EFFECT OF CO-OPERATIVE LEARNING IN RELATION TO ACADEMIC ACHIEVEMENT

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ABSTRACT:

The purpose of the study was to compare the traditional approach to teaching math at the higher secondary school level in Cuddalore District, Tamilnadu, with the effect of cooperative learning on the academic achievement of students. The study's independent variable was the teaching approach, whereas the dependent variable was the students' academic performance. In this work, cluster sampling approaches are employed. 42 students were selected from Standard 11 for this study. It is a Post Test - Post Test study. These 42 students were first taught Basic Algebra through traditional method of teaching (Control group). The achievement of the student is Assessed immediately. After a week student were taught Vector Algebra through Co-operative learningTechniques and achievement of the student is Assessed immediately (Treatment group). The Achievement tests contained 11 questions in 4 sections for both the groups. The achievement test is prepared to test memory, analysis, synthesis and Evaluation ability of the students. The time duration for the test was fixed as one hour for the both the groups. The maximum marks for the achievement test are allotted as Twenty-Five. Data collected from both groups was used for the further calculation through IBMSPSS23. The control group students show Low achievement but the treatment group students show high achievement in Maths. Co-operative learning Technique has effect on achievement of the higher secondary school students in Maths subject. Stepwise regression result shows that the gender uniquely accounted for approximately 24% of the Control group achievement but in Treatment group the gender uniquely accounted for approximately 11% of the of their students achievement. ANCOVA result shows that Age shows significant Effect on achievement through teaching with Co-operative learning Technique controlling traditional method of teaching.

Key Words:Academic AchievementAndCo-Operative Learning Technique.

INTRODUCTION :

Students' academic performance is greatly influenced by the teaching strategies used, and education is crucial for the development of the individual as well as the community. Cooperative learning is a student-centered method that emphasizes peer support, cooperation, and active participation in group activities to achieve common learning objectives. This method is different from traditional, individual-focused training in that it promotes teamwork, communication, and problem-solving skills. High school, a pivotal period in a student's educational journey, necessitates effective teaching strategies to raise academic performance and prepare them for future challenges. This study examines the impact of cooperative learning on high school students' academic performance in order to provide insight into its efficacy. Examining its impact on social and cognitive development, the study aims to help

SIGNIFICANCEOFTHE STUDY :

Research on the connection between higher secondary school student's academic performance and cooperative learning is crucial to enhancing educational outcomes. It highlights how, in addition to academic success, cooperative learning develops important life skills like communication, problem-solving, and teamwork. By fostering an inclusive and stimulating learning environment, this approach supports students from a range of backgrounds and ability levels, thereby addressing educational equity. The findings can help legislators create student-centered curricula, help educators adopt effective teaching strategies, and help close achievement gaps. Additionally, by offering practical guidance for improving overall student performance and engagement, this study adds to the growing body of research on innovative teaching techniques.

HYPOTHESIS

1. The level of achievement of the control group and treatment group is low.
2. There is no effective method of teaching**for Maths.**
3. There is no relationship between subsample of treatment group and their achievement.
4. There is no impact of **Co-operative learning Technique**over traditional teaching

5. There is no predictor of achievement in treatment group.

STATEMENT OF THE PROBLEM:

The problem of the study has been precisely stated as mentioned below **A Study on Effect of Co-Operative Learning in Relation to Academic Achievement Of Higher Secondary Higher Secondary School Students**
POPULATION:
There are 144 Higher Secondary Schools in Cuddalore district. Approximately 7500 students are perusing computer Science group in Standard 11.
SAMPLE:
In this work, cluster sampling methods are employed. Forty-two pupils were chosen from the Vallalar Gurukulam Higher Secondary School's Standard 11 computer science group in Vadalur, Cuddalore district. Both the control and treatment groups had the same set of students, but the subject and teaching strategy were altered.
LOCATION OF THE STUDY
The present investigation was conducted in the Standard 11 computer science group students in Vallalar Gurukulam Higher Secondary School, Vadalur, Cuddalore district.

Methodology:

The study was carried out to determine the impact of Cooperative Learning as compared to the traditional method of teaching in the subject of Mathematics at Higher Secondary School level. The dependent variable in the study was the achievement in the academic scores of the students, whereas the independent variable was the teaching strategy. Cluster sampling techniques are used in this study. 42 students were selected from Standard 11 computer Science group for this study. It is a Post Test - Post Test study. These 42 students were first taught **Basic Algebra** through traditional method of teaching. The achievement of the student is Assessed immediately. After a week student were taught **Vector Algebra** through **Co-Operative Learning techniques like Think pair share, Zigzag and group investigation** and achievement of the student is Assessed immediately.
TOOLS USED:
The tool contains 2 parts, Part one included only personal information and part 2 contains achievement test questions. An achievement test was prepared by the researchers with the consultation of experienced Mathematics faculty in the same Higher Secondary School form the topic **Basic Algebra** (in Annexure 1) for control group and **Vector Algebra** for Treatment group (in Annexure 2) from Tamilnadu state board Higher Secondary School syllabi. The Achievement tests contained 11 questions in 4 sections for both the groups. The achievement test is prepared to test memory, Comprehension, analysis, synthesis, Evaluation and creative ability of the students. The time duration for the test was fixed as one hour for the both the groups. The maximum marks for the achievement test are allotted as Twenty-five.

HYPOTHESIS: 1:The level of achievement of the control group and treatment group is low.

S.No	Level of Achievement		Score		Percentage	
	Table No 1. **PERCENTAGE ANALYSIS OF ACHIEVEMENT AMONG CONTROL GROUP AND TREATMENT GROUP**					
	Level	**Score**	**Control group**	**Treatment group**	**Control group**	**Treatment group**
1	**Very Low**	0-5	0	0	0	0
2	**Low**	6-10	24	0	57	0
3	**Moderate**	11-15	12	14	29	33
4	**High**	16-20	5	21	12	50
5	**Very High**	21-25	1	7	2	17
	Total		42	42	100	100

From the table1. it is clear that 57% of control group and 0% of treatment group of students have Low level of achievement in Maths, 29% of control group and 33% of treatment group students have moderate level of achievement in Maths, 12% of control group, 50% of treatment group of students have High level of achievement in Maths and 2% of control group, 17% of treatment group of students have Very High level of achievement in Maths. **Thus, it is concluded that majority of the control group students show Low achievement and majority of the treatment group students showhigh achievement in Maths.**

HYPOTHESIS: 2:There is no effective method of teaching for Maths.

Table.2MEAN AND STANDARD DEVIATION OF ACHIEVEMENT			
Group	Mean	N	Standard Deviation
Control group	42	11.55	3.80
Treatment group	42	17.21	3.29

The above table 4.2 shows the mean score and standard deviation of control group and treatment group in Maths achievement of school students. It is found to be 11.55 and 3.80 respectively for control group. It is found to be 17.21 and 3.29 respectively for treatment group.Thus, it is concluded that student's achievement in Control group is Moderate (11-15) and in Treatment group is high (16-20) in Maths. **So, The Cooperative learning is effective method for teaching Maths.**

HYPOTHESIS: 3: There is no relationship between subsample of treatment group and their achievement.

S. No	Variables		N	Mean	STD	t/f	Result
	Table-3- Relationship Between Subsample Of Treatment Group And Their Achievement						
1	**Gender**	Male	34	16.68	3.11	-2.291	S
		Female	8	19.50	3.25		
2	**Age**	15	4	15.00	2.94	3.848	**S**
		16	36	17.72	3.12		
		17	2	12.50	2.12		
3	**Mothers Qualification**	Illiterate	6	18.50	2.43	.957	NS
		School Level	35	17.09	3.41		
		College Level	1	14.00			
4	**Fathers Qualification**	Illiterate	2	16.00	1.41	.325	**NS**
		School Level	33	17.42	2.91		
		College Level	7	16.57	5.26		
5	**Parental Employment**	Daily wages	34	17.00	3.08	.465	**NS**
		Self- employment	2	16.50	4.95		
		Business	5	18.80	4.76		
		Government	1	18.00			
6	**Parental Income**	0-50k	35	17.03	3.48	-.813	NS
		50K-1L	7	18.14	2.12		
7	**Number of Family Members**	1-5	38	17.00	3.32	-1.310	NS
		6-10	4	19.25	2.50		
8	**Family Type**	Nuclear	30	17.80	3.36	1.970	**NS**
		Joint	7	16.29	3.50		
		Single	5	15.00	1.00		

❖ **Gender**: According to the computed t-value, there is much of a difference in male and Female student's achievement in **Treatment group**. The calculated t-value of 2.291indicates that it is significant at the 5% level. Consequently, the alternative hypothesis is accepted and the null hypothesis is rejected. **Therefore, it may be concluded that in Treatment Group Male and Female students differ in their achievement in Maths subject.**

❖ **Age:** The obtained f-value suggests that there is a significant variation in the **Achievement based on Age in Treatment Group.** Considering that the computed f-value (3.848) is significant at the 5% level. As a result, the Alternate hypothesis is acknowledged. **Therefore, in Treatment group the achievement differs based on the Age of the school students.**

❖ **Parental Income:** According to the computed t-value, there isn't much of a difference in Rs 0-50000 and 50001-One Lakh earning parents children's achievement in **Treatment group**. The calculated t-value of 0.813indicates that it is not significant at the 5% level. Consequently, the null hypothesis is accepted and the alternative hypothesis is rejected. **Therefore, it may be concluded that in Treatment group Rs 0-50000 and 50001-One Lakh earning parents childrennot differ in their achievement in Maths subject.**

❖ **Family Members:** According to the computed t-value, there isn't much of a difference in 1-5 Member Family and 6-10 Member Family children's achievement in **Treatment group**. The calculated t-value of 1.310indicates that it is not significant at the 5% level. Consequently, the null hypothesis is accepted and the alternative hypothesis is rejected. **Therefore, it may be concluded that in Treatment group 1-5 Member Family and 6-10 Member Family childrennot differ in their achievement in Maths subject.**

❖ **Mothers Qualification: The** obtained f-value suggests that there is not a significant variation in the **Achievement based on Mothers Qualification in Treatment Group.** Considering that the computed f-value (0.957) is not significant at the 5% level. As a result, the Null hypothesis is acknowledged. **Therefore, in Treatment group the achievement not differs based on the Mothers Qualification of the school students.**

❖ **Fathers Qualification:** The obtained f-value suggests that there is not a significant variation in the **Achievement based on Fathers Qualification in Treatment Group.** Considering that the computed f-value (0.325) is not significant at the 5% level. As a result, the Null hypothesis is acknowledged. **Therefore, in Treatment group the achievement is not differs based on the Fathers Qualification of the school students.**

❖ **Parental Occupation:** The obtained f-value suggests that there is not a significant variation in the **Achievement based on Parental Occupation in Treatment Group.** Considering that the computed f-value (0.463) is not significant at the 5% level. As a result, the Null hypothesis is acknowledged. **Therefore, in Treatment group the achievement is not differs based on the Parental Occupation of the school students.**

❖ **Family Type :** The obtained f-value suggests that there is not a significant variation in the **Achievement based on Family Type in Treatment Group.** Considering that the computed f-value (1.970) is not significant at the 5% level. As a result, the Null hypothesis is acknowledged. **Therefore, in Treatment group the achievement is not differs based on the Family Type of the school students.**

HYPOTHESIS: 4   There is no impact of Co-operative learning Techniqueover traditional teaching

Table-4-T- TEST SHOWING RELATIONSHIP BETWEEN CONTROL GROUP AND TREATMENT GROUP					
Group	**N**	**Mean**	**Std. Deviation**	**T Value**	**Result**
CONTROL GROUP	42	11.55	3.80	-7.301	S
TREATMENT GROUP	42	17.21	3.29		

❖ According to the computed t-value, there is much of a difference in control group and treatment group school student's achievement. The calculated t-value of -7.301indicates that it is significant at the 5% level. Consequently, the null hypothesis is accepted and the alternative hypothesis is rejected. **Therefore, it may be concluded that Cooperative Learning has significant impact on achievement of the Higher Secondary School students in Maths subject.**

HYPOTHESIS: 5There is no predictor of achievement in treatment group

Table: 5STEPWISE REGRESSION BETWEEN TREATMENT GROUP ACHIEVEMENT AND OTHER PERSONAL VARIABLES						
Model	**Unstandardized Coefficients**		**Standardized Coefficients**			
	B	**Std. Error**	**Beta**	**Pearson r**	**Sr^2**	**Structure Coefficient**
1 (Constant)	13.853	1.545				
Gender	2.824	1.232	0.341	0.341	0.116	0.341
Note: Note. The dependent variable **Achievement of Treatment group**. R Square=0.116 and Adjusted R Square=0.094. sr^2 is squared semi-partial correlation. $F_{(40,1)} = 5.249$						

The prediction model contained one of the eight predictors and was reached in one steps with **7** variables removed. The model was statistically significant, $F_{(40,1)} = 12.936, p < .001,$ **and accounted for approximately 11 %** of the variance of Treatment Group achievement (R Square=0.116 and Adjusted R Square=0.094).Treatment Group achievement is primarily predicted by the Gender.The Gender. Received the strongest weight in model. With the sizeable correlations between the predictors, the unique variance explained by each of the variables indexed by the squared semi-partial correlation was relatively high: The Gender. Uniquely accounted for approximately 3**4%** of the Treatment Group achievement. Inspection of the structure coefficient suggests that, **Gender was relatively strong indicators of Treatment Group achievement.**

CONCLUSION :

The current study clearly depicts that the Majority of the control group students show Low achievement and majority of the treatment group students show high achievement in Maths. The Gender uniquely accounted for approximately 24% and 11% achievement of the Control and Treatment group respectively. 16-year Female higher Secondary School students with school level educated mother and college level educated father, business occupant parents earning Rs 50000/-one Lakhs living with 6-10 family member in Nuclear family achieved high in treatment group. **The Cooperative Learning has significant impact on achievement of the Higher Secondary School students in Maths subject.** The adoption of advanced teaching methods prepares students to study and achieve more in their academics and related abilities. To achieve master learning for their pupils, teachers must be resolute in their efforts to teach their subjects using a variety of innovative methods of instruction. Therefore, in order to improve teaching efficacy, it is imperative that all teachers acquire cutting-edge methods like differentiated instruction. Students learning experiences must incorporate humanistic curriculum design, socioemotional learning, and universal design for learning.

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