

CHAPTER I INTRODUCTION

1.1 Background

Today's education reformations are required to be done. Reformation efforts in the field of education are basically aimed at businesses include: mastery of materials, media, and learning models used. Learning model is aimed at increasing student activity in the learning process so that the process will take place in an optimal teaching and learning activities between teachers and students.

Several factors are seen as the causes of the global problems in education are: (1) instructional methods used by teachers are often monotonous. Lecturing method is a method that is consistently used by teachers in the order of explaining and then giving examples, exercises, and homework. There is no variation in learning methods/ models based on the characteristics of the material to be studied, (2) Teachers rarely give students the opportunities to interact with their friends or teachers in developing an understanding of the concepts and principles. (3) Teaching process conducted by the teacher more emphasize on mathematical manipulations; they start with the definition of the concept, and then put it mathematically. (4) Teachers do not understand the method of resolving the problems systematically. Teachers only see the final result of the assignments or tasks that the students do. (5) Teachers are more interested in the students whose the correct answer without analyzing the mistakes of the student and completion procedures. (6) Teachers generally assume that all subject matters of sciences are enough taught by lecturing or giving complete theories without considering that some also need additional activity such as laboratory and outside activity to get deeper understanding. (7) Teachers focus only on giving materials without inviting students to do some projects to discover something which absolutely can improve students' discovery ability (Slavin, 2004).

In addition to the factors above, learning strategies and models are really important to be used by teachers to determine the quality of processes and student learning outcomes. Therefore, teachers should be good at choosing and using

learning strategies and modes that can involve all components optimally so that students can learn actively and develop all their competences.

There are so many learning models/ strategies prepared to get more interactive learning. Some models/ strategies focus on cooperative interaction among students, others focus on the stages of conducting experiment (scientific method), and many others. Due to the variation of innovative learning models/ strategies, the selection of suitable models/ strategies is very important to be main priority before teaching activities; it is considering that there are lots of kind of topics such as the topic which is full of theory, calculation, demonstration, and others. So that it must have been well-prepared in matching the models/ strategies used to the topics being taught. As the limitation of options, curriculum can be used as a reference to match model/ strategy to the topic. It will give recommendation about models/ strategies which are nowadays effective to be implemented based on the aims of today's curriculum.

In terms of improving the quality of education in Indonesia, the government also has made several attempts, one of them is changing the curriculum. For now, the government changed the curriculum of KTSP into the 2013 curriculum based on the idea of the future challenges, public perception, development of pedagogical knowledge, future competence, and negative phenomena which arise.

Based on the 2013 curriculum that aims to prepare Indonesian people that have the ability to live as individuals and citizens who are productive, creative, innovative, and affective and able to contribute to society, nation, state, and civilization of the world, so that students are required to develop a balance between spiritual attitudes and social development, curiosity, creativity, cooperation with intellectual and psychomotor abilities (Regulation of Ministry of Education and Culture No. 69 of 2013).

Learning is related to the success of the learning process that the outcome will determine the students' achievement will be achieved. Therefore, in choosing learning methods, a teacher must pay attention to several things; conformity with the purpose of learning methods and teaching materials, teaching methods and conformance with environmental education. The selection of models/ methods of

learning based on the 2013 curriculum also focuses on the character of students that can be developed from the subject matter that teachers teach. Learning model which are suitable on content of the 2013 curriculum among others namely the model of Problem Based Learning (PBL), Discovery Learning, and Project-Based Learning (PJBL). According Suradijono (in Warmada), Problem Based Learning is a teaching approach that uses problems as a first step in collecting and integrating new knowledge. PBL learning model is student-centered learning and put the teacher as a motivator and facilitator. According to the Sofa (2008), Discovery Learning is learning that requires discovery mental processes, such as observing, measuring, classifying, suspecting, explaining, and making decisions. While Project-Based Learning is an innovative approach to learning that enable students to learn and work autonomously to construct their knowledge related to real life, so as to produce a product of student work.

Based on the condition stated above, it will be absolutely the best way to put learning model of PBL, Discovery Learning, or PJBL to the subject matter (especially sciences) rather than using conventional method of teaching. Discovery Learning is highly possible to give the best result in teaching and learning sciences especially chemistry.

Chemistry is one of science subjects that has a very close relationship between the concepts with their application in everyday life. This means that the learning is not enough by teaching conceptually, but enhancing the understanding of students to use the concept significantly in their daily life. According to Tanjung (2007) there are some factors that are suspected to be the causes of the lack of mastery of chemistry in senior high school, those include: students often learn by rote without understanding the subject matter, material that is taught often float so that students do not find the key to understand the material, and teachers can't give the concept to master the material being taught. One of the problems that lower the students' achievement in learning chemistry is that many students' pre-assumption that consider chemistry is difficult subject so they are indirectly intimidated with that assumption and have a feeling that they will never get it. This case may be caused by the presentation of topics which are less

interesting and boring because the lack of innovative strategies/ models of teaching by teachers. Considering the fact that chemistry is daily applicative subject matter, students must be mastered in not only theory but also their capability of doing experiment or discovering concepts by experiment. One of chemistry topics which need understanding in both concepts and experiments is Solubility and Solubility Product. It is expected that Discovery Learning will be effectively applied in this topic.

The topic of Solubility and Solubility Product is one of topics in senior high school chemistry of grade XI. The scope of this topic based on the 2013 curriculum includes (1) The definition of solubility, (2) Solubility product (K_{sp}), (3) The relationship of solubility (s) and solubility product (K_{sp}), (4) The effect of a common ion and pH on solubility, and (5) The relationship of solubility product (K_{sp}) to precipitation. Solubility and solubility product is a concept that adequately represent the abstract of chemistry lesson so that this subject is difficult to understand. So that to fulfill the competences need to be achieved, there must be conceptual understanding obtained from doing experiment or discovering the concepts through the experimental activities. Here, students are obligated to have high analysis ability of observing, measuring, classifying, suspecting, explaining, and making decisions. If the students have low quality of analysis, there will be a big possibility of getting misunderstanding about the concepts and experiments. To avoid misunderstanding, researcher choose one of the Discovery Learning type which focus on students' analysis ability in experiment but still under the guidance of teacher as facilitator, motivator, and role model. This type of Discovery Learning is Guided Discovery-Inquiry Laboratory Lesson.

One of capabilities development of discovery-inquiry on students through science can be implemented by the activities of guided discovery-inquiry laboratory lesson. According to Amin (1979: 15), the term guided discovery-inquiry laboratory lesson is used when teacher provides wide guidance and clear instruction to the students in the activities of discovery-inquiry. Most of the planning is made by the teacher. From the definition, it can be concluded that

guided discovery-inquiry laboratory lesson is Discovery Learning where the cases/ problems are given by teacher.

Students do not formulate problems. Complete clues about how to compose and record are given by the teacher. According to Amin (1979: 15-16) In general, guided discovery-inquiry laboratory lesson consists of: 1) Statement of problems: problems for each activity can be expressed as a question or statement plain; 2) The principle or concept being taught: principles and/ or concepts must be discovered by the students through the activities/ experiments, should be written clearly and precisely; 3) Equipment/ materials: equipments/ materials must be provided in accordance with the needs of each student to undertake activities; 4) Directives Discussion: in the form of the questions presented to students (class) to be discussed before the students do activities/ experiments; 5) Discovery-inquiry activities: activity method of discovery-inquiry by the students is in the form of experimental activity/ investigation conducted by the students to discover concepts and/ or the principles set by the teacher; 6) The thought process of students: critical thinking and the scientific process must be owned by students during the activity; 7) Open-ended question: it should be a question that leads to the development of additional investigation activities that can be undertaken by students; 8) Notes of teachers: an explanation of things or tough parts of the activity/ lessons, content/ subject matter that is relevant to the activity, variable factors which can affect the result.

Guided discovery-inquiry laboratory lesson invites the students to learn actively. Students will be involved in a lot of activities which definitely need activeness, cooperation, and responsibility in conducting the activities to get the best result of learning. As the process going, another advantage will be obtained where there will be characters development earned by students. If the students have no that characters, learning activity will be hard to be well-done. Characters development had been a big problem of Indonesian education. Individualistic attitudes, selfishness, indifference, lack of sense of responsibility, and lack of empathy are the phenomenons that shows the lack of social values or characters in daily life. By these conditions, education can actually provide a substantial

contribution to overcome those big problems. Education can contribute in overcoming social problems because education has the function and role in improving human resources. But what does actually make the characters development in schools has not yielded the expected results yet? Many factors are indicated as the causes behind these. Factors could be from the curriculum, design, or implementation of the supporting factors of learning (Syaodih, 2009). Thus, the 2013 curriculum is expected to bring new solutions to fix those all problems by not only focusing on students' achievement of cognitive aspects but students' characters development as well.

As the beginning effort in implementing the learning models recommended by the 2013 curriculum, the prevention of using conventional method must be running in a row with it. Many conventional learning methods which are used by teacher are just to present a subject matter that makes the students tend to be lazy to think and just listen to the explanation without understanding what was said by the teacher, just say that one of the conventional learning method is mostly covered by Direct Instruction learning model. This model brings one direction communication where teacher dominates teaching and learning process without paying attention to what students actually needs and wants, this makes the students get bored and sleepy easily. But actually the case is that a teacher is expected to be able to present the subject matter as interesting as possible, so that the students are going to be interested in being creative and active in learning activities (Roestiyah, 2001).

This objective is very suitable on the 2013 curriculum goal as described above. So that it is absolutely effective to use this kind of learning model on the teaching and learning activities. Therefore, due to the condition described above, the researcher was interested to intently conduct the research entitled **The Implementation of Guided Discovery-Inquiry Laboratory Lesson Learning Model in Improving Senior High School Students' Achievement and Characters Development on the Topic of Solubility and Solubility Product**

1.2 Problems Identification

Based on the background described above, problems can be identified as follows:

1. Teaching and learning processes are generally running by conventional way where the processes tend to be dominated by teacher's activity
2. The unsuitable selections on the models or the lacks of proper learning methods conducted by teacher.
3. The lack of theoretical and practical understanding about science especially chemistry.
4. The lack of students' characters development through teaching and learning process.

1.3 Scopes of Research

In order to keep this research more focused and directed; research was limited as follows:

1. The research was conducted in SMA Negeri 1 Percut Sei Tuan, Deli Serdang Regency, North Sumatera and limited to the grade XI even semester of academic year of 2013/ 2014
2. The topic was limited to the unit of chemistry of Solubility and Solubility Product based on the 2013 curriculum
3. Teaching method used in this research was limited to the learning model of Guided Discovery-Inquiry Laboratory Lesson and Direct Instruction as a control
4. In this research, this study was limited to the investigation of students' character of activeness, cooperation, and responsibility
5. Students' learning outcomes to be measured in this research were students' achievement by cognitive aspect of the level C1, C2, C3, and C4 and characters development as affective aspects by observation sheet

1.4 Problem Statements

To give the direction of this research, the problem statements in this research were formulated as follows:

1. Is there any significant difference between students' achievement obtained by learning model of Guided Discovery-Inquiry Laboratory Lesson compared to Direct Instruction?
2. Is there any significant difference between students' character of activeness developed by learning model of Guided Discovery-Inquiry Laboratory Lesson compared to Direct Instruction?
3. Is there any significant difference between students' character of cooperation developed by learning model of Guided Discovery-Inquiry Laboratory Lesson compared to Direct Instruction?
4. Is there any significant difference between students' character of responsibility developed by learning model of Guided Discovery-Inquiry Laboratory Lesson compared to Direct Instruction?
5. Is there any significant correlation between students' character of activeness to the students' achievement obtained by Guided Discovery-Inquiry Laboratory Lesson?
6. Is there any significant correlation between students' character of activeness to the students' achievement obtained by Direct Instruction?
7. Is there any significant correlation between students' character of cooperation to the students' achievement obtained by Guided Discovery-Inquiry Laboratory Lesson?
8. Is there any significant correlation between students' character of cooperation to the students' achievement obtained by Direct Instruction?
9. Is there any significant correlation between students' character of responsibility to the students' achievement obtained by Guided Discovery-Inquiry Laboratory Lesson?
10. Is there any significant correlation between students' character of responsibility to the students' achievement obtained by Direct Instruction?

1.5 Research Objectives

The general objective of this research was to investigate the effectiveness of implementing Guided Discovery-Inquiry Laboratory Lesson learning model in improving senior high school students' learning outcomes on the teaching of Solubility and Solubility Product based on the 2013 curriculum. The specific objectives of this research were to investigate:

1. Whether or not there was significant difference between students' achievement obtained by learning model of Guided Discovery-Inquiry Laboratory Lesson compared to Direct Instruction
2. Whether or not there was significant difference between students' character of activeness developed by learning model of Guided Discovery-Inquiry Laboratory Lesson compared to Direct Instruction
3. Whether or not there was significant difference between students' character of cooperation developed by learning model of Guided Discovery-Inquiry Laboratory Lesson compared to Direct Instruction
4. Whether or not there was significant difference between students' character of responsibility developed by learning model of Guided Discovery-Inquiry Laboratory Lesson compared to Direct Instruction
5. Whether or not there was significant correlation between students' character of activeness to the students' achievement obtained by Guided Discovery-Inquiry Laboratory Lesson
6. Whether or not there was significant correlation between students' character of activeness to the students' achievement obtained by Direct Instruction
7. Whether or not there was significant correlation between students' character of cooperation to the students' achievement obtained by Guided Discovery-Inquiry Laboratory Lesson
8. Whether or not there was significant correlation between students' character of cooperation to the students' achievement obtained by Direct Instruction
9. Whether or not there was significant correlation between students' character of responsibility to the students' achievement obtained by Guided Discovery-Inquiry Laboratory Lesson
10. Whether or not there was significant correlation between students' character of responsibility to the students' achievement obtained by Direct Instruction

1.6 Research Significances

This research was expected to:

1. Provide guidelines for science teachers especially chemistry teachers to implement Guided Discovery-Inquiry Laboratory Lesson on the teaching of chemistry topics
2. Give reference of best teaching model (Guided Discovery-Inquiry Laboratory Lesson) which can improve the students' achievement on the teaching of Solubility and Solubility Product based on the 2013 curriculum
3. Establish both basic and advanced knowledge of students about Solubility and Solubility Product based on the 2013 curriculum
4. Give motivation to teachers to conduct similar and better research examining learning models to chemistry topics
5. Provide inputs for next researchers to do similar research in the future