The Effect of Concept Map on Student's Learning outcome for Ecosystem in Grade Tensma Islam Al Ulum Terpadu Medan

Syamsiah

Program Magister Pendidikan Biologi, Universitas Riau
syamsiah7851@grad.unri.ac.id

ABSTRACT

Concept maps are tools for organizing and representing knowledge. They include concepts, usually enclosed in circles or boxes of some type, and relationships between concepts or propositions, (indicated by a connecting line and linking word) between two concepts. Linking words on the line specify the relationship between the two concepts.This quasi experiment research aim to investigate the effect of technique concept map on the student learning outcome in ecosystem topic. The research conduct in grade X SMA ISLAM AL ULUM TERPADU Medan. The population of this research are 46 students and sample are total sampling consisting 46 students and samples are total sampling consisting 23 students, as an experimental class (X-B) And 23 Students of control class (X-A). 30 items of multiple choice test were used and validated before they were applied. The result shows that pretest in experimental and control class are (59.13 _+ 12.12) and (59.34 +- 14.16) t test reveals t cal -0.18 t table (1.687) : α =0.05. Pretest has no significant effect in the students preliminary knowledge. In the contrary, past test show different result (experimental class = 76.08 +_ 10.65; control class 67.60 +_ 8.90) . T test reveals that t count (2.98) > t table (1.678). This finding states that treatments has significant effect on students learning outcomes in biology. It advisable that technique concept map is in corporate in the learning process especially in teaching biology.

Keyword: Concept map, Learning, Ecosystem, Learning outcome.

Introduction

Teachers teach to stimulate, guide student learning and engage students in accordance with the objectives of lessons. Learning objective in general is that teaching materials are delivered fully mastered by all students. It can be demonstrated mastery of learning outcomes or student achievement obtained. In Muhibbin (2003) that there are 3 factors that affect student learning outcomes. The first internal factors (factors of the students) the state / condition of physical and spiritual students. Second, external factors (factors outside the student) the environmental conditions around the students. Finally, factor learning approach (approach to learning) that students' learning efforts which include strategies and methods used by teachers to students to engage in the learning process.

Many teachers still think that the conventional method is the most effective method to implement the learning process. So that the teachers tend to still use the conventional method. Though learning using conventional methods does not touch the cognitive learners themselves, so the learning outcomes of students who obtained tend to be low.

From interviews conducted by researchers with one of the teachers in the field of biology Al Ulum Islamic High School Field, Mam Utari Manja, she said that the most common method used today is the lecture method. Though this method makes the teacher dominates the teaching and learning activities in the classroom so that students become

passive. Teachers to be the solve source of information so that learning activities take place in one direction. This leads to lower student learning outcomes, which can be seen by the many students who have not reached the standard of learning outcomes and learning mastery (SKBM) field of biology is only 75, while Al Ulum Islamic High School field average value of the acquisition is 50 students.According Sudjana (2009:22) process is an activity undertaken by students in achieving teaching goals, while learning outcomes are the abilities of the students after he received a learning experience

To further facilitate the students' learning and understanding of the concept map can be used as an alternative. Concept maps as a strategy in teaching, effective use for the concept map is a way to improve student learning outcomes. According Corebima (2007: 8) in subjects with concept maps students are able to build relationships between the concepts of subject material, individually or group. use this way, students will always be motivated to find relationships between the concepts, although at each level, from the general to the most specific. With concept maps, students build their conceptual understanding, so that they can achieve higher results in learning meaningful lessons.

Pandley in Dahar (2003) told the media map concept is an instrument which is a systematic science concepts formed from the core of the problem to the support portion having a relationship with one another. Based on the things above, the researchers wanted to conduct an experiment to see the effect of concept map on students learning outcomes on ecosystem in class X at SMA Islam Al ulum.

Methodology

The method of this research was quasi experimental method. The quasi experimental non- equivalent control group design was used to explain the effect of assigning students with Concept map for ecosystem grade ten. The samples in this research were taken by total sampling technique with the number of students by 46 students (2 classes) The variable in this research divided into 2 part, they are :

Independent variable: Technique Concept map and traditional note and dependent variable: Student's learning outcome achievement on ecosystem lesson.

Class	*Pretest*	*Treatment*	*posttest*
Experiment	O_1	*C*	O_3
Control	O_2	*X*	O_4

Description:

C = Control group using regular assignment
O_1 = Pretest for Experiment class
O_2 = Pretest for Control class
O_3 = Posttest for Experiment class
O_4 = Posttest for Control class
X = Treatment (Experiment) Group assigned by using concept map.

In term of obtaining research data, the procedures were conducted step by step as described below :

3.5.1 Preparation steps

a. Determining research time, location and schedule. Research location was chosen by based on bilingual program's provisions. Based on schedule, the process of obtaining data for validity of research instrument was started before senior high National Examination, and pretest and posttest data obtained after national examination.

b. Preparing for research instrument in form of objective test for obtaining data.

c. Concept map will be used as evaluation tools to ask the student make the resume of the lesson. And after the student finish make the concept map, the student easy to do the posttest.

d. Both content and construct validity of research instrument were done objectives by the help the evaluator, Drs. Lazuardi, M.Si as content evaluator in which the validation is done by linking the cues and answer to specifics learning objective and Dr. Hasruddin, M.Pd for construct validity.

3.5.2 Step for Obtaining data

a. Research implementation was carried out in two classes. The first class is a control class and the second class prepwered to experience a treatment using concept map. Situation of treatment class mostly concern on the way students develop their understanding in Ecosystem.

b. Concept map will be introduced on teaching and learning process as students will solve the problem of certain key terms of selected materials. The students of experimental will try to solve the concept map in which student can do it individually or in small group discussion.

c. For control class, the same task will also be assigned in form of regular assignments (multiple choice) in accordance to learning material objectives used in concept map.

3.5.3 Final Step

a. Step for hypothesis after obtaining the data by using descriptive percentage data analysis in order to discuss research data findings.

Result and Discussion

Descriptive analysis applied on result of student learning outcome for ecosystem, revealed the maximum scores achieved by the experimental group were 95 and minimum scores obtained mere 60, with the average was 76.68 and standard deviation 10.65. Result of the normality test using liliefors test revealed that the data of learning outcome of experiment group grade ten were normally distributed , L observe< L table with the level of significant (α 0.05), (L observed= 0.105<L table = 0.173)

The descriptive analysis utilized on control group's learning outcomes for ecosystem topic, revealed that maximum scores achieved were 95and minimum scores obtained were 55with the average scores was67.60 and standard deviation 8.90

Result of the normality test using liliefors test revealed that the data of learning outcome of control group grade ten were normally distributed , L observe< L table with the level of significant (α 0.05), (L observed= 0.103<L table = 0.173)

The experimental group and control group were all homogenous for the level of significance (α 0.05), (F observed =1.34 < F table= 2.14)

4.1.1 Students beginning Ability on Ecosystem Pretest

Pretest was done before teaching and learning process. The result of data analysis reveled that students who were assigned with concept map beggining equal ability

59.13 $\pm$ 12.122 ($\overline{X}$ + SD) to students assigned without use concept map, 59.35 $\pm$ 14.167 ($\overline{X}$ + SD) (t = 0.056 P = 0.842) (figure 4.1)

4.1.2 The effect of Concept map on students' learning outcome

Students who were assigned with concept map were significantly affecting their learning outcome, 67.60 $\pm$ 8.90 ($\overline{X}$ + SD) (t = 2.928 ; P = 0.005) compare to students assigned with regular assigned 76.08 $\pm$ 10.65 ($\overline{X}$ +

SD) , it means that, learning with the help of concept map increase students' learning outcome as much 10%

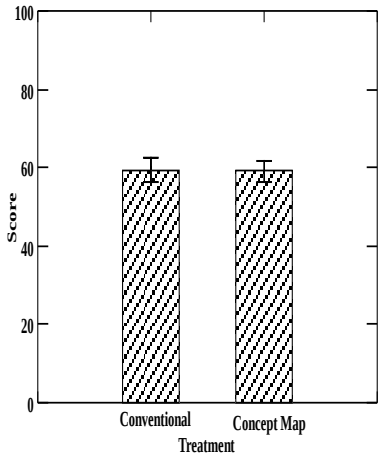

Figure 4.1 Result of Pre-test between Students who were taught with 'Conventional Note and those who were taught with Concept map earning model (t = 0.056 ; P = 0.842).

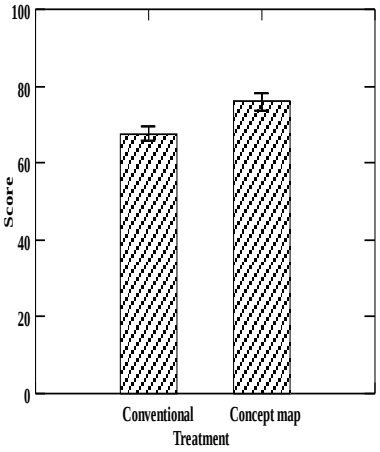

Figure 4.2 Result of Pre-test between Students who were taught with 'Conventional note and those who were taught with Concept map learning model (t = 2.928; P = 0.005).

The pretest result shows students learning outcome for ecosystem topic are not very different. In general, students do have similar initial capacity to start the topic (l obs = 1.36 < l table = 2.14) Therefore, Ho is accepted and Ha is rejected. Whereas the posttest the l obs = 2.98 > l table = 1.678. Therefore Ho is rejected and Ha is accepted. The two groups both have significant different learning achievement . Different treatments in both classes produce different learning outcome. The post test result show that there is an increase in the average score for both group59.13 to 76.08.(treatments class)and 59.34 to 67.60 (control class)

t-test showed there are significant differences of learning outcomes between students who were taught by the technique concept map and conventional note. Pretest and posttest result show that technique concept map improve the student learning outcomes in the ecosystem topic by 22%, while conventional strategy improve the student achievement 12%.Concept map learning process better than learning outcome because Joe Novak defines "concept" as a perceived regularity in events or objects, or records of events or objects, designated by a label. in visual forms, room ate is however less used in early childhood classrooms, is concept maps.

Concept comprise a network of connected and related concept. However, in concept map any idea can be connected to any other. Free-form, spontaneous thinking is required when creating a concept map and the aim of concept map is to find creative associations between ideas. thus concept map are principally association maps.

Thus percentage of students who are successfully answered the questions can be summarized as follow :

Experimental Class :

Pretest :15 % of C1: 10 %of C2: 5% of C3:6% of C4: 5% of C5: and3% of C6

Postest : 20 % of C1:10%of C2: 10% of C3:10% of C4:10% of C5: and5 % of C6

Control class :

Pretest : 15 % of C1: 10 % of C2: 7% of C3:6% of C4: 5% of C5: and 3% of C6

Postest :10% of C1:5%of C2: 7% of C3:4 % of C4:3% of C5: and1% of C6

Both of the experimental and control class also show the differences percentage of students in their activities.

The Experimental Class

- **First Meeting :** 46% of the activity students perform reading, express opinion, ask question or advice, discussion listening activity, writing activities (making concept map), mental activity (making decisions), emotional activity (interest)
- **Second Meeting: 70**% of students were observed to do all aspect of the first meeting.

The Control Class

- **First Meeting: 45**%of students do visual aspect of activities (reading) oral activities (to express opinions, ask question or advice, discussion), listening activities. Writing activities (making note), mental activity (making decisions), activities emotional (interest)
- **Second Meeting :**30% of student were observed to do all aspect of the first meeting.

The result of research shown that experimental group participating on strategy learning, learning process for ecosystem, note with concept map, have higher learning outcome compared to group of students learned with conventional note.

Application of technique concept map requires students thorough preparation of students self. This caused they have to use the whole brain by using making concept map and other graphics infrastructure to form a more profound impression.

One of the concept map strengths is summarize the material to be studied and will project the problems encounter in the form of maps or graphics technique, making them easier to understand and in conclusion a good note can bring the learning process yielding good result.

Conclusion.

Begining Ability of Student in control class biggeer than Experimental class average score for control class 59.13 and foe experimental class 59.35 .

The effect of Concept map on Student Learning outcome were significantly average score for experimantal class 76.08 and for control class 67.60.

References

Amita Dhaaka, 2012, C*oncept mapping : effective tool in biology teaching*

Arikunto,S., 2006, *Research Procedure A Practical Approach*, Rineka Copyright, Jakarta

Asan, A. 2007. *Concept Mapping in Science Class: A Case Study of fifth grade students*.

Ausubel, et all. 1978. *Educational psychology: A cognitive view*. New York: Holt, Rinehart & Winston.

Dahar, R. W., 1996, *Theories of Learning, Faculty-Teachers' Training College* Publisher Bandung. Bandung

Muhibbin, S., 2003, *Psychology of Learning*, King Grafindo Persada, Jakarta

Sudjana. 2002. *Statistical method*, Tarsito. Bandung