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Peculiarities of the Science of Fundamentals of Graphic Illustration in Developing Spatial Representation of Students

Zokirova Muribat Shokirovna

<u>Muribat@gmail.com</u>

The senior teacher of chair of fine arts and engineering graphics

Annotation: This research paper presents information about some of the scientists' research work in the field of geometry. The development of classical geometry during the Renaissance in Europe and the emergence and teaching of drawing geometry are described. There is information about research works of Russian and Ukrainian scientists on drawing and applied geometry. Here is some information on our geometry research in Central Asia.

Keywords: Graphics, drawing, spatial, geometric, mechanism, projection, detail, pencil, painting, composition, logic.

Introduction

The time is growing rapidly. The difference between the past and the present is that there is a big difference between today and the day before. News is being made in every minutes, the world is on the brink of science. Up-to-date education and upbringing is becoming more urgent. In our country, special attention is paid to the education and upbringing of young people under the leadership of President Sh.Mirziyoyev. We can cite a number of innovations in the field of education, the transparency of entrance examinations in higher education, and a number of conveniences. As we all know, the President of our country put forward five important initiatives on social, spiritual and educational activities. In one word, the educational work is being organized to educate the young generation on the basics of scientific knowledge, to develop their broad outlook and thinking, to develop their spiritual and moral qualities.

One of the main activities of the education system for the purpose of humanism is the development of creative thinking, imagination, the desire of young people to develop their ideas, which is the basis of building a law-governed state. As I said before, our young people need technical knowledge to be up to date, designing, building, and working in plants and factories. In other words, there is a great need for young people who are capable of interacting with every modern technology, capable of managing it, using it, possessing new ideas and imagination. Such specialists are required to have a thorough knowledge of drawing, graphic geometry, its importance in life, the goals and objectives of science, its successes and problems, and its graphic literacy. To do this, students need to develop such knowledge at an early age.

In the cave paintings over 25,000 BC, almost all wild animals are in a precise profile and show that they run around the hunter. If a wild animal turned his face to the man, it would have to be described as having a bow or a spear by him [1.44].

As we know, schools teach fine arts in grades 1-7 and drawing in grades 8-9. At the same time, students gain some skills and knowledge about drawing science. However, it would be desirable to give students more knowledge of these subjects in developing and shaping the imagination, as well as increasing the number of academic hours to give students an

understanding of graphics and visual science to enhance graphic literacy. Currently, graphics and graphic arts are taught in higher education by specialty.

The purpose of the course is to provide students with information about the services of mathematical scientists of ancient Greece and Egypt, scientists of Central Asia and Uzbekistan, their unique sources in the formation and development of the disciplines of drawing geometry and drawing, graphics and engineering graphics. The purpose is to introduce students to the history of geometric graphics. It also develops students' spatial representations, enhances their graphic literacy. The basics of graphics are mainly drawing. The drawing encourages students to think deeply and make accurate calculations.

The rapid development of science and technology requires people to master graphic literacy, that is, the laws of drawing and finishing and reading. The main document, which contains technical information, is a drawing, and no industry can exist without it. Drawings used in the arts have their own specifics and conventions.

Young professionals entering the industry after school and college must be able to work with graphic documentation. That is, they should be able to read and make drawings. In other words, they must have some degree of graphic training.

It is planned that students' graphic preparation will be enhanced in school drawing lessons. In recent years, the improvement of students' graphic training is due to the gradual and successful implementation of the Law on Education and the National Program for Personnel Training, adopted on August 29, 1997, on the basis of ideas developed in the Republic.

In his article, scholar B. Kadyrov, who conducted a separate study on talent, describes the following in his article: "Talent is a multifaceted, complex, hereditary, biological and social phenomenon" [2.65].

The need for research in this area is, first, due to the increased demand for scientific and methodological training of students, and secondly, the need for a didactic assessment of methodological progress in recent years.

Lessons in a school drawing course are very important for improving the student's graphic preparation. To illustrate the importance and content of the school drawing lessons, the following are appropriate:

a) Learning how to draw helps students learn about the environment;

b) The study of drawing prepares students for comprehensive development and production activities;

c) Learning how to draw develops the personality so perfectly that it cannot be developed in other ways;

d) The development of engineering and technical knowledge of students, along with the study of the drawing, directs them to technical development and demonstrates their ability in all areas of mechanization and automation of the national economy;

e) Drawing will help students gain greater knowledge of the technique and technology of modern production, the design of technical devices, and to understand the layout of the projections of objects on flatness;

e) Drawing helps students to develop technical thinking, knowledge, spatial representation and skills;

f) The study of drawing teaches students the elements of culture, such as discipline and observation, discipline and transparency in work, independence and excellence;

g) Students learn aesthetic taste by studying drawing;

The main focus of the drawing is on all-round conscious development of students and the development of technical thinking.

The curriculum for drawing is based on the development of science and technology.

Teaching to drawing and learning to read will be the first objective of a drawing lesson. Drawing not only solves polytechnic issues, but also enhances the student's comprehensive knowledge. Teaching structure and reading of diagrams enhances students' level of graphic preparation. In addition to drawing geometry, subject of fundamentals of graphic illustration is closely related to graphic and engineering graphicss.

As we know Graphics is a linear image. We find that all graphics or images are represented by lines. This means that the basics of graphic rendering will help us to explain the basics of the performance of that graphic.

In 1576 Filibert de Lorm published a book by Francis Henry II (the spiritual father). In it, he writes examples of stone cutting using rectangular projections[3.52].

The methodology of teaching engineering graphics teaches the origin, design, methodology of teaching the subject of drawing. Students will learn what the drawing is, how it can be done with drawings, read and write the drawings.

In a nutshell, the basics of graphic imagery teach students to combine all of their knowledge in the areas of drawing, plotting, geometry, graphics, and engineering graphics. The subject of fundamental of graphic illustration is representation, graphics, engineering graphics and all of the linear images.

Here we will talk about the engineering graphics, its history, the origin of the drawings. Because the linear images are the drawings. As we know from history of drawing, our ancestors used it to communicate with each other, to give their location, and even to hunt. At the same time, the engineering graphics of the drawings played an important role in the construction of various structures and projects.

Mathematics is called mental gymnastics, and drawing is a science that enhances one's ability to think and reason. "Man has intelligence. In this mind, the spirit is the natural beginning of man[4.120].

The history of the emergence of each science is indicative of its importance in life, its antiquity, and its contribution to the development of society. The rapid growth of society depends on the advancement of science and technology, and it calls on people to work harder and more civilized. Technology cannot be developed without drawings.

The emergence and directions of development of geometric graphic science (2a) appeared in the II-IV centuries in the works of geometric and philosopher scientists of ancient Egypt and Greece. It was founded by French scientist Gospar Monge (1746-1818) and wrote the first textbook (1798) on graphic geometry and taught as a subject in some French universities. It has also shown the practical application of this discipline in various fields of engineering and construction, as well as in the design of military equipment and fortifications. Over time, the sections of geometric graphics have developed in different directions.

The contribution of some geometric scientists to the development of geometric graphics during the Renaissance in Europe is also given. In Russia, this subject has been taught to students of the Peterborough Civil Engineering Corps since 1810 by French scientists, first by French, then by Russian scientists in Russian, and by some sections of science. Contribution of the prominent Russian scientists to the development of geometric graphics were given. Our values in Central Asia, which have done extensive research in various fields of science, are reported on the geometric work of Abu Nasir Farabi, Ahmad Farghoni, Al Khorezmi, Ibn Sina,

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Abu Rayhan Beruni and others. In the Middle Ages from the VII to the XV centuries in modern Central Asia there were great scientific discoveries. During that time, many scholars have done a thorough research in various fields. Their best works have been translated into a number of European languages. They contributed to the development of world science. They have shown in their works the principles of all the discoveries by drawing. Because of this, they have created many different ways of drawing.

Various types of architecture are also begun to develop. Architecture and engineering are honored professions. They were entrusted by kings to build fortifications and palaces. As it is known, nothing can be created without its drawing. Thus, it is possible to say that at that time, the drawings were very important in the development of architecture in Central Asia.

The history of teaching the subject "Drawing Geometry and Engineering Graphics" in connection with the establishment of the first universities in Uzbekistan is given. Here is the creation of the first textbooks by university professors and teachers. There is enough information about the great Russian professors, who have worked in our country for many years, and about almost all the scientists working in our country. For Uzbekistan more information about the Kiev scientific school and its leaders, trained by highly qualified scientists in 05.01.01."Applied Geometry and Engineering Graphics". The topics of development of theoretical and methodological directions of drawing geometry, engineering and computer graphics are given. This, in turn, can provide an opportunity for researchers of our Republic to conduct research. The appendix of the pamphlet contains brief descriptions of some of the graphic scholars as they are not fully collected. It also provides information about classical geometers that have been active in our country for many years. Ancient Egyptian and Greek scholars have contributed to the development of various fields of science. They have developed philosophical and natural sciences together.

Fales of Miletus (625-547 BC). Fales of Miletus was one of the seven wise men of his day. He was the leader of these seven wise men. Fales was the first to think about nature. Fales first realized that the solar eclipse was caused by the lunar eclipse. The circumference of the circle is that it is halved. Fales measured the height of the Egyptian pyramids by their shadow. His works are known: "On the motion of the Sun", "On the Equal Couple". His contemporaries used to say, "Philosophy begins with Fales, he was one of the first." Fales has a lot to do in the field of geometry. One of them is the Fales theorem, which is still taught to schoolchildren, and many of the principles of planometry are proved by this theorem.

Fales Theorem. If parallel straight lines that cut corners give equal cuts on one side and equal crosses on the other and it results as $OB_1 = B_1B_2 = B_2B_3 = B_3B_4$ that is $OA_1 = A_1A_2 = A_2A_3 = A_3A_4$ Figure 1.1. In the subject of drawing geometry, the Fales theorem is used to solve the problem of dividing the projections of the sheets in given proportion.

The theory and systematic explanation of geometry problems were developed in ancient Greece. Greek scientist Fales Miletsky (624-547 BC) was the first to deal with geometric design. One of the first issues that Fales solved was to determine the distance from the sea to the invisible shore by making triangles. He also measured the height of the Egyptian pyramids by using the shadow that fell on them. After the Greeks settled the dilemma of a square with a line and a circle, they began to solve the dilemma of a cube using a line and a circle. In this

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case, the problem of doubling the cube has to be geometrically made $\sqrt[3]{2}$ using liners and circuits.

If the edge of a given cube is a, and the edge of the cube to be drawn is denoted by x, then the doubling of the cube is $x^3 = 2a^3$, depending on the condition of the problem, and then $x = a \sqrt[3]{2}$.

However, it was not possible to make $\sqrt[3]{2}$ through circuits and liners. Many scientists around the world have done research on this issue. It has been proven that in the 19th century it was impossible to make $\sqrt[3]{2}$ without circuits and liners without auxiliary tools.

The course "History and Development of Graphics" has a special place in the improvement of professional and pedagogical training of future teachers in drawing geometry and drawing subjects and their theoretical and scientific methodological training. The aim of the course is to provide students with information about the services of the ancient Greek and Egyptian mathematical scientists, as well as the scientists of Central Asia and Uzbekistan, in the formation and development of the drawing geometry and drawing.

The requirements for the course "History and Development of Graphics" are as follows:

cultivation of world outlook, cultural level, creative thinking;

the development of the people's past, the heritage of the fine arts, the formation of respect for it;

wide knowledge about the role of graphic knowledge in human life, the national features of its historical roots;

To have extensive information about the history of graphic science in Uzbekistan and its development directions;

To gain insights into some of the work done by the encyclopedic scholars in Central Asia in the field of hematology

development of good taste with the use of graphic history materials in professional and work activities.

The basics of graphic designing are directly related to "Descriptive Geometry", "Geometric and Projection Drawing", "Theory of Machines and Mechanics", "Fundamentals of Mechanical Engineering", "Mechanical Engineering" and other technical sciences, geometry, mathematics and physics.

This discipline is also directly related to the subjects planned in the curriculum: mathematics, the history of fine arts, oil painting, painting, composition, sculpture, applied art, fine arts, drawing, computer graphics. In the process of the course of graphic drawing, these subjects will be associated with the course and will increase the efficiency of science.

As can be seen from the above, graphics illustration enhances students' spatial imagination and logical reasoning, as well as graphic literacy. In today's environment of teaching based on pen and paper, the learning process is highly effective in developing students' spatial imagination and training highly qualified specialists with the use of computer and information technology learning environments.

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Therefore, it is desirable to consider a number of graphic disciplines, such as engineering graphics and graphic geometry, not only as general education, but also as a field of human knowledge aimed at actively developing students' graphic preparation and spatial imagination.

Students' spatial imagination and logical thinking will develop and develop more fully in the course "Descriptive Drawing" and "Descriptive Geometry". These abilities are enhanced especially in the independent graphic works. Because students interact more with each other in graphic work, interact with each other, compare their knowledge, exchange ideas, and apply what they have learned to solve a particular problem, that is, the creative intelligence and spatial imagination of students is maximized, logical thinking. and spatial imagination skills are formed and strengthened. There are instances when mental analysis, comparison, sorting and application of all the experience gained is acceptable. In these environments, their consciousness, attention, intuition, cognition, knowledge and memory are high, which ultimately leads to students' potential. Any teacher who is able to create such a situation in the course of teaching will achieve the effectiveness of teaching any subject.

We can conclude that the process of forming a spatial representation is a very complex process that occurs in our minds, with many objective (e.g. lack of visual models, complexity of perceptions of reality) and subconscious (student activity, attention, and early understanding). .k.) factors affect. At the same time there is a need for the development of effective tools and techniques for the formation of spatial representations that minimize the impact of the above-mentioned factors, which can not be effectively studied without a well-formed spatial thinking.

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