

Implementation of Active and Creative Learning through Multimedia on the Teaching of Solubility and Solubility Product

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ABSTRACT

This research purposes to investigate student's achievement in implemented of active and creative learning through multimedia. This research was conducted in SMA Santa Maria Medan on topic Solubility and solubility product. Multimedia that used in this research consists of audiovisual, video, and Animation. Learning process in the class implemented by using PowerPoint. Type of research are experiment research, these researches consist of two classes, which is experiment class and control class. Learning process in experiment class will be conducted through multimedia while in control class will be conducted by conventional method (without multimedia). To know the increasing of student achievement, student conduct pretest that consist of 12 questions are used that covered the solubility and solubility product, then after teaching treatment student doing posttest. The result shown that there are significant different of student's achievement. Student achievement in experiment class that conducted by multimedia with ($M = 74.70 \pm 2.46$) higher than student's achievement in control class that using conventional method with ($M = 59.3 \pm 2.63$).

KEYWORDS: active, creative, multimedia

1. INTRODUCTION

Educators are required to provide the learning conditions for learners to attain certain skills that must be learned by the learner. In this case the role of design in the teaching and learning message is very important, because the design of the message refers to the process of learning to manipulate, or to plan a pattern or a signal and a symbol that can be used to provide the conditions for learning. Many student of senior high school consider that subject of chemistry is difficult so they have feeling not able to study it. This case may be caused by presentation of topics are less interesting and boring. Finally, it leaves a "dangerous", difficult, and scare to students who less understand a basic concept of chemistry[1], to remove them, teacher can apply learning strategy in learning process.

As a teacher in industrial revolution 4.0 must following worlds change in using Information and Communication Technology (ITC) in education. by using multimedia in learning process provide the student progress in understanding topic in delivering material rapidly make student active and easy to understand the topic. Making education following 4.0 in education is one of the idea for teaching which is trend now days .information communication technology facilities are described as all available facilities for the identification, generation, processing, storage, packaging, preservation, conservation and transfer of information, in which time and distance is not constraints. In other words, information communication technology is an information handling tools which can be used for producing, storing, processing, distributing and exchanging information especially in learning activity[2][3][4]

Education does not only face changes in the substance of data and facts, even further challenged to find forms approaches, strategies and methods learning that is able to answer challenges of the educational needs of the era globalization and information disclosure. Educational research and development in finding approaches, strategies and learning methods that are rooted in the context of the nation needs to be done consciously and sustainable[5]

One of chemistry topic is solution. Concepts in solution are abstract, especially solubility and solubility product. Furthermore, in learning the concept of solubility and solubility product must be combined the theory and the practice. By using the right learning method and media, the student's achievement on solving problems dealing with the subject materials could be improved. To help student teacher need to make innovation to help students become active and creative by using multimedia in era 4.0, Information and Communication Technology (ITC). Multimedia devices as part of information and communication technology facilities which are electronic media devices used to store and experience multimedia content. Multimedia is concerned with the computer controlled

integration of text, graphics, drawings, still and moving images (video), animation, audio and any other media where every type of information can be represented [6][7].

The development of technology has been raise all industry include education. Which is the available of software that can used as a media to make student active, creative in learning process and after learning process end student more active. Teacher will make student interest in learning because the display of material in learning process more attractive and stimulate student become active and creative[8]. Teacher as a facilitator must make innovation in delivering material to decrease student bore while learning activity in the class. Directly student will enthusiast and give attention for teacher explanation and material that completed by video, animation shat showed visually and they can see the real thing of teacher explain for them.[9]

Teacher must prepare by ICT competence to make the learning more fun and enjoyable especially for chemistry as science topic, where student really scare if they heard about chemistry in their mind the subject really difficult and they cannot following the process in the class. So to make student interest in teaching chemistry teacher must combine strategy in delivery material by using video and animation that displayed by PowerPoint. Implementation of this strategy can use in teaching and learning activity. The point of this research are the use of digital technology to support classroom activity between teacher and student that bring student think creative and more active after getting knew knowledge and developed by them[10].

The rapidly changing technological developments have affected education as it does every other fields of human endeavor. The number of technology applications used in education increases every day. One of these tools is multimedia. In the studies about the use of multimedia in education, it has been reached that multimedia increases students' success, affects students' attitudes in the positive way and makes lessons more enjoyable and understandable[9][10]. that is why teacher prepared by ICT skill moreover in industrial revolution 4.0 almost teacher have been use multimedia on teaching activity to increase their achievement especially in learning solubility and solubility product. Based on background that collected teacher need to use multimedia to help student active and creative and make them motivate to learn and the presence of media for example animation and video make the learning activity more interactive and student achievement will increase[11].

2. METHODOLOGY

The research is done by using implementation of multimedia to make student active, and creative in learning process. The populations of the study are students are all student in class XI in SMA Santa Maria Medan. The type of this research are experimental and the samples that be chosen for the research are students in class XI A and students in class XI B. The distribution of the students in the selected samples is arranged base on heterogeneous basic academic ability level of student. Class XI A as experimental class with use active, innovative and creative learning through multimedia and Class XI B as control class with use conventional learning. In this research, the instruments that be used are evaluation test in multiple choice. The question is made for each topic that is distributed base on the grade, category, and difficulty level of the subjects. Initial evaluation conducted by student pretest to know the initial student score both in experiment class and control class.

After doing pretest and posttest research conduct teaching treatment both in experiment class and control class, where experiment class implemented by multimedia in learning process while in control class using conventional method without multimedia. To know student progress in learning process next is doing posttest and to know the increasing student achievement. Then analyzed the data and make a conclusion [12-14]. The research procedure showed in figure 1 below.

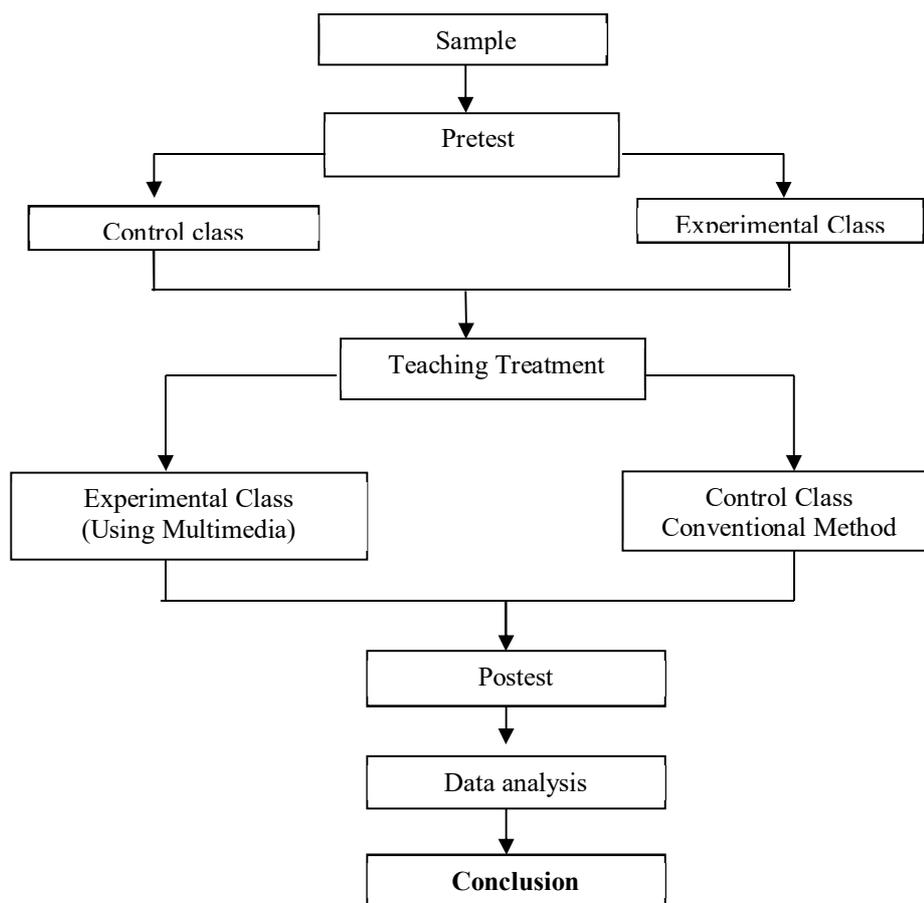


Figure. 1 Research Method

3. RESULTS AND DISCUSSION

To measure the ability of student’s knowledge and the understanding level of student toward Solubility and Solubility Product that will be learned, and also to see the level homogeneity of sample, so before the teaching and learning treatment are done, the first is doing the initial evaluation(experiment and control class). The result pretest both in experiment and control class shown on table 1.

Table 1. Result of pretest in experiment class and control class

	Value	N	Mean	STD. Deviation	STD. Error Mean
Pretest	Experimental	20	41.65	9.149489	2,045888
	Control	20	40	9.290629	2.077448

Student’s achievement in experiment class are (M=41.65±2.04), and student’s achievement in conventional method has (M= 40±2.07) the average still low. The effectiveness of learning through multimedia can be shown by student’s achievement after doing the learning treatment for teaching of solubility and solubility product base on student’s achievement poststest.

The last evaluation is Posttest that showed in table 2. Showed that average of student achievement in experiment is (M = 74.70± 2.46) higher than student’s achievement by using conventional method with average (M = 59.3±2.63). The result of the significance test mean shows that there is significant different between experiment and control class.

Table 2 Posttest in experimental class and control class

	Value	N	Mean	Std. Deviation	Std. Error Mean
Posttest	Experiment	20	74.70	9.54863	2.4675
	Control	20	59.30	11.77017	2.63189

According to students score both in pretest and posttest. Student achievement in experiment increase that showed by increasing the score of posttest. By using multimedia student more active and creative showed in learning process during learning process. Increasing of student achievement in pretest and posttest showed in table 3.

Table 3. Student Achievement in Pretest and Posttest

Pretest	Eksperiment	41.65
	kontrol	40
kontrol	Eksperiment	74.7
	kontrol	59.3

So the use of multimedia able to increase student achievement and effective to use in learning process and make the lesson more enjoyable and more attractive for student. The effectiveness of learning process through multimedia showed in figure 2 below

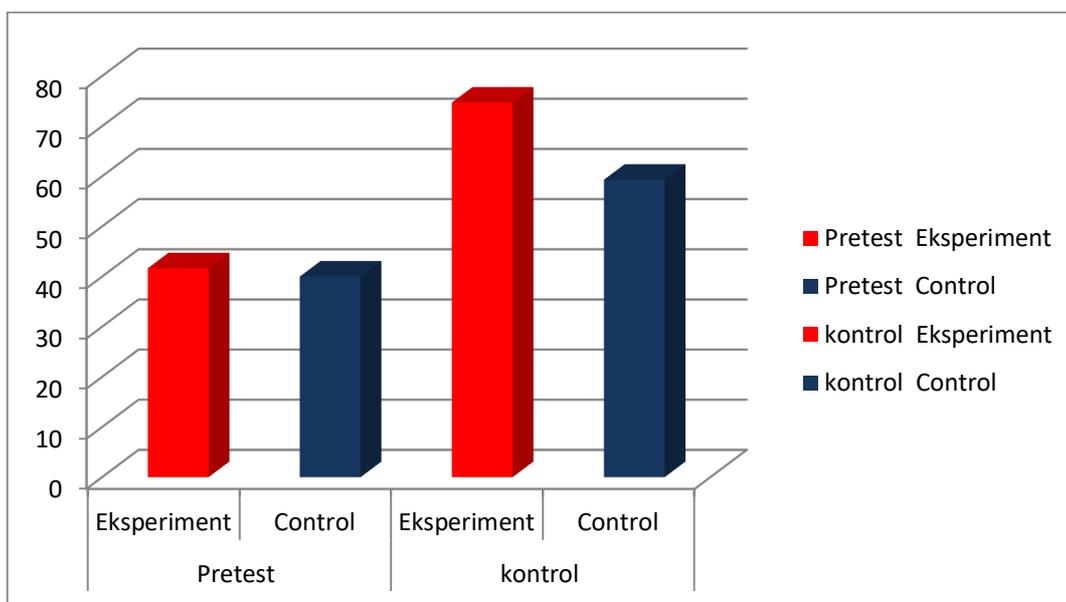


Figure. 2 increasing of student achievement in pretest and posttest both in experiment class and control class

Based on the figure above we can see that student achievement increase. In control class there is no significant different between pretest and posttest, but in experiment class there are significant different between pretest and posttest which is 41.65 become 74.70.

4. CONCLUSION

Based on the research result can be concluded that chemistry learning on topic solubility and solubility product by implementing of active, innovative and creative learning through multimedia can improve student's achievement. Multimedia (PowerPoint, Audiovisual Media, and animation) make student easy to understand chemistry concept especially in topic of solubility and solubility product because they give learning motivation to student. The result shown that there are significant different of student's achievement. Student achievement in experiment class that

conducted by multimedia is ($M = 74.70 \pm 2.46$) higher than student's achievement in control class without using multimedia (conventional method) student achievement is ($M = 59.30 \pm 2.63$). Carrying out topic of chemistry by using active, innovative and creative learning through multimedia makes student more interested to chemistry topic than without multimedia that is by using conventional method.

5. SUGGESTION

Chemistry teacher should use active, innovative, and creative learning through multimedia to carry out chemistry topic about solubility and solubility product constant because of having been proved that this method effective to improve student's achievement. By using this method student can enjoy in learning process and directly will make student interest in learning another chemistry topic and make them motivate to learn chemistry deeply because they will easy to understand the topic. So need to be considered for the use of active, innovative and creative learning through multimedia for teaching another chemistry topic.

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