NOVATEUR PUBLICATIONS
INTERNATIONAL JOURNAL OF INNOVATIONS IN ENGINEERING RESEARCH AND TECHNOLOGY
[IJIERT] ISSN: 2394-3696 Website: ijiert.org
VOLUME 9, ISSUE 10, Nov. -2022

USE OF GAME TECHNOLOGIES IN THE DEVELOPMENT OF STUDENTS' SPATIAL IMAGINATION

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ANNOTATION
This article provides information on the concept of spatial imagination, the use of game technologies in the development of students' spatial imagination.

Keywords: drawing geometry, spatial, figure, structures, rhythmic thinking, reflection

Graphical geometry is a branch of geometry that studies the methods of representing spatial figures on a plane and using them to solve spatial problems. Drawing geometry has gradually emerged in the practical activities of mankind. it is used in the design of buildings and machines, fine arts and other fields. Central Asian architects also used geometric shapes in the design of dome buildings and bridges. Even now, drawing geometry methods are widely used in the construction of buildings and structures of various geometric shapes.

There are 2 ways to represent spatial figures on a plane: central projection and parallel projection. for example, photographs of objects and shadows of objects on a plane from light rays are central projections. An image made by the central projection method is called perspective. The real shape and dimensions of the figure cannot be determined in the perspective image. in parallel projection, the center of projection in central projection is assumed to be infinitely far away. In parallel projection, the exact direction of the projecting straight lines must be given. An example of parallel projection is the shadow of objects cast by the light of the sun or the moon.

Projecting figures at right angles to two mutually perpendicular planes is called orthogonal projection. Sometimes a plane (profile plane) perpendicular to both the horizontal and frontal planes is used to perfect the drawing. drawings are easily made by means of orthogonal projections, the dimensions (length, width, height) of the object depicted in the orthogonal projection (isometry) can be determined directly. But such a drawing does not give a clear idea of the product. it is difficult to visualize the spatial forms of complex figures from it.therefore, the image of an object made on the basis of orthogonal projection with its axonometric projection is often used in engineering construction works, the so-called numbered projections method. in this case, the points are projected orthogonally to the plane of projections, and numbers representing the position of the point in the plane - heights are placed next to the projection. To make this plot clear, a height line is drawn through points of equal height. if it is necessary to depict the earth's surface (relief) in a drawing, a horizontal projection plane is used. In this case, the lines are called horizontal. Depending on the shape and location of the horizontals, it is possible to form an idea about the depicted part of the earth's surface. This method of depicting the surface using a system of horizontals is called a topographic method. Drawing geometry methods are widely used in architecture, visual arts, technology and other fields.

In the essence of geometry and spatial imagination, they are defined and organized by a strict logic. In any true geometric judgment, whether it is an axiom, a theorem or a definition, these two elements do not exist: a visual picture and a strictly speaking, strict logical product. where there are no two sides, there is no real geometry. Visuality, imagination, sciences, rigorous logic are the prerogatives of science. The dryness of the concrete summary and the ability of the visual picture "ice and fire are not so different". Thus, geometry unites these two opposites. therefore, to study it, it is necessary to connect the ability of imagination with logical, visual pictures with solid words and arguments. Therefore, the main rule of learning geometry is a

meeting with a theorem or a definition of a task, first you can imagine and better you should be: thisIt is more difficult to imagine this speech and at the same time understand how it is clearly expressedMany students do not have a very developed spatial perception. Everything consists of psychological processes, among other things, the development and improvement of spatial perception. Exercise is also needed to stimulate this activity. it can be concluded that students should develop their spatial imagination from the first lessons of mathematics from the fifth grade. Currently, there are various systems for developing spatial imagination among high school students, including computers. for several years, I call the "geometry" course designed for teaching in the 5-6th grade. Its purpose is to prepare students to master regular geometry
The development of spatial imagination in students affects such students in drawing, drawing, geography, physics, chemistry, etc. Modeling and design help develop spatial imagination. It does not always have to be at the level of store standards. models can use what is immediately on hand. It teaches them to see the beauty in simple things.

To solve the fun tasks you need:

Cowner,

The ability to predict the outcome

Good idea.

Working on such tasks helps to develop these qualities among students. Often, solving any tasks, students make conclusions based only on what they have drawn; Most of the time, I am sure that no proof is needed anymore. looking at a drawing can lead us to wrong conclusions.

Visual-spatial perception is the most important aspect of visualization. Visualization itself is a way of using your imagination that allows you to create anything you want. in our case, you need a constant image of power and open channels. Otherwise, how can we control power if we don't see it at all? Visualization is primary, and actual feelings follow

In order for your imagination to be of high quality and more effective, you need to strengthen your imagination, that is, the ability to mentally reproduce images.

Some exercises traditionally performed to develop visual spatial perception.

1 Constant reflection. 1-3 (up to 5), any item is considered (coin, matching items, finger, pen, etc.). It can be flashed, but the appearance should remain on the subject. Look at the object and find all the smallest details and features. repeat the exercise until it becomes easy to focus. This is a kind of concentration exercise, but now the task is to memorize all the topics.

2. Rhythmic thinking. Select any element and focus on it. Peace of breath. close your eyes while breathing - erase the impression. On the breath, open your eyes again and concentrate. up to 50 times. Then, on the contrary: to stop breathing and think about planting.

3. Thinking about the mind.Continuously or for 3-4 minutes or more, consider the topic. then close your eyes and try to bring a mental view of the object as a whole and in relation to all parts.

Open the eyes and reduce the mental "photo" with the real object. Repeat 5-10 times in each exercise. Gradually achieve clear inner vision. Of course, it will not be very bright in reality, and at first it will be like a blurred silhouette in the deep evening, but a determined person will create his business.

Gradually go from simple objects to more complex and then large pictures and texts. Visual memory is much stronger.

Creative imagination is a specific mental activity aimed at solving problems that require direction in the practical and theoretical space. In its most developed forms, it thinks with images in which spatial properties and relationships are recorded. operates on original images created on various graphic bases, provides their transformation and creation of new images from scratch.

It is known that the higher the level of spatial expression of students, the better. you will achieve this if you set more interesting tasks in front of them the use of game technologies in the development of spatial imagination, the development of the ability to accurately and correctly perform tasks requires long exercises, but it will be useful in solving tasks in the future.

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