Journal of Education, Teaching and Learning
Volume 2 Number 1 March 2017. Page 67-70
p-ISSN: 2477-5924e-ISSN: 2477-4878

Learning Chemistry by ICT (Virtual Animation) at Maumere High School, East Nusa Tenggara

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Abstract. This research was aimed to create attractive learning atmosphere which can make students excited inside theclass.Education was a right for every nation. It had to be given to improving a nation. Chemistry subject, especially in hydrocarbon chapter, was less-favorable by most students due to its difficulty level. Learning outcomes score were low. Many research showed that various method, strategy or another approach in teaching chemistry subject had significantlyimproved towards learning theoutcome of students. One of the approaches was by virtual animation as part of ICT. Based on data result analysis from this research, there was 0,000 < α = 0.05 significance. As result, H_0 was rejected. Itmeans that there was significant improve learning outcome using multimedia animation. The role of ICT as learning model should be utilised for granted by teachers to enriched chemistry science in school's scope.

Keywords**:** ICT; Virtual Animation; Multimedia function

I. INTRODUCTION

A high school in Indonesia obliged students to learn chemistry, especially for those who chose natural science as specialisation. Chemistry subject, especially hydrocarbon, was less-favorable or considered difficult. Learning outcome from this chapter was low based on teachers' observation. This could be caused by theuse of themethod, model, strategy or approach that was not yet suitable. As result, the score achieved was not optimal with curriculum's demand. Therefore, various learning model was researched and developed in order to find the most suitable for students. One of it was by Information Communication Technology (ICT) with virtual animation that was used to obtain optimal learning outcome.

This research was acollaboration between UHAMKA with IKIP Muhammadiyah Maumere, which was just established. Various learning model, method, strategy and approach were researched to be conducted by high school teachers in Sikka, East Nusa Tenggara (NTT) when teaching chemistry subject.

Some problems could be identified as follow:what kind of approach that is suitable to be applied on chemistry subject, especially in hydrocarbon chapter?Can teacher apply ICT-based learning method with virtual-animation in teaching chemistry subject, especially hydrocarbon chapter?Do ICT-based learning method with virtual-animation can make students easier to understand theconcept of hydrocarbon?. Formulation of theproblem in this research was "Is there any effect from the use of ICT in chemistry teaching process towards learning theoutcome of students in Maumere High School, East Nusa Tenggara?".

The ICT-based learning model was actually easy to use by theteacher if it had been mastered. We could say that ICT was a learning model that used thecomputer as media. It could help theteacher in explaining many things in chemistry through animation, such as core reaction, redox, thespeed of reaction, etc [1]. Nowadays, many animation videos were available onthe internet. The teacher could easily use those videos for teaching process [2].

One of theissues in chemistry subject was that there was thenegative stigma of it from students. They considered chemistry difficult to understand. Even some students were antipathy and "scare" of this subject. Why could it happen? There were at least two causes.

First, the chemistry learning method prepared by theteacher was monotone and lack from variation. This caused the learning process tend to be forgettable and less-attractive for students [3]-[4]. Second, most of thestudents had been influenced by majority opinion from their society that chemistry subject was difficult [5]. These two causes made chemistry subject more difficult to understand and learnt.

This issue had motivated expert to make chemistry learning model that was fun, cool, and smart. The model or method was aimed to create attractive learning atmosphere which can make students excited inside theclass. In this method, chemistry learning process was made like a recreation by watching interesting slides, and the other is learning chemistry with rhytme chemistry by poet, chemistry quiz, field trip memorising concept by funny sentence and recreation by simulation, etc.

The method of making rhyme used rhyme to explain concept and sub-concept in form of popular lyric or rhythm. The Ionic concept was explained along with popular rhythm so that students of class X who studied this chapter would memorize easily. It was also the same with chemistry poet method, where astudent used the beauty of poet to understand chemistry concept. Students were told to read a

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topic that would be learnt at class beforehand. Then teacher formulized the concept in form of poet. When the lesson began, student was asked to read poet in front of class. After that, teacher would explain meaning of the poet. "Based on this experience, students' enthusiasm in chemistry subject increased, meanwhile it also improved student's talent in art language".

According to Anni [6], learning outcome was change of behavior obtained by learner after undergoing learning activity. While according to Sudjana [7], learning outcome was ability that was obtained by student after receiving learning experience. It also had definition of an ability obtained by student after undergoing learning activity. It was influenced by 2 (two) major factors namely internal factor of student such as ability she/he had owned, learning motivation, interest and attention, learning attitude, social-economic condition, physical and psychological condition. The second is external factor, especially quality of teaching process.

According to Sudjana [8], optimal learning outcomecould be obtained by students through teaching-learning process that had characteristic such as the feeling of content and proud could grow learning motivation inside student. The student would not whine regarding low score and fight more to improve it or at least to maintain what he/she had achieved. Then, knowing his/her own potential and believe that the potential was not less important than other if every single effort had been done.

Information Communication Technology (ICT) – based Learning Model

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Learning Outcome

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II. RESEARCH METHOD

A. Research Design

This research was true experiment research with adesign that used treatment class and control class [9].

R O_1 X O_2
R O_3 O_4

Note:
R = Random Election
O_1 =pre-test of experimental group
O_3 =pre-test of control group
O_2 =post-test of experimental group
O_4 =post-test of control group
X =treatment

B. Implementation

Two Science Classes in class XI were chosen with certain number of students, one class as treatment class and the other as control class,The treatment class conducted learning process by using ICT method, while control class was using classical/conventional method,At

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first, students were given pre-test to measure their ability, and post-test was given after treatment, the difference only in the learning method, treatment class was given ICT method using virtual-animation for hydrocarbon chapter, while control class was not given any special treatment.Test in form of formative test was given to both classes after finishing the treatment to obtain data.

C. Location and Period of Research

The research was conducted on January – March 2015. Data were obtained at Sikka Regency on February 2015.

D. Population and Sample of Research

Research's population was students of Sikka High School from Science Class. While thesample was representative of High School in Maumere. Target population from the research was students of Science class II from SMAN 2, Maumere. While thesamplewas Science Class IIA and IIB. The classes were chosen from the available three classes.

D. Technique and Analysis

Data obtained by giving test instrument in form of normative questions made based on thelesson that had been learning. Essay test was given to both respondents, either treatment class or control class. Then data would be described and analyzed in form of statistic.

E. Processing and Serving Data

Data processing used *entry, editing, cleaning*and *Tabeling* process with acomputer program. Afterwards, data was analysed statistically using variant analysis (ANOVA) to find the influence of ICT using virtual-animation as alearning model. The result from data processing was showed in form of table and graph based on statistic calculation [10].

II. RESULT AND DISCUSSION

The aim of this research was to find theinfluence of using virtual-animation as part of ICT as learning model towards student's learning outcome for chemistry subject on hydrocarbon lesson. Result and discussion were based on statistical analysis by computer.

Table I
Pre-Test Description of Experimental Class

Data	Result
Median	31
Mode	20
Std. Deviation	11.369
Variance	129.243
Minimum	10
Maximum	53

Table II
Pre-Test Description of Control Class

Data	Result
Median	28.09
Mode	30
Std. Deviation	7.887
Variance	62.198
Minimum	13
Maximum	40

Table III
Test of Normality

	Pre-test	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Pretes	Experiment	.065	37	.200*	.982	37	.792
	Control	.167	35	.214	.936	35	.043

From the table above, it could be seen that the students' pre-test score had asignificant level that was bigger than α = 0.05. It meant that pre-test data distributed normally. Based on normality test(*Kolmogorov-Smirnov)*, if *P-value* was bigger than significance level of α = 0.05, then data was considered distributed normally.

Table IV
Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
4.051	1	70	.058

From the table above, it could be seen that the students' pre-test score had asignificant level that was bigger than α = 0.05. It showed that pre-test data of experimental class and control class was homogeny. Based on theresult from homogeneity test (*Lavene Statistic/Alpha Cronbach)*, if *P-value* was bigger than significance level of α = 0.05, then both data was considered homogeny.

The hypothesis that would be tested on theaverage equation test were as follow:

H_0: there was no difference between pre-test and post-test averageresult

H_1: there was difference between pre-test and post-test averageresult

The test criteria are rejected and accept H_0 if $t_{tabel} < t_{hitung}$ and H_0 for other conditions. Criteria testing using SPSS is if sig>α, then H_0 is accepted and if sig <α, then H_0 is rejected.

Because the statement normality and homogeneity have been met, then for the average pretest known similarity with t-test. The following test results in could be seen in Table V.

Table V
Test Of Average Equation

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		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
Pretes	Equal variances assumed	1.292	70	.201	2.995	2.318	-1.629	7.619
	Equal variances not assumed	1.305	64.321	.197	2.995	2.296	-1.590	7.581

IV. CONCLUSIONS

Based on the above table it can be seen that the significance of 0.201> α = 0.05. So H_0 is accepted, which means there is no significant difference between the pre-test experimental class and control class pretest.

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