# CHAPTER I
# INTRODUCTION

## 1.1 Research Backgroud

Improving the quality of education is closely related to the teaching and learning process is done in the classroom. The learning activities are carried out is the process of a state of not knowing the material becomes aware of such material. Success in the delivery of the material is influenced by external and internal factors. Factors that can influence the process and outcomes of learning in students, there are two, namely internal factors and external factors. Internal factors are factors that exist within the students themselves, the students' level of intelligence, ability, attitude, aptitude, interest and motivation of students. while factors are external factors that come from outside of them, namely family circumstances, curriculum, teaching methods, learning set and school facilities (books, practical guidance and laboratory) and infrastructure (Syah.2006). To achieve optimum results, the internal and external factors that need to be pursued the best possible way.

As it is written in the Law of the Republic of Indonesia No. 20 of 2003 on the National education system "Each unit formal and non formal education provides facilities that meet the meet the needs of education in accordance with the growth and development of physical potential, intellectual, social, emotional, and obligations of learners "(Law RI 2003). Also the Government Regulation No 19 year 2005 on the Education National Standards VII Article 42 paragraph 1 and 2:

-Each educational unit shall have facilities which include: furniture, educational equipment, books and other learning resources, consumables and equipment required to support the learning process on a regular and on going.

-From each educational unit includes: land, classroom, boardroom, staff room, library room, a laboratory, a cafeteria, a place of exercise and a place of worship, playgrounds, places of recreation, and other places of space needed to support the learning process and sustainable. (PP RI 2005).

Chemistry is one of the most important branches of science; it enables learners to understand what happened around them. Because chemistry topics are generally related to or based on the structure of matter, chemistry proves a difficult subject for many students. Chemistry is a key, enabling science, and is a subject that is considered by many to be difficult for secondary school students (Chang & Chiu, 2005). A variety of reasons have been posited. Taber & Coll (2002) note that the chemistry concepts are abstract in nature and require students to construct mental images of things they cannot see, and thereby find it hard to relate to. A further complication in the learning of chemistry (and other sciences) noted in the literature concerns the medium of instruction. Chemistry is the science of matter and its transformations. Matter, from the chemical point of view, consists of the substances we encounter in our daily lives, such as solids, liquids, and gases, as well as the atoms and molecules of which these substances are composed. Within this sweeping concept are several big ideas which the science of chemistry routinely encompasses. Chemists move among these ideas to come up with explanations of how matter behaves.

The importance of laboratory work is also pronounced in curriculum statements, science textbooks , teacher education programs and practical guidance , for example. Some even advocate laboratory work as almost the defining characteristic of science education, and it has been seen as essential for developing students' scientific knowledge and their knowledge of science (Hodson 1988; Millar 2004).

Furthermore, Hodson (2001) argues that lab work is important for the purpose of doing science, which means: "engaging in and developing expertise in scientific inquiry and problem solving". The purposes and objectives of laboratory work can be characterized in different ways. In research results presented in reviews of school science laboratory work, a shared image of important objectives for students' laboratory experiences appears. Lab work is said to help students learn scientific concepts and to enhance students' interest, motivation, practical skills and problem solving abilities. It is also said to help students develop understandings about science, about scientific work and how science connects to everyday life (Hofstein and Lunetta 2004)

This statement is made clear by the research entitled "The laboratory in chemistry education:thirty years of experience with developments, Implementation, And Research**"** have some conclusion such as students need to be able to enable students to interact intellectually as well as physically, involving hands-on investigation and minds-on reflection, Students' perceptions and behaviors in the science laboratory are greatly influenced by teachers' expectations and assessment practices and by the orientation of the associated laboratory guide, worksheets, and electronic media, Teachers need ways to find

out what their students are thinking and learning in the science laboratory and classroom (Hofstein,A.2004)

Espensially, Chemical equilibrium is the state in which both reactants and products are present in concentrations which have no further tendency to change with time. Chemical equilibrium topic is abstract and difficult to understand by students. So, to learn topic needed combination with practicum in laboratory.

To support the activities of laboratory experiments required equipment, materials and practical guidance in accordance with the curriculum. Many obstacles faced when trying to perform such unavailability laboratory equipment and materials as well as the inadequacy of practical guidance used school. Based on observations, practical guidance used school subject esspencially for chemical equilibrium topic only possessed two sub topics practicum such as reversible reaction and the effect of temperature changes on the equilibrium. The matter in chemical equilibrium are not all contained in the practical guidance . It is therefore necessary to develop a practical guidance its specialty chemical equilibrium. The research and development (R&D) that aims to produce and develop a product prototype, design, learning materials, media, learning strategies, educational evaluation tools, etc. Research to solve practical problems in education, problems in the classroom, facing lecturers / teachers in learning. The study is not to test the theory, hypothesis testing, but the test and refine the product (Soenarto, 2008).

Guided inquiry is as a learning process where the teacher presents the elements of the principles in one lesson and then ask students to generalize, according to Sanjaya (2008: 200) learning guided inquiry is an inquiry learning

model in which the implementation of teachers providing guidance or instructions spacious enough to students , Most of the planning was made by the teachers, the students did not formulate the problem or problems. In the teacher guided inquiry learning is not simply remove the activities undertaken by students. Teachers should provide direction and guidance to students in conducting activities so that students who think slow or students who have low intelligence still able to follow the activities that are being implemented and the students have the ability to think high not monopolize activities therefore teachers must have the ability to manage great class. Development of practical guidance using guided inquiry model can guide students to make the formulation of the problem, make hypothesis, designing experiment , analyze the data and can make conclusions with the guidance of teachers.

Research that supports to development of practical guidance integrated guided inquiry model is Arifah.I dkk (2014) as "Development practical guidance integrated Guided Inquiry-Based Practice for Optimizing Student Semester II Hands On Physical Education Studies Program, University of Muhammadiyah Purworejo Academic Year 2013/2014". In this study showed: 1) practical guidance based guided inquiry worthy to be stated by the validator by 89%; 2) practical guidance based guided inquiry is implemented properly in the practicum based observer ratings of 85%; 3) practical guidance based guided inquiry optimized enough hands on students based on observer ratings of 84%.

Research that supports to development of practical guidance integrated guided inquiry model is Umah,S.K dkk(2014) as "Development of instructions practicum science based on guided inquiry theme on food and health". In this

study showed : practical guidance is valid and fit for use by obtaining an average score of 2.75 on the feasibility component content of practical guidance and on the feasibility components of language and presentation of > 2.5 in the practical guidance.After doing the calculations with the formula n gain obtained gain classical as 0,49 (medium), with the percentage of classical completeness is 97.06%. practical guidance based guided inquiry is able to increase the activity and student learning outcomes. The results based on the t-test showed a significant difference between before and after the learning using practical guidance based guided inquiry. Thus, we can conclude that practical guidance of science based on guided inquiry food and health themes have been proven valid and decent for use in learning.

According Rustaman (2003), process skills are skills that involve cognitive skills or intellectual, manual and social. Cognitive skills involved because by doing process skills of students using mind. Manual dexterity skills clearly involved in the process because they involve the use of tools and materials, measurement, preparation or assembly tools. Social skills are also involved in the process skills as they interact with each other in carrying out the teaching and learning activities, for example, discuss the results of observations. Process skills should be developed through direct experiences as a learning experience. Through direct experience, one can better appreciate the process or activity being performed.

Science process skills (SPS) is the complex skills used by scientists to conduct scientific investigations into the series of the learning process. According Dahar (1996), science process skills (SPS) is the student's ability to apply the

scientific method in understanding, developing and finding science. SPS is very important for every student in preparation to use scientific methods in developing science and are expected to gain new knowledge or develop the knowledge you have already.

Research that supports the use practical guidance integrated guided inquiry model toward on science process skills is (Hilman,2014) "Effect of Guided Inquiry Learning with Mind Map of the Science Process Skills and Science Learning Outcomes" . In this reseacrh explain the results showed there where significant positive effect of guided inquiry learning with mind map on process science skills and cognitive learning outcomes.

According to Nworgu,L.N and Otum,V.V (2013) Effect of Guided Inquiry with Analogy Instructional Strategy on Students Acquisition of Science Process Skills. The result of the study revealed that whereas teaching method was statistically significant ($p<0.05$) in enhancing students' acquisition of science process skills in favour of the guided inquiry with analogy Based on these findings, it was recommended that science teachers should adopt the guided inquiry with analogy teaching method in science classrooms since it would encourage both male and female students to perform well and reduce the gap between the two groups.

Based on some of the above information, the authors will choose a title **"The Effectiveness using of Guided Inquiry Model in Practical Guidance Towards Science Process Skills and Student achievement in The Chemistry Topic"**

## 1.2 Problem Identification

1. How is effective practical guidance chemistry towards science process skill and student achievement?
2. Are all School have an adequate practical guidance chemistry ?
3. Are all practical guidance chemistry used school in high school accordance with the syllabus of learning?
4. How is the good preparation format on practical guidance chemistry for high school?
5. How is create a practical guidance as viable and attractive, easy to use, safe for the practitioner during implementation and can assist students in learning chemistry?
6. How is the perceptions of teachers and lecturers chemistry toward the feasibility or standardization practical guidance that used by high school?

## 1.3 The Scoupe of Research

The Scope of this research are:

1. This research was conducted in two classes at SMA Negeri 5 Medan.
2. This research only on chemical equilibrium topics such as reversible reaction, the effect of temperature on chemical equilibrium, the effect of the concentration of the chemical equilibrium and making stalactites and stalagmites
3. Implementation of practical guidance integrated guided inquiry model.
4. The research focused on the perception of a chemistry teacher who has a minimum qualifying undergraduate (S1) and actively involved in

laboratory and chemistry lecturer in Sated University of Medan (UNIMED).

**1.4 Problem Statement**

The problem statements of this research are:

1. How do the feasibility and perception of lecturer and chemistry teacher in practical guidance chemistry integrated guided inquiry model grade XI in high school based on BSNP of questionnaire has been modified ?
2. Is student achievement that learned using guided inquiry model in practical guidance higher than student achievement using practical guidance for school subject research on chemical equilibrium?
3. Is the student science process skill that learned using guided inquiry model in practical guidance higher than science process skill using practical guidance for school subject research on chemical equilibrium?

**1.5 Research Objective**

1. To know the feasibility and perception of lecturer and chemistry teacher in practical guidance chemistry integrated guided inquiry model grade XI in high school based on BSNP of questionnaire has been modified.
2. To know the student achievement that learned using guided inquiry model in practical guidance higher than student achievement using practical guidance for school subject research on chemical equilibrium.
3. To know the student science process skill that learned using guided inquiry model in practical guidance higher than student science process skill using practical guidance for school subject research on chemical equilibrium.

## 1.6 Significance of the Research

The significance of the research are :

1. For educators ( teachers, headmaster, and goverments) as contribute ideas more depth about the results of the development of practical guidance chemistry integrated guided inquiry model grade XI in high school on chemical equilibrium topic.
2. For students as can enhance students understanding in terms of formulating a problem, make hypothesis, designing laboratory, analyze the data and make conclusion on chemical equilibrium topic
3. For other Researcher , this result can be a literature to make a further research related to this research.

## 1.7 Operational Definition

According Bungkaes (2013), the effectiveness is the relationship between output and purpose. In terms of effectiveness is a measure of how much the output level, the policies and procedures of the organization achieve the goals set. In a theoretical or practical sense, there is no universal agreement on what is meant by "effectiveness". However definitions relating to the effectiveness of a common approach. When traced effectiveness is derived from the effective basic meaning: (1). Have effect (influence, consequently, sounded) like: effective; efficacious; impervious; (2). Use of the method / means, the means / tools in implementing activity so effective (achieve optimal results).

Borg and Gall (1983:772) Educational Research and development (R & D) is a process used to develop and validate educational products. The steps of this process are usually referred to as the R & D cycle, which consists of studying

research findings pertinent to the product to be developed, developing the products based on these findings, field testing it in the setting where it will be used eventually, and revising it to correct the deficiencies found in the filed-testing stage. In more rigorous programs of R&D, this cycle is repeated until the field-test data indicate that the product meets its behaviorally defined objectives.

Guided inquiry model is  where students are given the opportunity to work formulating procedures, analyze the results and draw conclusions independently while in the case of the determination of topics, questions and material support from the teachers and only act as a facilitator. Practical guidance  is a book that is compiled to assist in the laboratory that contains the title of the experiment, the purpose, the basic theory, tools and materials, and the question that leads to the destination by following the rules of scientific writing.

Science process skills are skills that involve scientific cognitive skills or intellectual, manual and social required to acquire and develop the facts, concepts and principles of science (Rustaman, 2005: 86).