

The Application of Comic Learning Media to Improve Student's Achievement on Reduction and Oxidation Reaction Topic

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Abstract - Among many reinforcement learning media, comic learning media is a strategy to give a good quality learning process. The research aims to improve the student's achievement on reduction and oxidation reaction topic in class X MAN 2 MODEL MIA Pekanbaru. This study uses a quantitative approach and is included in the type of experiment research with pretest-posttest design. The research subject is determined on similarity of the average value of prasyarat exam and measurement instruments using objective *test*. Data analysis technique used is the *t-test*. Based on data analysis, average gain score student's achievement in experiment class is equal to 0.81 that included in high category, while the category improvement of student achievement in control class was medium category with gain score is 0.68. This means that H_0 refuse and H_1 accepted so there is influence of comic learning media on student's achievement.

Keywords : comics learning media, learning achievement, reduction and oxidation reaction

I. INTRODUCTION

Providing appropriate learning towards the needs of all students is crucial to achieve their full potential. Learning is a process that contains a series of actions of teachers and learners on a reciprocal relationship that takes place in educational situations to achieve certain goals [1]. The successful achievement of learning objectives depend on how the learning process experienced by learners. Teachers have an important role in the learning process, between the role of the teacher is to make learning design, using learning

materials adapted to the conditions of learners and school conditions [2].

The use of a media of learning in the learning process can streamline and facilitate achieving the learning objectives. Learning media can attract and motivate learners to the material, including the chemistry lesson. One subject on chemical subjects studied in class X SMA / MA is the reduction and oxidation reactions. On the subject of reduction and oxidation reactions containing material about the development of the concept of reduction and oxidation reactions, the determination of the oxidation number and nomenclature of compounds based on the rule of oxidation states. In general, the material being studied is rote and count [3].

Based on observations and interviews in MAN 2 MODEL Pekanbaru data obtained semester 2014/2015 academic year that the average value of learners who took the exam subjects, especially on the subject of chemical redox under 75. Based on the range of curriculum assessment ratings in 2013, the average test scores obtained by the students included in the low category because it is below a predetermined KKM school of 80, this is because the students understanding of the material is still lacking. The learning process is usually done with a redox materials group discussions, but in the process of group discussion was dominated by clever and diligent learners learners read while others still seem difficult to convey the idea due to lack of understanding of the material. In the process of discussion worksheets teachers also provide learners serves

to help obtain more information about the subject matter. However, learners' worksheets that are generally used are still monotonous (reading text without pictures, colorless and unattractive views) causes quick learners feel bored so that the learning process has been applied is still visible lack of interest and motivation of learners.

Efforts to do is use the appropriate learning media. One media that can be used is the comic learning media. Comic learning media is a form of visual communication media have the power to convey information in a popular and easy to understand [4]. Comic learning media allows students to learn not only with text but also with pictures, so consider that comics can increase student interest that learning is slow [5]. Comic learning media is an art form that uses no moving images are arranged so that an storylines. Will Eisner, senior cartoonist said the comics as the order image and set of words in sequence [6].

The aim of research are as follow: (1) To know what the application of comic learning media can improve student's achievement on reduction and oxidation reaction topic, (2) To know how the categories improve student's achievement with the application of comic learning media on reduction and oxidation reaction topic.

Use of the comic learning media can be applied in various forms such as media presentations, modules, *handouts*, and student worksheet. The finding relate about Research has been conducted on the application of the comics media showed that the use of comics as a learning tool to increase student interest in fifth grade elementary school learners Wiropaten [5]. Studies have found that comics appeal to students from a myriad of backgrounds, cultures and personalities, educators also urged the use of comics as an alternative, exciting way for students to analyze the development of the characters, as well as develop writing and research skills [7].

Based on the description that has been stated, the authors are interested in doing research about "The application of comic learning media to improve student's achievement on reduction and oxidation reaction topic".

II. METHODS

The subject or research selected for this study in class X MAN 2 MODEL Pekanbaru second semester of the academic year 2014/2015. Time of research in april until may 2015. The population in this study are all students who took the class X science subjects are chemistry series 1 class: X Science₁, X Science₃, and X Science₄, whereas the samples was determined at random based on test results of material preconditions that have normal distribution and tested kehomogenannya. Retrieved class X Science₄ as an experimental class and class X Science₁ as the control class. This study uses a quantitative approach to research methods experiments conducted on two classes with design *pretest-posttest* [8].

Data collection techniques in research are engineering *test* technique. The data collected are derived from: (1) The results of the test material preconditions, (2) pretest,

conducted at both the class before teaching the subject of the reduction reaction and oxidation, and (3) posttest, given on the second class after learning the subject of the reduction reaction and oxidation, data analysis technique used in this research is the t-test. Statistical testing using t-test can be carried out based on the criteria of normal distributed data. Normality Test normality test using test *Lilifors*[9]. After the data were normally distributed, then carried variance homogeneity test by testing two samples (homogeneous or not) and the median equality test using t-test two parties to determine the capabilities of both the sample homogeneity. Formula t-test on homogeneity test is also used to see the changes in the form of achievement of learning outcomes of learners between the experimental class and control class (hypothesis testing research). Hypothesis test used is the right party t-test [10].

Category achievement of learners after applying the comics medium is measured by a test of normality (*N-gain*) with value classification *N-gain* ternormalisasi can be seen in Table 1 [11].

Table 1 Values of *N-gain* Ternormalisasi and Category

Avg -average <i>N-gain</i> normalized	category
$N-gain \geq 0.70$	High
$0.30 \leq N-gain < 0.70$	medium
$N-gain < 0.30$	Low

III. RESULTS AND DISCUSSION

The application of comic learning media on research carried out during the group discussion process. The experimental class using comic learning media, while the control class using conventional media. Utilization of media that is acceptable to arouse the interest of learners (Syaiful Bahri Djamarah and Aswan Zain, 2002). One media that can be used in the form of worksheets students with the subject matter and the oxidation reduction reaction with instructions student worksheet workmanship, learning objectives, subject matter and practice. The subject matter for each meeting contained in student worksheet comics presented in dialogue form, played by characters in comics in the form of a story, beginning with the observation of problems in comics related to everyday life that require learners to be able to formulate problems related with the purpose of learning, then answer the problem formulation aimed at advanced reading stories in comics and draw conclusions from problems in the comic strip.

The initial activity of research, the entire population is 3 classes of class X MAN 2 MODEL Pekanbaru taking chemistry series 1 in the second semester of 2014/2015 academic year in advance given the test material *prerequisites*. The results of the data analysis material tests *prerequisite* performed using Lilliefors test to determine the normal distribution of data. Furthermore, the class tested the

normal distribution and homogeneity of variance. Homogeneity of variance test and the test is a test conducted on the two classes to determine these two classes of homogeneous or not. After testing the homogeneity then selected randomly, class X Science4 as an experimental class and class X Science 1 as the control class. Further test data analysis of the data acquisition.

A. Normality Test Grade Control and Experiment

Results of normality test score pretest and posttest experimental and control classes are presented in Table 2.

Table 2. Results of Analysis of Normality Test Data pretest-posttest

data	Class	N	x	S	L _{count}	L _{Table}	Description
- Pret - est	Exp.	23	32.9 3	8 78	0.12	0.18	normal distribution
	Con.	22	27.5 0	5.0 6	0.13	0.19	normal distribution
- Post test	Exp.	87.1 7	23	6.5 4	0.15	0.18	normal distribution
	Con.	22	76.9 3	6.7 6	0.15	0.19	normal distribution

Description:

N = the number of data in the sample,
x = the average value of the sample,
s = standard deviation, and

L = statistical symbol to test the normality.

Table 2 shows the results of data normality test pretest and posttest in the experimental class and control class that has $L_{maks} < L_{tabel}$ price so that the data pretest and posttest normal distribution.

B. Hypothesis Test

Data used to test the hypothesis in this study is the difference between the *pretest* and *posttest*. Difference in value indicates the magnitude of the increase in student's achievement before and after learning the subject of reduction and oxidation reactions with perlakuan. The result given hypothesis test analysis are shown in Table 3.

Table 3. Test Results Hypothesis

Class	N	Σ X	χ	S _{gab}	t _{table}	t	Description
Exp.	23	1247.5	54.2391	5.07	1.67	3.18	hypothesis is accepted
Con.	22	1087.5	49.4318				

Improving learning achievements of students with the use of the comic learning media is greater than the achievement of learners without the use of the comic learning media. Hypothesis testing is done by using the t test right, H₁ is accepted if they meet the criteria $t > t_{table}$ with the criteria of probability $1 - \alpha$ is 0.95 and $df = n_1 + n_2 - 2$. The result of the calculation, $t = 3.18$ and t_{table} at $\alpha = 0.05$ $df = 67$

is 1.67. Value_t is greater than t_{table} ($3.18 > 1.67$) so that the application of the comic medium can improve the achievement of learners on the subject of reduction and oxidation reactions in class X MAN 2 MODEL Science Pekanbaru.

C. Category Improving Learning Achievement Learners

Results of the analysis categories of learners achievement test based on *gain* the normalized is presented in Table 4.

Table 4. Performance Improvement category Learning student

Class	N	pretest (Xi)	posttest (Xi)	N-gain	category
Exp.	23	32.9348	87.1739	0.81	high
Con.	22	27.5000	76.9318	0.68	Average

Table 4 shows the category of learners achievement experimental class was high with $N-gain = 0.81$ while the control class category is being with $N-gain = 0.68$.

D. Results Average Value Worksheets learners and Evaluation of Students

Improving learning achievements of learners can be seen from the average value student worksheet and evaluation of each meeting are presented in Figures 1 and 2.

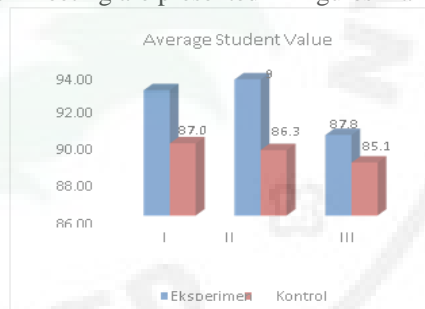


Fig. 1 Diagram Value Worksheet Learners (STUDENT WORKSHEET) to experiment and control Each class meeting.

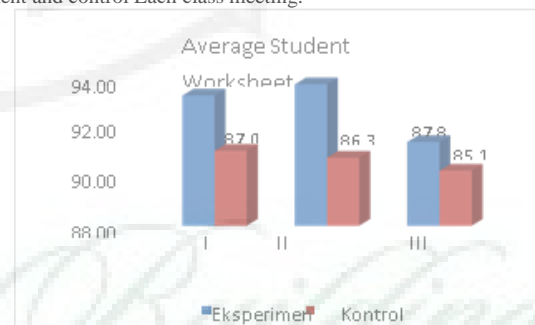


Fig.2 Diagram value evaluation for classroom experiment and control Each meeting

Fig. 1 and Fig. 2, Result of value of the average student worksheet and evaluation of experimental class than control classes due to the use of student worksheet comics during the process of group discussion. Materials of oxidation and

reduction reactions require learners to further streamline absorption, memory and extending the exercise to work on the problems in order to better understand the absorption materi. Keefektifan learners to study materials that are difficult and complicated can happen with the help of tools such as instructional media. Even the acclaimed instructional media can generate good feedback from learners [12].

The discussion process using comic student worksheet seen students who have read student worksheet began actively asking for things he does not know and express opinions about he knew, so that interest and motivation to generate curiosity of self-learners, especially in the matter of concluding observations and work on the problems. Motivationalis an attempt to create a certain condition that makes people curious and interest to do something to achieve a high learning motivation. Then motivation cause increased student achievement [2].

IV. CONCLUSIONS

Based on the results of this study concluded that application of comic learning media in chemistry learning can improve achievement of students on reduction and oxidation reactions topic in class X Science MAN 2 Model Pekanbaru. Based on data analysis, average *gain score* student's achievement in experiment class is equal to 0.81 that included in high category, while the category improvement of student achievement in control class was medium category with *gainscore* is 0.68. This means that H_0 refuse and H_1 accepted so there is influence of comic learning media on student's achievement.

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