains the result of analysis data and judgment from five expert. Table 3.1 shows table and column that have classified after judgment conducted.



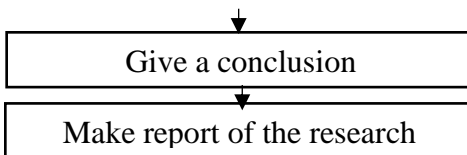


Figure 3.1 Research Procedure

Table 3.1 Percentage of Indonesia National Examination and Cambridge International Examination

		2011				2012				2013			
		INE		CIE		INE		CIE		INE		CIE	
		Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Cognitive Process Dimension	C1												
	C2												
	C3												
	C4												
	C5												
	C6												
Knowledge Dimension	Factual Knowledge												
	Conceptual Knowledge												
	Procedural Knowledge												
Content	Organism and ecosystem												
	Ecosystem												
	Matter												
	Force, motion, and energy												
	Sound and light												
	Electricity and magnetism												

E. Technique of Collecting Data

As explained before, method was used in this research is content analysis. Technique of collecting data in research briefly explained in Table 3.2

Table 3.2 Technique of Collecting Data

No	Data	Source	Technique of Collecting data
1.	The scope of material Indonesia Curriculum	Standard contents and syllabus science in junior high school curriculum KTSP	Content analysis
2.	Indonesia National Examination test items year 2011, 2012, and 2013	Papers of Examination from Pusat Penilaian Pendidikan BALITBANG-KEMDIKBUD	Content analysis
3.	The scope of material Cambridge Curriculum	Syllabus Cambridge IGCSE combined science from www.xtremepapers.com	Content analysis
4.	Cambridge International Examination IGCSE level test items year 2011, 2012, and 2013.	Papers of Examination download from www.xtremepapers.com	Content analysis

This study do to analyze Indonesia National Examination and Cambridge International Examination IGCSE level test items which have collected. The analysis is carried out to find out scope of material, cognitive process dimension, and knowledge dimension. Syllabus and papers of Cambridge

International Examination download from www.xtremepapers.com. As for the document to be analyzed are as follows:

- (1) Indonesia National Examination and Syllabus of curriculum KTSP. Indonesia National Examination from Pusat Penilaian Pendidikan BALITBANG-KEMDIKBUD. The selected test are science Examination of Junior High School year 2011, 2012, and 2013. Based on Indonesia National Examination, test items of each year contains 40 question of multiple choice. While, syllabus of curriculum is analyzed for analyze scope of content or material in curriculum KTSP. Syllabus is published by ministry of education.

- (2) Cambridge International Examination IGCSE level and syllabus Cambridge IGCSE combined science. Cambridge International Examination IGCSE level and syllabus are download from www.xtremepapers.com. The selected test are combined science of secondary education year 2011, 2012, and 2013. Cambridge International Examination IGCSE level contains 40 questions of multiple choice. Then, syllabus of curriculum is analyzed for analyze scope of materials or contents in Cambridge curriculum.

F. Technique of Analysis Data

After researcher collected the data which related with this research, then researcher start to analysis that data. Technique of analysis that used is content analysis method. In this process, things that have to do is classify all of data.

Content analysis is did to analysis the data then simplify it so easily for make interpretation. Technique of analysis data that do in this research are:

1. Analysis Indonesia National Examination test items, steps for analysis data are:

- a. Analysis scope of content, cognitive process dimension, and knowledge dimension. Then, the result of analysis give to five expert judgment. The result of analysis show in appendix C.1.
- b. Then, the result of analysis was reduction in two table matrix. Number of column depend on number of content and number of cognitive process dimension. There are lot of content both of examinations, so the researcher classified content become six categories for be efficient. Table 3.3 will show categories of contents in Indonesia National Examination and table 3.4 categories of contents in Cambridge International Examination. This classified occur on Cambridge International Examination. First matrix of Indonesia National Examination between content and cognitive process dimension, illustrated in table 3.5

Table 3.3 Categories of Content in Indonesia National Examination

No	Contents	Contents in Indonesia National Examination
1.	Organism	mahluk hidup
		kelangsungan mahluk hidup
		pertumbuhan dan perkembangan
		sistem gerak pada manusia
		sistem pencernaan pada manusia
		sistem pernafasan pada manusia
		sistem peredaran darah pada manusia
		struktur dan proses kehidupan tumbuhan
		sistem ekresi pada manusia
		sistem reproduksi pada manusia
		sistem koordinasi pada manusia dan alat indera pada manusia
		pewarisan sifat

2.	Ecosystem	ekosistem
		pengamatan gejala alam biotik dan abiotic
		bioteknologi
		tata surya
3.	Matter	Besaran dan satuan
		suhu dan pemuaian
		asam, basa, dan garam
		unsur, senyawa dan campuran
		zat dan perubahan wujudnya
		kalor
		perubahan fisika dan kimia
		partikel materi
4.	Force, motion, and energy	gerak lurus
		gaya dan percepatan
		usaha dan energi
		tekanan
5.	Sound and light	getaran dan gelombang
		bunyi
		cahaya dan alat optic
6.	Electricity and magnetism	listrik statis
		listrik dinamis
		energi listrik dan daya listrik
		kemagnetan

Table 3.4 Categories of Content in Cambridge International Examination

No	Content	Contents in Cambridge International Examination
1.	Organism	Characteristics of living organisms
		Cells
		Enzymes
		Nutrition
		Transportation
		Respiration

		Coordination and response
		Reproduction
2.	Ecosystem	Energy flow in ecosystems
		Human influences on the ecosystem
3.	Matter	The particulate nature of matter
		Experimental techniques
		Atoms, elements and compounds
		Stoichiometry
		Energy changes in chemical reactions
		Chemical reactions
		Acids, bases and salts
		The Periodic Table
		Metals
		Air and water
		Organic chemistry
		Simple Kinetic Molecular Model of Matter
		Matter and Thermal Properties
4.	Force, motion, and energy	Transfer of thermal energy
		Motion
		Matter and Forces
		Energy, Work and Power
5.	Sound and light	Waves
		Light
		Sound
6.	Electricity and magnetism	Electricity and chemistry
		Electromagnetic spectrum
		Electricity
		Electric Circuit

Table 3.5 Matrix of scope of contents and cognitive process dimension

No	Content	Cognitive Process Dimension						Total
		C1	C2	C3	C4	C5	C6	
1.	Organism							
2.	Ecosystem							
3.	Matter							
4.	Force, motion, and energy							
5.	Sound and light							
6.	Electricity and magnetism							
Total								

Every row fill depend on amount of test items that content the material based on cognitive process dimension. Example, in organism there are two questions that contains C1 of cognitive process dimension, so on row organism and C1 fill number 2 and so on. Completely, matrix scope of contents and cognitive process dimension result of analysis Indonesia National Examination show in Appendix D.1.

Then, second matrix between content and knowledge dimension. Table 3.6 shows the matrix.

Table 3.6 Matrix of scope of content and knowledge dimension

No	Content	Knowledge Dimension	Total
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		Factual Knowledge	Conceptual Knowledge	Procedural Knowledge	Metacognitive Knowledge	
1.	Organism					
2.	Ecosystem					
3.	Matter					
4.	Force, motion, and energy					
5.	Sound and light					
6.	Electricity and magnetism					
Total						

Way to fulfill the row is same with matrix of scope of contents and cognitive process dimension. Completely matrix scope of contents and knowledge dimension result of analysis Indonesia National Examination show in Appendix D.2.

2. Analysis Cambridge International Examination IGCSE level test items, steps for analysis the data are:
 - a. Analysis scope of content, cognitive process dimension, and knowledge dimension. Then, the result of analysis give to five expert judgment. The result of analysis show in appendix C.2.
 - b. Same with Indonesia National Examination, the result of analysis was reduction in table matrix. The matrix Cambridge International Examination of content and cognitive process dimension shows in Table 3.7. Completely, matrix scope of contents and cognitive process

dimension result of analysis Cambridge International Examination show in Appendix D.3.

Table 3.7 Matrix of scope of contents and Cognitive process dimension

No	Content	Cognitive Process Dimension						Total
		C1	C2	C3	C4	C5	C6	
1.	Organism							
2.	Ecosystem							
3.	Matter							
4.	Force, motion, and energy							
5.	Sound and light							
6.	Electricity and magnetism							
Total								

Then, matrix of content and knowledge dimension of Cambridge International Examination shows in Table 3.9. Completely, matrix scope of contents and cognitive process dimension result of analysis Cambridge International Examination show in Appendix D.4.

Table 3.8 Matrix of scope of content and knowledge dimension

No	Content	Knowledge Dimension	Total
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		Factual Knowledge	Conceptual Knowledge	Procedural Knowledge	Metacognitive Knowledge	
1.	Organism					
2.	Ecosystem					
3.	Matter					
4.	Force, motion, and energy					
5.	Sound and light					
6.	Electricity and magnetism					
Total						

3. Measure Alignment index with Porter Alignment Index. Porter Alignment Index measure from matrix proportion of content and cognitive process dimension. And also from matrix proportion of content and knowledge dimension to measure alignment of knowledge dimension. Then, the number fill to formula of Porter's Alignment Index. The formula is:

$$P = 1, 0 - \frac{\sum|x-y|}{2}$$

Notes:

P = Porter's Alignment Index

x = proportion cell of assessment

y = proportion cell of standard

The values of Porter's Alignment Index ranges from 0 (no alignment) to 1 (perfect alignment) (Firman, 2013; Porter, 2007), with criteria as follows:

$P < 0.5$: low level of alignment

$0.5 < P < 0.66$: moderate level of alignment

$0.6 P > 0.66$: high level of alignment

(Oktariani, 2014; Fonthal, 2004)

In addition, this research measure proportion of each Examination. The ways is calculate the difference in total for each component matrix.