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Polygonal-Pyramidal Method of Structured Anatomical Analysis in Professional Art Education

*Método poligonal-piramidal de análisis anatómico estructurado
en la enseñanza artística profesional*

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ABSTRACT

This article examines the author's method for teaching professional art education through the utilization of polygonal and geometric shapes. It delves into the fundamental principles, tools, and techniques involved in working with such forms. Academic Drawing, a cornerstone discipline in painting education, is explored within the context of this method. Specifically, the article discusses the Method of Anatomical Polygonal-Pyramidal Structured Analysis and Geometrical-Plastic Modeling of Form, implemented within the professional art education curriculum at the Lugansk State Academy of Culture and Arts, Russia, under the Faculty of Fine and Applied Arts, Department of Easel Painting. To assess the method's effectiveness, a study employing the stratometric modeling method was conducted with five student study groups, comprising female students aged 18-25, all pursuing training in Stationary Painting. The study spanned various periods, revealing the method's capacity to expedite professional development and yield significant student achievements. The article concludes by underscoring the method's importance in nurturing spatial-artistic thinking, rooted in the identification of anatomical nodes influencing overall figure structure and internal plasticity. By connecting these nodes into a cohesive system, the method facilitates the expression of artistic constructive form. Through the transformation of triangles into volumetric geometric forms and their layered application, the method enables the creation of tonal gradations and overall figure volume. Moreover, it cultivates anatomical constructive thinking, enhances understanding of human structure, and fosters proficiency in applying mathematical principles to creative problem-solving.

KEYWORDS: Anatomical Constructive Drawing, Anatomical Reference Points, Teaching Methods, Academic Drawing, Constructive Drawing, Vocational Art Education.

RESUMEN

Este artículo trata de la disciplina *Dibujo académico* como una de las principales disciplinas que forma cualidades profesionales en las personas estudiantes de pintura. El artículo trata del *Método de análisis estructural anatómico poligonal-piramidal y modelado geométrico-plástico de la forma*, que se desarrolla e implementa en el sistema de educación artística profesional en la Academia Estatal de Cultura y Artes de Lugansk que lleva el nombre de Mikhail Matusovsky en la Facultad de Bellas Artes y Artes Aplicadas, Departamento de pintura de caballete (Federación Rusa). Para revelar la eficacia del método, el estudio se realizó utilizando el método estratométrico de modelización de la muestra del grupo de trabajo. En el estudio participaron 5 grupos de estudio de estudiantes. El grupo estaba compuesto por chicas, con edades comprendidas entre los 18 y los 25 años. Todas las personas estudiantes recibieron formación en Pintura Académica. El estudio se llevó a cabo durante distintos periodos. El método modernizado revela la eficacia en la formación profesional y permite obtener altos resultados de los alumnos en el menor tiempo posible. El artículo concluye sobre la importancia

del *Método de análisis anatómico estructurado poligonal-piramidal y modelado geométrico-plástico de la forma* en el proceso de aprendizaje, que desarrolla el pensamiento espacial-artístico. El método artístico se basa en la identificación de nudos anatómicos que influyen en la estructura general de la figura y muestran su plasticidad interna. El método permite conectar estos nudos y transformarlos en un sistema unificado de expresión de la forma constructiva artística. La figura humana se construye a base de triángulos que se transforman en formas geométricas volumétricas. Definir un conjunto de formas geométricas volumétricas y superponerlas permite crear gradaciones tonales y el volumen general de la figura humana. El método desarrolla y activa el pensamiento constructivo anatómico y profundiza en el conocimiento de la estructura humana, permite ver y comprender las formas en diversas reducciones de perspectiva. El método obliga a estudiar y aplicar leyes y regularidades matemáticas en la resolución de problemas creativos.

PALABRAS CLAVE: Dibujo anatómico constructivo, Puntos de referencia anatómicos, Métodos de enseñanza, Dibujo académico, Dibujo constructivo, Enseñanza artística profesional.

INTRODUCTION

The development of professional art education remains one of the topical issues in educational institutions. Academic drawing is the basis in achieving professional literacy. Determination of methods of spatial-constructive drawing is an actual problem at all stages of professional art education. The development of technologies and techniques, require and search for modern methods in art education, which will meet the requirements of modernity.

As practice shows, in the process of evolution two methods of artistic representation of reality were formed. Geometrical and natural methods are the main ones in the process of education. In the scientific article we will consider and develop a new methodological system that will improve the quality of education, develop spatial thinking and reveal anatomical knowledge. Globality in the study of students of disciplines of the professional cycle, is to guide them to a conscious understanding of the surrounding reality, to make them think deeply, to avoid superficial solutions in solving artistic and plastic problems.

The purpose of the scientific article is to create and describe one of the author's methods in the study of the discipline Academic Drawing. The method of anatomical polygonal-pyramidal structured analysis and geometral-plastic modeling of the form, allows developing spatial and figurative thinking, activating anatomical knowledge and mastering the principles of constructive geometral construction of the object with the subsequent softening of the facets of geometric forms.

The method of anatomical polygonal-pyramidal structural analysis and geometric-plastic modeling of form represents an evolution of the author's instructional approach, blending geometric and natural methods. This development aims to systematize previously acquired knowledge and experien-

ces. At the core of the method lies the exploration of triangles and their volumetric transformations, which contribute to the creation of dynamic and lifelike objects. By employing this technique, artists can depict objects of considerable complexity.

In the construction process, both equilateral and isosceles triangles find application. The equilateral triangle, particularly in rendering nude figures, embodies geometric stability, symbolizing harmony and balance. Its uniform sides mirror the natural symmetry of the human body, serving as a template for ideal proportions. By adhering to geometrical principles, artists can discern the harmonious relationship between the head, torso, and lower extremities. This stable geometric form accentuates the aesthetic beauty and balance inherent in the human physique.

Across various artistic disciplines such as graphics, sculpture, and painting, the equilateral triangle holds significance as a foundational element for depicting human forms. Its graceful contours and equilibrium provide a framework for crafting proportionate and dynamic representations. The interconnected sides of the equilateral triangle underscore the harmonious interplay between different bodily elements, resulting in visually striking symmetry.

Moreover, the equilateral triangle embodies notions of strength and vitality. Its inherent stability conveys a sense of balance and well-being within the figure. Furthermore, it symbolizes the unity of mind, body, and spirit, representing holistic wellness and cohesion.

In summary, the equilateral triangle, when utilized in constructing nude figures, serves as a geometrically stable form epitomizing harmony, balance, and proportionality. It not only facilitates the creation of aesthetically pleasing images but also embodies qualities of strength, energy, and inner harmony within the human form.

Many artists, teachers and art historians have considered methods in teaching drawing, but the method that is touched upon now has not been considered before.

For the formation of professional qualities one of the main disciplines is Academic drawing. The methodological approach chosen correctly helps to reveal the features of nature. The educational process is aimed at making students learn to see and understand the form of the object they are considering. At the same time, they learn not to copy the outer contour, but to find the depth of the object's construction, its inner content. In the learning process, the methodological sequence of tasks starts from simple to complex. One of the main tasks is drawing a nude figure. The human figure is the most complex structured form-forming system, which allows us to study it in the form of simple geometric shapes and their combinatorial solutions.

In drawing, pictorial means contribute to the disclosure of the idea and reveal the object with its characteristic features. Pictorial means are: a point, further the union of two points grows into a line, several lines create a plane.

This scientific article consists of the following main parts: title of the article, abstract, keywords, introduction, methodology and materials, analysis and discussion of the results, conclusions and recommendations.

METHODOLOGY AND MATERIALS

The efficacy of education and the optimization of learning materials hinge directly upon the choice of teaching methodologies. Throughout the history of teaching drawing, numerous artist-educators, including Anton Ashbe, D. Kardovsky, I. Kramskoi, A. Ryzhkin, O. Gudchenko, and D. Hamm, have contributed significantly to the development of instructional methods.

Central to the learning process is the imperative to understand the construction and internal structure of objects. Objects can often be deconstructed into simple geometric figures, as emphasized by Anton Ashbe (Moleva & Beliutin, 1958). By recognizing and combining these basic geometric shapes, individuals can create intricate and complex plastic objects.

An essential aspect of drawing instruction involves analyzing the object thoroughly, studying its design, and breaking it down into its constituent components. This methodological approach not only facilitates the depiction of an object's outline but also instills the ability to generate new objects in accordance with fundamental laws and principles.

I. Kramskoi expands upon this notion, asserting that drawing transcends mere delineation of lines and outlines; rather, it encompasses sculptural modeling of form, grounded in reality (Aksenov & Levidova, 1986, as cited in Kovalenskaya, 1988, p. 38). Consequently, drawing entails continuous comparison of elements and objects, facilitating the determination of characteristic forms and the synthesis of observations.

D. Kardovsky underscores the importance of perceiving form as volumetric entities resembling basic geometric figures. In drawing, the depiction of integral form volumes supersedes the representation of lines, which do not exist as such in the physical world. Objects acquire three-dimensional form through planes, not lines (Kardovsky et al., 1938, as cited in Kanunnikova, 2014, p. 24).

For instance, when constructing the form of a human figure, it is crucial to recognize its skeletal foundation. Therefore, the establishment of reference points and constructive lines should be rooted in the skeleton rather than the surface form. Although the structural laws governing the human body remain constant, the identification of nuanced anatomical reference points allows for the portrayal of individual model characteristics. Geometric forms serve as a conduit for conveying similarity and structure.

The skeleton is the foundation of the human structure. This foundation has a complex structure and is complicated by soft matter: muscles and skin. Knowledge of the internal system of hu-

man structure makes it possible to match the fixed anatomical support units with the external and internal plasticity of the person and thus achieve individual characteristics (Barber, 2021, p. 21).

A profound comprehension of the internal structure of the human figure, coupled with the recognition of fundamental anatomical landmarks influencing its plasticity, is paramount for achieving accurate depictions imbued with lifelike realism. These landmarks not only shape the external contour but also inform both external and internal plasticity.

D. Kardovsky, an esteemed artist and educator, advocated for a constructive approach to creating large forms by subdividing them into geometric planes. This method results in a robust yet detailed construction, characterized by a series of small elements filling out the larger form (Kardovsky, 1940).

Breaking down complex living forms into broad, volumetric shapes provides a foundational structure for establishing basic proportions and constructional elements before refining details and incorporating subtle tonal transitions. “Using schematic representations of the human figure and emphasizing simplified planes in complex shapes promotes a clearer perception of form” (Ryzhkin, 2014, p. 16). Decomposing the human figure into simplified geometric planes, which allow you to understand the design and understand the form, to find the interaction between small forms.

Since the main method discussed in this article is related to the definition of anatomical reference points, let us characterize their meaning by one of the researchers on this subject.

The anatomical reference point is considered the starting point for the linear design process. The result of all creative work depends on the precise definition of this point. When creating an instructional drawing, additional elements also appear in the form of conjugate points located near the main point. The interrelationship of these points reveals the geometric figures from which the desired volumetric structure is formed (Kuznetsov et al., 2013).

The method discussed in the article is based on geometric laws and generalizations.

As the main method of constructivist approach in teaching drawing, geometric generalization of volumetric-spatial reality is a means of expressing perspective and spatial regularity of the image. With the help of geometric generalization all unimportant details are cut off and the constituent features of the form are revealed. The scheme of geometrical generalization reveals the reference points that form the model construction. Reference points of geometry are at the same time essential points of regular perspective change of surfaces of volumetric-spatial form of objects. In this regard, geometric generalization of the model is considered as a way to analyze spatial relations (Kalina, 2014, p.15).

Certain statements concerning anatomical reference points are given by G. Sontu,

Reference points play an important role in determining the figure’s position in space and its proportions. They are the starting points for drawing with perspective, and also help to convey

the character of movement of each part of the body. Among the basic reference points of a human figure it is possible to allocate the bosom articulation and iliac protrusions from the front, and also the lower vertebra of a coccyx and iliac protrusions from behind which define position of a pelvis. The first and seventh cervical vertebrae, the twelfth thoracic vertebra, the lower part of the sacrum and the coccyx register the character of spinal motion. The jugular fossa and sternum, as well as the projections of the ends of the thoracic vertebrae indicate the inclination and rotation of the thorax. The greater trochanters of the femur, knee and ankle joints help to transmit proper motion to the legs. The acromial processes indicate the width and rotation of the shoulders, while the shoulder, elbow and wrist joints determine the movement of the arms. In the process of creating figure details, it is necessary to define reference points for individual bones and muscles (finger joints, inner and outer ankles, knee condyles) in addition to the main reference points (Sontu, 2020, p. 2).

Drawing by means of triangles and pyramids, allows to cut off big forms in a human figure, thus to lay down basic constructive features of the concrete model. Each geometrical form conveys a perspective direction, which lays dynamism in the plasticity of the human figure.

The process of human figure construction on the picture plane begins with definition of large triangles which compositionally place the model of a person.

“At construction of a human figure anatomical reference points are defined taking into account proportions and direction of form, and knots are fixed schematically at points where the direction of form changes” (Pechenezhsky, 2011, p. 23).

Fixation of reference points, where plastic fractures of forms occur, conveys the general plasticity of the human figure and divides it into a series of small plastic forms. The result is the organization of rhythm with the help of certain plastic blocks.

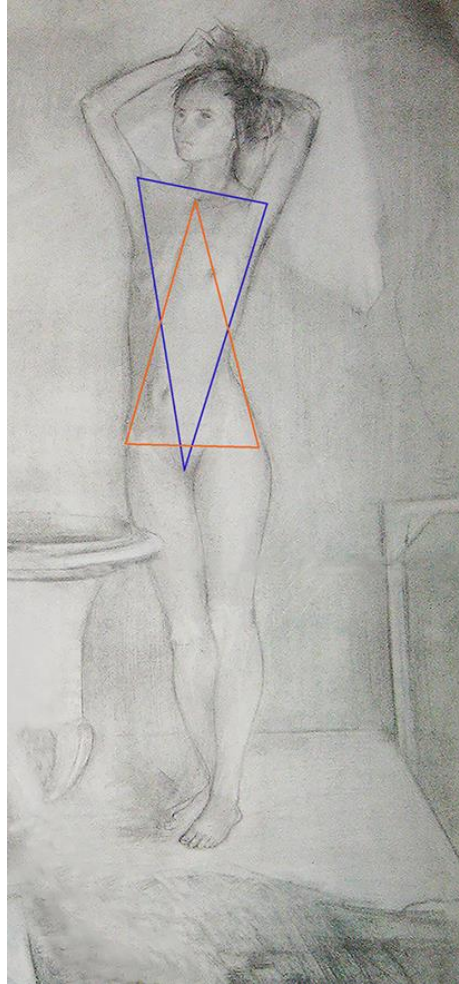
Two triangles can be laid in the figure of a person to represent the characteristic features of the person.

Hamm (2007) mentions the method of a double triangle at construction of a human figure. The basis of the first triangle includes such anatomic points as two acromion and a pubis, the second triangle is based on a jugular hollow and two acetabular hollows. The principle of triangles helps to pay attention to diagonals which are incorporated in a figure of the person. Also the method of construction with the help of triangles conveys basic proportions, plasticity of the model and dynamics (p. 51).

Figure 1 shows a diagram of two triangles that are used to form a human figure. See Figure 1.

Figure 1.

Constructing a figure using two triangles



Source: Creative work by author Konstantin Parkhomenko, (2018), (Parkhomenko, 2018).

An important element of the human being is the head. It houses one of the basic triangles, which forms the break of the lateral and facial planes. The equilateral triangle creates a convex and volumetric form of a facial part.

Application of the rule of an equilateral triangle at arrangement of parts of a face concerning each other is a priority in process of construction of a head. Two corners of a triangle coincide with external corners of eyes, and the third is on the base of a lower lip irrespective of whether we represent usual or laughing mouth (Hamm, 2007, p. 18).

Triangles serve as key visual aids in accentuating prominent features of the human head, such as the spacing of eyes and the length of the nose to the lips. This geometric approach facilitates the portrayal of distinct facial characteristics with precision and clarity.

Drawing upon the method advocated by [Gudchenko \(2020\)](#), the human figure can be conceived as a composite of simple geometric forms, with basic bodily masses delineated by larger geometric shapes and finer details articulated through smaller geometric bodies. This methodological framework effectively highlights both primary and secondary elements within the human form.

The implementation of the Anatomical Polygonal-Pyramidal Structured Analysis and Geometrical-Plastic Modeling of Form method at the Federal State Budgetary Educational Institution of Higher Education, Lugansk State Academy of Culture and Arts, offers valuable insights into the teaching of Academic Drawing. Utilizing the stratometric method, the study involved five academic groups comprising individuals aged 18 to 25, with a diverse educational background and geographical representation.

A mixed age group was chosen for the experiment. Each academic group studied the artistic method in a separate creative workshop. The following criteria were applied to the formation of the experimental sample: content criterion (criterion of operational validity); criterion of equivalence of subjects (criterion of internal validity). The results of the sampling apply to each member of the sample; the criterion of representativeness (criterion of external validity). The sample represents the general population qualitatively (age, gender, education, socio-demographic characteristics) and quantitatively.

The method of Anatomical polygonal-pyramidal structured analysis and geometrical-plastic modeling of a form is calculated on initial simplification of a form. It allows to study the structure of the human figure, which consists of complex forms, by decomposing it into simple geometrical forms. When drawing, one searches for the relationship between the elements. One of the main tasks is that geometricity and stumpyness, by means of long work and layering of geometric forms one on another led in the end to a living plastic unified human form. The artistic method conveys an initial monumental volumetricity, which is replaced by an airy-spatial one. Constructive understanding of form and knowledge of plastic anatomy are essential for solving artistic problems.

When working on the depiction of the human figure, the artist delves into analyzing various aspects of artistic value such as perspective, proportions, gestures and movement. These elements contribute to the development of professional skills and enrich artistic creativity. In addition to studying anatomical principles, the artist analyzes weight, balance and tension in body movements, which gives his work added depth and realism ([Wango, 2021](#), p. 51).

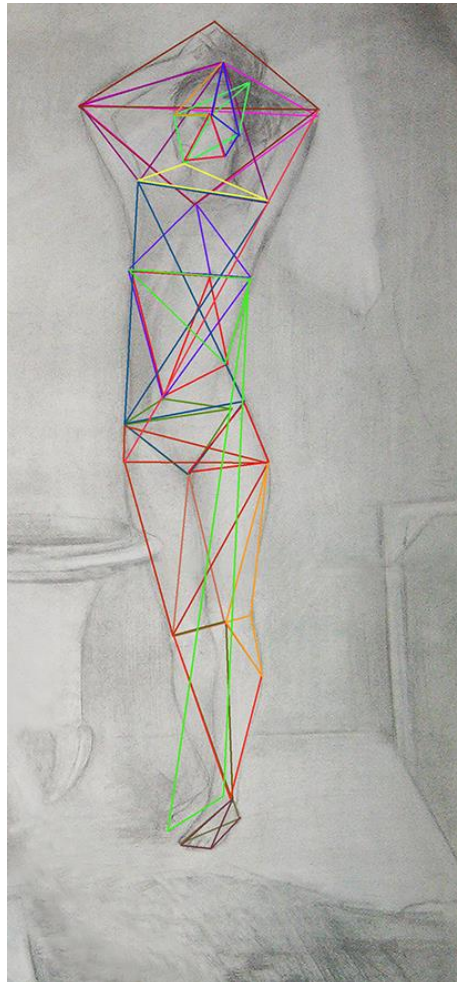
[Figure 2](#) illustrates the utilization of basic geometrical figures in the construction of a human figure

In this creative work, the author solves a problem based on a realistic setting. The author takes a realistic object, generalizes it to simple geometric shapes. The construction of the human figure begins with large triangles, which are combined with pyramids, gradually the geometric shapes are reduced. The human figure consists of large, average and small a geometrical form that allows to define in it the main and minor and to allocate the basic volumes in a figure. The drawing demonstrates

initial stages of process over construction of a figure. At long work on a creative task geometrical figures acquire fundamental structuring and at multilayer layering of one form on another acquire a full-fledged volume with tonal parsing, which contains tonal nuances.

Figure 2.

Basic principles and regularities of interaction of pyramids and triangles when constructing a nude human figure



Source: Creative work by author Konstantin Parkhomenko, (2018), (Parkhomenko, 2018).

Figure 3 depicts the construction of a human figure utilizing triangles and pyramids, showcasing dynamic elements. In contrast, Figure 2 illustrates the figure's construction using comparatively static geometric shapes. Notably, Figure 3 distinctly emphasizes dynamism, with geometric forms contributing to the overall dynamic portrayal of the figure. Specifically, Figure 2 portrays a female figure characterized by plasticity and softness, achieved through the deliberate development of geometric shapes oriented accordingly. Conversely, the male figure embodies traits of rigidity and confidence,

reflected in the intentional incorporation of pyramidal structures. The systematic application of geometric principles yields a cohesive and holistic artistic composition.

Figure 3.

Interaction of pyramids in constructive construction of the nude human figure



Source: The work was done by Maria Stoyanova, a student of the academic group specializing in Academic Painting, (2024).

The principle of constructive analysis of form is the main methodological principle in drawing. The student should be guided by the logic of thinking, represent geometric shapes in space, be able to find the relationship between them. The student should represent, see both visible and invisible forms, elements of the object (Savinov, 2010, p. 91).

It should be noted that indeed, when depicting an object, it is necessary to be guided by the logic of thinking. Not mindlessly sketching the outline of the object, but learning to find the inner content of the object, to fill it with volume and deep content.

The process of creating a constructive drawing involves the conversion of form into a generalized model, as expounded by Chistov (2015). As highlighted earlier, the learning trajectory initiates with simple tasks and progressively advances towards more intricate challenges. Commencing with the exploration of basic geometric shapes, students delve into the structural intricacies of each object, honing their ability to observe nature. Pokhlebaeva (2017) emphasizes the importance of conscious drawing, wherein students develop a profound understanding of form and the interplay of individual shapes within a complex structure. This approach precludes superficial representations, fostering a comprehensive grasp of fundamental principles.

The efficacy of the drawing process hinges on the selection of an instructional methodology that stimulates cognitive engagement. The artistic method, characterized as an anatomical block system, operates on the basis of anatomical reference points and nodes. These elements coalesce to form segments, which in turn contribute to the formation of polygons. Employing a multitude of geometric planes, this method facilitates perspective reductions and imbues forms with depth and fillability.

The specificity of the method lies in the construction of 3D-objects using polygons.

Polygonal figures consist of faces of planes (polygons), united into one element by means of vertices: an edge represents a line protruding from a face; a face (polygon) represents a plane into one element with the help of vertices: an edge represents a line protruding beyond the boundary of a face; a face (polygon) represents a plane consisting of triangular or quadrangular cells forming a grid. The number of cells is unlimited; a vertex is a point that connects edges. (Kukushkina y Bordyugova, 2021, p. 301)

The main geometrical form when using the method is a triangle and its volumetric transformations, such as: pyramid, tetrahedron, octahedron. The student searches for polygons not simply as auxiliary elements of human figure construction, but as exact blocks of anatomical construction. Search of polygons and their interaction leads to revealing of characteristic features of a concrete human figure.

The reference anatomic point occupies an important place at construction of the naked human figure. Reference points interact with each other and reveal soft transitions between complex anatomic forms.

At the core of the human being is the skeleton. It reveals and conveys the basic plasticity and structure of the human figure. Therefore, it is very important to follow the convexities on the surface of the human figure. These bulges are anatomical reference points and reveal the plausibility of the *living* form.

Structured analysis and geometrical-plastic modeling of form is considered as an analytical anatomical deep thought process of realizing the unity of all elements of the human body with further creation of a harmonious integral plastic mechanism on the picture plane. A human being is constantly in active dynamics or easy movement. The position of the skeleton and muscles changes, some of them are tense and others are in a static position, which leads to a change in the overall plasticity. With spatial thinking, the student immediately notices the change in shapes and masses. He begins to perceive the outer plasticity through the inner plasticity of the form.

When drawing, students often forget about the method of comparison and observation. Many try to quickly and spacelessly sketch an outline and shading, forgetting the important thing - the internal unity, harmony, proportions, image, internal structure. Let us characterize the construction as an internal structure of creation of a concrete object.

The student examines and considers the causes that cause changes in external forms. Human forms that is not visible but affect overall plastic change is explored. The student examines triangular relationships within the figure, a through analysis is made.

It was possible to consider the method in the form of other geometric shapes, but in our opinion, the triangle and its volumetric transformations are most accurately able to attach the muscle to the desired anatomical reference point, as well as acutely identify the anatomical knot and develop the volumetricity of large masses.

Students begin the process by studying simple geometric shapes. They mark three points on the picture plane, which should convey space. Thanks to the different pressure on the pencil, contrasting and less contrasting points are obtained, which contributes to the transfer of planarity on the picture plane. Next, they connect the dots, and an edge is formed. Consequently, in the first stage, students learn to think in terms of space and to convey geometric figures in a conventional volume. The next stage is to combine several geometric shapes. Two triangles, three or more are depicted, between which scales, proportionality and space are searched.

One geometric form is not a volume and does not fully convey it. Several geometric forms are combined into one pictorial system and allow checking the proportions of individual features of the model. Creative work is done in masses. One mass of forms is layered on another, resulting in an increase in volume.

Let's reveal the main anatomical reference points. In a head such points can be considered: frontal tubercles, protrusions of supraorbital arches, cheekbones, angle of a lower jaw, edge of an eye socket, chin elevation, parietal tubercles, auricular aperture, mastoid process, high point of a parietal, middle of nose bridge.

In the human figure the following anatomical reference points are traced: Seventh cervical vertebra, jugular hollow, acromion, acromion, mechoid process, edge of the rib cage, nipples, umbilicus, anterior superior iliac spines, bunion fusion, sciatic tubercles, elbow, styloid process of the radius, head of the fibula, patella, greater trochanter, inner and outer ankles, fingertips, heel bone (Parkhomenko, 2023).

Students, compare all these anatomical points with each other, thereby determining proportions, foreshortening and laying down internal plasticity.

There can be more anatomical reference points. This article identifies the main ones that influence plasticity.

The artistic method is applicable to many teaching assignments such as: still life, human head, clothed human figure. The human figure is a complex anatomical system that contains the laws and regularities of the whole surrounding reality. Also, drawing the human figure leads to the development of soft graphic techniques and the solution of plastic problems.

The educational process is built on the alternation of nude figures in the study of the discipline *Academic Drawing*. The study begins with a male nude figure, in which anatomical reference

points are more strictly traced, forms are expressed more actively. The next learning task is a female nude figure.

The alternation of the male figure to the female figure in the training allows the student to master the strictness in drawing and painterly approach.

Students start solving problems in the study task by determining the general position of the human figure. The whole figure is visually covered and the inclination of the shoulder girdle is determined. Identification of acromions, which act as anatomical reference points, reveals the accuracy of the shoulder girdle direction. The direction of the pelvis is determined using the anterior superior iliac bones. Next, the direction of the kneecaps, inner and outer ankles is determined. The next step is to identify and match other reference anatomical points that will begin to construct the human figure. For example, the student takes an acromion, jugular fossa, nipple and invisible anatomical reference point in the form of the seventh cervical vertebra, also such anatomical knots as: two anterior superior iliac bones, bosom fusion and spit or two nipples, navel, elbow can act as points. As a result, a three-dimensional geometric shape begins to form. Each line creates a facet of the geometric shape, so the student searches for the pressure of the line. The line becomes darker in the first plane and becomes lighter in the second plane. The difference in pencil pressure results in a spatial solution in the drawing. Gradually the student complicates the mathematical system of reference points. The object is created as a crystallized shape. Each geometric shape reveals the spatial air solution. Multiple application of one geometric figure on another allows softening the edges and thus, beginning to convey the soft *living* form of the human body, devoid of stumpy schematicity.

Initially, the student selects the basic triangles that will most characterize a particular model of a person, his features. First, the general design is manifested in the form of one large or at most two triangles. The student considers the proportions of the triangle, the angle of inclination and thus immediately determines the basic proportions of the person and his plastic internal structural system. Next, the student searches for medium triangles, small triangles, and smallest triangles. The method does not allow the student to copy the model of the person. He must constantly compare the relations, reflect, analyze. In thoughtless drawing, anatomical reference points are out of place and thus, violate the fundamentality of the construction of the figure. Consequently, it begins to look insecure, out of proportion and inanimate. The pyramidal method accustoms the student to strictness and accuracy in graphic drawing.

Note that the student can apply tone in the drawing or limit him to linear-pyramidal construction. The layering of pyramids in the drawing creates a definite tonal solution and begins the modeling of form with nuanced transitions.

The visual method is fundamental to drawing. Students, first of all, use it. The method develops the eye, teaches correct spatial vision and thinking, accurate proportional relationships.

The student identifies the source of illumination. For example, the light source is located on the left side, therefore, the right side is the shadow side. The shadow side of the human figure develops more geometric shapes that enhance the tonality. Additionally, the contrasting and less contrasting pressure on a pencil occupies global value. Note the fact that there is a lateral form in the human figure. Certain difficulty causes to students modeling of a lateral part of a human figure, as in it there is a perspective reduction. Therefore, students search for directions of sides of geometrical figures, watch for tonal activity in them. On the fractured part of the human figure, small triangles are developed to enhance the tone and create conditional detailing. The small elements begin to reveal planarity in the figure. Through the fractured form the student begins to look in space at all the other large masses of the human figure and the other elements of the parts of the living body.

One of the student's main goals is not to leave the conventionally constructed form, but to reveal the *living* human body with its plastic possibilities.

ANALYSIS AND DISCUSSION OF THE RESULTS

Through the analysis of collected data and information processing during the experiment, a notable obstacle in the educational process hindering the comprehensive development of students' creative, imaginative, and constructive thinking emerged: the insufficient allocation of time for assignments. Upon scrutinizing the current situation, it was found that 75% of time was dedicated to drawing from life, while only 25% was allocated to reproduction from memory. This disparity underscores the imperative to prioritize and allocate more time to the process of studying and drawing from life. A critical concern is the lack of conscientious engagement by students in the learning process. Continuous monitoring of task completion and comprehensive evaluation of the entire creative process are essential. The experiment's outcomes underscore the method's efficacy: a discernible increase in intelligence, imaginative capacity, and theoretical knowledge was observed following its implementation.

To evaluate the effectiveness of the methodological system within the framework of the pedagogical research, the control stage of the pedagogical experiment was conducted with the participation of five study groups of students. At this stage, students were offered creative tasks aimed at testing the level of knowledge in the field of anatomy, development of imagination, creative thinking and professional experience.

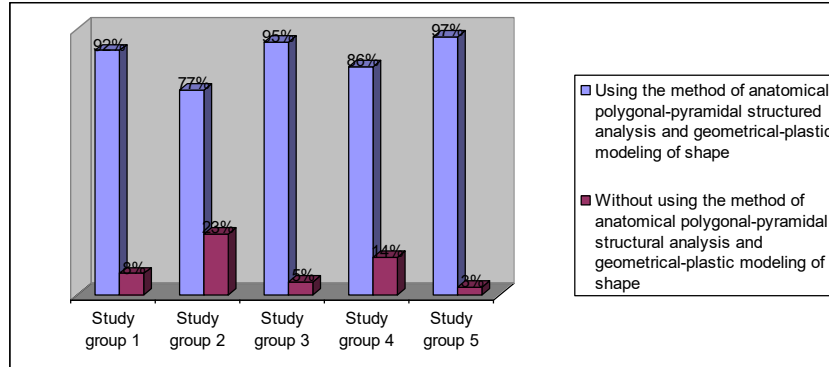
The main task was to depict a nude drawing of a human figure. Tasks were offered alternately: first to draw a male figure, then a female figure.

The alternation helped students to study different types of physiques, to identify basic proportions and individual features using geometric shapes, and to determine the approach to working with pyramids when depicting a male or female figure.

Let us consider in Figure 4 the dynamics of knowledge level increase due to the use of the method of anatomical polygonal-pyramidal structural analysis and geometrical-plastic modeling of form.

Figure 4.

Increase in the level of anatomical knowledge and understanding of the object design



Source: Own elaboration (2024).

It can be seen that the maximum result in the implementation of the method of Anatomical polygonal-pyramidal structured analysis and geometral-plastic modeling of form was achieved in the 5th study group and it amounted to 97%. In the third and first study groups the rates are slightly reduced, but they are close to the maximum indicator. In contrast to the learning form, where the method is not applied or not applied sufficiently, the application of the method demonstrates an increase in the level of knowledge in students.

Let's consider some active study groups of painting students and compare the indicators of knowledge with which the students entered, which they developed with the help of the natural and geometrical method and the knowledge which was acquired through the method of anatomical polygonal-pyramidal structured analysis and geometrical-plastic modeling of form.

Let us trace in Figure 5 the change in the quality of comprehension and transfer of constructive anatomical construction with the development of anatomical knowledge due to the application of the method in the teaching process for 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023.

Drawing demonstrates an increase in the quality of professional formation in students. Application of natural and geometric methods in creating a creative graphic picture increases the level of knowledge. Every year the level of quality of knowledge gradually increases. Maximum growth of quality of knowledge is traced at application of the method of anatomical polygonal-pyramidal structured analysis and geometral-plastic modeling of form. The 1st study group in 2021 shows the highest result, which is 93%. For the rest of the period the values differ slightly. In general, the method shows high performance among other methods in training.

Statistics of academic performance, which was considered in the form of percentage data, proves the effectiveness of the method. The method is based on linear volume-constructive approach. When

working on an academic creative task for a long time, it is able to move into another form of artistic expression. This form is a tonal solution with a pictorial orientation.

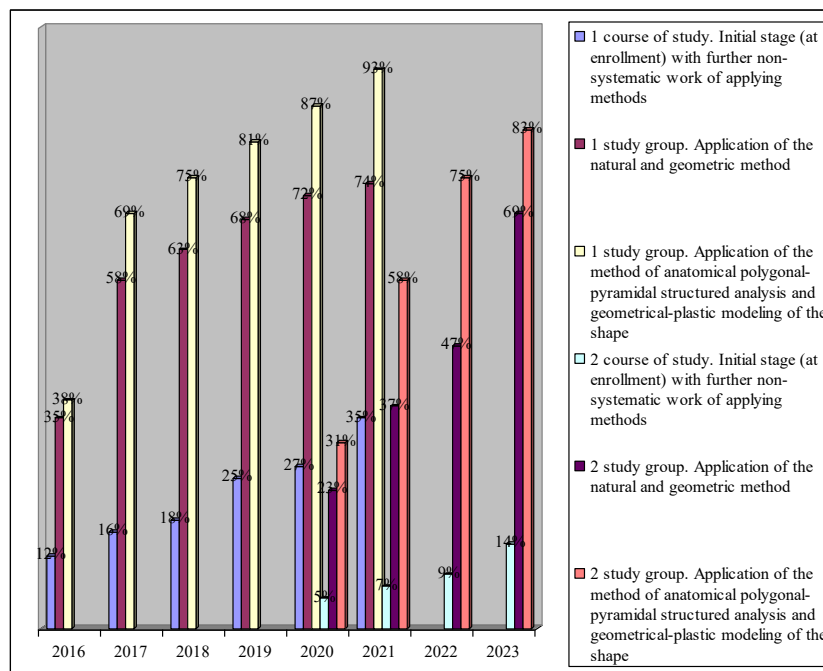
One of the methods used by students was the method of Pyramidal-polygonal constructive modeling, which has a similar approach with the method of Anatomical polygonal-pyramidal structured analysis and geometrical-plastic modeling of form for building a human body and revealing its construction (Parkhomenko, 2023).

The difference lies in the through drawing and realization of materiality and change of plastic features in invisible parts at a certain time of drawing. The artist sees the human figure transparently and immediately processes it in 3D form.

Students were offered various methods and techniques of working on academic tasks, and then they, based on observation and analysis, chose the one that can accurately reflect the characteristic features of the human figure. Students, beforehand, made sketches and sketches in which they tried different methods. A combined approach was also used. Practical works, which were performed by students, were evaluated, and the quality of works and development for each participant was analyzed.

Figure 5.

Change in the indicators of the quality of mastering the educational material when using different methods



Source: Own elaboration (2024).

To evaluate the efficacy and proficiency of the method, academic papers from two distinct groups were reviewed and analyzed over a span of different periods. Each group underwent a comprehensive study lasting four years.

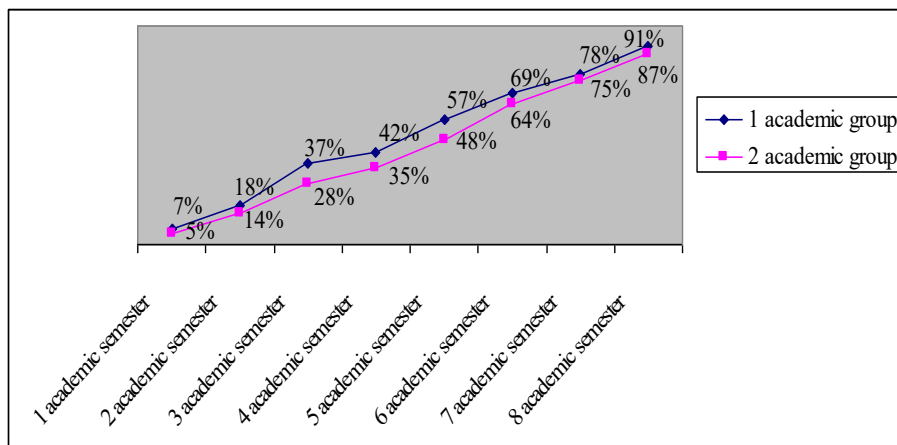
Figure 6 illustrates the progressive increase in positive scores observed across academic semesters following the implementation of the new teaching method.

The data from the figure shows a systematic steady increase in the level of achievement.

After the completion of the experiment, the set goals and objectives were successfully achieved. The introduction of this methodology in the educational process contributes to the improvement of education and formation of key professional skills necessary for the development of the artist.

Figure 6.

Dynamics of learning achievement level



Source: Own elaboration (2024).

CONCLUSIONS

The construction of pyramids to analyze the human nude figure is one of the methods to systematize and classify various aspects of human anatomy, and to use this information to create realistic and aesthetic graphic or pictorial creative works.

The method of multivariate statistical analysis was used to determine the effectiveness of the art method. A pedagogical experiment, observation and conversation were conducted.

In this paper various aspects of using anatomical reference points, triangles and pyramids in constructing the human figure in professional art education were considered. The study revealed the importance and effectiveness of these methods in creating realistic and expressive depictions of the human figure. Anatomical reference points are the basis for constructing the correct proportionality of

the human figure. Studying these points allows the artist to more accurately represent the anatomical structure of the body and correctly distribute volumes in the drawing. It is especially important at creation of realistic portraits or images of a human body in movement.

Anatomical reference points also help to improve the understanding of anatomical features of different age groups, genders and body types. When depicting the human figure, triangles are an important tool for creating the correct anatomical structure and volume distribution in a drawing. They help to define the main directions and proportions of the figure, as well as to create balance and harmony in the composition. Triangles can be used to emphasize key elements of the figure, such as the head, shoulders, waist and legs, and help to emphasize their importance in the image.

Pyramids in depicting the human figure also play an important role in creating dimensionality and depth in a drawing. They help to create a three-dimensional effect and convey a sense of space and depth. Pyramids can be used to create three-dimensional body shapes such as breasts, abdomen or hips, and help convey a sense of mass and weight to the figure. The use of anatomical reference points, triangles and pyramids in professional art education has many advantages. First, these methods help the artist to create a realistic and expressive depiction of the human figure, which is an integral part of professional art education. Second, the use of anatomical reference points, triangles, and pyramids helps develop observation and analysis skills, which is an important aspect of an artist's professional growth. Third, these techniques allow the artist to be more flexible and creative in creating images, expanding the possibilities of interpretation and stylization.

Thus, the discipline Academic drawing is the basis in professional art education. The developed method of Anatomical polygonal-pyramidal structured analysis and geometrical-plastic modeling of form, which is applied in training classes at the Lugansk State Academy of Culture and Arts demonstrates great opportunities to increase the quality of education. It forces the student to approach the set creative learning tasks in a meaningful way. Students learn to create works of art with the help of mathematical regularities and laws. First of all, students actively study Plastic Anatomy which enables them to identify anatomical reference points and nodes and accurately form geometric figures later on. Training takes place, which aims to convey the characteristic features of the human model and its plasticity with the help of geometric shapes.

Combining methods and searching for new ones will raise the level of education to a completely different professional level.

The use of anatomical reference points, triangles and pyramids in constructing the human figure is an important component of professional art education. These techniques allow the artist to create realistic and expressive images, develop skills of observation and analysis, and expand opportunities for interpretation and stylization. Professional methods of working with anatomical reference

points, triangles and pyramids include the study of theoretical foundations, practical application and analysis of artwork.

The research will improve the quality and realism of drawings, as well as provide a deeper understanding of the anatomy of the human body and its proportions, which will significantly increase the professional level and creative potential of artists.

RECOMMENDATIONS

In the process of learning, students are increasingly facing a number of problems. The main problems are the lack of spatial, figurative thinking and logic, insufficient theoretical knowledge in the discipline of Plastic Anatomy, as well as incomplete work of analytical activity. The artistic method, which is discussed in the article, promotes the development of analytical thinking, teaches accuracy and clarity in academic instructional drawing. Systematic work on assignments such as: nude human figure, builds the student's sense of plasticity and understanding about golden proportional ratios. The method forces the student to think deeply, to identify the reasons for changes in plasticity, to look through the human figure, to see it through. Searching only the outer contour of the human figure can lead the student to a dead end. The important task remains the study and disclosure of the inner content. It is constantly necessary to train, to draw as much as possible, while watching the line of the pencil, so that it conveys space. In order for the space to be conveyed it is necessary to develop a sense of airiness, learn with the help of pressure on the pencil to reveal the planarity. When drawing it is necessary to remember that the surrounding reality consists of mathematical laws and regularities. The artistic method touches on the triangle and volumetric transformations. The methodical approach accustoms to think in large forms and masses and with the help of a stumpy form to convey a living model of a person with his psychological features.

Let's give some recommendations to students that will help them to cope with the creative task.

The first step in constructing a nude figure using pyramids is to determine the basic proportions. It is recommended to start with the spatial placement of the pyramid, which serves as a basis for the construction of the overall shape of the body and affects the plasticity. It is necessary to take into account that each part of the body has its own unique proportions, and consequently, their sizes should be correctly coordinated with the general composition of the figure. Further, to reveal the design and spatial solution, it is recommended to clarify the main lines and apply volumetric and spatial contours on the pyramid. It is important to remember that the human body has a flexible structure, and, consequently, its contours should be soft and smooth. When drawing a nude figure, students should pay attention to all details, including the skeleton and muscles. In addition, while working on the construction of the nude figure, it is useful to use the pyramid of motion method. This method allows students to focus on the dynamics and liveliness of the character being portrayed. The pyramid of

movement involves constructing the figure by considering its basic movements, including turns and foreshortening. While working, students should also pay attention to light shading and perspective to create a three-dimensional and realistic image. Proper use of light and shadow can improve the quality and realism of the figure, emphasizing its bulk and detail. In conclusion, when constructing a nude figure, students are encouraged to constantly analyze and adjust their work. A critical look at their own work helps them to improve and achieve better results.

In summary, constructing a nude human figure using pyramids requires skill, practice, and careful analysis. By following these guidelines, students will be able to successfully construct a structure and achieve spatial resolution in their artwork.

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