CHAPTER I
INTRODUCTION

1.1 Background

The education problem in Indonesia is related to the quality of education, which still needs to be improved. The low education rate is evident from the achievements of students' absorption of the subject matter (Rejeki et al., 2013). One of the problems faced in our education world is the problem of the weak learning process (Sanjaya, 2008). In the learning process, students are less encouraged to develop thinking skills. To deal with every problem well, everyone needs a higher level of thinking ability. One form of high-level thinking ability is thinking critically (Wulandari, 2015).

Higher-level thinking skills include critical thinking, logical, reflective, metacognitive, and creative—essential critical thinking skills to solve problems and make decisions. The thought process will evolve if individuals face unknown problems, challenging questions, or dealing with a problem. Higher-level thinking would happen if someone has information stored in memory and acquire new knowledge and then link the data to achieve a goal or obtain answers and possible solutions to a confusing situation (Lewis & Smith, 1993).

During this time, the Student's ability to think critically is not developed because of the dominance of conventional teaching and learning methods; it is varied and less active learning. As a result of knowledge, just like delivering information (student as listener and note-taker). Less variation learning methods of active learning cause the critical thinking skills of students to be low and yet developed because of the lack of activity asking, answering, responding and expressing opinions, reasoning, not used to solve a problem with either, so in conclusion, induction and deduction is still sorely lacking in learning activities in the classroom. This leads to lower student learning outcomes. Learn not just the memorization process and accumulate knowledge but how knowledge gained meaningfully and connected with everyday life (Sanjaya, 2008).

Chemical science education, in particular, is expected to train students' critical thinking skills through learning activities and requires students to be able to apply the learning materials in everyday life. In chemistry, learning in school requires students to think critically. Hove

(2011) says exercising critical thinking skills in classroom learning can improve academic ability. Critical thinking can help students enhance their understanding of the material being studied. Also, the concept gained longer be stored in memory for the students actively learning to find the concept independently (Mone, 2009).

Problems in the learning process are found by observations and interviews with teachers of chemical subjects SMA Negeri 1 Tanah Pinem; the results obtained through these interviews of chemistry students who achieved grades are generally still low. This fact is obtained from the assessment data semester exams for class XI TP 2018/2019 with a value between 60-80 and value - average grade of 68, while the chemical KKM this school is 75; however, it has reached the value obtained by the students already their additional deal of teachers. From the results of the chemical value received by the Student, it can be concluded that their students' achievement level was classified since the value of the obtained chemistry student has yet to reach the KKM.

Another problem is found, teachers of chemistry at school SMA Negeri 1 Tanah Pinem have made an excellent authentic assessment format cognitive, behavioral, or skills in lesson plan by the assessment standards mandated by the government, namely the national curriculum, but not documented as an instrument capable of measuring the Student's character is supposed to be measured. Teachers observe each display of students' attitudes. Still, the teacher has yet to be recorded in a book to see the mood of the student assessment process, so teachers can not compare to see students' perspectives with the assessment rubric. Then the teacher can not determine the level of achievement of student attitudes.

Difficulty understanding the concept experienced by high school students of class XI IPA at the material buffer solution includes the level of understanding of the concept of students in the material buffer solution categorized as low as most students do not understand the concept, resulting in the inability of students to answer the questions provided—another factor affecting student comprehension difficulties when learning due to commotion in the classroom. Unrest generally occurs when the teacher is explaining the subject matter. Teachers' teaching methods with lectures get them bored until they talk with their friends. Another cause of students having difficulty understanding the concept of solubility and solubility products based on the data is the habit of students rarely asking what is not understood. Students expect in chemistry learning, especially on the material solubility and solubility product, the teacher can use a variety of

learning models of the other so that students remain focused and enthusiastic about learning (Ulfah et al., 2016).

Following the characteristics of the material of this buffer solution, the researchers choose and implement the ideal learning strategy that can direct and requires students to form their knowledge. Among much-existing learning strategies, one of the models that could facilitate the formation of critical thinking skills is a problem-based learning model (Sungur, 2006).

The problem-Based Learning (PBL) model is chosen because it has several advantages, among others: 1) solving a given problem can be challenging and provoke critical thinking skills of students as well as give satisfaction to finding new knowledge, 2) the learning model PBL is considered more pleasant and preferably students, 3) Model PBL can enhance the activity of students in the learning process, and 4) the PBL model can allow students to apply the knowledge they have in the real world. PBL is expected to enhance Student's critical thinking abilities by exploring and developing existing indicators of critical thinking skills.

Assuming that the problem-based learning model can improve students' critical and creative thinking is better than the direct learning model is based on the opinions of experts. According to Sanjaya (2006), problem-based learning strategies can be defined as a series of learning activities emphasizing the process of resolving the problems faced scientifically. On implementing the problem-based learning model, students gathered together and discussed solving problems related to real life. Problem-solving will be successful when the issue is presented through teaching materials and reasonably realistic problems that kompleks. Completion given a situation is not the ultimate goal of learning because learning is not only meant to help students find a solution to a problem but also helps students understand the facts, concepts, skills, and principles of mathematics through the problem (Sunaryo, 2014).

Yatmis (2016) found the chemical learning outcome of students that learned using an integrated model of Problem-Based Learning Discovery Learning using audiovisual higher than the conventional way without the media. The average increase in the first experimental class, student learning outcomes increased by 71%, and the practical course II increased by 55%. Then, students' critical thinking skills are learned using an integrated model of Problem-Based Learning Discovery Learning using audiovisuals higher than the conventional way without the

media. The average necessary thinking skills of students in class experiment I was 41, and in the middle class II experiment, at 32.

Patchouli (2015) found that the difference between the results of studying chemistry students learned by the learning model Problem-Based Learning and Discovery Learning model study on the material solubility and solubility product by 29%.

Aprilia (2015) found the results of the influence of the Problem-Based Learning model study using real media and virtual labs on cognitive learning achievement. Still, there is no influence on practical achievement. The average cognitive learning achievement of students using the learning Problem-Based Learning Virtual lab (71.25) is better than those using the learning Problem-Based Learning in the actual Laboratory (58.75). Moreover, there is an interaction between real and virtual media labs with visual and kinesthetic learning styles the cognitive knowledge. Still, there is no interaction between real and virtual media labs and visual and kinesthetic learning styles on the effectiveness of learning achievement.

Based on the above background, the researchers will conduct a study entitled **"The Effect of Problem-Based Learning (PBL) Oriented Lesson Study With Interactive Powerpoint Toward Critical Thinking Ability In Materials Buffer Solution."**

1.2 Identification of Problems

Based on the background of the problems that have been described, it can be identified with the following issues:

1. Students learning habits of memorizing cause their thinking ability to be limited.
2. Chemistry is one of the most challenging lessons because of its abstract and complex concepts.
3. Learning that takes place with the Direct Instruction Model (DI) runs monotonously and is still centered on the teacher, which causes learning outcomes not to be maximized.
4. The need for exciting media to improve critical thinking skills

1.3 Scope Of The Problem

For research to be more effective, efficient, and directed, problem boundaries are needed. In this study, researchers limit the problem based on identifying problems number 2 and number 4. Number 2namely, chemistry is one of the lessons that is difficult to learn because of its

abstract concept and complex complexity. Number 4 is the need for an exciting medium to improve students' critical thinking abilities. The learning model used is Problem-Based Learning (PBL) oriented Lesson Study with interactive PowerPoint on essential thinking ability in the buffer solution material.

1.4 Formulation Of The Problem

To give a more specific direction of research and based on the restriction of the above problem to be studied are:

1. Does the implementation of problem basic learning (PBL) oriented lesson study with interactive PowerPoint, have significant effect on students critical thinking ability in the buffer solution material?
2. Does the implementation of problem basic learning (PBL) oriented lesson study with interactive PowerPoint, have significant effect on students learning outcomes in the buffer solution material?
3. Is there a relationship beween students' critical thinking ability on students learning outcomes?
4. Is the increase in students' critical thinking skills through learning model Problem-Based Learning (PBL) oriented Lesson Study using Interactive Powerpoint higher than the necessary thinking skills through learning with Direct Instruction on the material buffer solution?

1.5 Research Purposes

Based on the above problem formulation which is the goal of this research is:

1. To determine the increase in students' critical thinking skills through the Problem-Based Learning (PBL) model based on lesson study with flash media macros is higher than the ability to think critically through the di model.
2. The critical thinking aspect developed through Problem-Based Learning (PBL) based on lesson study with interactive PowerPoint.

1.6 Benefits of Research

1. This research was conducted to provide the following benefits: For Students, the front is expected to increase students' interest and active participation during the learning process

because of the presence of models and methods offered to improve learning outcomes and students' critical thinking skills.

2. Teachers As consideration of the reference material and teachers, especially teachers of clams, choose the model and the suitable teaching media in teaching and assist teachers in finding a form of learning that is effective and efficient in the delivery of chemical material, especially material buffer solution.
3. For Schools Is a new discourse for schools in choosing suitable models and media for learning chemistry students.
4. For researchers Adding insight into the field of research and the ability and experience in improving competence as educators later.

1.7 Operational Definition

To avoid different interpretations in understanding any existing variables in this study, it is necessary to clarify its operational definition. The functional purpose of the study is:

1. Model Problem-Based Learning is a learning model-based issue where the problem becomes a center of learning which will be combined with a material buffer solution as a subject to be used by students. The problem-Based Learning Model will direct learners to the issues, organize groups, develop and present the results of independent study and group and analyze some problems that exist in the material buffer solution (Awang et al. (2008) Heriyanto (2015)).
2. The direct Instruction Model is a model of a teacher-learning center specifically designed to support the students' structured learning process associated with declarative knowledge and procedural knowledge (Trianto, 2010).
3. The Lesson study combines the Problem-Based Learning (PBL) model to foster teachers' profession or competence through collaborative learning and continuous assessment based on collegiality and mutual understanding to build a learning community (Hendayana et al., 2006).
4. Critical thinking is the thought process of high level, which in this study determines the Student's ability to think critically and critically low on the material resulting from reaction rate of observation, experience, reflection, reasoning, or communication as a

guide to confidence and action.Angela (1999) ; Screven & Paul (1996) (in Filsaime, 2008).

5. Interactive PowerPoint is a simple, accessible, complete learning media that can be used anytime and anywhere, so it is very suitable for interactive learning. Interactive PowerPoint learning media combines text, video, audio, animation, images, educational games, evaluation, and conclusions to improve student learning outcomes.
6. The buffer solution is a pH that is relatively static (unchanging) on the addition of slightly acidic or alkaline. Judging from the composition of the constituent substances, there are two systems of buffer solution, the buffer system with low acid and base conjugate and the weak base buffer system with conjugate acid (Sudarmo, 2014).
7. The results of studying chemistry are the students' abilities after they received the chemistry learning experiences in terms of cognitive, affective, and psychomotor. In this study, the chemical aspects of the learning outcomes to be measured are cognitive learning outcomes (Izzati, 2009).
8. Normalized gain is the percentage increase in critical thinking skills which is calculated based on the post-test value subtracted by the pretest against the maximum score minus the pretest score multiplied by one hundred percent; the value obtained is the result of increased critical thinking skills carried out before and after the researcher conducts the research. (Melzer, 2002).