CURRENT RESEARCH JOURNAL OF PEDAGOGICS
(ISSN –2767-3278)
VOLUME 04 ISSUE 04 Pages: 06-10
SJIF IMPACT FACTOR (2021: 5. 714) (2022: 6. 013) (2023: 7. 266)
OCLC – 1242041055
Publisher: Master Journals

Journal Website: https://masterjournals.com/index.php/crjp

Research Article

WAYS TO DEVELOP STUDENTS' DESIGN ABILITY

Submission Date: April 02, 2023, **Accepted Date:** April 06, 2023,
Published Date: April 11, 2023
Crossref doi: https://doi.org/10.37547/pedagogics-crjp-04-04-02

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ABSTRACT

In given article lit ways developments to abilities of the designing and mobility of the spatial imagination student in graphic activity by means of exercises, containing elements of the designing in building drawing.

KEYWORDS

Technique, design, replacement, spatial imagination, medium, design elements, size, ability, interest, skills, creativity.

INTRODUCTION

It is necessary to have a sufficiently high level of spatial imagination and spatial thinking in all spheres of human activity. No designer (designer) can imagine a complex mechanism or machine in his mind completely.

But in the design process, performing various drawings, making calculations, you can begin to determine the general appearance, other aspects of some elements. As a result, the basic idea of the design is likely to make a big difference. Since the executed drawing (technical drawing) and spatial thinking are in dialectical relationship, they complement each other with interesting ideas.

As a result, spatial thinking leaves the drawing behind and enhances it by performing a mental image on paper. Thus, thinking allows you to identify the image and explore the relationship of certain elements, and then continue the construction, spatial thinking.

A person who cannot quickly, accurately and accurately depict on paper will face great difficulties in quickly capturing even hypothetical images in his mind on paper. This requires a quick hypothesis and the

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immediate inclusion of mental images in it, especially when using modern computers.

For this reason, it is necessary for each person to master spatial imagination and thinking, as well as the skill of putting on paper what he assumes in his mind. One of the parameters determining the aforementioned potential is the graphic literacy of the student.

A student participating in the design process must be able to draw up a drawing and read it. In order to think creatively, imagine, design and implement it on paper under a given condition, it will be necessary to know the laws of the discipline of drawing.

The parts are made by casting, stamping, machining. The simpler the form of a detailed model, the easier it is to make it and cheaper.

In the practice of mechanical engineering, parts with a flat surface and a rotating surface are more often used. Because on the existing machine (machine) it is possible to achieve their fast, easy and inexpensive manufacture. It is easily processed on flat and rotating surfaces on milling, grinding, forging, revolving and turning machines. Parts with a complex structure are formed by casting. The part is formed in individual and low-volume production by hammering, deposition from a piece of steel and colored material. The parts of the products produced in series are mainly made by hot or cold stamping.

The parts obtained by stamping are characterized by high accuracy and low failure during processing. Many threaded mounting parts produced in the same series are also manufactured on cold automatic unloading presses. A product made in this way is of high quality and is inexpensive.

Flat rotation parts, oval, square, rectangular, hexagonal, of various shapes are obtained from varietal (varietal) rolled sheet materials by cold stamping. In most cases, the blanks are made in different ways, the type that requires saving is selected from them.

Depending on the size of the part, the geometric shape, the material used, the number of pieces produced, the degree of accuracy of execution and the type of manufacture, its workpiece is selected (an intermediate product from which finished products are subsequently obtained).

The workpiece of parts obtained by casting and stamping is processed as pretreatment, straightening, grinding, leveling, presses (the process of processing the outer or inner surfaces of cylindrical, prismatic parts), centering.

During the design process, it is necessary to mentally replace the image of various objects by means of graphic images. With such a replacement, the size of objects and parts changes.

According to the analysis of methodological literature, such questions can be divided into three groups. These are issues related to a change in the spatial position of the object, a change in the spatial position of a part of the object, a change in the shape of the object.

Performing various statements in subjects contributes to the development of the most necessary combinatorial abilities for a person, interpretation of the source data from different points of view and similar qualities.

The process of mental transformation of the initial state of the graphic material becomes even more complicated when a dynamic representation of spatial relations in students is required. Therefore, the solution of the above issues contributes to the development of technical creativity of students.

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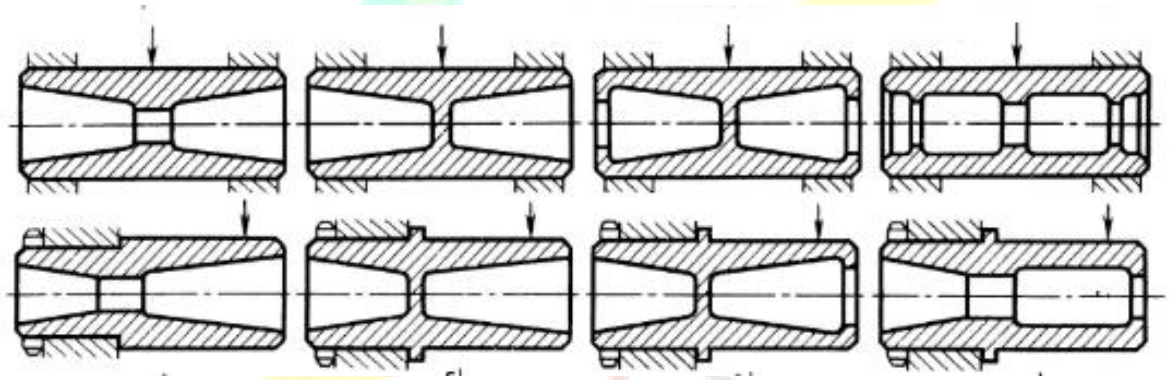
Exercises containing elements of construction in construction drawing require students in graphic activity increased excitability of spatial imagination, developed logic and imaginative thinking, in other words, qualities inherent in creative activity.

In the creative activity of a person, a graphic image performs two interrelated functions. Firstly, a drawing is a kind of tool of thinking; secondly, a means that gives a thought (idea).

Therefore, in the project activity, first of all, attention is paid to its graphic aspects. Creating an image of an object mentally in the brain and its graphic representation through consciousness can be called a successful aspect of project activity.

With an increase in the external dimensions of the parts and a decrease in the thickness of their walls, it is necessary to increase stiffness in the direction transverse to the action of bending moments in order to avoid local deformations.

For cylindrical shafts, this task is solved by introducing belts and stiffeners (Fig.1, a, b) in the plane of action of loads, on the support and sealing sections, as well as on the free ends of the part (Fig.1, c, d).



a) b) v) d)

Fig.1

(Fig. 2) shows the reinforcement of beams by transverse ribs 1, boxes 2, semicircular linings 3, oblique links 4.5.

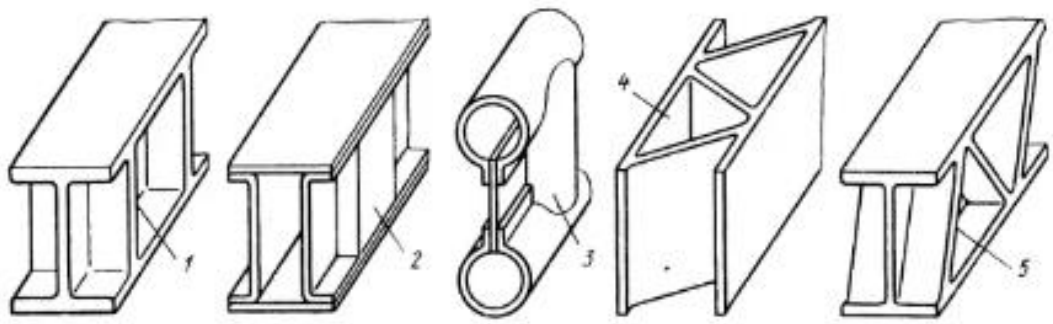


Fig.2

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After students complete a series of design works mentioned in examples like the ones above, they will have improved design skills. They will also perform computer-aided design of complex surfaces at later stages.

Hence, graphic activity stands on the general plan of scientific creativity. Therefore, students should have formed important qualities-spatial hypothesis and imagination, which will help replace the spatial structure and relationships of the subject necessary for the reconstruction of objects related to the design. This quality can be achieved by performing regular and purposeful exercises in the field of spatial substitutions.

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