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## INTEGRATION OF DESIGN AND ENGINEERING GRAPHIC SCIENCES TO INCREASE EDUCATIONAL EFFICIENCY

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**DOI: 10.5958/2249-7315.2022.00010.7**

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### ABSTRACT

*This article discusses ways to increase the effectiveness of students by integrating engineering graphics and design sciences, as well as how to quickly read the missing projections by showing ready-made color details through design.*

**KEYWORDS:** *Engineering Graphics, Design, Science, Knowledge, Skills, Abilities, Integration, Imagination, Object, Method, Technique, Education, Society, Nature, Infrastructure, Pedagogy, Category, Invention, Detail.*

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### 1. INTRODUCTION

Research is being conducted internationally to increase the effectiveness graphics and design, to develop students' knowledge, skills and abilities, and to integrate the content of related disciplines. This allows students to apply the knowledge and skills gained in engineering graphics and design in the design, understanding, comprehension, and the realization of educational goals in the formation of artistic imagery. [1]

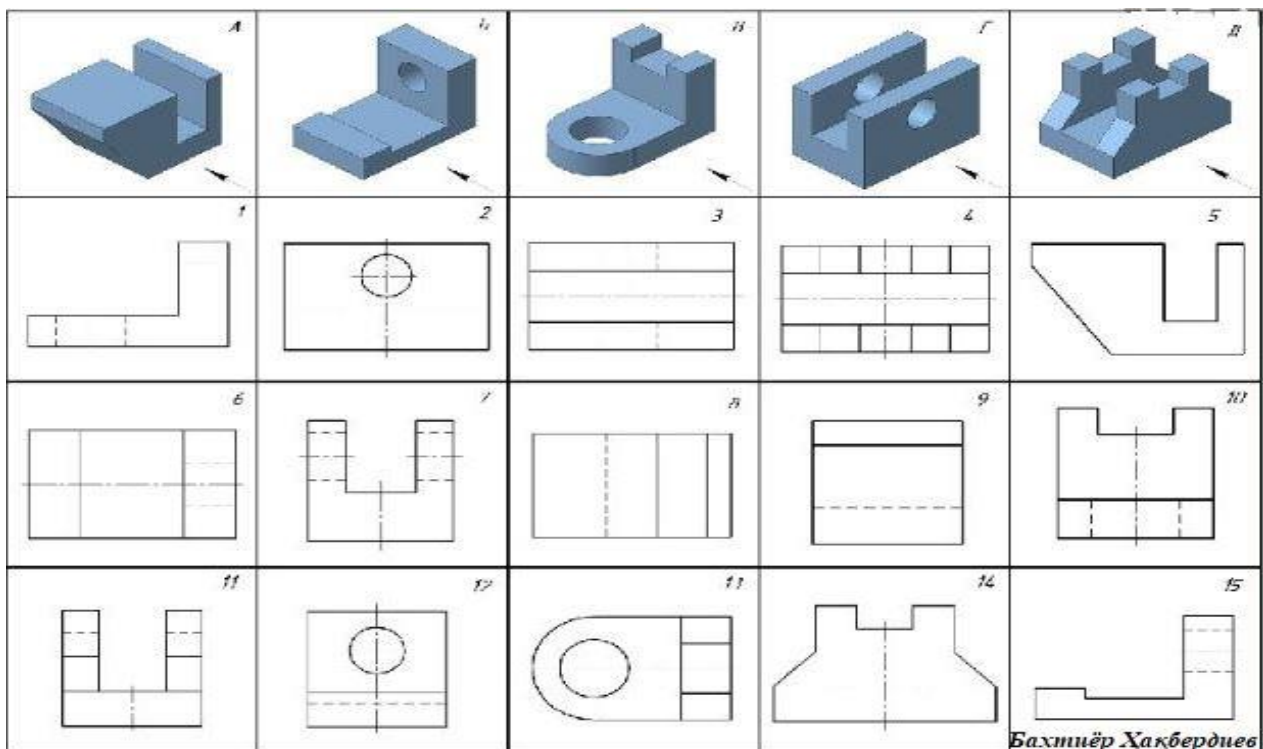
Only an integrative method can ensure the quality and success of the educational process, which is a complex integrative object. Academician A.P.Belyaeva justified the need for an integrated methodology in a new direction in education and science. According to AP Belyaeva, in addition to systemic objects (science, technology, production, education, man, society, nature), the methodology itself is intertwined, condensed, updated, and its complex type of infrastructure on the basis of integration and differentiation is interdisciplinary. Interactions occur. The systematic object given by A.P.Belyaeva's scientific school has a multifaceted nature of genetic origin, and it has been found that it goes beyond the tertiary aspect (pedagogy, spheres of activity, and philosophical categories of labor). AP Belyaeva's scientific and practical research shows that in the field of methodology, the integration of a large complex into a single structure is impossible without integration. [2]

The above idea gives an integrative character to these two sciences, as it combines artistic skills, dealing with material things, and knowledge of engineering and design sciences. Engineering graphics at all stages of science is impossible without the use of inventors, architects, builders, designers in design work. The quality of engineering graphics training in design work is assessed by the ability to spatially read drawings based on technical ideas and drawings. A clear representation of the spatial imagination and design work of the idea in the drawings helps to develop the imagination of inventors, architects, builders, designers. [3]

Every designer invents something through his creativity, taking into account the convenience, comfort, affordability, affordability. The science of engineering graphics fully engages the designer in the creative environment and its stages, from the simplest to the most complex.

Improving engineering graphics and design through integrated teaching usually has the effect of giving students a small group task as an independent work because the task is completed quickly as a result of managing small groups. Students will be able to easily and efficiently complete complex drawings using the methods used to improve teaching based on the integration of these two disciplines. In the process of completing such metric and positional tasks, students quickly understand the integration of the two disciplines and also determine the level of quality of their knowledge, skills, abilities, and individual behaviors. It should be noted that finding solutions to metric and positional problems through the integrated teaching of these two disciplines will further increase students' confidence. This will ensure the success of the teaching process by integrating engineering graphics and design disciplines, as well as the high quality of the knowledge they acquire, and incorporate specific aspects of quick comprehension into the lessons. [4]

We know from history that the ancient Egyptians did not draw any of the daily events in their palaces, but gave them as drawings. They drew such drawings that they were not based on mathematical law under the design, but because of the law of orthogonal projection, with an intuition. Because of adapting the detail to the design and getting acquainted with it, students can compare their experience with the state of the detail, which helps to develop a spatial imagination. You give students a mix of different details and their looks and put them in place. [5] (picture-1)



1-PICTURE

Now pay attention to the fact that the theoretical study of this problem has gained experience in teaching engineering graphics and design in developed countries and higher education institutions of the Republic through integrating engineering graphics and design. We found that the work on its development had not been sufficiently studied. Because, as mentioned above, in teaching, it is

possible to easily integrate these two disciplines, or to show the picture of the details under the design in picture 1, and then find three views, such as metric and positional. [6] We believe we can create very effective lessons through issues. Therefore, integrating concepts in these disciplines, the need for a comprehensive study of the effective development of students' knowledge, skills and abilities because of the creation of relevant textbooks, and tried to explain at least a little.

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