

# Application of Mind Mapping and Audio Visual In Learning General Biology to Train Thinking Skills And Mastery of College Student Concepts

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**Abstract-** This research is a research on the application of mind mapping and audio visual in general biology learning, which aims to improve students' mastery of concepts and thinking skills in learning general biology in the material of the human nervous system. The method of data analysis was carried out in a descriptive quantitative-qualitative manner with the results of: (a) good learning performance (3,7); (b) The prominent frequency of student activities is in listening and paying attention to lecturers' explanations by 21.2% (c) the results of students' mastery of concepts increase (N-Gain: 0.71 with high criteria); (d) students' thinking skills improve, students' thinking ability shows that the students' average score in the class of pretest multistructural level thinking ability is 9.3% after the learning process with audio visual aided mind mapping has increased to 33.3% at the time of the post test . Classically, the ability of students in the abstract level is expanded to increase from pre-test to post-test scores, from 0% to 35% (e) positive student responses, namely student responses to the learning activities component 87% expressed very interested, expressed very easily 80% and who expressed agreement with the application of mind mapping assisted by audio visual media as much as 84.6%. The conclusion of this research is that the application of general biology learning mind mapping and audio-visual media with material for studying the human nervous system can improve students' mastery of concepts and thinking abilities.

**Index Terms-** Audio Visual, Thinking Skills, Mind Mapping, Concept Mastery

## I. INTRODUCTION

Learning is a system with various components, namely: material, methods, teaching aids and evaluation, with an organized and organized form used to obtain certain goals. The four things that are components in the teaching and learning process are important to be the attention of educators in choosing and applying both the methods and learning models that are suitable for use in learning activities (Rusman, 2012).

Future challenges require learning that can deliver students in facing the world with technological advances and communication that are very fast, emphasizing the ability of students in critical thinking, as well as connecting their knowledge with real things. The skills possessed can be obtained through an appropriate learning process in terms of mastery of the material concepts and thinking skills.

Thinking skills are needed for everyone to succeed in their lives. Slavin (2011) said that the application of learning according to Piaget's theory is done by focusing on ways of thinking or mental processes, and not just from the results. One process / way of thinking is mental behavior in terms of developing and discovering ideas that are original, constructive, and aesthetic that are directly related to the concept view and emphasize rational thought processes. Chiappta and Kobala (2010) convey that science is essentially a way of thinking (a way of thinking), a body of knowledge, and science and its interaction with technology and society. Learning biology, which is one part of science, is not only emphasized on the results, but also on the discovery of attitudes. Through the process of discovery, students will learn how to study. (learning how to learn) means in general, start a learning process from a number of learning methods, by looking at an outline of what will be learned, first get a comprehensive picture of its contents, then look Biology which is a science related to living things is studied by using scientific principles and work, an appropriate learning is needed in learning it and to foster students' creativity in biology, especially regarding the ability to think, so that it can motivate students to become good thinkers and provide many alternative answers to solving a problem. Some concepts learned by students in learning biology are easy to observe but some are not, such as the nervous system material so that lecturers need learning media that can visualize the material (Conscience, 2016).

Considerations in choosing appropriate learning and media, among others, are: subject matter, learning environment, and supporting facilities in the form of school buildings, libraries, and teaching tools. In this way, the objectives of the planned learning can be achieved. The quality of learning can be seen from the components, including processes and products. The process component is the ability of a learning to create joyful learning situations and conditions and also strives for students to be more active in learning and thinking creatively. The product component emphasizes the ability of learning to achieve its objectives.

There are various ways that can be done in learning activities, one of which is by applying mind mapping learning, is learning by creative note taking techniques from subject matter so that it can facilitate students in learning. In making mind mapping an imagination of the creator is needed so that creative students will more easily make this mind mapping. Likewise, with the more frequent students making mind mapping, it will be more creative, so that with these methods students are able to improve memory up to 78%. (Buzan, 2008).

In line with this, it is expected that by applying mind mapping learning in general biology learning, especially the nervous system material, it can facilitate students in memorizing their parts by creative note taking, which is to make thought maps in the form of charts (sketches). In this way, complex material can be changed to be simple. The thought process becomes more systematic and easier to remember. The application of mind mapping learning in general biology courses supported by audio visual media can help educators to deliver messages and respond to students' thoughts, feelings, concerns, and wishes so that learning activities can take place properly. To facilitate understanding of the concepts and mechanisms of the nervous system in the human body, we need the help of a learning medium, one of the media that is expected to make it easier to visualize nervous system material is audio visual. So that the material of the nervous system will be easier to learn and understand by students. Audio visual is a media consisting of sound elements and image elements that can be seen, for example video recordings, various sizes of films, sound slides, and so forth. This media looks interesting because it contains audio and visual elements.

Based on this background, the researcher is interested in conducting research on the application of mind mapping and audio visual in general biology learning to practice thinking skills and mastering student concepts.

for the main principles. Reducing writing, supplementing with pictures, sounds, schemes, graphics, sketches and mind maps, this is the core of thinking skills.

Based on the background that has been described, the problem formulation of this research is "How is the thinking skills and mastery of students' concepts after applying mind mapping and audio visual in general biology learning on human nervous system material?"

## II. IDENTIFY, RESEARCH AND COLLECT IDEA

### A. Human Nervous System

The human nervous system can be divided into two, the central nervous system and the peripheral nervous system.

#### a. Central Nervous System

The central nervous system is the brain and spinal cord. The nerve center controls and regulates the work of tissues and nerve cells. Large brain, cerebellum, advanced marrow (medulla oblongata), and spinal cord (spinal cord).

#### b Peripheral Nervous System.

The autonomic and non-autonomous (somatic) nervous system is the peripheral nervous system. A total of 12 pairs of head (cranial) nervous systems are non-autonomous (somatic) systems, while the sympathetic nervous system and parasympathetic nerves are the autonomic nervous system.

### B. Mind Mapping

Mind map is a creative, effective way of recording and mapping one's thoughts in an effort to make it easier for the brain to place and deliver information. Proverbs as a city map that is the concept of mind map. That is, there is a city center in the middle and several roads that lead in different directions. The center of the mind map is the main idea of the mind, while some of the ways are a translation of the main thoughts (Buzan, 2010: 4).

Mind maps in Indonesian are better known as concept maps. According to Martin (Abidin, 2009: 158) Concept map is a concrete graphic illustration by indicating that a linking of a single concept with other concepts in the same category. According to Nur (Abidin, 2009: 160), there are four types of concept maps namely the cycle concept map, the network tree concept map, the event chain concept map and the spider concept map map) Mind map is another term for spider concept map, so that it is concluded that mind map is one form of concept maps.

### C. Audio Visual

Audio visual is a media that has sound elements and picture elements so that this type of media has better capabilities because it includes sound and images. In audio visual media, there are two elements that are united, namely audio and visual. Audio visual is a modern instructional media that is in accordance with the times (advances in science and technology), including media that can be seen and heard "(Rohani, 1997). The existence of an audio element allows students to receive learning messages through hearing, while the visual element brings up learning messages in the form of visualization, thus establishing conditions that can make students able to obtain knowledge, skills, or attitudes. Audio visual media can be in the form of slide photos, videos, films and television. (Suleiman, 1988).

### D. Thinking Skills

Lawson (2005) defines skill as the ability to do something well or "the ability to do something well". It is said to be skilled if its performance: knowing what to do (knowing what to do), when to do it (when to do it), and how to do it (how to do it). So to be skilled, one must: know a set of procedural steps (knowing a set of procedures), and become an expert to carry out the procedural steps (being professional at executing those processes). Thinking skills can help someone understand how to look at themselves, how to look at the world, and how to relate to others. A person can do an analysis of one's own mind to decide in making choices and inferring them precisely through thinking skills.

### E. Mastery of Concepts

Mastery of concepts is the ability of students to understand the meaning of learning and apply it in everyday life. Good mastery of concepts will help to use more complex concepts. Mastery of concepts can be demonstrated through test results, which are in the form

of numbers or certain values. A student can be said to master the concept if the test results have exceeded the applicable score criteria. Students who have high thinking skills tend to more easily master certain concepts, because thinking skills are a form of thought that requires the use of analytical and evaluative cognitive processes and consists mostly of analyzing arguments for logical consistency in recognizing bias and wrong reasoning (Arends, 2012). This is in line with the statement of Borich (2006) that students with higher-order thinking skills tend to have strategies in solving problems, evaluating ideas, and making decisions, which also impacts on the mastery of the concept. The better the students' thinking skills, the mastery of the concepts also tends to be better.

The results of research conducted by Erianti (2017) stated that there is an influence of the problem posing learning model combined with audio-visual media on critical thinking skills and student learning outcomes in the endocrine system.

Joni Purwono, et al (2014) stated that student learning outcomes, student absorption in receiving lessons, and the percentage of Minimum Mastery Criteria (KKM) after the teacher used audio-visual media in Natural Sciences subjects at SMP Negeri 1 Pacitan had increased. Audio visual media is also to guide students who represent SMP Negeri 1 Pacitan in the Regency or higher level Science Competition. Swandani (2014) said that through the use of audio visual media can improve student learning outcomes in the first cycle and second cycle there was an increase in the first cycle the classical percentage was 51% with high success rate criteria and in the second cycle 100% with criteria the success rate is very high, so student learning outcomes have increased by 49%.

### III. WRITE DOWN YOUR STUDIES AND FINDINGS

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### IV. GET PEER REVIEWED

Here comes the most crucial step for your research publication. Ensure the drafted journal is critically reviewed by your peers or any subject matter experts. Always try to get maximum review comments even if you are well confident about your paper.

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### VI. CONCLUSION

From the results of the research that has been carried out, it can be concluded that the application of mind mapping and audio visual in general biology learning with material study of the human nervous system can improve thinking skills and mastery of student concepts.

### APPENDIX

Appendixes, if needed, appear before the acknowledgment.

#### ACKNOWLEDGMENT

The preferred spelling of the word “acknowledgment” in American English is without an “e” after the “g.” Use the singular heading even if you have many acknowledgments.

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