

Analysis of Structure and Content Chemistry for Class XII using the Model of Educational Reconstruction (MER)

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Abstract—This study aims to analyze the structure and content of the XII grade SMA / MA chemistry subjects using the Model of Educational Reconstruction (MER). This model consists of 3 components, namely: content structure analysis, teaching and learning research and learning development and evaluation. This research is limited to the content structure analysis stage only. Data were collected through documentary studies from various written sources. The documents used are a copy of the Minister of Education and Culture Regulation number 37 of 2018, the revised bloom taxonomy, XII grade high school chemistry books and university standard textbooks. Based on the results of the structural analysis, there are 10 basic competencies that need to be improved from the 11 existing basic competencies, and the results of the content analysis result in material content that needs to be improved, namely regarding the equalization of redox reactions.

Keywords— Structure, Content, Model of Educational Reconstruction, Copy of Permendikbud, bloom taxonomy

I. INTRODUCTION

Education is the main foundation for improving the quality of human resources. The government continues to make efforts to improve the quality of education. This is done by changing the education system from period to period, but has not shown significant progress. The results of reports issued by TIMSS (Trends in International Mathematics and Science Study) and PISA (Program for International Student Assessment) state that the learning outcomes of Indonesian children are only in the top six from the bottom (PISA 2018 result). Responding to this, (Isjoni 2005) revealed that various educational policies have been implemented by the Indonesian government, one of which is the change and improvement of the curriculum.

The curriculum reflects the nation's philosophy of life, in which direction and how the form of life will be determined by the curriculum used by the nation. Every curriculum that has been applied in Indonesia from the period before 1945 to the 2013 curriculum has several different systems. Differences in the system that occur can be either the advantages or disadvantages of the curriculum itself. These weaknesses and strengths can come from the foundation, components, evaluation, principles, methods, and curriculum development models.

To correct existing deficiencies, according to Law of the Republic of Indonesia Number 20 of 2003 article 57 paragraph 1 Evaluation is carried out in the context of controlling the quality of education nationally as a form of accountability for education providers to interested parties, a new curriculum is expected to be compiled. with the needs of society and the

demands of the times. The whole series of curriculum changes that have been carried out by the government and based on the results of the national education assessment (National Assessment) are only the 1975 curriculum and the PPSP curriculum (Project Perintis Sekolah Pembangunan (1974-1981). The rest are changes based on theoretical assumptions, not on the basis of findings. -the findings of the evaluation were carried out systematically (Soedijarto: 2008).

The current curriculum applied in Indonesia is the 2013 revised Curriculum 2013. Since its implementation until now the 2013 curriculum has undergone four improvements, namely in 2014, 2015, 2016 and 2018. The Minister of Education in the Kemendikbud bulletin once said that the 2013 curriculum improvement was almost complete, means not finished.

Based on these problems, reviewing every application of the curriculum that is applied especially to the content and structure of the curriculum is of course very necessary in order to obtain a change which is expected to change the world of education in Indonesia for the better.

II. METHODS

A. Research Design

The type of research is a descriptive study with qualitative data collection techniques. Descriptive research is one type of research that aims to describe systematically, factually and accurately about the facts and characteristics of certain populations, or to try to describe phenomena in detail (Sukmadinata, 2011).

The design of this study used a modified educational reconstruction model (MER). This model consists of three components, namely: content structure analysis, teaching and learning research (empirical studies), and learning development and evaluation (teaching reconstruction). (Duit,2012).

The discussion of this research is focused on the analysis of structure and content which includes: literature analysis, clarification of basic content (clarification of original text), and text modification stage (deletion and insertion). The structure and content analysis in this study is broadly carried out by analyzing the Ministry of Education and Culture's policies and the scientific content is analyzed based on standard textbooks.

Analysis stages:

1. Structure Content analysis

In the content structure analysis, 4 stages were carried out, namely literature analysis, research trials with a series of interviews, clarification of the content structure, and modification of the content structure. At the literature analysis stage, a review of the 2013 revised 2018 chemistry curriculum and high school chemistry textbooks from the Ministry of Education and Culture was conducted. The study was carried out on KI and KD to analyze the curriculum structure in the cognitive and psychomotor domains which refers to the Revised Bloom Taxonomy. In a review of the SMA Chemistry textbook from the Ministry of Education and Culture, a study was carried out on the coverage of chemistry material in class XII SMA / MA. High school textbook review is carried out to limit the material studied at the SMA level.

Furthermore, a test was conducted on the structural analysis of the KI and KD analysis in accordance with the revised Bloom Taxonomy by involving a chemistry teacher. Then the structure and content clarification stage is carried out by clarifying the results of the structural analysis which refers to the revised Bloom Taxonomy, while the content analysis refers to the chemical standard textbook. In the structure and content modification stage, the results of the structure and content clarification are modified, by refining and inserting the points to be fixed based on the results of the structure and content analysis.

2. Construction of the results of the structure and content analysis

At this stage, the construction of the structure and content that has been modified is carried out so that the structure and content of the construction result are produced.

B. Data Collection Techniques

Data collection technique in this research is through documentation study. In the documentation study, information was obtained from various written sources. Documentation studies are carried out by collecting documents and data that can support research that is reviewed in depth. Documents used in this research include: a) Copy of Permendikbud No.21 of 2016

concerning Content Standards; b) Copy of Permendikbud Number 37 of 2018 concerning Core Competencies and Basic Competencies; c) Revised Bloom's Tasonomi; d) Class XII high school chemistry book which was approved by the Ministry of Education and Culture; and e) Standard chemistry textbooks

III. RESULT AND DISCUSSION

The results of the study were a description of the content structure analysis using the Model Of Educational Reconstruction (MER) in the 2013 Revised 2018 curriculum in class XII SMA / MA. The results of the research include: (1) Analysis of Core Competencies 3; (2) Analysis of Core Competencies 4; (3) Analysis of Basic Competencies; (4) Analysis of the Relationship between KI and KD; (5) Analysis of the Suitability of the Order of Chemistry Subject Textbooks with Books Standard Text, as well as; (6) Relationship of IP, KD and Material. Following are the findings, analysis and discussion of the research.

A. Core Competency 3 Analysis

Core competency 3 contains competencies that students must achieve from the aspect of knowledge. Core Competency Analysis 3 is carried out by describing the meaning of each word contained in the formulation of core competency 3 for class XII SMA / MA 2013 revised curriculum listed in Permendikbud No. 37 of 2018. The competencies expected in the 2013 Revised curriculum refer to the Revised Bloom Taxonomy which separates the dimensions of knowledge (knowledge) and dimensions of cognitive processes (Widodo, 2005: 63). As well as a scientific attitude in the form of increased student curiosity.

The cognitive dimensions expected in class XII SMA / MA start from the level of understanding (C2), applying (C3), analyzing (C4), and evaluating (C5). In each cognitive dimension, there are several operational verbs that can be used according to scientific needs, while the expected knowledge dimensions include factual, conceptual, procedural and metacognitive knowledge. The four dimensions of knowledge are related to the cognitive dimension, so that 56 components of core competencies 3.

These 3 core competency components describe the relationship between the dimensions of knowledge and the dimensions of cognitive processes that must be achieved by students in accordance with the basic competencies of each material presented in the revised 2013 curriculum. The KI 3 component is used as a reference in classifying the cognitive dimensions and the dimensions of basic competency knowledge contained in chemistry subjects in class XII SMA / MA in the 2013 revision of the 2018 curriculum.

B. Core Competency 4 Analysis

Based on the formulation of Core Competency 4, it can be seen that there are two dimensions of skills, namely abstract skills and concrete skills. Abstract skills which consist of processing, reasoning and presenting were developed by Dyers. For imitation, manipulation, precision, articulation and naturalization concrete skills developed by Dave and perception, readiness, guided response ., The mechanism, complex visible response, adaptation and creation was developed by Simpson. If linked between sentences of the dimensions of abstract skills and concrete skills, thirty-six components of Core Competency 4 are obtained. The components of Core Competency 4 will be used to classify basic competency skills in class XII SMA / MA.

C. Basic Competency Analysis

The analysis was carried out focused on the competence of knowledge and skill competencies contained in the basic competency formulation of chemistry subjects for class XII SMA / MA. The analysis was carried out by clarifying the suitability of the dimensions of cognitive processes and skill activities in the basic competencies in class XII SMA / MA with bloom taxonomy and skill dimensions. The basic competency formulations in class XII SMA / MA contained in the 2013 Revised Curriculum total 11 basic competency formulations. Of the 11 existing basic competencies, 10 of them have experienced improvements because the coverage of the cognitive level is too broad.

D. Analysis of the Relationship between Core Competencies and Basic Competencies

Based on the results of the analysis of the relationship between the components of Core Competency 3 and Basic Competencies, there are every Basic Competency that represents the cognitive level from understanding to analyzing, and there are no Basic Competencies that represent the cognitive level of evaluating. Then the formulation of Core Competency 3 that is

suitable is Understanding, applying, and analyzing factual, conceptual, procedural, and metacognitive knowledge based on his curiosity about science, technology, arts, culture and humanities with insights into humanity, nationality, statehood and related civilizations. causes of phenomena and events, as well as applying procedural knowledge to specific fields of study according to their talents and interests to solve problems.

E. Sequence Analysis of Chemistry Textbook Material with Standard Textbooks

The analysis of the order of the material in the chemistry textbooks approved by the Ministry of Education and Culture aims to see the suitability of the material order and its completeness with the main material on basic competencies and to see the suitability of the order of the textbook materials in chemistry class XII SMA / MA class with the order of the material in the standard textbook. The standard textbooks used are Chemistry 10th Edition by Raymond Chang and Chemistry: Matter and Its Changes by James Brady.

F. Relationship between Core Competency, Basic Competence and Material

The final step in this research is to connect all the components that have been analyzed. The first analysis carried out was an analysis of the formulation of the Core Competencies contained in Permendikbud No. 37 of 2018 class XII SMA / MA. From this analysis, it is found that the components of KI 3 and KI 4 must be achieved by students. Furthermore, an analysis of the basic competency formulations for class XII SMA / MA is analyzed and then connected with the appropriate KI 3 and KI 4 components. The next analysis was carried out on the order of the material, its breadth and depth in the chemistry textbooks for class XII SMA / MA which were clarified using the chemistry university textbooks. After everything has been analyzed, it is necessary to have a summary of all the results of the analysis.

IV. CONCLUSION

Based on the research data, it was found that the structure of the chemistry curriculum, namely the formulation of Core Competencies (KI) and Basic Competencies (KD), needed improvement. Likewise, the curriculum content has also improved.

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