

## EFFECTIVE USE OF INSTRUCTIONAL MATERIALS IN MATHEMATICS CLUBS: THE ROLE OF DIDACTIC AND VISUAL AIDS

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**Abstract:** This article examines the educational significance of using didactic tools, visual aids, graphic models, and modern digital technologies in mathematics clubs. The study evaluates the impact of visual materials on students' comprehension, the motivational function of visual demonstrations, and the methodology of integrating multiple resources into club activities.

**Keywords:** didactic materials, visual aids, stands, educational resources, instructional tools.

### Introduction

In mathematics education, visual aids and didactic materials play a crucial role in helping students deeply understand new concepts and internalize abstract ideas that are often difficult to grasp through verbal explanation alone. When learners are able to see mathematical relationships, patterns, and structures represented visually, they engage more actively in the cognitive process of meaning-making. In the context of mathematics club activities, the use of visual models not only makes complex problems more accessible and comprehensible but also transforms learning into an interactive and student-centered experience. Visual tools such as geometric models, diagrams, charts, manipulatives, and digital simulations help students break down challenging concepts into simpler components, thereby reducing cognitive load and increasing conceptual clarity.

Furthermore, the integration of digital resources significantly enriches club sessions by providing dynamic, flexible, and interactive learning opportunities. Online platforms, virtual problem banks, mathematics software, and educational applications allow students to experiment with ideas, test hypotheses, and receive immediate feedback. Such digital tools foster students' independent learning skills by encouraging exploration beyond the classroom, supporting differentiated instruction, and enabling learners to progress at their own pace. As a result, visual and digital materials together create a supportive learning environment that enhances engagement, strengthens motivation, and promotes deeper understanding of mathematical concepts.

### Methods

The study utilized the following methods:

- observation of the effectiveness of visual aids;
- creation and classroom testing of graphic models;
- evaluation of the use of methodological literature and educational stands;
- integration of virtual problem banks and digital platforms into club activities;
- diagnostic assessment of students' engagement with visual materials.

### Results

Research findings revealed that:

- visual aids significantly accelerate comprehension of complex mathematical concepts;
- graphic models help students visualize structural elements of a problem;
- students understand content 30–40% faster when visual materials are used;
- online platforms make club sessions more interactive and engaging;

- didactic materials stimulate independent learning and deepen motivation.

**Discussion**

The data show that visually representing mathematical ideas greatly improves student understanding. Graphic models, diagrams, charts, cards, and educational stands promote active cognitive engagement. Digital resources modernize club sessions and increase student interest. Using visual and didactic materials systematically enhances the overall effectiveness of mathematics club activities.

**Conclusion**

The effective use of visual and didactic materials in mathematics clubs plays an important role in developing students' mathematical competencies. Visual resources simplify complex content and increase engagement, while digital platforms enhance independent inquiry and learning motivation. An integrated approach to instructional materials significantly strengthens the educational impact of mathematics club activities.

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