

ANALYSIS OF THE TEACHING AND LEARNING IN CHEMISTRY CLASS X VOCATIONAL HIGH SCHOOL ACADEMIC YEAR 2015/2016

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Abstract- This study aims to analyze teaching material, syllabus, lab activities and supporting infrastructure learning in SMK Wira Karya Mandiri. The population was grade X-TKJ SMK Wira Karya Mandiri in the academic year 2015 / 2016. Data analysis techniques used in this research were descriptive analysis and percentage. The instruments used to analyze infrastructure learning was observation sheet, and then syllabus, teaching material, and lab activities data collected by distributing questionnaires to students and teachers. It was found that: (1) The eligibility of the lab chemistry workbook and chemical laboratory equipment in SMK Wira Karya Mandiri is categorized as Pretty good (2.77), and (2) the students learning activities were affected by teachers performance and instructional media.

Keywords: chemical laboratory equipment, lab activities, and teaching materials

1. INTRODUCTION

Chemical Learning emphasizes providing direct learning experience through the use and development of process skills and scientific attitude so that the learning objectives can be achieved at an optimal chemical [1]. Teachers and students as the main character plays an important role in education. Teachers are responsible for the transmission of knowledge. Measures teaching activities associated with the presentation of mental students in order to find an input to develop a theory [2].

The standard curriculum regarding chemical sciences are introduced in three sequence, among others; structure, reactivity, and quantitative [3]. Related to learning facilities, textbooks is one of the important access to education in the national education. This was stated one of the efforts to improve the quality of education is through the provision of quality learning materials [4].

To achieve good learning outcomes can be done in a way to train students to develop skills (listening, say, read, and write) as well as critical thinking [5]. This way of thinking students more extensively with group discussions. The approach is done in a specific manner to analyze the level of difficulty of learning [6].

With the motivation of learning in students activities become more interesting and involving a positive thing [7]. As big students find motivation for the school, as well as the activities of the students understand the usefulness of teaching chemistry they get in school [8].

Skills are expected to develop cooperation achieve better results. The lesson is a pedagogy that providing experience and skills properly studied chemistry [9]. One of them with the teaching of chemical sciences (science) to prepare about improvement, but concern for the students' preparation to cope with change and challenges around the neighborhood. The chemistry is usually centered on the acquisition of content with less emphasis on the development of attitudes and scientific skills. Teachers as introductory material as well as learning mediator moderator [10].

2. METHODS

This research is descriptive. Because, mini research study conducted through a limited basis. Mini research conducted at the vocational high school (SMK) Wira Karya Mandiri Jl. Struggle No. 215 Desa Tanjung Selamat district. Sunggal Kab. Deli Serdang, North Sumatra in the first half FY 2015/2016 on September 22, 2016.

The population in this study were all students of SMK Wira Karya Mandiri Class X FY 2015/2016 and teachers of chemistry. The samples used were 1 teacher (chemistry teacher) and 25 SMK Students Semester I. Instrument Research conducted among others; (1) The study consisted of Syllabus and Subjects, (2) data collection instruments, namely Questionnaire and interviews.

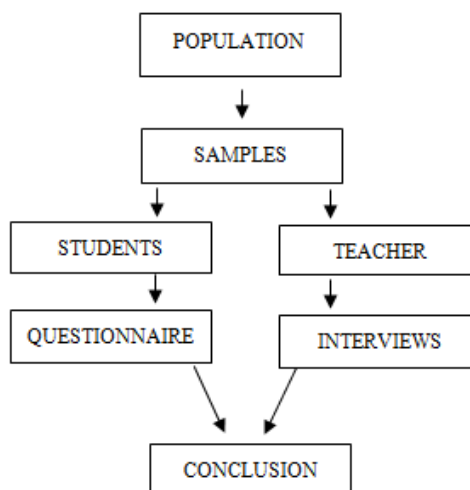


Figure 1. Schematic of Research Activities

Data analysis technique used in this research is the analysis mini descriptive and percentage. Data were analyzed with descriptive techniques include (1) Analysis of the School of Chemistry Textbook At this stage of the study of chemistry in school textbooks. Chemistry textbooks were selected from two different publishers for analysis. Aspects that will be examined include: the design of chemistry textbooks, learning objectives tailored to SK/ KD (Curriculum KTSP) and KI/ KD (Curriculum 2013) for a chemical material a semester. Additional information as an adjunct to improve the quality of learning chemistry also obtained from the interview with chemistry teachers and students.

The descriptive analysis of quantitative data obtained in this study comes from the analysis of questionnaire items is calculated as a percentage. Test the validity of the questionnaire obtained in this study is qualitative data which is processed from the answers to the questionnaire by the teacher about the existence of chemical and chemical laboratory equipment in schools.

Data questionnaire was analyzed with steps - steps as follows: (a) Data obtained in the form of a checklist, which are summarized in tabular form. Grading scale used is 1 to 5 with the caption: (1) not good; (2) less good; (3) Good Enough (4) good and (5) Very good. (b) Adjust the results of the feasibility analysis of the data with numbers in the table. (c) Drawing conclusions from data analysis.

Each item questionnaire value is calculated using the formula: A determination of the questionnaire score can be known through the highest score range is reduced on average used can be seen in Table 1.

Table 1. Eligibility Criteria Presence and Laboratory Equipment Chemistry

No.	Mean	Variable Criterion
1	>4,2 s/d 5,0	Very Good
2	>3,4 s/d 4,2	Good
3	>2,6 s/d 3,4	Good Enough
4	>1,8 s/d 2,6	Less Good
5	□ 1,0 s/d 1,8	Not Good

3. RESULTS AND DISCUSSION

3.1 Analysis Chemistry Book Publishers A

Before doing a mini research, first performed an analysis of the chemistry book publisher A. Books chemical analysis to discuss the materials and materials chemistry lab concerning class X. Based on the analysis of the range of material and lab (practicum breadth, the suitability of SK and KD and indicators). The chemical materials including: (1) Introduction to Chemistry (2) Material and its amendment (3) Formulas and Equations Chemical Reactions (4) Atomic Structure and Periodic System (5) Institute of Chemistry (6) Calculation of Chemistry. Fatherly chemistry lab activities based on the book: (1) Observing changes in physical and chemical changes (2) Investigate the enactment of conservation of mass (3) Prove occurrence and rustiness prevention (4) Investigate the polarity of

various molecular compounds. Textbooks used only four times the experiment is based on the subject matter of chemistry.

Systematic presentation of the teaching material does not include the depth of the material presented. However, examples and insight presented sufficient support for the learning process. Both figures and tables supporting digunkan chemical materials appropriately. At the turn of the material to be covered there is a summary of the material before and continued with exercises and tests of understanding the material. The book is presented not quite adept at creating news discourse related to the application of chemical materials to the environment and the benefits of learning the material. Likewise with practicum presented understanding of the material, signs of dangerous materials and no working procedure is still ambiguous pemahamnya. Books and practical guidance should be a matter of understanding the concept of the use of chemicals on the surrounding environment. In addition, the presentation of the book to be innovative and creative that will affect the growing work ethic of creative and critical thinking of the results of their study.

3.2 Interview

Results of interviews that have been conducted by teachers of chemistry SMK Wira Karya Mandiri Tanjung Selamat and one teacher, the results data obtained them; (a) Syllabus and Distribution of Subjects by SBC. The distribution of subjects as follows: (1) Role of Chemistry in life (2) Atomic Structure and Periodic System Elements (3) Institute of Chemistry (4) Electrolytes and Non-Electrolytes Solution and (5) Oxidation Reduction Reactions. (b) Evaluation and Assessment System test subjects conducted in mid and end of the semester. Held two times each semester exam / evaluation. The exam consists of a combination of all the subjects contained in half a semester. If students do not complete the test (UTS/ UAS), the students are obliged to follow remedial implemented after the UAS in each semester. (c) textbooks are used as a reference is the book *Chemistry For Class X SMK and MAK*. (d) Infrastructures on learning activities in schools Wira Karya Mandiri (Jl. Struggle). The facilities available at the school include: classrooms, library, chemical laboratory, nursing lab, computer lab, staff room, den leaders and employees, rooms, halls, toilets, canteen, field of Sports and a parking lot. Student learning space level I and II. On the first floor which comprises 12 local and capacity of 45 students per class. Study room is equipped with LCD and fans. Students laboratory space located on the 1st floor consisting of: (1) Chemical Laboratory base (2) Medical Analysis Laboratory. The library room was on the first floor that can accommodate 50 people, which provided nursing literature, language, public health and general books. The library room is equipped with chairs, tables and shelves of books read. Computer laboratory is located on the 2nd floor lab is not equipped with internet facilities. Thus, learning is still passive. Mushola space for students and the entire teaching staff Wira Karya independent Moslems also provided. This mosque is provided ablution.

3.3 Survey

Results of the students' answers in answering the questionnaire can we know that students do not like clams or subjects related to the chemical. In the graph known at the number (1) students like chemistry or related to chemistry (2) the student is always present on subjects related to chemical (3) students always pay attention to the teacher when explaining the material related to chemical (4) students stay on task related to chemical well and on time (5) students are forced to attend on subjects related to chemistry (6) students do not understand the chemistry lessons (7) students like chemistry lesson, but do not like to do his job (8) students did not like chemistry, because it is difficult chemistry (9) students like chemical material but not with praktikumnya (10) students do not like school-related chemistry but I am happy participated chemistry lab (11) students are always reading books relating to chemical (12) students like studying chemistry with field work (13) students do not like the chemistry lesson as less attractive (14) students do not like to study chemistry for boring (15) students like related chemicals everyday life (16) students like chemistry because they relate to media applications.

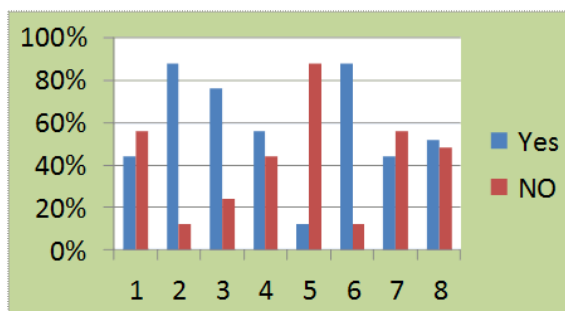


Figure 2. Assessment Response Students Against Subjects Chemistry

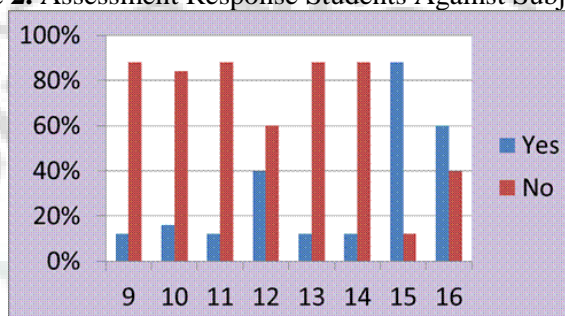


Figure 3. Results of student response Rate Against subjects Chemistry

Student answers the questionnaire results regarding chemical subjects taught by the teacher, the graph is known in number (1) Master came on time when teaching chemistry (2) teacher see the list of absent students before studying chemistry (3) the teacher before teaching provides apersepsi related to chemical (4) Teachers teaching methods (in addition to lectures in class) (5) the teacher explains the material related to the chemistry in good (6) Teachers do not understand materials related to the chemical (7) Teachers often teach by using media presentation infokus per group (8) Teachers give students the opportunity to ask (9) Teachers give rewards to students who are active (10) the teacher assignments and chemistry exam in a professional manner (11) the teacher made exam chemistry as described (12) the teacher makes about chemistry exam is too difficult (time is not enough, matter toomuch) (13) Teachers are often made about the chemistry exam in Essay forms (14) the teacher distributes chemical test results in a timely (15) teachers give extra assignments for students who did not pass.

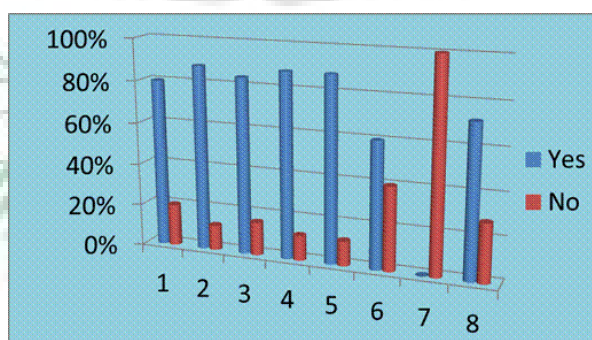


Figure 4. Assessment Against student Response Subject Teacher Chemistry

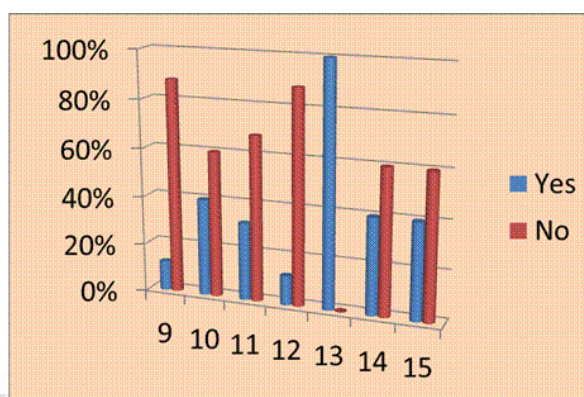


Figure 5. assessment Against student Response Subject teacher Chemistry

3.4 Questionnaire results of chemical assessment studies teachers

Drawn from the assessment questionnaire results Unimed lecturer has been validated. Questionnaire assessment made about the conditions and the presence of the chemical laboratory at SMK Wira Karya Mandiri. Respondents' opinions are taken through a questionnaire with assessment criteria excellent (score 5), excellent (score 4), pretty good (score 3), less good (score 2) and not good (5). The components are assessed include the availability of supplies clothes practicum, Guidance lab chemical laboratory at the school, air circulation in the room chemistry laboratories in schools, water facilities (source water) in the laboratory to carry out practical activities, Facility sewerage laboratory experiments, Means electricity to carry out activities practicum, Means of fire extinguishers in the laboratory, equipment chemicals in the laboratory to carry out practical activities, supply chemical apparatus in the laboratory to do the lab work.

The instrument used in this study was a questionnaire that has been standard and have been divalidasika by previous researchers associated ratings feasibility chemical laboratory. This questionnaire given to the chemistry teacher who is experienced in teaching chemistry and chemical material master.

The results of the respondents' assessment on the feasibility of the existence of a chemistry teacher and laboratory equipment chemicals can be seen in Table 3 and Table 4. Response obtained expressed in terms of average ratings, value it can also be converted back to the previously used standard is the standard 5. these standards can be converted to 5 scale criteria (average > 4,2s / d 5.0), which means "very good", the scale of 4 (average > 3.4 s / d 4.2), which means "good", the scale 3 (average > 2.6 s / d 3.4), which means "good enough" and the scale 2 (average > 1.8 s / d 2.6), which means "less good" and 1 (average ³ 1.0 s / d 1.8), which means "not good", (Arikunto, 2002). Based on these criteria is stated that the feasibility of the existence and the supply of laboratories chemistry in SMK Wira Karya Mandiri is in the category Good Enough (2.77) for the chemical practicum activities.

Table 2. Presence Laboratory at the School

No	Question	Response	
		Yes	No
1	Is the school where you teach chemistry laboratory available?	√	
2	Does the chemistry lab at the school where you taught separately from other laboratories?	√	

Table 3. Laboratory Equipment in School

No.	Indicator	The response Response				
		1	2	3	4	5
1	Availability of supplies clothes practicum				√	
2	Guidance chemistry lab course in the school	√				
3	Air circulation in the chemical laboratory at the school				√	
4	Means of water (source of water) in the laboratory to carry out practical activities				√	
5	Means waste disposal laboratory experiments	√				
6	Means of electricity to carry out practical activities				√	
7	Means of fire extinguishers in the laboratory		√			
8	Attachments chemicals in the laboratory to carry out practical activities		√			
9	Supply chemical apparatus in the laboratory to do the practicum			√		

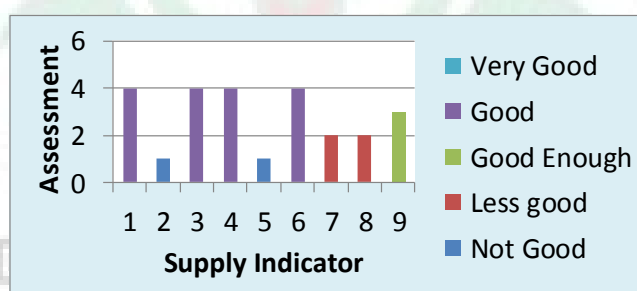


Figure 6. Chemistry Teacher Assessment Results Of Feasibility existence and Chemical Laboratory Equipment.

4. CONCLUSIONS

Based on the results and discussion, it can be concluded that:

4. K.13 curriculum has not been applied in the learning process in SMK Wira Karya Mandiri Medan. The curriculum used is the SBC.
5. Methods and media used in the learning process chemistry teacher at SMK Wira Karya Mandiri Medan is the method Lectures, discussions and audio-visual (LCD / Computer).
6. Chemical subjects in SMK Wira Karya Mandiri Medan based SBC. The distribution of subjects as follows: (1) Role of Chemistry in life (2) Atomic Structure and Periodic System Elements (3) Institute of Chemistry (4) Electrolytes and Non-Electrolytes Solution and (5) Oxidation Reduction Reactions.
7. Interests of students in SMK Wira Karya Mandiri Medan on subjects related to chemistry is still low.
8. Based on the results of a feasibility study on the existence of the data and supplies the chemical laboratory at SMK Wira Karya Mandiri are in good enough category (2.77) for chemical lab activities.
9. Problems faced by students in the learning process is learning less attractive and the media that has not been innovating lead learning less effective or not maximized, the library facilities are still no support equipment chemistry book.

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