

STUDY THE EFFECT OF INSTRUCTIONAL MODEL ON ENHANCING MATHEMATIC CONCEPTS

* Shital Sankare & ** Prof. Bhagyashree Upasani

*Research student & **Guide and Assistant Professor, Ashoka College of Education, Nashik.

Abstract:

Mathematics is often perceived as an abstract subject by many students, especially when it involves formulas. Concepts such as area and perimeter are fundamental in geometry, yet students frequently memorize formulas without understanding their formation and application. The present study examines the effect of an instructional model designed to enhance conceptual understanding of mathematical concepts among VI standard students. The study adopted a quantitative experimental approach using a pre-test and post-test control group design. An achievement test on area and perimeter was administered before and after the implementation of the instructional model. Statistical analysis using mean, standard deviation, and t-test revealed a significant improvement in students' understanding and academic performance ($t = 6.18$, $df = 41$, $p < 0.05$). The findings indicate that the instructional model effectively enhances conceptual clarity and meaningful learning in mathematics.

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Introduction:

Mathematics plays an important role in developing logical thinking and problem-solving abilities among students.

However, many learners perceive mathematics as a difficult and abstract subject. Geometrical concepts such as area and perimeter are often taught through formulas which students tend to memorize without understanding their origin or practical meaning.

As a result, students may find it difficult to apply these formulas in different situations. To overcome this problem, activity-based and model-based teaching approaches can be used to make mathematical concepts more concrete and understandable. Instructional models that involve hands-on learning allow students to visualize geometrical

shapes and understand the formation of formulas logically.

The present study attempts to examine the effectiveness of an instructional model designed to enhance student understanding of the concepts of area and perimeter of square and rectangle among VI standard students.

Objectives:

1. To develop a teaching model for explaining the area and perimeter of square and rectangle.
2. To help students understand the logical formation of formulas.
3. To study the effect of the instructional model on enhancing students' mathematics learning.

Hypothesis:

H_0 (Null Hypothesis): The instructional model does not enhance students' understanding of mathematical concepts.

H_1 (Alternative Hypothesis): The instructional model enhances students' understanding of mathematical concepts.

Review of Literature:

Previous studies in mathematics education reveal that students often find concepts of area and perimeter difficult because they memorize formulas without understanding them. Research suggests that activity-based and model-based teaching methods improve conceptual clarity and student engagement.

The use of instructional and manipulative models helps learners visualize geometrical concepts and understand the formation of formulas. Constructivist approaches also emphasize that hands-on learning enhances retention and problem-solving abilities among students.

However, many studies mainly focus on the application of formulas rather than helping students understand how these formulas are formed. Therefore, there is still a need for research that focuses on conceptual learning through instructional models in mathematics teaching.

Need of the Research:

Mathematics teaching in many classrooms still focuses on memorization of formulas rather than conceptual understanding. Students often learn formulas for area and perimeter without understanding how these formulas are derived or why they work. This results in confusion, low interest in mathematics, and difficulty in applying concepts in real-life situations.

Therefore, there is a need to introduce innovative instructional strategies that promote conceptual learning. Instructional models that involve activities and visual representations can help students better understand mathematical concepts.

The present research is important because it attempts to examine whether an instructional model can enhance students' understanding of mathematical concepts, particularly the concepts of area and perimeter among upper primary students.

Research Gap:

1. Earlier studies mainly focused on traditional teaching aids and less attention was given to interactive instructional models.
2. Most studies emphasize the application of formulas rather than the conceptual formation of formulas for area and perimeter among upper primary students.

Research Methodology:

The present study used the experimental method to examine the effectiveness of the instructional model in enhancing students' understanding of mathematical concepts.

Research Approach: The study followed a quantitative research approach.

Research Design: Pre-test – Post-test Control Group Design was used.

Sample: The sample consisted of VI standard students selected through random sampling.

Research Tool: An achievement test on the concepts of area and perimeter was prepared and used as pre-test and post-test.

Data Analysis:

The collected data were analyzed using Mean, Standard Deviation, and t-test to determine the significance of difference between the groups.

t-value = 6.18

Critical t-value = 2.02

Since $6.18 > 2.02$, the result is statistically significant. The paired sample t-test revealed that the implementation of the instructional model significantly improved students' understanding and academic performance in mathematics ($t = 6.18$, $df = 41$, $p < 0.05$).

Findings:

The instructional teaching model was found to be effective in improving students' understanding of area and perimeter concepts. Students taught using the model showed better conceptual clarity regarding the formation of formulas rather than memorization.

The model also helped students visualize mathematical ideas and relate them to real-life situations.

Future Scope:

The study can be extended to other mathematical topics such as triangles, circles, and volume of solids. The instructional model can also be applied to higher classes to study its effectiveness. Future research can incorporate digital or ICT-based instructional models for teaching mathematics.

Conclusion:

The findings of the study indicate that the use of an instructional teaching model significantly improved the understanding of area and perimeter concepts among VI standard students. By making abstract formulas more concrete through instructional and manipulative activities, the model enhanced student engagement and participation.

As a result, students developed better conceptual clarity and achieved improved learning outcomes in mathematics.

Cite This Article: Sankare S. & Prof. Upasani B. (2026). *Study the Effect of Instructional Model on Enhancing Mathematic Concepts*. In *Educreator Research Journal: Vol. XIII (Issue III)*, pp. 446-448