

A STUDY ON THE CORRELATION BETWEEN CONCEPT ATTAINMENT MODEL AND TRADITIONAL METHOD OF TEACHING ON THE BASIS OF GENDER FOR LIFE SCIENCE TEACHING

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ABSTRACT:

Form the 'Vedic' period teaching learning process play very important role to convert a human to human resource. The most important part of education system is the method of teaching, and there are so many method of teaching introduced time to time. Like so many method or model of teaching concept attainment teaching and traditional method of teaching are playing an important role for fulfill the aims of education system. This paper is based on these two teaching methods or the effectiveness of those two methods in our education system. This paper is focused on the comparative strategy of student's performance and data collected from the experimental process on the basis of gender discrimination.

Key words: gender, traditional method of teaching, concept attainment model.

1. INTRODUCTION:

We know or been studied various strategies of teaching methods or models. The term concept attainment model and traditional model of teaching are related to teaching strategies. Teaching model is the format to total task which a teacher can apply on the class room. Teaching model can set a objective according to educational goal, provide appropriate strategy and can modify it according the basis of feedback from the student. Teaching model provide

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some teaching technique for the effectiveness of classroom teaching and a technical way to fulfill the various aims of educational system for the all-round development of children.

1.1. Concept Attainment Model:

Concept attainment model is introduced by Jerom Bruner in his book named 'A study of thinking' in the year of 1956. The concept attainment model is the instructional model for build up the principle of conception. This concept can help the student to understand the originality or the conceptual aspect. Through concept attainment model one student can learn the whole matter with the comparison, analysis and example formation. There are two types of example format either yes or no.

1.2. Traditional Method Of Teaching:

New and experienced teacher are always trying to make his class more effective. In that caused teachers are attend many type of professional improvement programs. Effectiveness is the improvement of information to students. Efficiency and effectiveness are the two sides of teaching process. From traditional method of teaching a teacher teach them with those procedure which are coming from past experience. Traditional teaching is the technique when a teacher use the teaching strategy from his past experience with the help of cognitive domain and recitation. Traditional method is called by basic or conventional or customary education. They use more than role learning and teacher center education where lecture method is too much used.

2. REVIEW OF RELATED STUDY:

Dr.M.L.Jadhav (2011) discuss in his study with the sample size of 80 students that for the subject of geography "Concept attainment model is more effective than other.

Dr. (Mrs.) MadhuchandaMukherjee(2011)

He studies in his experimental research that the Concept Attainment Model was found to be effective in terms of achievement of students in Science.

Subhadeep Ganguly(2012),in biological science is biggest improvement to be found with the strategy of concept attainment model in west bengal.

Michael N. Silkwood (2000) found in his study no significance difference between traditional model of teaching and modular method for the student learning and not found any performance difference between the two models.

Andrew J. Elliot, Mandy M. Shell, Kelly Bouas Henry, want to examined the achievement level of performance contingencies with 3 times experiment in the present of other variable Performance-avoidance goals damaged performance virtual to performance-approach and mastery goals, regardless of contingency condition. Performance-approach goals had a more confident effect on performance than did mastery areas in the presence, but not in the absence, of a contingency. Also, the existence of a likelihood highlighted the effects of performance-based goals on performance and had slight impact on the effect of mastery goals on performance. These fallouts speak right to a current puzzle in the achievement goal literature and climax the need for a difficult, systematic examination of the link between achievement goals and performance that takes into deliberation structures of the success task, context, and situation.

Joy R. Mayer, Montana State University, Bozeman, Montana. Objectives of the study were The ability to learn new biology concepts and to think critically is vital for high school biology students through concept attainment model with inductive reasoning. Perilous thinking skills include synthesis, analysis and evaluation of evidence in order to make a result. The researcher include fourth and fifth period for the experiment in total 53 student. As a result he found that with concept attainment model the students are better understood, they can analysis their thinking process and effects on student and teacher motivation and attitude.

3. OBJECTIVES:

1. To identify the best performance of teaching models.
2. To find out the gender wise achievement level.

3. To find out the socio-economic-status wise achievement level.

4. HYPOTHESIS:

- H_1 : There would be no significant difference between the mean achievement scores of the Experimental Male Group and Control Male Group (CAM And TMT) on the Achievement Test.
- H_2 : There would be no significant difference between the mean achievement scores of two treatment male groups (CAM and TMT) due to the variation in the levels of Socio-Economic Status (High, Average and Low) on the Achievement Test.
- H_3 : There would be no significant difference between the mean achievement scores of the Experimental Female Group and Control Female Group (CAM And TMT) on the Achievement Test.
- H_4 : There would be no significant difference between the mean achievement scores of two treatment female groups (CAM and TMT) due to the variation in the levels of Socio-Economic Status (High, Average and Low) on the Achievement Test.

5. ANALYSIS:

5.1. *Collected Data:*

- a. Academic Achievement scores of the experimental group (CAM).
- b. Academic Achievement scores of the control group (TMT).
- c. Socio-Economic-Status Scores of the experimental group.
- d. Socio-Economic-Status Scores of the control group.

5.2. *Symbols Used In The Study:*

N = total sample;

X = raw score;

f = frequency;

M = Mean;

σ = Standard deviation;

t = Critical t - ratio;

df = degrees of freedom;

** = Significant at 0.01 level

A = Instructional Model

A₂ = Treatment through TMT

SD = Combined Standard deviation;

F = Variance;

ns = Not significant

* = Significant at 0.05 level

A₁ = Treatment through CAM;

5.3. Systematization Of Data:

Systematization of data has been made to verify the objectives and null-hypotheses on the basis of two observable variables: (i) Instructional Models and Methods (CAM and TMT), (ii) Students' Socio-Economic-Status Scores (High, Average and Low). Scores of different treatment groups under different situations have been incorporated in the following tables.

The main and interaction effects have been analyzed by the method of **ANOVA**, following the experimental design of the study.

In this experiment, two factors: Instructional Models and Methods (A) and Students' Socio-Economic Status (B) have been studied simultaneously on academic achievement under knowledge, understanding and application levels and also total achievement scores. The data obtained from the experiment were analyzed to determine the main effects of three factors and their interaction effects on achievement scores. In the study the two treatment groups were formed under the two instructional models:(i) Concept Attainment Model (A₁) and (ii) Traditional Methods of Teaching (A₂). The 2 x 2 BlockDesign has been adopted for finding out the **F**-ratios for main, interaction effects.

A = Models of Teaching; **B** = Socio-Economic-Study, The scores obtained from the Achievement Tests have been analyzed to determine the main and interaction effects of two factors.

- ✓ **Main Effects:** Main effects are the effects of any one of these two independent variables: Models and Socio-Economic-Status on student's achievements in the area of cognitive learning.
- ✓ **Interaction Effects:** Interaction effects are the effects between two independent variables on students' achievements in the area of cognitive learning.

ANALYSIS OF MAIN AND INTERACTION EFFECTS FOR IMMEDIATE LEARNING (CRT-I) THROUGH 2X2 BLOCK DESIGN

Table- 5.1 Showing the Analysis of Variance for Achievement Scores (K+U+A) of Male samples.

Source of variation	Sum of squares	df	Mean Square	F-ratio
Model (A)	662.699	1	662.699	37.27**
SES(B)	978.467	2	489.23	27.52**
A X B	86.401	2	43.23	2.43 ^{ns}
Within cells	426.8	24	17.78	
Total	2163.4	29		

**=significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.2 Showing the Analysis of Variance for Achievement Scores in Knowledge level of the Male samples.

Source of variation	Sum of squares	df	Mean Square	F-ratio
Model (A)	86.8	1	86.6	37.98**
SES(B)	91.5	2	45.75	20.07**
A X B	15.1	2	7.55	3.31 ^{ns}
Within cells	54.8	24	2.28	
Total	248.2	29		

** = significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.3 Showing the Analysis of Variance for Achievement Scores in Understanding level of the Male samples.

Source of variation	Sum of squares	df	Mean Square	F-ratio
Model (A)	56.1	1	56.1	18.83**
SES(B)	118.5	2	59.25	19.88**
A X B	2.8	2	1.4	0.61ns
Within cells	71.6	24	2.98	
Total	249	29		

** = significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.4 Showing the Analysis of Variance for Achievement Scores in Application level of the Male samples.

Source of variation	Sum of squares	df	Mean Square	F-ratio
Model (A)	83.4	1	83.4	33.36**
SES(B)	126.1	2	63.05	25.22**
A X B	16	2	8	3.2ns
Within cells	60	24	2.5	
Total	285.5	29		

** = significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.5 Showing the Analysis of Variance for Achievement Scores in (K+U+A) of the Female samples.

Source of variation	Sum of squares	df	Mean Square	F-ratio
Model (A)	1092.1	1	1092.1	61.29**
SES(B)	1721.3	2	860.65	48.30**
A X B	341.2	2	170.6	9.57**
Within cells	427.6	24	17.82	
Total	3582.2	29		

** = significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.6 Showing the Analysis of Variance for Achievement Scores in Knowledge level of the Female samples.

Source of variation	Sum of squares	df	Mean Square	F-ratio
Model (A)	104.6	1	104.6	47.76**
SES(B)	171.5	2	85.75	39.16**
A X B	37	2	18.5	8.45**
Within cells	52.5	24	2.19	
Total	365.5	29		

** = significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.7 Showing the Analysis of Variance for Achievement Scores in Understanding level of the Female samples.

Source of variation	Sum of squares	df	Mean Square	F-ratio
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Model (A)	108.4	1	108.4	57.70**
SES(B)	194.9	2	97.45	51.84**
A X B	45.7	2	22.85	12.15**
Within cells	45.2	24	1.88	
Total	394.2	29		

** = significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.8 Showing the Analysis of Variance for Achievement Scores in Application level of the Female samples.

Source of variation	Sum of squares	df	Mean Square	F-ratio
Model (A)	145.2	1	145.2	50.59**
SES(B)	207.2	2	103.6	36.10**
A X B	41.6	2	20.8	7.25**
Within cells	68.8	24	2.87	
Total	462.8	29		

** = significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.9. Showing the 't' values for Total Achievement Scores of Male samples.

Paired Samples Test							
	Paired Differences				t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error	95% Confidence Interval of the Difference			

				Mea n	Low er	Upp er			
Pair 1	A1xH - A2xH	7.00	1.58	0.71	5.04	8.96	9.9 0	4	.001
Pair 2	A1xA_v - A2xA_v	7.00	3.08	1.38	3.17	10.83	5.0 8	4	.007
Pair 3	A1xL - A2xL	14.20	3.49	1.56	9.86	18.54	9.0 9	4	.001
Pair 4	BH - Bav	4.60	2.59	0.82	2.75	6.45	5.6 2	9	.000
Pair 5	Bav - BL	9.20	4.85	1.53	5.73	12.67	6.0 0	9	.000
Pair 6	BH - BL	13.80	5.09	1.61	10.16	17.44	8.5 7	9	.000
Pair 7	A1 - A2	9.40	4.39	1.13	6.97	11.83	8.3 0	1 4	.000

** = significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.10 Showing the ‘t’ values for Achievement Scores in Knowledge level of Male samples.

Paired Samples Test								
	Paired Differences					t	df	Sig. (2- tailed)
	Mea n	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			

Pair 1	A1xH - A2xH	2.20	0.84	0.37	1.16	3.24	5.88	4	.004
Pair 2	A1xA_v - A2xA_v	2.60	0.89	0.40	1.49	3.71	6.50	4	.003
Pair 3	A1xL - A2xL	5.40	2.30	1.03	2.54	8.26	5.24	4	.006
Pair 4	BH - Bav	1.40	1.07	0.34	0.63	2.17	4.12	9	.003
Pair 5	Bav - BL	2.80	2.04	0.65	1.34	4.26	4.33	9	.002
Pair 6	BH - BL	4.20	2.20	0.70	2.63	5.77	6.03	9	.000
Pair 7	A1 - A2	3.40	2.03	0.52	2.28	4.52	6.49	14	.000

** = significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.11 Showing the ‘t’ values for Achievement Scores in Understanding level of Male samples.

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	A1xH - A2xH	2.40	0.89	0.40	1.29	3.51	6.00	4	.004
Pair 2	A1xA_v - A2xA_v	2.20	1.64	0.73	0.16	4.24	2.99	4	.040
Pair 3	A1xL - A2xL	3.60	0.89	0.40	2.49	4.71	9.00	4	.001
Pair 4	BH - Bav	1.70	1.42	0.45	0.69	2.71	3.79	9	.004
Pair 5	Bav - BL	3.10	1.66	0.53	1.91	4.29	5.89	9	.000

Pair 6	BH - BL	4.80	1.75	0.55	3.55	6.05	8.67	9	.000
Pair 7	A1 - A2	2.73	1.28	0.33	2.02	3.44	8.27	14	.000

** = significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.12 Showing the 't' values for Achievement Scores in Application level of Male samples.

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	A1xH - A2xH	2.40	1.14	0.51	0.98	3.82	4.71	4	.009
Pair 2	A1xAv - A2xAv	2.20	2.17	0.97	-0.49	4.89	2.27	4	.086
Pair 3	A1xL - A2xL	5.40	1.95	0.87	2.98	7.82	6.19	4	.003
Pair 4	BH - Bav	1.50	1.27	0.40	0.59	2.41	3.74	9	.005
Pair 5	Bav - BL	3.40	2.12	0.67	1.88	4.92	5.07	9	.001
Pair 6	BH - BL	4.90	2.28	0.72	3.27	6.53	6.79	9	.000

Pair 7	A1 - A2	3.33	2.26	0.58	2.08	4.58	5.72	14	.000
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** = significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.13. Showing the ‘t’ values for Total Achievement Scores of Female samples.

Paired Samples Test									
		Paired Differences					t	df	Sig. (2- taile d)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	A1xH - A2xH	7.00	1.87	0.84	4.68	9.32	8.37	4	.001
Pair 2	A1xA_v - A2xA_v	15.60	16.68	7.46	-5.11	36.31	2.09	4	.105
Pair 3	A1xL - A2xL	21.60	4.98	2.23	15.42	27.78	9.70	4	.001
Pair 4	BH - Bav	10.50	13.18	4.17	1.07	19.93	2.52	9	.033
Pair 5	Bav - BL	7.80	13.24	4.19	-1.67	17.27	1.86	9	.095
Pair 6	BH - BL	18.30	8.49	2.68	12.23	24.37	6.82	9	.000
Pair 7	A1 - A2	14.73	11.23	2.90	8.52	20.95	5.08	14	.000

** = significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.14. Showing the ‘t’ values for Achievement Scores in Knowledge level of Female samples.

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	A1xH - A2xH	1.60	0.89	0.40	0.49	2.71	4.00	4	.016
Pair 2	A1xAv - A2xAv	2.80	1.10	0.49	1.44	4.16	5.72	4	.005
Pair 3	A1xL - A2xL	6.80	1.79	0.80	4.58	9.02	8.50	4	.001
Pair 4	BH - Bav	2.20	1.23	0.39	1.32	3.08	5.66	9	.000
Pair 5	Bav - BL	3.60	2.63	0.83	1.72	5.48	4.32	9	.002
Pair 6	BH - BL	5.80	3.16	1.00	3.54	8.06	5.81	9	.000
Pair 7	A1 - A2	3.73	2.60	0.67	2.29	5.18	5.55	14	.000

** = significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.15. Showing the ‘t’ values for Achievement Scores in Understanding level of Female samples.

Paired Samples Test				
		Paired Differences	t	df

		Mea n	Std. Deviation	Std. Erro r Mea n	95% Confidence Interval of the Difference				Sig. (2- tailed)
					Low er	Upper			
Pair 1	A1xH - A2xH	1.80	0.84	0.37	0.76	2.84	4.8 1	4	.009
Pair 2	A1xA_v - A2xA_v	2.40	1.34	0.60	0.73	4.07	4.0 0	4	.016
Pair 3	A1xL - A2xL	7.20	1.64	0.73	5.16	9.24	9.8 0	4	.001
Pair 4	BH - Bav	1.90	1.52	0.48	0.81	2.99	3.9 4	9	.003
Pair 5	Bav - BL	4.20	3.01	0.95	2.05	6.35	4.4 1	9	.002
Pair 6	BH - BL	6.10	3.07	0.97	3.90	8.30	6.2 8	9	.000
Pair 7	A1 - A2	3.80	2.78	0.72	2.26	5.34	5.2 9	14	.000

** = significant at 0.01 level,

* = significant at 0.05 level,

ns = non significant

Table- 5.16. Showing the ‘t’ values for Achievement Scores in Application level of Female samples.

Paired Samples Test							
	Paired Differences				t	df	Sig. (2- tailed)
	Mea n		Std. Erro	95% Confidence			

			Std. Deviation	r Mean	Interval of the Difference				
					Lower	Upper			
Pair 1	A1xH - A2xH	3.60	1.52	0.68	1.72	5.48	5.31	4	.006
Pair 2	A1xA _v - A2xA _v	2.00	1.22	0.55	0.48	3.52	3.65	4	.022
Pair 3	A1xL - A2xL	7.60	1.95	0.87	5.18	10.02	8.72	4	.001
Pair 4	BH - B _{av}	2.60	2.01	0.64	1.16	4.04	4.09	9	.003
Pair 5	B _{av} - BL	3.80	3.65	1.15	1.19	6.41	3.30	9	.009
Pair 6	BH - BL	6.40	2.67	0.85	4.49	8.31	7.57	9	.000
Pair 7	A1 - A2	4.40	2.85	0.74	2.82	5.98	5.98	14	.000

** = significant at 0.01 level,

* = significant at 0.05 level,

ns = Non-significant

6. INTERPRETATION OF THE STUDY:

H_1 there would be no significant difference between the mean achievement scores of the Experimental Male Group and Control Male Group (CAM and TMT) on the Achievement Test.

It is observed from table – 5.1, 5.2, 5.3, 5.4 that the F ratios of teaching model (A) are significant at 0.01 level on the levels of achievement test (K, U, A) as well as total achievement test. So the null hypothesis H_1 is rejected and it may be interpreted that there is a significant difference between the mean achievement scores of total and all levels of achievement under the study due to the effects of the teaching methods (CAM & TMT). For further study, it has

also been found from the tables – 5.9, 5.10, 5.11, 5.12 (male “t”) that the values of “t” for total and all levels of achievement test are significant except only in the Academic achievement score in Application levels’ Average Socio-Economic Status Group of Male samples ‘t’ (Table – 5.12) are not significant. Hence, it may be further interpreted that average SES group of male sampled did not show any difference in their Achievement on experimental and control situation.

⁰H₂There would be no significant difference between the mean achievement scores of two treatment male groups (CAM and TMT) due to the variation in the levels of Socio-Economic Status (High, Average and Low) on the Achievement Test.

It has been found from the table – 5.1, 5.2, 5.3, 5.4 that the F-ratio for Socio-Economic-Status (B) is significant at 0.01 level ($p < 0.01$) on the levels of achievement test (K, U, A) as well as total achievement test. So the null hypothesis ⁰H₂ is rejected and it may be interpreted that there is a significant difference between the mean achievement scores of total and all levels of achievement under the study due to the effects of SES (High, Average and Low). For further study, it has also been found from the tables - 5.9, 5.10, 5.11, 5.12 (male “t”) that the values of “t” for total and all levels of achievement test are significant except only in the Academic achievement score in Application levels’ Average Socio-Economic Status Group of Male samples ‘t’ (Table – 5.12) are not significant. Hence, it may be further interpreted that average SES group of male sampled did not show any difference in their Achievement on experimental and control situation.

⁰H₃There would be no significant difference between the mean achievement scores of the Experimental Female Group and Control Female Group (CAM and TMT) on the Achievement Test.

It is observed from table-5.5, 5.6, 5.7, 5.8, that the F ratios of teaching model (A) are significant at 0.01 level on total achievement test (K, U, A). It has also been found from the tables- 5.13, 5.14, 5.15, 5.16 (female “t”) that the values of “t” for total and all levels of achievement test are significant. So the null hypothesis ⁰H₃ is rejected it may be interpreted that there is a significant difference between the mean achievement scores of total and all levels of achievement under the study due to the effects of the teaching methods (CAM & TMT).

⁰H₄There would be no significant difference between the mean achievement scores of two treatment female groups (CAM and TMT) due to the variation in the levels of Socio-Economic Status (High, Average and Low) on the Achievement Test.

It has been found from the table – 5.5 that the F-ratio for the main effects of students' attitude towards Socio-Economic-Status (B) is significant at 0.01 level ($p < 0.01$) on Total cognitive learning on the criterion of immediate learning. Thus, the null hypothesis ⁰H₄ is rejected. Tables –5.6, 5.7, and 5.8 also show that the F-ratios for the 'B' main effect are significant at 0.01 level ($p < 0.01$) for Knowledge, Understanding and Application levels of cognitive learning. It may be interpreted that there is a significant difference between the mean achievement scores of Total cognitive learning and Knowledge, Understanding and Application levels of cognitive learning, due to the effects of the levels of students' attitude towards Life-Science (favorable) on the criterion of immediate learning.

7. CONCLUSION:

There are several possible explanations for this result. These differences can be explained in part by the proximity of Concept Attainment Model and Traditional Method of teaching. A possible explanation for this might be that there is significant difference of achievement between Concept Attainment Model & Traditional Method of teaching. Another possible explanation for this is that significant different between CAM & TMT due to Socio-Economic-Status (High, Average and Low). The researcher try to compare the best teaching model for the effective teaching learning model. At the end of the study the researcher conclude, in case of life science teaching the concept attainment model is the best one for' cognitive, affective and psychomotor domain of student.

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