

CHAPTER I

INTRODUCTION

1.1. Background

Education is one important factor in determining the quality of a nation. Primarily through formal education in schools. Student's achievement is the end result of teaching learning process. There are several factors that can affect the success of teaching learning process. Factors that affect the learning process is comprised of internal factors and external factors of students. The internal factors include motivation, interest, and how to learn. While the external factors are the factor of family environment, school environment, society and so on.

(Simanjutak, A, 2011)

A good quality of education in a country, indicate of success development in education sector in that country. In our country Indonesia showed that quality of national education still under national standard. This matter can be seen from student's achievement in senior high school especially in chemistry. Generally, in MAN 2 Model Medan the evaluation value of students in chemistry lesson is in 5 up to 10. There are many students who have value lower than KKM that decided by the school, it is about 65%. Based on that percentage of averaging value shown that teaching of chemistry was not maximal yet to get a good result. Therefore still needed the improvement to minimize the percentage of students number who have the value that lower than KKM which is have been decided by the school.

One of the problems that make low the student's achievement in learning chemistry is Many students 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 concepts of chemistry (Situmorang, 2006). Many teachers in Indonesia just using conventional method in teaching of chemistry. It make students become boring and finally it can influenced the student's achievement.

Chemistry teacher should be make chemistry is more relevant enjoyable, easy to learn and have meaning for students. Chemistry as one of the science lesson, that is to provide experience to students in planning and conduct of scientific work, to form a scientific attitude (Simamora, 2006). Chemistry is a collection of concepts, principles, theories and laws. Chemistry can be viewed as the product knowledge gained through scientific methods and can also be viewed as a process that is as a method of reasoning or thinking. The attitude is needed in the form of scientific method are a desire to know, openly and responsibly. By studying the chemistry students will learn to make observations, conduct experiments to find answers to the hypothesis, the experiment students will be able to explain the objects and events, ask questions, construct explanations and test explanations based on theories that are studied (Team of Chemical Education, 2006) .

So, it is important for teacher to choose the various methods on the teaching, in this cased students will remember the subject in a long time. According Darmodjho and Kaligis (1991), it is a mistake when teaching chemistry by transferring only what is in the textbook to their students. This is due to what is written in the book's text is just the one side or one dimension of the IPA is the dimension of "products". Text books is the body of knowledge of science, an accumulation of previous efforts of the pioneering science and generally have been arranged in a complete and systematic. Text books is important, but from the other side of the science is no less important is the dimension of "process", meaning the process of getting the science itself. (Manik, 2011)

In the study of chemistry, one method of learning that can be used is experimental method. This method is highly recommended for learning chemistry because it is suitable with the educational goals that include the development of knowledge, implant scientific attitude, and practice the skills. Experimental method is a way of presenting the lesson, where students are experimenting with having to prove and learned something by themselves. In teaching and learning with practical methods, students are given the opportunity to experience for theirself or make their own, follow a process, observing an object, analyze, and

prove and draw your own conclusions about an object, situation, or process anything (Djamarah and Zain, 1995) .

Based on the results of research conducted by Neni (2010) show That student's achievement in experimental class (75.48 ± 6.01) is higher than the control class (67.53 ± 4.69). it is appropriate with research that conducted by Siti Jahro (2008) stating that the learning outcomes of students who applied methods lab showed that a higher yield (81.6 ± 4.3) than the learning outcomes of students are not acquainted with the teachings with the practical methods (68.7 ± 8.6). In addition, based on questionnaires distributed revealed that 89.2% of students increased enthusiasm for learning chemistry when chemical material objects can be observed directly. Then 86.9% of students agreed that the lab activities can help improve understanding of the chemical material learned.

It is not appropriate with the reality. Learning activities carried out without the lab sometimes (or familiar) is done. Whereas if the cut "Chemistry" become "Chem-Is-Try", chemical is an experiment (Try). Even chemistry is also born of the experiment, then came the theories of chemistry. In rural areas and even urban areas can also happen that studying chemistry without experiments. The reason is a classic, because:

1. Uncompleted of the tools and lab materials
2. Unavailability of the laboratory,
3. The lack of chemistry teachers,
4. Lack of skills of chemistry teachers
5. Unavailability of practical guidance.

(Urip. 2012)

Based on data from self-evaluation of chemistry education program from Tracer study results that distributed of 103 alumni who have long worked as teachers in some districts / city in North Sumatra (teacher student civil PPL) constraints experienced by teachers in the implementation of practical chemistry, among others, the absence of laboratory 13.66%, the absence of material / substance 29.81%, the absence of practical guidance 14.28%, and the other for 27.32%. (Manik,2012)

Based on the data above, practical guidance and availability of substances and materials are the constraints that had been around by chemistry teachers in implementing the experiment. The less of practical guidance and a lack of availability of equipment / materials can certainly lead to practical implementation is not done. To overcome these problems need creativity in formulating practical guide to using the tool / material contained in the student and is also safe to use.

Based on the description above, the authors interested to do research with the title **The Influence Of Experimental Method Using PAS In Senior High School Toward Student's Process Skill And Achievement In Electrolyte And Non Electrolyte Solution.**

1.2. Problem Identification

Appropriate with the background that explained above, so the problem can be identified as follows:

1. Does teaching and learning process with experimental method using PAS increase student's achievement in senior high school?
2. Does teaching and learning process with experimental method with PAS attract the student's interest?
3. Does teaching and learning process with experimental method with PAS improve the implementation of experiment in the school?

1.3. Problem Limitation

Given the wide scope of problems in identifying the problems mentioned above, this study is limited to the following:

1. The study was conducted at the high school level class X (superior) using KTSP curriculum, semester 2 TA 2012/2013, in MAN 2 Model Medan.
2. The topic that had been taught is the electrolyte and non electrolyte solution..
3. Teaching methods was applied in this study are experimental methods by using PAS.

4. Student's process skill that had been measured in this study are: using tools correctly, observing, planning the experiment, and communication.
5. Student's achievement that had been measured in this research is the cognitive aspect of the level of C1, C2, C3, and C4.
6. Feasibility test had been applied is *PAS* guidance.

1.4. Problem Formulation

In this research, used as formulation of problem is as follows:

1. Is student's achievement who had been learnt by using experimental method with *PAS* higher than students achievement by conventional methods?
2. How many the average percentage of feasibility of *PAS* guidance to use in learning electrolyte and non electrolyte solution topic?
3. How is the result testing *PAS* guidance in electrolyte and non electrolyte solution at chemistry lesson X SMA in laboratory chemistry UNIMED?
4. How many the average percentage of level skills of students who were taught by using experimental method with *PAS* ?
5. How many the average percentage of student's perception to *PAS* guidance in electrolyte and non electrolyte solution that have been designed and tested in UNIMED FMIPA chemistry laboratory?

1.5. Research Objective

Based on the problems above, the research was conducted to study for the purpose of knowing :

1. The results comparisons of student's achievement who had been learnt by experimental method using *PAS* guidance with conventional teaching methods.
2. The average percentage of feasibility of *PAS* guidance to use in learning electrolyte and non electrolyte solution.
3. The result testing *PAS* guidance in electrolyte and non electrolyte solution topic at chemistry lesson X SMA in laboratory chemistry UNIMED.

4. The average percentage of process skill of students who were taught by using experiment method with *PAS* guidance.
5. The average percentage of student's perception to *PAS* guidance in electrolyte and non electrolyte solution topic that have been designed and tested in FMIPA UNIMED chemistry laboratory.

1.6. Benefit Of Research

The benefits of this research are:

1. Can be input for teachers – especially for chemistry teacher in solving the problems that hinder the implementation of practical activities through practical guide by using *PAS*.
2. Can provide guidelines for teachers of science, especially chemistry teachers to carry out practical work in schools to improve student motivation and learning outcomes.
3. Can change the paradigm of students that chemistry is not an abstract subject, because the chemical is an experimental science.
4. Provide material inputs to similar research in the future.

1.7. Operational Definition

1. *PAS*

PAS is the term of Indonesian language, that is the continuation of "Praktikum Alternatif Sederhana". *PAS* is already famous in chemistry teacher in senior high school as the alternative for doing experiment. *PAS* is used as alternative experiment to could be done easier. Where *PAS* use apparatus and material that easy to found by students because the apparatus and material present in around of students. Besides the material that was used is not harmful because it is near to our daily life, so the students can enjoy to do the experiment without worry about its effect. And also the *PAS* guidance is arranged as alternative of guidance experiment standard. So, in this research, researcher want to know the feasibility of *PAS* and the student's perception to *PAS*. Whether *PAS*

guidance can be used in experiment and can support teaching learning process as guidance to do experiment in order that can improve student's achievement.

2. Student's Process Skill

Student's process skill is the student's activity when they do the experiment. In this case, the student's process skill is scientific skill process because the activity that had been done by students is experiment. student's skill process that had been observed in this research include using laboratory equipment correctly, observing, communication and planning the experiment. The student's skill process can be seen by doing observation. The observation had been done when students do the experiment by using *PAS* guidance. To observed students process skill is used observation sheet. Based on the score that present in observation sheet, it can be known how the level skill of student in scientific process.

3. Student's Achievement

Student's achievement is the result of teaching learning process. It can be gotten after researcher do the treatment (experiment method using *PAS* in experiment class and conventional method in control class). Student's achievement can be seen based on pre test and post test value of students in both of class. The test is in multiple choice form which is have 5 option. Student's achievement that had been measured in this research is the cognitive aspect in the level of C1, C2, C3, and C4.