



# APPLICATION OF ENVIRONMENTALLY BASED EXPERIMENTAL METHODS TO IMPROVE LEARNING OUTCOMES IN ACID-BASE SOLUTION

Sri Ismulyati<sup>1</sup>, Rauzatur Rahmi<sup>2</sup>, Dessi Nur Adiska<sup>3\*</sup>, Syarifah Yanti Astryna<sup>4</sup>  
Pendidikan Kimia, Universitas Serambi Mekkah, Aceh, Indonesia  
\*sri.ismulyati@serambimekkah.ac.id

## ABSTRACT

Based on the data obtained, the chemistry learning process still uses lecture and question-and-answer methods. Because of *that the students are less active and the learning atmosphere is less enjoyable. It showed that there are still many students who are not happy when starting to learn. Students play around in learning activities; they experience difficulties and obstacles in learning, and do not understand the material presented by the teacher. The aim of this research was to determine whether environmental-based experimental methods can improve student learning outcomes in acid-based solution material in class VII of SMPN.2 Alafan, Simeulue Regency. This research method is descriptive-qualitative, which uses direct observation data on the classroom learning process. The research subjects were 19 students, consisting of 9 males and 10 females. The test was given in the form of multiple-choice questions with 20 questions. The research results showed that the completeness of student learning outcomes was 94.74%. This shows the results of learning using environmental-based experimental methods, especially on acid-based solution material.*

**Keywords:** *problem-based learning models, videos, learning outcomes, virus material*

## 1. INTRODUCTION

Chemistry is a natural science that studies matter which includes the structure, properties and changes in matter and the energy that accompanies it. So, with the many chemical concepts and structures that must be studied, most students think that studying chemistry is difficult (Johari & Rahmawati, 2006). The chemistry learning process still uses lecture and question- and- answer methods. So, it makes students less active, and the learning atmosphere is less enjoyable. It can be seen that there are still many students who are not happy when starting learning, most of them play around in learning activities, experience difficulties and obstacles in learning. So, they cannot fully understand the material.

The environment is a learning medium that is very useful for students in forming knowledge. Students can learn knowledge based on the environment around them. Lessons using the natural environment allow students to develop their potential like humans who have reason (Rahmawati, 2006). This approach emphasizes learning activities that are linked to the natural environment around students' lives and the real world, so that apart from being able to open up diverse thinking insights, students can learn various concepts and how to relate them to real life problems. In this way, students' learning outcomes are more meaningful for their lives, as creatures of God, social creatures, and their own integrity.

The experimental method is a method of providing opportunities for individual or group students to be trained in carrying out a process or experiment. Through the experimental method, students will be invited to learn in a more comfortable and enjoyable atmosphere, so that students will be freer to discover various new experiences in their learning (Djamarah, 2000). With this method, it is hoped that various student learning activities can grow in connection with student learning activities. In other words, educational interactions are created, while students act as recipients or being guided. The experimental method is a learning procedure that allows students to carry out experiments to prove for themselves a question or hypothesis being studied (Anggraini, 2010).



## 2. METHODS

This type of research is descriptive qualitative. The research subjects were 19 students in class VII-2 SMP in the odd semester, consisting of 9 boys and 10 girls. The instrument used is a written test consisting of 20 multiple choice questions. This research was carried out in 2 meetings, where each meeting consisted of 3x40 minutes. At the first meeting, the teacher conveys the material to be studied, then they are given worksheets so that students get as much information as possible regarding the material provided and the assignment to see their understanding using environmental-based experimental methods. In the second meeting, students were asked to present the results of discussions held at the previous meeting and were given a pretest at the end of the lesson.

## 3. RESULTS & DISCUSSION

Based on the results of class VII-2 students' complete learning in acid-base solutions, a learning outcome score of 94.74% was obtained. This shows that the learning outcomes using environmental-based experimental methods, especially on individual acid-based solution material, have reached the level of completeness. So, the alternative hypothesis ( $H_a$ ) which states "The application of environmentally based experimental methods on class VII acid base solution material at SMPN 2 Alafan achieved completeness" can be accepted, namely classical completeness of  $94.74\% \geq 85\%$ , so that the classical completeness obtained is greater than specified completion. When students carry out learning using the experimental method, students carry out the experimental steps themselves and obtain the results that have been carried out from the existing experiments. So that the learning process makes students able to understand the material being taught and can remember it for a longer period of time so that students do not easily forget the material taught by the teacher.

The students' average scores also experienced a better increase from the initial conditions when the researcher made observations. The learning outcomes obtained by students in class VII of SMP Negeri 2 Alafan, Simeulue Regency were 94.74%. An increase in student learning outcomes can be recorded because the ongoing learning process is able to increase student motivation in learning. Students are trained to carry out experiments well. Students are given the opportunity to find answers to the questions given on the student worksheet by conducting experiments with friends in their group so that students can work together to solve existing problems. This is in accordance with previous research, showing that the application of environmentally based experimental methods can improve students' chemistry learning outcomes on the concept of colloidal systems. The average post-test score increased from 61.87 with a KKM of 22.58% in cycle I to 81.12 with a KKM of 90.32% in cycle II (Muslim, 2013).

## 4. CONCLUSION

The completeness of learning outcomes for class VII students at SMPN 2 Alafan, Simeulue Regency using environmentally based experimental methods on acid base solution material was 94.74%, which shows that learning outcomes using environmentally based experimental methods have achieved individual completeness.

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