CHAPTER I
INTRODUCTION

1.1 Background of Study

Learning process is an ineffective process when the teacher verbally communicating information to the students while the students passively receiving and encoding it in their memories. It is necessary to teacher to use the interesting and interactive teaching method. Teaching methods with allowing the student's participate in teaching and learning process is better than giving them all of these information of the material. The teaching methods is refer to active teaching with allowed the student is being active in learning process. Active learning leads to better student attitudes and improvements in students' thinking and writing. One form of active learning surpasses traditional lectures for retention of material, motivating students for further study and developing thinking skills (Prince, 2004).

Studies have shown that students learn better when they are actively involved in the teaching-learning process. There are many different types of active learning, all of which involve the students engaged with the material, rather than passively listening to lectures (Slish, 2005). Students who participate actively in note taking process performed better than those who copied notes already prepared by their teachers (Madu, 2012).

In fact, the lack of variety strategy in teaching such as still using lecturing models with taking notes strategies. Some researchers find that students retain less of the information, and many instructors find themselves dealing with students who pay less attention and being noisy in class (Hackathorn, 2011).

The beneficial of the ease learning for difficult material is to make students is not only to memorize, however they can create their student's result as the implicitly of good understanding to construct the difficulties of material. It means the student have their own creation in learning process. The student's creation can help the student to understanding well to the material even thought it is difficult material. It give some effect. The student are able to identify the

concepts in the real world, manipulate phenomena for their own purposes, think about the material in new and complex ways, comprehend phenomena conceptually, and recall, retain, and memorize the material better.

Learning biology in high school had a lot of experience difficulties. Lazarowitz and Penso (2012) attributed difficulties in learning of the topics that are considered difficult to two reasons: The biological level of organization and the abstract level of the concepts. The appropriateness of biological level of organization might be a reason; young students or poor achieving students may get higher scores if instructed in topics of the levels of organisms, population, and community while they have difficulties in learning concepts of molecular, cell, tissue, and organ levels (Ozcan, 2003). Some factors that cause physiological material is considered difficult and complicated, namely characteristics of biological materials to be studied, how to teach the material, and initial capability of students who will study the material. (Tekkaya, 2011).

According to Mahardika (2014), the teachers of SMAN 8 Tangerang said that 60 percent of the students of class XI Science have got low leaning outcomes of the cell concept. The low learning outcomes is caused the cell concepts of plant and animal cell and transport mechanism concept were abstract concept.

According to Tanjung (2013), at SMA N 1 Tebing Tinggi in 2012 that students only memorize the theory without understanding the concepts and its application in students' daily life. The results were the information can not retain, because students just memorize base on their note that caused the students have no effectiveness in learning biology and can not recall the information in term having good retention, while the students achievement were still low because the low of understanding the material in order still use the note taking strategies . When students were given test, the cognitive learning outcome for grade XI students in this school were 62 in average score. Meanwhile, the minimum completeness criteria is 75 in average.

Based on interview with teachers of SMAN 1 Bumiayu, the cellular topic is the one of difficult Biology topic. It can be seen from the result of learning achievement in cognitive aspect is low. It just about 52.38% of students can

reached out the minimum scores meanwhile the minimum scores is 75. That's caused the conventional methods with using lecturing that created less of active learning (Khikmah, 2013).

Some researchers find that students retain less of the information, and many instructors find themselves dealing with students who pay less attention and being noisy in class (Hackathorn, 2011). It can caused the decreasing of the attitude of students. If the student can make a creation. It can help the student to understanding well to the material even thought it is difficult material and training to have a good attitude as an effect of the good understanding of the material.

Based on the fact, the necessary thing to do is to find the way to solve this problematic. It starts to change the learning strategies being an active learning strategies. This turning point of learning processes asks for designing of instruction that deals with students as builders not receivers of knowledge, students who construct knowledge through interaction and connecting their experiences and their prior knowledge with the current situations, and students who have learning strategies to help in building their knowledge and understanding. Therefore, effective instruction emphasizes on the teaching of strategies that enable students to learn with understanding. The learning strategy can influence the effectiveness for student to learning Biology in class is the variation of note taking as their work to produce the student's creation.

According to Mona and Khalick (2008) that researchers confirmed that visual presentation is an essential for students to understand new knowledge. One of the most powerful tools for visual presentation is mind map which is a "useful tool for helping younger students with the process of building conceptual understanding of content and promoting achievement defined the mind map as "an expression of Radiant Thinking and is therefore a function of the human mind. It is a powerful graphic technique which provides a universal key to unlocking the potential of the brain". The mind map has four essential characteristics: The subject attention is crystallized in a central image, the main themes of the subject radiate from the central image as branches, branches

comprise a key image or key word printed on an associated line, and the braches form a connected nodal structure.

Mind maps have also been used as reflective tools that allow for broader associations to be made to the material. Moreover, utilizing mind maps aids teachers vary their teaching methods which may be more likely to reach diverse learners. The utilization of mind maps can be assisted with "the adoption of colors, images, codes, and multidimensional approaches to help human memory, so that one could concentrate the mind on the central part, which is, the crucial subject". Buzan (1993) stated that mind maps help learners to use graphic representation which may help in the brainstorming process. McGriff (2000) confirmed that relating images to concepts is a creative task which requires thinking instead of memorizing (Jbeili, 2013).

A mind map is a diagram used to represent words, ideas, tasks or other items linked to and arranged radically around a central keyword or idea and as an aid in study, organization, problem solving, decision making and writing. Buzan described mind-map as an image-centred diagram that represents semantics or other conceptions between portions of information. The mind mapping strategy is one of the teachers' strategies in teaching. Mind Map also show the overall structure of a subject and the relative importance of individual parts of it (Madu, 2012).

The rule of the mind mapping are be an useful technique that helps to learn more effectively, to improve the way to record information, and to support and enhance creative problem solving, and also stimulate creativity, discovery and enquiry oriented in students since at the end of lesson, the student may fashion their notes according to their ability to facilitate their retention (Hackathorn, 2011). Adam and Mowers (2007) found that learners who could express their learning with visual skills had a 40% higher retention rate than that of just verbal learners.

The findings by Long indicated that when students constructed by thinking Maps. In this case, the thinking maps is mind map, they are able to achieve greater understanding than those students who used traditional note taking strategies. The

purpose of this research was to determine if the use of Mind Maps would increase student achievement. Because Mind Maps allow students to express their thoughts and ideas non-linguistically, instructors actually see the graphic representation of a student's thought process. By using mind maps instead of traditional methods, students are able to visualize links between non-linear ideas, which in turn provides for creativity and meaningful learning. Because mind maps are essentially the visual representation of student thought, they allow for a greater retention of information. (Long, 2011). Based on the background above, the research with the title "The Effect of Mind Maps to the Student's Learning Achievement and Retention in Cellular Biology topic of Grade XI IPA at SMA Negeri 1 Sidikalang Academic Year 2014/2015" has been done.

1.2 Problem Identification

According to the background above, the identified problems are :

1. Learning process is an ineffective process when the teacher are communicating verbally while student is passive .
2. Cell concept is difficulties topics that are considered difficult to two reasons namely the biological level of organization and the abstract level of the concepts.
3. The students just memorize that caused the students have no effectiveness in learning and can not recall the information.
4. The students achievement (cognitive and affective aspect) were still low because low understanding in order still use the note-taking strategies.

1.3 Scope of Study

This research focuses on using Mind maps in cellular Biology topic so that student's get their own experience learning by doing something such as make their own mind. It can help the student can construct the abstract conceptual. It is used to make the student's is being creative to make their own note such as mind map strategies. Mind map can be a tools to make an ease to understand the material , to analyse their component parts mapping to illustrate clearly and also

to recall the information about the complex topic especially cellular Biology topic. The student-centered is used in this research and it can accomodate all of the learning style to reach a maximal learning especially in their retention and learning achievement trough learning outcome or cognitive aspect and attitude or affective aspect.

1.4 Research Question

In accordance with the issue, the problem can be formulated:

1. Is there any effect of Mind maps on Student's learning achievement (cognitive and affective) in cellular Biology topic for grade XI IPA SMA Negeri 1 Sidikalang?
2. Is there any effect of Mind maps on Student's retention in cellular Biology topic for grade XI IPA SMA Negeri 1 Sidikalang?
3. How the percentage of retention ability after two weeks?

1.5 Research Objectives

1. To know the effect of Mind maps on Student's learning achievement (cognitive and affective) in cellular Biology topic for grade XI IPA SMA Negeri 1 Sidikalang.
2. To know the effect of Mind maps on Student's retention in cellular Biology for grade XI IPA SMA Negeri 1 Sidikalang.
3. To know the percentage of student's retention in two weeks who are taught Mind maps strategies and students who taught by using note taking strategies.

1.6 Significance of Research

1. Teacher can use the mind maps as strategies or models in note approach for replacing the note taking strategies.
2. To provide information longer to emphasize student's retention in teaching and learning activity.

3. To improve students encouragement in studying cellular Biology topic through increasing learning achievement.
4. To help teacher to optimize their performance in teaching cellular Biology topic.