



A STUDY ADVANCE ORGANIZER MODEL OF TEACHING ON ACADEMIC ACHIEVEMENT OF SECONDARY SCHOOL STUDENTS IN MATHEMATICS

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Abstract

The present study investigated the impact of the Advance Organizer Model of Teaching on the academic achievement of secondary school students in Mathematics. The experimental method with pre-test and post-test control group design was adopted. The sample consisted of 120 secondary school students, divided equally into Experimental and Control Groups, with boys and girls represented equally. The Advance Organizer Model was administered to the Experimental Group, while the Control Group was taught through the conventional method. Academic Achievement Test in Mathematics was used as the tool for data collection. The collected data were analyzed using Mean, Standard Deviation, and t-test. The findings revealed that students exposed to the Advance Organizer Model demonstrated significantly higher academic achievement than those taught through traditional methods. The model proved effective in enhancing meaningful learning, retention, and understanding of Mathematics concepts.

Keywords: Advance Organizer Model, Academic Achievement, Mathematics, Secondary School Students, Experimental Study.

1. Introduction:

Education plays a vital role in developing students' intellectual abilities and preparing them for responsible citizenship. Mathematics, as a school subject, helps learners understand society, culture, history, and civic responsibilities. However, students often face difficulties in comprehending abstract concepts and relating new knowledge to their previous experiences.

David Ausubel's Advance Organizer Model of Teaching emphasizes meaningful verbal learning by connecting new information with the learner's existing cognitive structure. Advance organizers provide a conceptual framework before presenting the actual lesson content, thereby facilitating understanding and retention. The model encourages students to assimilate new concepts effectively and develop higher academic achievement.

The present study aims to examine the effectiveness of the Advance Organizer Model in improving the academic achievement of secondary school students in Mathematics.

2. Need and Significance of the Study

The traditional lecture method often promotes rote learning and passive participation. Modern educational practices emphasize meaningful learning and conceptual understanding. The Advance Organizer Model assists learners in integrating new information with prior knowledge, thereby improving comprehension and retention.

Mathematics requires analytical thinking, interpretation, and conceptual clarity. Therefore, it is important to investigate whether the Advance Organizer Model can significantly enhance students' academic achievement in this subject. The findings of the study may help teachers adopt innovative instructional strategies for effective classroom teaching.

3. Objectives of the Study

1. To study the effect of the Advance Organizer Model on the academic achievement of Girls' Control Group.
2. To study the effect of the Advance Organizer Model on the academic achievement of Boys' Control Group.
3. To study the effect of the Advance Organizer Model on the academic achievement of Girls' Experimental Group.
4. To study the effect of the Advance Organizer Model on the academic achievement of Boys' Experimental Group.

4. Hypotheses

1. There exists no significant difference between the pre-test and post-test academic achievement scores of Girls' Control Group (GCG).
2. There exists no significant difference between the pre-test and post-test academic achievement scores of Boys' Control Group (BCG).
3. There exists no significant difference between the pre-test and post-test academic achievement scores of Girls' Experimental Group (GEG).
4. There exists no significant difference between the pre-test and post-test academic achievement scores of Boys' Experimental Group (BEG).

5. Methodology:

5.1. Research Method:

Experimental Method.

5.2. Research Design

Pre-test – Post-test Control Group Design.

5.3. Sample

A total of 120 secondary school students were selected through random sampling.

Group	Boys	Girls	Total
Experimental Group	30	30	60
Control Group	30	30	60
Total	60	60	120

5.4. Tool Used:

Academic Achievement Test in Mathematics developed and standardized by the investigator.

5.5. Statistical Techniques

- Mean
- Standard Deviation
- t-test

6. Analysis and Interpretation

1) **Hypothesis 1: There exists no significant difference between the pre-test and post-test academic achievement scores of Girls' Control Group (GCG).**

Table 1: Comparison of Pre-test and Post-test Academic Achievement Scores of Girls' Control Group

Test	N	Mean	SD	t-value
Pre-test	30	41.20	5.80	0.82NS
Post-test	30	42.40	5.60	

Table Value at 0.05 level = 2.05

Interpretation

The obtained t-value (0.82) is less than the table value (2.05). Hence, there is no significant difference between the pre-test and post-test academic achievement scores of Girls' Control Group. Therefore, the null hypothesis is accepted.

2) **Hypothesis 2: There exists no significant difference between the pre-test and post-test academic achievement scores of Boys' Control Group (BCG).**

Table 2: Comparison of Pre-test and Post-test Academic Achievement Scores of Boys' Control Group

Test	N	Mean	SD	t-value
Pre-test	30	40.80	6.10	0.87NS
Post-test	30	42.10	5.90	

Table Value at 0.05 level = 2.05

Interpretation

The obtained t-value (0.87) is less than the table value (2.05). Hence, there is no significant difference between the pre-test and post-test academic achievement scores of Boys' Control Group. Therefore, the null hypothesis is accepted.

3) **Hypothesis 3: There exists no significant difference between the pre-test and post-test academic achievement scores of Girls' Experimental Group (GEG).**

Table 3: Comparison of Pre-test and Post-test Academic Achievement Scores of Girls' Experimental Group

Test	N	Mean	SD	t-value
Pre-test	30	40.90	5.70	12.84**
Post-test	30	58.60	4.80	

Table Value at 0.05 level = 2.05

Interpretation

The obtained t-value (12.84) is greater than the table value (2.05). Hence, a significant difference exists between the pre-test and post-test academic achievement scores of Girls' Experimental Group. Therefore, the null hypothesis is rejected. The Advance Organizer Model significantly improved academic achievement among girls.

4) **Hypothesis 4: There exists no significant difference between the pre-test and post-test academic achievement scores of Boys' Experimental Group (BEG).**

Table 4: Comparison of Pre-test and Post-test Academic Achievement Scores of Boys' Experimental Group

Test	N	Mean	SD	t-value
Pre-test	30	41.10	5.90	13.56**
Post-test	30	59.20	4.60	

Table Value at 0.05 level = 2.05

Interpretation

The obtained t-value (13.56) is greater than the table value (2.05). Hence, a significant difference exists between the pre-test and post-test academic achievement scores of Boys' Experimental Group. Therefore, the null hypothesis is rejected. The Advance Organizer Model significantly improved academic achievement among boys.

7. Major Findings:

1. No significant difference was found between the pre-test and post-test academic achievement scores of Girls' Control Group.
2. No significant difference was found between the pre-test and post-test academic achievement scores of Boys' Control Group.
3. A significant improvement was found in the post-test academic achievement scores of Girls' Experimental Group after exposure to the Advance Organizer Model.
4. A significant improvement was found in the post-test academic achievement scores of Boys' Experimental Group after exposure to the Advance Organizer Model.
5. The Advance Organizer Model proved more effective than the conventional method in enhancing academic achievement in Mathematics.

8. Educational Implications

1. Teachers can effectively use the Advance Organizer Model to improve conceptual understanding in Mathematics.
2. The model helps students relate new information to existing knowledge.
3. It promotes meaningful learning and long-term retention.
4. Curriculum planners may incorporate advance organizers into instructional materials.
5. Teacher training programs should emphasize the use of innovative teaching models such as the Advance Organizer Model.

9. Conclusion:

The study concludes that the Advance Organizer Model of Teaching has a significant positive impact on the academic achievement of secondary school students in Mathematics. While students in the control group showed only marginal improvement, those in the experimental group demonstrated substantial gains in achievement scores. The findings indicate that the model facilitates meaningful learning by linking prior knowledge with new concepts. Therefore, the Advance Organizer Model can be recommended as an effective instructional strategy for teaching Mathematics at the secondary school level.

References:

1. Ausubel, D. P. (1968). Educational Psychology: A Cognitive View. New York: Holt, Rinehart and Winston.
2. Joyce, B., Weil, M., & Calhoun, E. (2015). Models of Teaching (9th Ed.). Boston: Pearson.
3. Best, J. W., & Kahn, J. V. (2016). Research in Education. New Delhi: Pearson Education.
4. Aggarwal, J. C. (2014). Essentials of Educational Psychology. New Delhi: Vikas Publishing House.
5. Garrett, H. E. (2011). Statistics in Psychology and Education. New Delhi: Paragon International Publishers.

