ANALYSIS OF CHEMISTRY TEXTBOOK BASED ON CURRICULUM 2013

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Abstrak: Buku teks dan kurikulum dianggap sebagai alat pendukung bagi guru. Khusus perubahan kurikulum menjadi kurikulum 2013, buku teks yang digunakan guru dan siswa harus memenuhi standar sesuai kurikulum 2013. Tujuan dari penelitian ini adalah untuk menganalisis buku-buku kimia yang digunakan oleh sekolah binaan di sekolah menengah atas dan sekolah menengah kejuruan. Jenis penelitian ini adalah penelitian deskriptif dan pengumpulan data dilakukan dengan wawancara kepada guru kimia dan angket untuk menganalisis buku-buku kimia topik larutan elektrolit dan nonelektrolit. Analisis dilakukan terhadap empat jenis buku kimia dengan penerbit yang berbeda. Dari hasil analisis, buku A dikategorikan layak digunakan dengan persentase kelayakan sekitar 81,6%, buku B memiliki persentase 74% dikategorikan cukup layak, buku C dengan persentase 50% dikategorikan tidak layak dan buku D dengan persentase 35% dikategorikan tidak layak. Kelayakan buku teks untuk digunakan hanya buku A dan B.

Kata Kunci : Analisis, Buku Teks Kimia, Kurikulum 2013

Abstract: *Textbooks and curriculum are considered as support tools for teacher. Especially a recent change in curriculum become curriculum 2013, textbooks that used by teachers and students must meet standards according to the 2013 curriculum. The purpose of this study is to analyze the chemistry books used in senior high school and vocational high school. Type of this research is descriptive research and data collection is done by interviewing chemistry teachers and questionnaires to analyze chemistry books in topic electrolyte and nonelectrolyte solution. Analysis was carried out on four types of chemistry books with different publishers. From the results of the analysis of book code A categorized as feasible to use with a feasibility percentage of about 81.6%, book B has a percentage of 74% categorized as quite feasible, book C with a percentage of 50% is categorized as inappropriate and book D with a percentage of 35% is categorized as unfeasible. Textbooks eligibility for use only books A and B.*

Keywords: *Analysis, Chemistry Textbook, Curriculum 2013*

INTRODUCRION

Efforts to improve the quality of education are continuously carried out by the government. One of the way that used are develop a curriculum that is used nationally, this is also done in all countries in the world (Khaddoor et al., 2017). The curriculum currently being implemented is the 2013 curriculum, to achieve this goal in the learning process in the classroom the teacher must also have the competence to teach students according to the applicable curriculum characteristics (Dagher & BouJaoude, 2011). Besides the curriculum, development is also carried out on teaching materials, learning models and evaluation / assessment systems so that they can compete globally.

According to Leshin's taxonomy, learning media can be classified into: 1) Human-based media, such as teachers, instructors, tutors, role playing, group activities, etc., 2) Print-based media, such as books, guides, work / exercise books, and loose sheets, 3) Visual-based media, such as books, charts, graphs, maps, figures / images, transparency, film frames or slides, 4) Audio-visual media, such as videos, films, films along with tape, television, and 5) Computer-based media, namely teaching with the help of computers and interactive videos (Arsyad, 2010).

Learning media used in schools are teaching materials in the form of textbook. The teaching material used must be in accordance with the development of learners, interactive and student-centered learning (Marpaung & Azzajjad, 2020), so that it can help understanding chemical concepts that will improve student learning achievement can improve understanding of the material by students overall (Lamb & Annetta, 2013). With the existence of textbooks, teachers and students will be helped in expediting the learning process. Textbooks are one means of successful teaching and learning (Lamb, 2013). The success of the teaching and learning process depends on the way the teacher creates a fun classroom atmosphere, makes students more active, creative and innovative (Marpaung, 2019).

Chemistry subject is one of the compulsory subjects in high school in the Natural Sciences specialization group also in vocational high education. Chemistry is one of the subjects that is less desirable by students, because it is one of the subjects that is not easy to understand by students so that many senior high school students who have difficulty learning chemistry (Rusianti et al., 2019). Mudlofir stated that the problem often faced by teachers is that teachers provide teaching materials that are too broad, too little, too deep, too shallow, and not in accordance with the competencies students must achieve, and finally they are lack of knowledge (Mudlofir, 2011; Khasanah et al., 2017; Kahveci, 2010; Gilbert et al., 2011).

Based on the results of interviews with teachers in senior high school and vocational high school the textbooks used consisted of three types of curriculum-based chemistry books originating from different publishers. This happens because the chemistry books used have their advantages and disadvantages in terms of the curriculum applied. To find out the quality of each book that is used it is necessary to do an in-depth analysis using assessment criteria set by the government. Textbooks that have been circulating at school often draw criticism when viewed in accordance with curriculum demands and concept truth (Pun, 2019). The truth of the concept is an absolute requirement that must be met by a teaching material (Muslich, 2010). Besides the concept, in the 2013 curriculum students are also expected to develop their soft skills by bringing up character education in chemistry books. the presentation of material in textbooks tailored to character education will be very helpful in internalizing character values (Marpaung et al., 2019). This is further strengthened by the issuance of Minister of Education and Culture Regulation No. 20 of 2018 concerning Strengthening Character Education in Formal Education Units (Anwas, 2016; Permatasari et al., 2019).

The success of students in learning is not only seen from the results of learning, but also now the most important is the character of these students (Leonard, 2018). Among them are seeing, (1) the suitability of the contents of teaching materials with Graduate competence standard, main competence and standard competence, (2) integration of concepts / topics, and (3) the suitability of the contents of teaching materials with the concept of scientific approach. The suitability of the contents of the book, that the chemistry book, which is in line with the demands of the 2013 curriculum (Laksono et al., 2016). Besides that especially in electrolyte and nonelectrolyte topic, students must master the competence consisting of. Received, ask questions, collect information, associate, communicate.

So the chemistry books used at school need to be analyzed, the material being analyzed is the topic of electrolyte and non-electrolyte solutions. The analysis carried out in this textbook aims to be one way to improve the quality of learning in chemical materials, especially electrolyte and non-electrolyte material to fit the 2013 curriculum criteria in accordance with developments made by the government.

METHOD

Type of this research was descriptive research. The research data were obtained from the analysis of grade X chemistry senior high school and vocational high school textbooks based on the 2013 curriculum of four books.

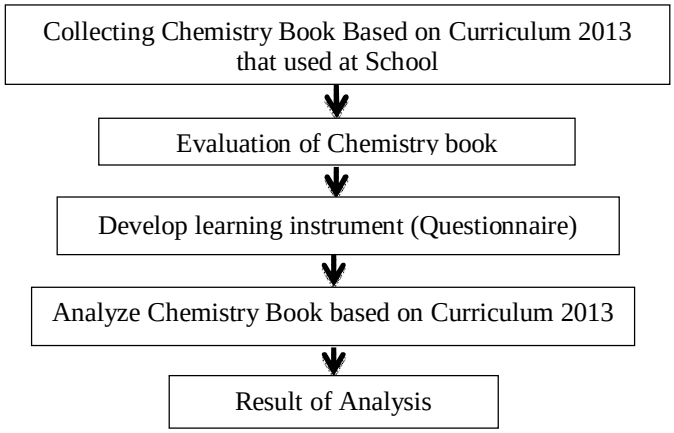

Figure 1. Research Procedure

The feasibility of the book was obtained from the results of a questionnaire given by researchers to chemistry lecturers and chemistry teachers. The procedure of the research conducted can be seen in Figure 1.

Percentage of quality of teaching materials books calculated using the equation below.

$$\%P = \frac{total\ score\ from\ data\ collection}{score\ criteria}\ X\ 100\%$$

Noted :
P : Percentage of sub variables
Criteria : Highest score X number of aspects X amount respondent.

To determine the quality of the book being analyzed, there are a number of categories that support the quality of the book, which is seen from the percentage of data analysis results from a questionnaire that has been collected by researchers. The categories of books according to the curriculum analyzed can be seen in the Table 1.

Table1. Teaching Material Suitability Assessment Category

Percentage	Quality Category
21≤ Ps≤ 40	Bad
41≤ Ps≤ 60	Less
61 ≤ Ps≤ 80	Enough
81≤ Ps≤ 100	Good

RESULT AND DISCUSSION

Results

The activity carried out for the first time by researchers interviewed chemistry teachers in the research target schools. This is done to find out what teachers need to implement the 2013 curriculum in the classroom to provide material during the teaching and learning process by implementing the 2013 curriculum that is in accordance with the advice of the minister of education, then looking for chemistry books used by teachers for students as learning resources using textbooks for high school chemistry based on the curriculum 2013.

From the results of interviews conducted with teachers, the high school chemistry books used by teachers and students have used the 2013 curriculum, but the chemistry books used come from four different publishers consisting of Esis, Yudhistira, Tiga Serangkai and Yrama Widya. The researcher then analyzed the book with a questionnaire guide that had been prepared based on the book content criteria adjusted to the 2013 curriculum. The results of the analysis of the four books are listed in Table 2.

Tabel 2. Analysis of Chemistry Textbook Based on Curriculum 2013

No.	Name of Book	Chapter	Pages	Publisher	Category
1.	Chemistry 2B for Senior High School Grade X Semester 2 (A)	Chapter V Subchapter 1) The concept Solution 2) Determining the pH of salt solutions 3) Electrolyte in daily life	15 Pages	Esis	Good
2.	Chemistry for Senior High School Grade X (B)	Chapter VI Subchapter 1) Element of solution 2) electricity 3) strength of solution 4) formation electrolyte compound	14 Pages	Yudhistira	Enough

3.	Theory and Application of Chemistry for Grade X (C)	Chapter VII Subchapter 1) Electrolyte and Non Electrolyte Solution 2) Grouping Electrolyte solution based on Electricity 3) Electrolyte solution based on bonding	12 Pages	Tiga Serangkai	Less
4.	Bilingual Chemistry For Senior High School Grade X Semester 1 & Semester 2 (D)	Chapter V Subchapter 1) Conductorand Isolator 2) Definition Electrolyte and Arrhenius's Theory 3) Electrolyte Tester 4) Electrolyte intensity	12 Pages	Yrama Widya	Bad

Based on the result of survey, there are four chemistry textbook that analyzed and it is given name textbook code A, code B, code C, and code D in Table 2. The researcher was analyzed the chemistry topic of Electrolyte and Non Electrolyte Solution in grade X at even semester for all target textbooks which appropriate with description criteria. The researcher assessed the textbooks by checking list (√) in appropriate column of the questionnaire.

Table 2. Result of Analysis Chemistry Textbook

No.	Criteria	Book A		Book B		Book C		Book D	
		ΣStatement	**%**	**ΣStatement**	**%**	**ΣStatement**	**%**	**ΣStatement**	**%**
1	Content	3	75	3	70	2	50	2	50
2	Extension	3	84	1	60	2	50	1	25
3	Depth	3	82	2	80	2	50	1	25
4	Design	3	85	2	85	2	50	2	50
5	Language	3	80	3	75	2	50	1	25
	Average (%)	81.6		74		50		35	

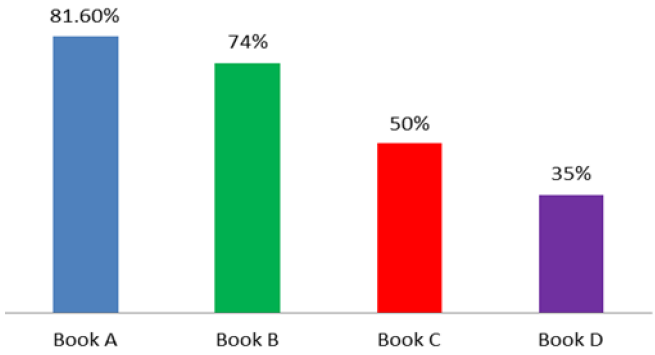

Figure 2. Percentage of Book Analysis

Based on the result of description analysis in the table 2 above shown and could be known that the comparison of percentage suitibility for all target textbooks., it could be seen that good textbook that have analyzed was the textbook code A 81.6% then followed the textbook code B 74%, textbook code C 50% and textbook code D 35%. It means that the textbook code A were better than textbook code B and It better than textbook C and D on topic Electrolyte and Nonelectrolyte Solution. Among chemistry textbook two of them was appropriate as a good enough to use as a references for student's or teacher which is book A and B, but two of them still need revised to make easy to understand and make it more interactive because it is categorized as not good enough textbook for book C and book D.

Discussion

The renewal of the curriculum carried out by the government leads to all aspect. One of the most influential aspects is the book as a source of learning, so that all stakeholders must think about the availability of textbooks that should be used by students and of course based on the 2013 curriculum which is currently being used. There are many books available in the market according to the 2013 curriculum, but the contents of the book are still incomplete if reviewed based on the context determined by the government, for example textbook must contain the ability of students to think critically, improve the character of education. So it is necessary to do an analysis in order to student needs that are in accordance with the current curriculum.

Curriculum as a key concept for teacher to design learning process both in preparing of material and decision making what will they give for students. Textbook as a learning material and curriculum must be synchronized and teacher also must improve their teaching skill that called pedagogic which is containing of three aspects that consist of evaluation, implementation and evaluation. Especially for science teacher, teacher must design learning process due to government regulation (Davis et al., 2016), where teacher must implement curriculum 2013 based on step that government already stated. Curriculum applicable in all country in the world that used as an indicator to describe student outcomes and competence (Giuliani et al., 2020). So teacher must analyze all the aspect that can support student learning outcomes that is for textbook.

Analysis conducted on many textbooks is done by researchers especially textbooks for high school, the material that take is electrolyte and nonelectrolyte solution. This is must done to make sure the contents of the textbook are in accordance with the character of learning for students based on curriculum 2013. Some of the analyzes carried out include, analyzing learning concepts , non-textual elements in textbooks, visual representation, how integrated concepts, learning content or learning text analysis (Vojíř & Rusek, 2019). Researchers also analyzed in terms of the content in depth, extension, depth, design and language of the book. Appropriate learning media can make students motivated to follow the learning material delivered by the teacher and be enthusiastic about receiving material from the teacher (Pongkendek et al., 2019; Kahar, 2018).

The curriculum design as outlined in the textbooks used in schools must be able to make students more active and creative. While the results of interviews with chemistry teachers regarding the book used are still far from expectations if viewed from aspects of the 2013 curriculum that should be in the book. So that if this continues then students will only be able to memorize only when using books but still cannot apply the knowledge they get from the teacher (Ardianto & Pursitasari, 2017). The knowledge gained by students is not enough, they also be preparing with the educational character which is independent, responsibility, curiosity, creative, and hardworking. This condition also must support by facilitating teacher training in curriculum 2013. Terms of curriculum use are recommended to improve teachers' ability to use curriculum (Chen et al., 2019) especially curriculum 2013. In curriculum 2013 teacher must design the situation in learning activity to improve student thinking to think critically. science material that given by teacher to the student must raise student creativity to improve student problem solving with variation strategic (Florentina & Leonard, 2017). This aspect must be done on the textbook.

Result of analysis from four textbook that good category is from Esis publisher with percentage 81.6% and suitable based on curriculum 2013. Book from Esis become good because the content is completely and completeness by student character and also when student read the book able to increase student critical thinking. Findings of Laksono (2016), average the results of all aspects of book analysis are categorized suitable according to the 2013 curriculum, 82,14% (Jati Laksono et al., 2016). The textbook used must be in accordance with the curriculum although there are still a number of books found in some publishers that are still not in accordance with the 2013 curriculum. The 2013 curriculum is designed so that students can have good competence in terms of the ability to think critically, observe, communicate, and solve problems finding something during learning takes place. Beside that the content of the textbook able to activated student from the question that take place on book (Overman et al., 2013). So students can investigate new things they get in school because curriculum 2013 emphasizes student-centered learning not teacher. Teacher as a professional educator should prepare and choose which book that effectively applicable in which activities student able to develop their own ideas and exploring what they have (Vos et al., 2011)

Chemistry textbook with curriculum 2013 for topic electrolyte and nonelectrolyte solution that was analyzed by researcher, suggested that the good chemistry textbook to use only book in code A and B. where the content of the book have been facilitated with student activity that already determined by government in curriculum 2013 for example students doing observations, asking questions, and making sense of the knowledge being taught. Beside that book also completed with integrated themes in order to have knowledge about the environment, life, and have a strong personal foundation in social life, better creativity and completely with From the research books based on curriculum 2013 can meet government standards only from two publishers including Esis and Yudhistira while from Tiga Serangkai and Yrama widia need to be developed.

CONCLUSION

Result of book analysis from four publisher find that book code A is 81.6%, categorized as a good book because met requirement of curriculum 2013 and already good in core competency, basic competency, feasibility of content, design presentation, and feasibility of language. Code B2 is 74% categorized suitable enough and still quite good to used, code B3 is 50% less suitable and not suggested to use. And the last book is code B4 is 35% is bad , because the content of the book not too depth, language that used not interactive and far from requirement based on curriculum 2013, so it needs to be revised and suitable to use as a learning media in learning process. Book that suggested use for topic electrolyte and nonelectrolyte solution are book A dan B.

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