

COMPARATIVE STUDY OF INDUCTIVE THINKING MODEL AND TRADITIONAL METHOD OF TEACHING FOR TEACHING SCIENCE: AN EXPERIMENT

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Abstract

The main aim of the present study was to develop instructional plans for Inductive Thinking Model and Traditional lesson plans and study their effectiveness in real classroom. A sample of 120 students was selected by using purposive sampling method. The researcher found that the Inductive Thinking models was more effective than traditional classroom method in terms of Achievement of students. Again it was concluded that Inductive Thinking Model proves to be effective in enhancing reasoning ability of the students than traditional and Inductive Thinking Model found to be effective in enhancing favorable attitude of students towards science than Traditional method of teaching.



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Introduction

In the present days, with the rapidly changing educational policies the role of the teacher is changing rapidly, where he is enshrined with the responsibility of enhancing fruitful learning and stimulating the students by adopting appropriate strategies.

Now days it is very essential to adopt the new methods of teaching so that students can be able to cope with the demand of the age. Therefore it is very essential to employ modern methods of teaching.

Models of teaching:

The credit for transforming prevailing theories into different models of teaching goes to Bruce Joyce and Marsha Weil in 1980. A Model of Teaching has many dimensions. It is used to plan curriculums, courses, units and lessons, to design instructional materials, books & workbooks, multimedia programs and computer- assisted learning programs. The models provide learning tools to the students. The most important aim of models of teaching is to improve the teaching in an interactive atmosphere and to shape the curriculum. Bruce Joyce and Marsha Weil (1972) have developed more than twenty models that are grouped on the basis of their chief emphasis, the way they approach educational goals and means.

In the present study one model has been selected from information processing family ie- Inductive Thinking Model.

Objectives of the Study

- 1) To design and develop instructional plans for teaching Biological science at secondary level based on -
Hilda Taba's, Inductive Thinking model and Traditional Lesson plans.
- 2) To find relative effectiveness of Inductive Thinking Model & Traditional Method of teaching on Pupils achievement in Biological Science
- 3) To find relative effectiveness of Inductive Thinking Model & Traditional Method of teaching on Development of Reasoning ability.
- 4) To find relative effectiveness of Inductive Thinking Model & Traditional Method of Teaching on Development of favorable attitude of students towards science.
- 5) To study the effectiveness of Inductive Thinking Model and Traditional Method of teaching in terms of achievement of students when intelligence is taken as covariate.

Hypothesis :

- 1) There will be no significant difference between Inductive Thinking Model and Traditional Method of teaching in terms of achievement of students.
- 2) There will be no significant difference between Inductive Thinking model and Traditional Method of teaching in terms of Reasoning ability of students.
- 3) There will be no significant difference between Inductive Thinking model and Traditional Method of teaching in terms of favourable attitude of students towards science.
- 4) There will be no significant difference between Inductive Thinking model and Traditional Method of teaching in terms of achievement of students when intelligence is taken as covariate.

Sample :

In the present study purposive sampling method was used. Sample were drawn from Kendriya Vidyalaya, Ajani, Nagpur. From this school six sections were selected three sections for IX class and three sections from VIII class. Similarly sample were drawn from Saraswati Vidyalaya, Shankar Nagar, Nagpur. Total 120 students were selected from two schools of Nagpur district.

Tools :

As per objectives of the study, to measure the students during pre-test and post-test on the criterion variables and the co-variance.

The following tools were developed by the investigator for collecting the data-

- i) Achievement Test

The following standardized tools were selected for the study-

- i) Reasoning ability Test by Dr. SadhanaBhatnagar.
- ii) AvinashGrewal’s Science Attitude Scale (SAS)
- iii) Verbal Intelligence Test by R.K. Ojha and K. Ray Chowdhary.

Research Methodology :

The present study was experimental in nature. Quasi experimental two parallel group design has been used for the study.

Analysis of Data :

Hypothesis -1- There will be no significant difference between Inductive Thinking Model and Traditional Method of teaching in terms of achievement of students.

Table -I:

Relative Effectiveness: t-ratio of post-test mean scores on Achievement in Science.

Groups	N	df	Mean	S.D	t-ratio
Group A	60	59	21.43	2.09	19.39*
Group B	60	59	14.06	2.10	S

* Significant at 0.01 and 0.05 level.

The Calculated t- ratios of post test mean scores of achievement of both the models is 19.39 which is significant even at 0.05 level of significance this implies that both the groups A & B taught inductive thinking model and traditional method of teaching differ significantly on achievement of students. Hence the null hypothesis is rejected. Therefore it is concluded that Inductive thinking model and traditional method of differ in effectiveness in enhancing achievement of students in science. Inductive Thinking model is more effective than traditional method of teaching.

Hypothesis -2- There will be no significant difference between inductive thinking model and traditional method of teaching in terms of Reasoning ability of students.

Table –II

Relative Effectiveness t-ratio of Post-test mean scores on Reasoning Ability.

Groups	N	df	Mean	S.D	t-ratio
Group A	60	59	22.4	3.63	3.51*
Group B	60	59	20.5	2.81	

*Significant at 0.01 and 0.05 level.

The obtained t- ratios of post-test mean scores of reasoning ability of both the method is 3.51 which is significant at 0.01 and 0.05 level of significance. This implies that both the groups A & B taught through inductive thinking model and traditional method of teaching differ significantly on reasoning ability of students. Hence the null hypothesis is rejected. Therefore it is concluded that inductive thinking model and traditional method of teaching differ significantly in fostering reasoning ability of students.

Hypothesis –III - There will be no significant difference between inductive thinking model and traditional method of teaching in terms of favorable attitude of students towards science.

Table –III

Relative Effectiveness : t-ratio of post-test mean scores on development of Attitude Towards Science.

Groups	N	df	Mean	S.D	t-ratio
Group A	60	59	56.3	3.92	3.28*
Group B	60	59	54.10	3.50	

* Significant at 0.01 and 0.05 level.

The obtained t- ratios of post-test mean scores of development of scientific attitude of both the models is 3.28 which is significant at 0.01 and 0.05 level of significance. This shows that both the groups A & B taught through inductive thinking model and traditional method of teaching differ significantly on scientific attitude scale of students. Hence the null hypothesis is rejected. Therefore it is concluded that inductive thinking model and traditional method of teaching differ significantly in fostering scientific attitude of students.

Hypothesis – 4 - There will be no significant difference between inductive thinking model and traditional method of teaching in terms of achievement of students when intelligence is taken as covariate.

Table IV

Summary of ANCOVA for overall achievement by taking Intelligence as co-variate

Sources of Variance	Df	SS Y.X	MSS Y.X	F (Y.X)
Among Mean	1	2.25	2.25	0.70*
Within Group	118	378.74	3.210	
Total	119	--	--	

*Non significant at 0.01 and 0.05 level

The calculated f- ratio of post-test achievement scores of Inductive thinking model and traditional method of teaching intelligence scores of the variations among and within group is 0.70 which is not significant at 1/118 degree of freedom at 0.01 and 0.05 level of significance. Thus the two groups are equal on Intelligence when taken as co-variate. This finding favor the acceptance of hypothesis.

Conclusions :

- 1) Inductive Thinking model was effective than traditional method of teaching in terms of achievement of students in science.
- 2) Inductive Thinking Model was found to be more effective than traditional method of teaching in developing favorable attitude of students towards science.
- 3) Inductive Thinking Model was found to be more effective than traditional method of teaching in terms of development of scientific attitude of students towards science.
- 4) Inductive Thinking Model and traditional method of teaching was found to be equally effective in terms of overall achievement when intelligence was taken as covariate .

Suggestions :

- Study can be repeated for various classes and grade levels using different contents to conform the results and conclusion of the study.
- Variables like pupils cognitive level, creativity, problem solving ability, persistency, students background, conceptual level, environment factors and the like can be studied.
- Teachers acceptance can studied for different information processing models of teaching.
- Models can be used for various disadvantaged groups, handicapped and the gifted students.

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