

CHAPTER I

INTRODUCTION

To support these research there are several stage that should be discuss to make this research become good research, which consist of: Research background, Problem Formulation, Scope Of Research Problem Formulation, Research Objective, Significant Of Research, And Operational Definition that will explain in this stage as follow:

1.1 Research Background

According to law of republic of Indonesia No.20th, 2003 in National education system” each unit formal and non formal education provides facilities that need of education in accordance the growth and development of physical potential, intellectual, social, emotional, and obligation of learners”. Improving the quality of education is closely related to the teaching and learning process in classroom. Learning activity are carried out the process of stage of unknowing material become understand such a materials. The success of delivery of material influenced two factors, first is internal factor which is exist within the student themselves, student level of intelligence, ability, attitude, aptitude, interest and motivation of students. Second is external factor which is coming from outside namely family, circumstance, curriculum, teaching method, and school facilities (book, practicum guidance and laboratory) and infrastructure (Syah. 2009).

Chemistry as part of the science associated with natural phenomena was systematically not only the body of knowledge in the form of facts, concepts or principles, but also a process of discovery (Yunisfu, 2014). Therefore, to study the chemistry is not only focused on the delivery of material but also involves practicum activities. Studied chemistry not only discuss theoretically substances, but also attempted to address empirically. This is because the lab method is one approach to the process. For students holding practicum in addition to train how to

use the tools and the right materials, it also helps their understanding of the chemical materials being taught in the classroom, in addition to students who have the curiosity is high then through their practicum can get answers from curiosity know is real. Practicum can also give children the opportunity to exercise the power of reason, rational thinking ability, and attitude in apply scientific methods in the search for the truth of what they learned. (Jahro, 2009)

Studying chemistry is not only to mastery the knowledge in the form of facts, concepts or principle but chemistry science that can be learned only through reading, writing, or listen (Jahro, 2009), Tezchan and Bligins (2004) stated parable about learning chemistry, " person who learned to draw, but without using paint and canvas, or person who wants to try to bring bicycle but without use of bicycle as well as person who studied chemistry without doing work laboratory, it means that the most effective learning chemistry should be do practicum activities. Especially is chemistry topic acid and base solution. Interviews and surveys beginning with some chemistry teacher who taught Grade XI of high school in Medan, obtained by the fact that in the process of teaching chemistry in schools not intensive do practicum this is due to several factors include: (1) lack of preparation and experience in students in practicum activities (2) tools and materials are incomplete is not even available in the laboratory (3) lack of practicum guidance provided in schools

Utilization of school laboratories is of particular interest, given practicum is believed to be one of student methods that can be used to improve the understanding and skills of the students in the study of chemistry. in addition to preparing learners skilled, able to think analytically in the decision not to think mechanistic (routine) and be able to cooperate and collaborate in solving problems, require a learning process conducted in an interactive, inspiring, fun challenging, motivating the students to participate actively, as well as provide enough space initiative, creativity and independence in accordance with their talents, interests and physical and psychological development of students. It further emphasizes that learning is not only aimed to achieve student the cognitive

domain but also can cultivate students' chemistry laboratory attitudes and skills. There are so many researcher in science education stated that work laboratory can increase students competence for science subject which able to develop cognitive, affective and psychomotor domain of students to reach the goal

Hudson (2001) argues that lab work is importance for the purpose of doing science, which name: engaging in and developing expertise in scientific inquiry and problem solving. The purpose of laboratory work can be characterized in different way. Lab is said to help students learn scientific concepts and to enhance student's interest, motivation, practicum skill and problem solving abilities. It is also said to help students develop understanding about science, about scientific work and how science connects to everyday life (Hofstein and Lunetta, 2004)

Results showed a lot of students who think that there is absolutely no role or application in everyday life so is not interesting to learn (Stieff and Wilensky, 2003). In addition, students are also difficulties in constructing their thinking related materials such as thermo chemical micro, acids and bases and chemical changes with the reason his lack of practicum activities in the learning process (Tatli and Ayas, 2012)

In constructivist learning, learners are actively developing their knowledge by thinking, doing and interacting with the surrounding environment (Tatli, 2011). According to research conducted by Tatli and Ayas (2012), the use of the laboratory is the implementation of a constructivism approach for effectively improving the ability to develop an understanding of learners through interactions with their surroundings

The main task of a teacher is to help students in learning, which seeks to create conditions that allow the learning process through the implementation of a variety of suitable methods. Generally there are three scientific approaches that can be done by teachers to meet student's requirement especially in the study of

science, namely, Discovery / inquiry learning, Problem Based Learning and project based learning. The general approach is how educators are trying to increase students' motivation and interest in science in an attempt to scaling up of student learning outcomes. The scientific approach should be strengthened by applying the learning model based disclosure /research (inquiry). To encourage the ability of learners to generate contextual work, individual and group highly recommended

In this research model that used by researcher are guide inquiry. Sandoval and Reiser (2004) pointed out in order to build the inquiry-based classroom environment must construct a community of practice like the scientists work. In authentic inquiry-based activities, the students take action as scientists did, experiencing the process of knowing and the justification of knowledge.

Inquiry based laboratories are more student-centered, contain limited direction of the teacher and students take more responsibility. Inquiry based laboratory requires students to search for knowledge, generate hypothesis, collect data, interpret evidence and make conclusions (Chang., et al, 2003). In this laboratory method, students can design their own experiments and instead of following a verification process, they try to reach the scientific concepts by themselves and they develop higher order cognitive skills.

Inquiry processes address many thinking and learning skills such as critical thinking, creative thinking, self-regulated learning skills, metacognitive ability and communication skills (Hmelo., et al, 2007). Akkus, Gunel and Hand (2007).The findings of the study reveal that inquiry based teaching approach have a positive effect on students' achievement. Suwondo and Wulandari (2013) in their study concluded that students' attitudes (Science process skill) changed after using inquiry learning model. In addition, the findings indicated that the learning outcomes of the inquiry learning model, the achievement of the majority of students from the two groups are at a good level. This means that inquiry-based learning can be used as one method to improve student achievement. Trianto

(2007) stated inquiry does not only develop intellectual abilities but all potential students, including the emotional and skills development

This research aims to develop more specific guidance material practicum acids and bases solution, the principle of the experiment can be done in the classroom, laboratory and natural surroundings. Guidance lab developed integrated with guided inquiry learning model that the students helped to design and discover. Besides product research results can also help teachers to perform lab without having to laboratory, so that schools that do not have yet complete laboratory facilities can help with lab developed this guide.

To support the student's laboratory attitude of the students that using guided inquiry model need to observe the science process skill of students during practicum because guided inquiry learning address the thinking and learning skill of students. According to Karamustafaoglu (2011), science process skills are the thinking skills used to get scientific information. Karamustafaoglu note that science process skills are the skills used by scientists in their studies and reflects on the correct behaviors of scientists when solving a problem and planning an experiment.

The interaction with process-skills is evident throughout the students' daily lives and also in science lessons when they engage in practical activities. The activities carried out by the students under this framework will enable them to practice and utilize process-skills (Hesbon, et.all, 2014)

Feyzioglu., et al, (2012) studied the validity and reliability of science process skills for secondary students the reliability of the test was (0.83). The test consisted of sub-dimensions such as, observing, classifying, measuring, communicating, inferring, predicting, formulating hypotheses, identifying variable, organizing data, and interpreting it, designing investigations, acquiring data. The results of the confirmatory factor analysis supported validity and reliability of the test.

Some of Researcher with guide inquiry model not only to increase student's achievement but also for cultivate attitude and student's skill. (Ural .2016) "The effect of guided-inquiry laboratory experiments on science education students' chemistry laboratory attitudes, anxiety and achievement". Showed there was a significant increase in students' attitudes towards chemistry laboratory, and their academic achievement. Abdi (2014) "The Effect of Inquiry-based Learning Method on Students' Academic Achievement in Science Course "concluded that there are differences in learning outcomes of students who take the group inquiry learning model with a group of students who take the conventional learning model, where students who take the inquiry learning model to obtain a higher value than the group of students who take conventional learning models

Despite the many advantages associated with practicum work and great attempts by teachers to use practicum work in the teaching of Chemistry, many science educators have expressed significant doubts about the effectiveness of practicum work in teaching science knowledge and skills (Abrahams & Millar, 2008; CERG, 2009; Dikmenli,2009; Kennedy, 2011). This could be mainly due to the nature of practicum activities carried out in schools.

According to (Ituma.,et al, 2015) Practicum work is important for effective learning of Chemistry, practicum work in Chemistry mainly involves 'hands on' activities where learners follow laid down procedures to arrive at a predetermined outcome. This may lead to working on practicum activities without much thought of the actions and thus low conceptualization resulting in poor performance in Chemistry at the end of the course. This study aims at providing alternative approach on how to engage the learners' mind more in practicum activities. The study suggests a model for organizing instructional activities for Chemistry practicum work

Based on the research background above author interested to research the effectiveness of using practicum guidance towards students learning outcome that integrated by suitable model that to make students easy to understand, attractive

and easy to use during experiment with entitled: **The Effectiveness of Innovative Practicum Guidance To Increase Student Learning Outcome on The Teaching Acid and Base Solution for Senior High School.**

1.2 Problem Identification

Based on background that has been stated above, problem identification are identified as follow:

1. Unavailable suitable practicum guidance in chemistry that integrated with guided inquiry to cultivate student's science process skill
2. Acquisition of understanding of scientific concepts, generalizations, principles, and law through the systematic study and experience of aspect of a body of knowledge.
3. Effectiveness of practicum guidance integrated with guide inquiry to increase students learning outcomes
4. Practicum guidance that used at school is not attractive , easy to use save for practitioner during implementation and assist students in doing practicum so it need to make innovation
5. Perception of teacher and lecturer toward the feasibility or standardization of practicum guidance that use by high school
6. Unavailable of innovative Practicum guidance that produces that obtain figure of tools and it function

1.3 Scope of Research

Based on the problems identified above, scope of this research as follow:

1. This research only on topic acid and base solution for Senior High School grade XI in second semester
2. Innovation that apply in practicum guidance is guided inquiry and science process skill and source of learning that taken from internet
3. Learning outcomes that assessed are student achievement and science process skill
4. Implementation of practicum guidance integrated by guided inquiry Model

5. The research focused on feasibility and the perception of a chemistry teacher who has minimum qualifying undergraduates (S1) and actively teaching in Laboratory and chemistry lecturer with minimum qualifying (S2) in state university of Medan

1.4 Problem statement

Based on the background and problem limitation above,

1. How do the feasibility and perception of lecturer and chemistry teacher in innovative practicum guidance that integrated by guided inquiry model based on BSNP of questionnaire has been modified?
2. Is student achievement that learned by using innovative practicum guidance higher than student's student achievement that using practicum guidance from school on teaching acid and base solution?
3. Is student science process skill using innovative practicum guidance higher than student's science process skill using practicum guidance from school on topic acid and base solution?
4. How the effectiveness of innovative practicum guidance that was developed is can increase student achievement?

1.5 Research Objective

Based on problem formulation, the research objective of this research are:

1. To know the feasibility and perception of lecturer and chemistry teacher in innovative practicum guidance that integrated by guided inquiry based on BSNP of questionnaire has been modified
2. To know the student achievement that learned by using innovative practicum guidance higher than student's achievement that using practicum guidance from school on teaching acid and base solution
3. To know the students science process skill that using innovative practicum guidance higher than student's science process skill using practicum guidance from school on topic acid and base solution
4. To know the effectiveness of innovative practicum guidance that was developed can increase student's achievement

1.6 Significant of Research

The significant of research as follow:

1. For teacher as teaching materials being able to motivate the student interest in learning chemistry with acid and base solution topic for senior High School grade XI in Second semester and can conduct in classroom.
2. For Students, as a source of science and enhance student to facilitate the understanding in term of science process skill during experiment, formulating problem, make hypothesis, designing laboratory, analyze the data and make conclusion especially for acid and base solution topic.
3. For researcher as a literature to continue and develop research in a future

1.7 Operational Definition

The effectiveness is relationship between output and purpose. In term of the effectiveness is a measure have effect (influence, consequently, sounded) in implementing activity become effective. Research and Development method is used to produce the particular product that consist of: research and collecting information, planning, develop preliminary form of product, preliminary field testing, main product revision, main field testing, operational product revision, operational field testing, final product revision, dissemination and implementation, and the last tested the effectiveness of the product.

Guide inquiry model are development of thinking abilities systematically, logic, and critical as a mental process, where students given the opportunity to work by formulating procedures, analyze the result and make conclusion guided by teacher, while question and topic coming from teacher in others words teacher only as a facilitator. Innovative practicum guidance is book is compiled to assist in laboratory to do experimental process that integrated by guided inquiry learning model and science process skill Students learning outcomes include student's achievement and student's laboratory attitude (Science Process Skill).