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THE USE AND EFFECT OF CONCEPT MAPPING HEURISTIC IN
FACILITATING LEARNING OF VARYING ABILITY GROUPS
IN COLLEGE INTRODUCTORY BIOLOGY

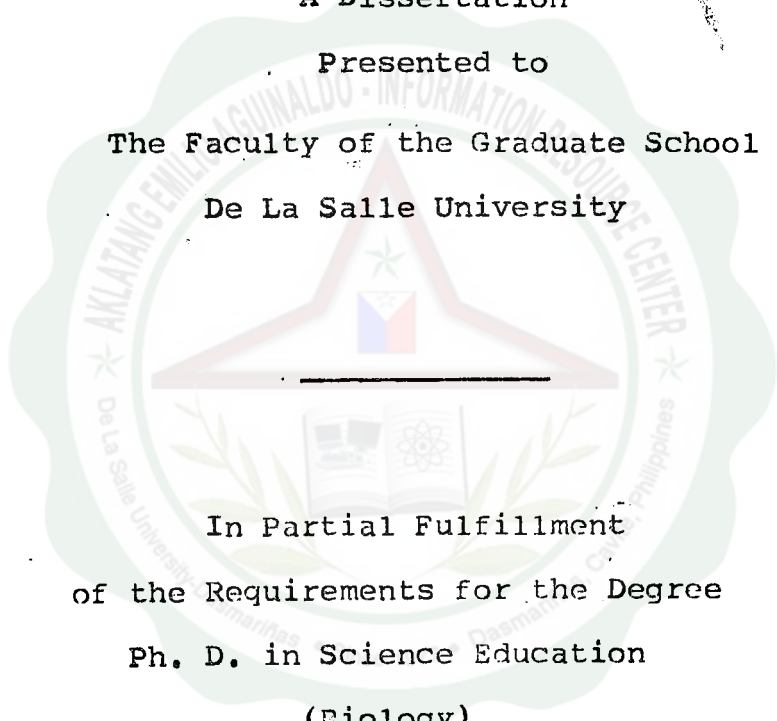
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A Dissertation

Presented to

The Faculty of the Graduate School

De La Salle University



In Partial Fulfillment

of the Requirements for the Degree

Ph. D. in Science Education

(Biology)

by

Asuncion V. San Juan

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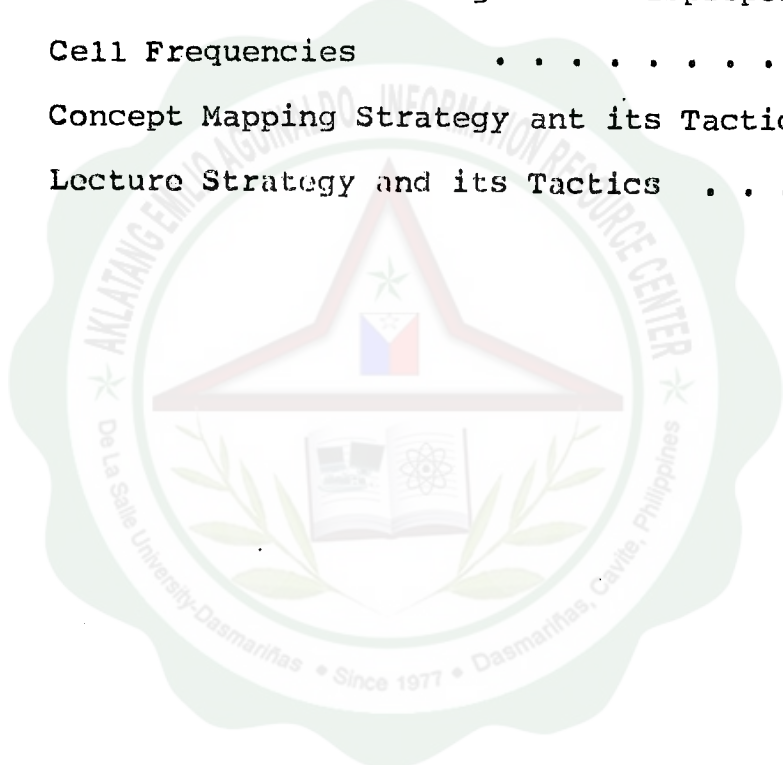
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ABSTRACT

Title: The Use and Effect of Concept Mapping Heuristic In Facilitating Learning of Varying Groups In College Introductory Biology

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School : De La Salle University

Course : Ph. D. in Science Education- Biology

This study was undertaken to determine whether concept mapping as a method in teaching biology is effective in facilitating learning in terms of better performance in achievement test.

The non-equivalent control group design involving experimental and control group was employed with the teacher-made test as the main tool for gathering data.

The design of the study permitted the investigation of the following questions:

1. Are there significant differences in achievement among students taught by concept mapping, by combined concept mapping and lecture and those taught by the lecture method of instruction?
2. Is there any significant interaction between the method of teaching and student's activity on achievement?
3. Which of the following groups of students retained their knowledge better?



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- a. those taught by concept mapping method
- b. those taught by combined concept mapping and lecture
- c. those taught by the lecture method

A total of 98 college students enrolled in biology in the Catanduanes State Colleges and in the Catanduanes College were given the pretest and posttest.

The data gathered from the posttest scores were statistically analyzed within a 3 x 3 factorial design. Analysis of covariance (ANCOVA) was employed to test simultaneously all the independent variables on the achievement scores. 'Scheffe' method was performed only when any of the F-Ratio was shown to be significant. The t-test for correlated samples was applied in the analysis of student's retention.

The significant findings of the study were the following:

1. There was a significant difference in the achievement scores of students taught by concept mapping, by combined concept mapping and lecture and those taught by the lecture method.
2. No significant interaction existed between the method of teaching and students' ability on achievement.
3. Students who were taught by concept mapping had comparable achievement scores to the students



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who were taught by combined concept mapping and lecture method.

4. Students in concept mapping group significantly outscored the students in the lecture group in the achievement test.

The following conclusions were derived:

1. Achievement in biology was highly related to the student's mental ability and pretest. Hence, either ability or pretest, as variable, could be used as predictor of student's achievement.
2. The student exposed to concept mapping and those exposed to combined concept mapping and lecture methods performed equally well in the achievement test. Hence, either of these methods could be used in teaching biology for more effective learning of biology concepts.
3. On the average, the students in concept mapping group demonstrated superior performance in terms of achievement scores in biology over those in the lecture group. Hence, concept mapping, as a method, was effective in facilitating learning of biology concepts.
4. The effect of method of teaching on the student's achievement scores is independent of the type of student.



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5. Retention of knowledge was more efficient in students exposed to concept mapping than those exposed in the lecture method.

In the light of the findings and conclusions made regarding this study, the following recommendations are offered;

1. The use of concept mapping method be adopted in teaching biology by teachers to help students learn science not by rote learning but as a process by which the students are taught to find out things for themselves.
2. Enrichment exercises in biology for concept mapping task should be given more as often as possible to students, so they can develop more complete understanding of the subject and consequently attain meaningful learning.
3. Teachers may employ the two methods - concept mapping and combined concept mapping and lecture in biology teaching.
4. For the benefit of the students, school administrators, teachers and curriculum planners should develop instructional materials with illustration of concept maps.
5. Textbooks or references in biology should provide models of concept maps to acquaint



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students on the mechanics of concept mapping processes and to have an understanding of what the method is all about.

6. For curriculum designers, concept maps should be viewed as important curricular and instructional tools in the selection, organization and structuring of intended learning outcomes (ILO's) cognitive in nature, and appropriate in biology teaching.
7. Future research may be conducted in natural sciences in order to draw a more general and conclusive findings on the effect concept mapping had on the achievement of the students.
8. Similar studies may be conducted using other good bases, for categorizing the subjects according to mental ability, so as to formulate a more general and valid conclusion regarding performance of students of varying mental ability as a result of exposure to concept mapping.

