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"Effectiveness of Two Stay - Two Stray Learning Model on Academic Achievement in Biological Science among Higher Secondary Students."

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Abstract:

The researcher aims to determine the Effectiveness of Two Stay - Two Stray Learning Model on achievement in biological science of 11th grade students of higher secondary school of Channarayapatna. The type of this research is a True experimental (Parallel design) study. The population of this study was the 11th grade students of higher secondary school of Channarayapatna. The sample of this research consisted of two classes namely 11th -A grade as an experiment class and 11th - B as a control class. The research instrument used are test of student's learning outcomes of multiple choice and standardised tools to measure academic achievement. Based on the results of the research, it was obtained that average score of the post-test in experimental class is **44.0000** with standard deviation (s) is **6.89314** and after given the treatment, the average score of the post-test in

control class is **39.0000** with standard deviation (s) is **4.29669**. According to the observation of the student activities carried out in two cycles, student activity is quite active. Based on the results of two tailed t-test for post-test data in experimental class was significant. Therefore, H_0 is rejected and the otherwise H_a is accepted. Based on the results of this research, it can be concluded that the cooperative learning model with two stay two stray type affected to student's learning outcomes of 11th grade students.

1.0 Introduction:

Learning is a “process that leads to change, which occurs as result of experience and increase the potential of improved performance and future learning”. The difficulties of learning science are related to learner's tendency towards remembering science vocabulary and scientific names which are prominent parts of biological science education and to the methods by which science is customarily taught without regard to what is known about children's learning.

One aim of biological science teaching is to provide students with the optimum conditions for acquiring a grasp of concepts needed to interpret and predict natural phenomena and to solve problems. Thus, the concepts should have wide applicability. The level of understanding of these concepts and the extent of their applicability will of cores vary according to the age of the student and the type of instruction given.

The learning process will be effective when the teachers understand the learning model and their implications in a classroom situation. Teachers should choose the suitable learning model based on the competencies.

Strategy is one of the ways that used by the teacher to help the students interested in teaching learning process. Ahmadi and Prasetya (2005:11) stated that a strategy may be defined as the teacher's effort in creating an environment

system that probably teaching process happened. Actually, there are many strategies that can do if teacher teaches his/her students in a classroom, but in this research, the researcher has chosen the convenient strategy based on the experience and opinion.

Two Stay Two Stray is one of cooperative learning. Lie (2010:29) pointed out that cooperative learning is not same with learning in group. There are some basic elements of cooperative learning that different with dividing group inappropriately. The right procedures of cooperative learning will make the teacher manages the class more effectively.

2.0 Review of related literature:

The research studies conducted on Two Stay - Two Stray learning model, cooperative learning approach and its effects on psycho-social and other academic variables are discussed in this section.

1. **Yusri , Mantasiah , and Jufri (2018)** conducted research on The use of two stay two stray model in English teaching to increase student's learning outcome The purpose of this study was to determine whether the application of cooperative learning model two stay two stray can increase student's learning outcome in English learning. Data collection techniques used in this study consists of observation, tests and questionnaires. This study was conducted in two cycles, each cycle is carried out two meetings. In preliminary tests, the average of learning outcome in pre-test is was 53, 73, the first cycle was 65.4 and in the second cycle was 77.93. From these results it can be concluded that the use of cooperative learning model two stay two stray can increase student's learning outcome in English learning.
2. **Dintje Fintje Pendong , Femmy H Rogahang (2018)** studied on Comparison of biological learning outcomes, using problem based instruction and two stay two stray model, on the subject of plant structure. Biology is a branch of

natural science, the most dynamic. The phenomenon of life in living things, save a lot of interesting problems learned. Problem-based learning makes students centered in learning. Research has been conducted to compare students' learning outcomes by using two stay two stray model and problem based instruction. The method used in this research is quasi experimental method (quasi-experimental research). From the results of research that has been obtained, it can be concluded that the learning type of problem-based instruction, the keep structure of plants is very effective for students. This model can train students to be independent and can solve biology especially related to the structure of plants, and train students to look at things in an integrated manner. Model of learning problem based instruction, has a better learning outcomes, compared with the model of learning model two stay two stray.

3.0 Theoretical framework:

Theoretical Perspectives on Co-operative Learning

While there is a general consensus among researchers about the positive effects of co-operative learning on student achievement, there remains a controversy about why and how they affect achievement and, most importantly, under what conditions they have these effects. Different groups of researchers investigating co-operative learning effects on achievement begin with different assumptions and conclude by explaining the effects of in terms that are substantially related.

In earlier work, Slavin (1995, 2009; Slavin, Hurley, and Chamberlain, 2001) identified Motivationalist, Social cohesion, Cognitive developmental and Cognitive-elaboration as the four major theoretical perspectives held by different researchers on the achievement effects of co-operative learning.

The Motivationalist perspective presumes that task motivation has the greatest impact on the learning process, and that the other processes (such as planning and helping) are driven by individuals' motivated self-interest. Motivationalist scholars focus especially on the reward or goal structure under which students operate. By contrast, the social cohesion perspective (also called "social interdependence theory") suggests that the effects of co-operative learning are largely dependent on the cohesiveness of the group. In this perspective, students help each other to learn because they care about the group and its members and come to derive the benefits of self-identity from group membership (Johnson and Johnson, 1989; 1999; Hogg, 1987).

The two cognitive perspectives focus on the interactions among groups of students, holding that these interactions themselves lead to better learning and thus better achievement. The cognitive developmentalists attribute these effects to processes outlined by scholars such as Piaget and Vygotsky.

The cognitive elaboration perspective instead asserts that learners must engage in some manner of cognitive restructuring (elaboration) of new materials in order to learn them; co-operative learning is seen to facilitate that process.

A model of how co-operative learning might improve learning, adapted from Slavin (1995), is depicting the main components of group learning interaction and representing the functional relationships among the different theoretical approaches. The interdependent relationships among the components begins with a focus on group goals or incentives based on the individual learning of all group members. It assumes that motivation to learn and to encourage and help others to do so activates co-operative behaviours that will result in learning. This includes both task motivation and motivation to interact in the group. In this model, motivation to succeed leads directly to learning, and it also drives the

behaviour and attitudes that foster group cohesion, which in turn facilitates the types of group interactions - peer modelling, equilibration, and cognitive elaboration - that yield enhanced learning and academic achievement.

Cognitive-Developmental Theory

An early theory of cooperation is cognitive-developmental theory.

The cognitive developmental theories of cooperation include those of Piaget (1950), Vygotsky (1978), and Johnson and Johnson (1979, 2007, 2009a). To Jean Piaget (1950), cooperation is striving to attain common goals while coordinating one's own feelings and perspective with a consciousness of others' feelings and perspective. From Piaget and related theories comes the premise that when individuals co-operate on the environment, socio-cognitive conflict occurs that creates cognitive disequilibrium, which in turn stimulates perspective-taking ability and cognitive development. Cooperation in the Piagetian tradition is aimed at increasing a person's intellectual development by forcing him or her to reach consensus with others who hold opposing points of view about the answer to the problem. A number of researchers have conducted studies on cooperation from the Piagetian point of view (e.g., Hayek, Toma, Oberle, & Butera, 2014).

TWO STAY - TWO STRAY LEARNING MODEL OF COOPERATIVE LEARNING APPROACH:

- The synergy generated in Two Stay - Two Stray Learning cooperative settings generate more motivation than do individualistic, competitive environments. Integrative social groups are, in effect, more than the sum of their parts. The feelings of connectedness produce positive energy.
- The members of Two Stay - Two Stray Learning in cooperative groups learn from one another. Each learner has more helping hands than in a structure that generates isolation.

- Interacting with one another produces cognitive as well as social complexity, creating more intellectual activity that increases learning when contrasted with solitary study.
- Cooperation increases positive feelings toward one another, reducing alienation and loneliness, building relationships, and providing affirmative views of other people.
- Cooperation increases Attitude, Creativity and Efficacy not only through increased learning but through the feeling of being respected and cared for by the others in the environment.
- Students can respond to experience in tasks requiring cooperation by increasing their capacity to work productively together, in other words, more the children are given the opportunity to work together, the better they get at it with benefit to their general social skills.

OBJECTIVES OF THE STUDY

The objectives are

1. To find out two Stay - two Stray Learning is more effective than that of the traditional approach in biological achievement.

HYPOTHESES OF THE STUDY

Based on the above objectives the following hypotheses have been formulated.

1. There is no significant difference between the mean scores of pre-test and post-test in the academic achievement of biological science among the control group.
2. There is no significant difference between the mean scores of pre-test and post-test in the academic achievement of biological science among the experimental group

RESEARCH DESIGN:

In the present study, True experimental (Parallel design) design will be used. True experimental (Parallel design) designs are used in experimental situation. Among randomized Control group, Pre-test - Post-test Design will be adopted for the present study.

E	O1	X	O2
C	O3	-	O4

Where:

E : Experimental class

C : Control class

O1 : Pre-test in experimental class

O2 : Pre-test in control class

X: Treatment for experimental class.

O3: Post- test in experimental class

O4: Post -test in control class

Sampling:

In the present study purposive sampling technique will be used. The sample for the present study consists of the 40 students for control group and 40 students for experimental group students studying in Pre-University college in Channarayapatna taluk.

TOOL FOR THE STUDY:

Biological achievement Scale aims at finding out the pre-treatment biological achievement and post-treatment biological achievement of the control and experimental groups.

Result:

Based on the analysis of the research data, the summary of the pretest and post test scores is shown in Table 1.& 2

Mean and t-Value for Experiment and Control

Class Data Class Experimental Control. (EG-Experimental group-Control group)

1. There is no significant difference between the mean scores of pre-test and post-test in the academic achievement of biological science among the control group

Table 1:

	Mean	N	Std. Deviation	Gain-score	Correlation	t-Value	Sig.
BA PRE-TEST-CG	37.7500	40	7.16025	-1.25000	.318	-1.116	Not significant
BA POST-TEST CG	39.0000	40	4.29669				

Interpretation:

Based on the above results There is no significant difference between the mean scores of pre-test and post-test in the academic achievement of biological science among the control group so acceptance of Ho and reject Ha.

2. There is no significant difference between the mean scores of pre-test and post-test in the academic achievement of biological science among the experimental group.

Table 2:

	Mean	N	Std. Deviation	Gain-score	Correlation	t-Value	Sig.
BA PRE-TEST-EG	37.8500	40	6.89314	-6.15000	.722	-8.137	Significant
BA POST-TEST EG	44.0000	40	5.25259				

Interpretation:

Based on the above results there is a significant difference between the mean scores of pre-test and post-test in the academic achievement of biological science among the experimental group so acceptance of H_a and reject H_o .

Discussion:

Based on the results of the study with post-test average score is 44.0000 and the average score of the observation sheet for the two stay two stray cooperative learning model .

Therefore, it could be concluded that the use of Two-Stay Two-Stray there is a significant difference between the mean scores of pre-test and post-test in the academic achievement of biological science among the experimental group.

Discussion:

Discussions Regarding to the result of the data analysis above, the result showed that the obtained t- value 8.137 was higher than t-critical with the degree of

freedom (40) at the 0.05 level. It can be concluded that there was significance effect of using Two-Stay Two-Stray Technique in academic achievement of biological science among the experimental group.

Therefore, the alternative hypothesis of this research which stated that the use of Two Stay Two-Stray Technique is significant academic achievement of biological science among the experimental group.

The first meeting with the control group, the researcher found that there were many students who kept silent during the teaching learning process. It was occurred because of the technique that is used to teach the control group students could not attract the students' participation and monotonous. Therefore, the researcher distinguished the treatment between two classes in order to see the effect of the treatment itself towards the student's writing achievement. After that, the researcher would see whether the technique was effective or not to be implemented. Because of the control group students did not accept the treatment, in this case Two-Stay Two-Stray Technique. As the result, only several students gave their participation and most of them still passive. During the second meeting, the researcher explained the material in more detail and the students showed their attention to the teacher and they had a better understanding about the material. After that, in the last meeting, the researcher asked the students to take achievement test. Even though in the pre-test most of them did not complete the test because they did not know what to write and run out of time. But, in the post-test they could write the Achievement test completely.

CONCLUSION AND SUGGESTIONS

Conclusion:

There is a significant effect cooperative learning model with two stay two stray type to the students' academic achievement in biological science among 11th grade students of Channarayapatna.

SUGGESTIONS:

Based on the results of the research and discussion as well as conclusions, the authors would like to give suggestions to carry out further research to students at different levels of education units, and by taking a larger sample. Thus, this learning model is expected to be used as one of the important indicators in the preparation of the curriculum, especially in biology lessons that are even better in the future.

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