



## THE USE OF THE LAWS OF AUTOMATED COLOR RENDERING IN THE STUDY OF THE DISCIPLINE "COLOR SCIENCE"

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### Abstract

Modern educational technologies in the educational process in higher education institutions contain new innovations. Social innovation is interconnected with education. Education as a social function reflects changes in society. It can even be said that the level of development of the education system is the result or consequence of a certain degree of development of society. But the education system also affects society and its development.

**Keywords:** Art history research, information technology, education, color science, optimization.

### Introduction:

In this article, we will talk about the possibility of optimizing the educational process in the discipline of "Color Science" using modern information technologies, computer graphics and a number of practical tasks performed by students.

Changes in education are not only a result, but also a prerequisite for further social development (4). The discipline "Color Science" was taught at the Faculty of Design and is currently taught in a classical way. But this can be implemented not only in modern teaching methods, but also in the educational process of training designers. After graduation, graduates work mainly only with an automated color rendering system, so they can use this system for training in order to get closer to the process of their future profession. Many artists and fine art theorists have studied the laws of color science. The relevance of using modern information technologies in the study of color science appeared with the advent of the possibility of switching from the paper image method to the electronic digital method. This determines the existence of an automatic process for working with colors in 2D graphics programs such as Corel Draw, Adobe Photoshop and Adobe Illustrator. The use of modern information technologies makes it possible not only to use the color spectrum quantitatively, but also to change the color in the process of work at a qualitative level. In their projects, designers use a variety of color models, such as RGB, CMYK, HSB, etc. These color models use their own orientations and quantitative scales. In his book "The Art of Color", the Swiss artist, art theorist and teacher I. Itten(3) compared the learning





process to a cart that is easy and convenient to move along the planned path. But the beaten path ends at some point, and then you have to walk and walk alone. This comparison applies to the entire educational system of this artist and teacher, who did not give individuality and helped the artist choose his path. The opportunity to study an automated color rendering system brings the student closer to professional activity, therefore, after leaving the "basket", a novice designer can independently work in this field, using the experience gained in studying colors close to his professional activity. Color has always been a way of artistic expression for certain people. Color can control our attention, turn our gaze to the main thing, distract from the secondary or vice versa. Leonardo da Vinci created the first harmonious color system. He not only established that the variety of colors can be limited, "there are 6 simple colors: white, yellow, green, blue, red and black", but also 2 possible aspects of color - the famous German poet Johann Wolfgang Goethe created a huge (1400 pages) "work on the nature of color", and he himself he superimposed it on his poetic work. I appreciated it very much. Goethe comprehensively considered color, taking into account the psychological, logical and physiological aspects. Color and color energy are involved in different areas of design, and modern color solutions conquer with their novelty. Interior and environmental design, graphic design, fashion design - color is very important in all directions. Color is the strongest element in terms of effect and the most difficult. We perceive each color or color combination differently. For example, in the field of advertising design, you can see that certain areas of activity have already been assigned certain colors and color schemes. 1. Corporate color is also an essential element of a particular company and one of the components of its overall image. Colors make the corporate identity more attractive, more memorable and allow you to have a strong emotional impact. A corporate color may have legal protection in case of proper registration of a trademark in this color. Other approaches are also typical for the design of the room – for example, with the help of smooth lines and muted tones, a calm and confident mood is created inside. Natural cream and woody shades, common in the color scheme, develop the theme of natural harmony and beauty, convey the tranquility and warmth of family life. Soft and pastel tones define the overall mood of the apartment interior. In the collection of clothing models, you can also see samples of autumn, winter and summer colors. Color characterizes not only the aesthetic significance of clothing, but also its symbolic meaning that unites people. Our eyes can distinguish a huge number of colors. But all this diversity can only be divided into 2 groups: achromatic (that is, unpainted) – black, white and their mixtures - gray; achromatic (that is, coloring) – in order to combine this color correctly, the designer must know its basic properties. All artists and designers



working with flowers are guided by their own subjective feelings, but even the great artists of the world are seriously engaged in working with flowers, so many, for example, Rodin, Matisse and others, thought through and calculated the composition of flowers that were realized or discarded as unnecessary in the process of work, but nevertheless they were not. If the artist approaches color not only subjectively, but also in accordance with the laws of color science, then the designer will have to treat color with even more attention. The contrast of light and darkness. Students of art universities begin their studies of color with the introduction of achromatic shades. For artists, white and black are the most powerful means of expression, allowing them to identify light and shadow, like day and night, chiaroscuro. White and black are opposite in all respects, but there is an area of gray tones and a whole range of chromatic colors between them. The number of visible shades of gray depends on the sensitivity of the eyes and the limits of the viewer's perception. This restriction can be changed in the course of practical work, which will increase the number of visible step-by-step transitions. The uniform gray color and its lifeless surface can give a mysterious activity by modulating the best shadows. This opportunity is very important for artists and designers, it is necessary to be very sensitive to the difference in tone. Neutral gray is an impersonal achromatic color with no characteristic features, which easily changes under the influence of contrasting tones and colors. For example, students complete a task on mastering these shades in a lesson devoted to the study of computer graphics. In Adobe Photoshop, students complete landscape tasks in different colors with accents of varying intensity. The new version of the program offers a very rich selection of drawing brushes that you can upload to the palette and freely draw ready-made objects such as clouds and leaves. This process is not time consuming, and you usually have more options to do it manually for manual work<sup>1</sup>. Handmade works are no more interesting than on a computer, but they are very time-consuming and time-consuming. You can also edit collages in Adobe Photoshop from black-and-white and gray fragments of photos of different gradations to fully explore achromatic colors. To understand the possibility of changing the tonal solution, it is recommended to use information technology. Tone. Tonal is a new chromatic color that differs from the previous one in such characteristics as lightness and saturation. There are many color shades. Saturation is the degree of severity of its tone. Pointing to the color gradient. This color change can be performed on a computer in both a raster and vector program, increasing the percentage of color channels for each new shape when filling out the form. In the Color dialog box, you can move the color fields and enter the color channel numbers. Similarly, you can use a fill to draw chromatic gradients. Draw a color circle, depict the changes in brightness and saturation of



chromatic colors in a mixture of white and black, and show optical color mixing, composite colors, and complementary colors. Gradient fill allows you to perform the task of stretching colors from more saturated to slightly saturated or to display the transition from one color to another. Adobe Photoshop allows you to change the tone of any color photo. You can perform tasks in which the same landscape changes in tone, but it depends on the time of day. In the graphics editor, this can be done using color correction methods and curve histograms. For example, a landscape in which the state of nature changes depending on the time of day. The founder of tonal painting is Nikolai Krymov, who developed a table of tone changes depending on time. He painted the White House at different times of the day. In 1934, Krymov painted the pedagogical landscape "Table" of TSU, which he called "changes in the landscape of the ratio of tone and color at different times of the day." "The same landscape was repeated 9 times at different times of the day and night. There were photos of a white house with a red roof, a vacant lot next to it and a forest in the distance – under the bright sun, gray days and sunsets, late evenings, moonlit nights. Changes in both tone and color rendering are clearly visible in the work, depending on the time of day and weather conditions. You can also use the color correction function in Adobe Photoshop Raster to change the color tone of a photo or adjust the selected motif depending on the time of day. All these operations can be performed using the histogram of the image curve, and then using the correction curve. If you draw the histogram of the curve down through all the color channels, you will get a photo that will be brighter than the usual tone, and if you zoom in all the channels, you will get a photo that will be darker than the usual tone. The first option is in the early morning, and the last one is in the evening or at night. To convey the atmosphere of the evening, you can give the sky channels colors close to sunset and highlight this area individually using the selection tool. With the help of color correction knowledge, you can not only convey the state of the landscape, but also try to depict the seasons using only 1 motif in the photo. Colour. Chromology (from Latin color - color, paint) is the science of color, which studies the nature of color, basic, composite and additional colors, color properties, color contrast, color mixing, coloring, color harmony, color culture and color language, one of the most important means of emotional and artistic expression. the expression is the color. 1. Color is a system of color ratios that form a certain unity, an aesthetic expression of the colorful diversity of reality. In assignments with students, in addition to simple drawing and analyzing the color changes of familiar shapes, you can perform many creative tasks that are aimed at knowing the material you have passed. For example, you can create compositions of suprematist shapes, depict them in the Corel Draw vector graphics editor and perform them taking into



account the material in question. First, build the image in a cold scale, and then in a warm one, the next option is to combine both warm and cold colors in 1 composition, and subsequent variations should be based on additional colors: purple and yellow, orange and blue, red and green. Students with interesting color solutions can be considered creative rather than performing, and they still agree with the use of additional colors in design objects. The video sequence for the poster layout can be created using knowledge in the field of color science and chromology. In the current situation of modernization of education, the computerization of the educational process in this direction can be considered the main sign of its development.

**To conclude:** The future of design today depends on the rapid development of technological progress, the emergence of new graphics programs and the improvement of previously released graphics packages.

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