CHAPTER I
INTRODUCTION

1.1 Background

Education is a conscious effort to prepare students through guidance, instruction, and training for its role in the days to come. School as a formal educational institutions, systematically plan the various environments, namely educational environment that provides opportunities for students to perform a variety of learning activities (Hamalik, 2011).

Based on the author's experience when doing program of integrated field experiences (PPLT), many students who stated that the physics lesson is a lesson that is less attractive. They also tend to think of that physics is one of the lessons which are boring and difficult because it is always synonymous with much formula and difficult to remember. In addition, teachers often use patterns of teaching by presenting the material and completion problems with the formula. Students can only count but cannot understand the concept of the real physics. In the process of learning, especially learning physics teacher is a figure that should be good at choosing models, and media that will be used to explain the subject matter so that the learning objectives can be achieved.

According Zamista & Kaniawati (2015: 5), "of the many skills to be developed through the study of physics, science process skills is one of the important skills to have students". According Ulmiah, Andriani & Fathurahman (2014: 2), "Physics provides a great opportunity for students to develop these skills. This is because many of the concepts of physics that must be known to students through a process, not merely a concept in the form of rote ".

According to Rahmani, Halim & Jali (2016: 74), science process skills of students in science learning process are seen still lacking ". According Sukarno, Permanasari & Hamida (2013: 81), "the cause of the low science process skills are rarely conduct experiments based learning activities. Students are rarely given the opportunity to understand the phenomena around it based on concepts that have been learned in the learning process through observation and experiment ". This fact proves that the practicum can be used as a forum for developing science process skills, especially in physics.

Science process skills do not just listen and observe the teacher's explanations. According Harlen & Elsegeest (1992: 51), "there are several aspects of the science process skills students need to have in learning are: observe, formulate hypotheses, predict, find patterns and relationships, communicate effectively, designing experiments as well as measuring and calculating". If these aspects can be developed by teachers with good science process skills of the students will also be high. Therefore, it takes a learning model that can provide hands-on experience for students to develop the science process skills.

The learning model *Scientific Inquiry* is a design model that is expected to solve the problems described above. According to Joyce, Weil & Calhoun (2009: 194), "the core of this model is to involve students in research problems are really original in a way exposes them to the field of investigation, helping them identify problems conceptually or methodology in the field, and took them to devise ways of solving the problem ". According to Muslim & Tapilouw (2015: 89), "in *Scientific Inquiry is* the process of digging through investigation or observation is done naturally through an observation or phenomenon that occurs based reasoning and creativity of the students". According Ulmiah, Andriani & Fathurahman (2015: 2), "when students investigate and investigate the problem scientifically by finding and collecting evidence, the students do a lot of learning activities that can help to develop science process skills that are now owned by every student ".

According Maroangi, Werdhiana & Tiwow (2015: 38), "inquiry learning model through the skill of the process is one of learning techniques required by the curriculum in 2013, where the achievement should not be emphasized on the cognitive abilities of the students but on the formation of attitudes and skills that subsequently became a knowledge. Knowledge itself is the result of learning through a learning process that involves students actively in learning activities ".

Strengthening research learning model *Scientific Inquiry* is including Hussain, Azeem, & Shakoor (2011: 273), which concluded that learning *"Scientific Inquiry* is better than traditional learning in teaching Physics intermediate level. The average scores obtained from *Scientific Inquiry* guidance (40.6), *Scientific Inquiry* directional (31.6) and the combination of *Scientific Inquiry* (37.8) compared with the lecture method (34.3) ". This model is also

supported by Muslims and Tapilow (2015: 96), who said that models *"Scientific Inquiry* can improve students' science process skills and more control of the science process skills. This is because their activity in a model student *Scientific Inquiry* in determining the formulation of the problem and the work step ".

Based on the results of previous studies it is known that there is significant influence between the learning models *Scientific Inquiry* against science process skills of students. However, previous studies have difficulties with the allocation of time is not quite right, because students are still confused with what to do, especially when determining the formulation of the problem, ask questions, determine the study variables, and specify the experimental procedure. Therefore, researchers will conduct research in learning model *Scientific Inquiry* to increase the efforts that have been made previous researchers that the achievement of students' science skills will be better.

For physics materials that are difficult to be visualized by demonstrations or ordinary experiments then computer simulation can be used as an alternative strategy to approach the process of learning physics. One form of technology that has conformity with guided inquiry theory is a virtual laboratory. Utilization of a virtual laboratory in the learning process more effective in terms of time and improve student achievement (Tatli & Ayas, 2013). Research Bajpai, 2013) entitled "Developing Concepts in Physics through the Virtual Lab Experiment: An Effectiveness Study" concluded that the concept of learning through a virtual laboratory of the photoelectric effect is more effective than the real lab. The study also shows the use of virtual laboratory in physics learning better in improving students' understanding of concepts rather than learning through real lab.

Wijaya, (2013) examined the influence of inquiry learning model-assisted virtual laboratory for understanding physics concepts to eighth grade student of SMP Negeri 1 Negara the academic year 2012/2013. Based on these results, it can be concluded that the implementation of inquiry learning model-aided virtual laboratory in physics learning is very effective in improving the understanding of physics concepts than models of inquiry learning and conventional learning model.

The difference of this research with previous research is place of research, research sample, research material, time of research implementation, and media in research. Where researchers conducted research in SMAN 1 Perbaungan on the subject matter of Dynamics and Equilibrium of Rigid Bodies.

Based on the problem above, the author wishes to know the extent of the effect of the use scientific inquiry learning model assisted virtual laboratory in teaching and learning process, then the author feels need to carry out a study entitled: **"The Effect of Scientific Inquiry Learning Model Assisted by Virtual Laboratory to Student's Science Process Skills on Dynamics and Equilibrium of Rigid Bodies in Class XI of SMA N 1 Perbaungan Academic Year 2018/2019"**.

1.2 Problem Identification

Based on the background above, the problem identification of the research are as follows;

1. Physics learning was saturating and boring
2. Students are not active in physics learning
3. Learning model used by teacher was not varied
4. Lack of using media in physics learning
5. Low of student's outcomes in physics

1.3 Problem Limitation

Based on the identification problem, so that limit the problem in this research are:

1. The learning model used is a Scientific Inquiry learning model assisted by virtual laboratory for classroom experiments and conventional learning models the control class.
2. The subjects studied are students Semester I class XI SMA N 1 Perbaungan in the school year 2017/2018.
3. The material taught as research material is dynamic and equilibrium of rigid bodies.

1.4 Problem Formulation

Based on the above problem definition, then that becomes the problem in this research are:

1. How the student's science process skills by using Scientific Inquiry learning model assisted by virtual laboratory on Dynamics and Equilibrium of Rigid Bodies in class XI SMA N 1 Perbaungan A.Y 2018/2019?
2. How the student's science process skills by using the Conventional Learning Model on Dynamics and Equilibrium of Rigid Bodies in class XI SMA N 1 Perbaungan A.Y 2018/2019?
3. How the student's activity based on science process skills indicator during the learning process using scientific inquiry learning model on Dynamics and Equilibrium of Rigid Bodies in class XI SMA N 1 Perbaungan A.Y 2018/2019?
4. How the effect of scientific inquiry learning model on student's science process skills on on Dynamics and Equilibrium of Rigid Bodies in class XI SMA N 1 Perbaungan A.Y 2018/2019?

1.5 Research Objectives

To research objectives are as follows:

1. To know the student's science process skills by using Scientific Inquiry Learning model assisted by virtual laboratory on Dynamics and Equilibrium of Rigid Bodies topic at class XI SMA N 1 Perbaungan A.Y 2018/2019
2. To know the student's science process skills by using Conventional Learning model on Dynamics and Equilibrium of Rigid Bodies topic in class XI SMA N 1 Perbaungan A.Y 2018/2019
3. To know the student's activity based on science process skills indicator during the learning process using the scientific inquiry learning model on Dynamics and Equilibrium of Rigid Bodies topic in class XI SMA N 1 Perbaungan A.Y 2018/2019

4. To know the effect of scientific inquiry learning model on student's science process skills on Dynamics and Equilibrium of Rigid Bodies topic in class XI SMA N 1 Perbaungan A.Y 2018/2019

1.6 Research Benefit

The research benefits to be achieved from this research are:

1. To Authors

   Enhance knowledge and broaden horizons writer on *Scientific Inquiry* learning model.

2. To Teachers

   As input for a physics teacher in choosing appropriate learning model in order to facilitate the learning of physics.

3. To Students

   The *Scientific Inquiry* learning models can improve the student's science process skills in physics and help students to be more active in the learning

4. To School

   Give good contribution in order to improve the learning process and the quality of the school by increasing student's science process skills and teacher professionalism.

1.7 Operational Definition

1. Learning model *Scientific Inquiry* is a model of learning in the first phase of implementation is the teacher gives the student orientation issues to be investigated, the second phase of the teacher guiding students to formulate hypotheses relevant to the problem set by the teacher, the third stage of teachers guide students perform data collection and analysis the fourth phase of the data on the student's teacher members the opportunity to formulate an explanation as the experiment proceeds.
2. Direct Learning is learning that is often used by teachers, where teachers do lectures and exercises repeatedly, causing boredom for students
3. Science process skills is the ability of students to apply the skills are applied in a practical lesson begins by observing , formulating hypotheses,

predicting, designing experiments, discover patterns and relationships that exist, measure and quantify and communicate effectively both the communication when testing and when presenting the experimental results.