Learning of Color in Croatian Primary Schools

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Abstract - In this article the learning of color will be described by presenting concrete illustrations of art problems, which pupils are solving by reproductions of art masterpieces. The reproductions are examples from the teaching program for the subject visual art in primary schools from the 5th to 8th grade. After the theoretical part of the learning of color, the use of a database of art reproductions for pupils and teachers will be elaborated as an useful application in practice. For this purpose examples of paintings are stored in an original computer program previously developed by the authors.

Keywords – learning, color, primary schools, visual art, computer program

I. INTRODUCTION

The education of color from the 5th to the 8th grade in elementary school is defined by the Curriculum for the subject Visual arts. [6]

This is an obligatory program for Visual arts education in all Croatian primary schools, so all pupils are included in this research about Learning of Color.

Since the learning of color should be accessible (adapted) to children, teachers in daily practice, i.e. in art classes encourage interest in the visual arts area and motivation for learning, by showing artworks of art painters (.ppt(x) presentation). Artistic artworks are one of the main initiators of the learning and teaching activity of the subject Visual Arts. It has been proved that by an enlarged presentation on a screen, i.e. by a slide or video projector, the visual attention and motivation of the children increases.

For each lesson teachers plan different tasks for children to motivate and encourage them for active learning: observation of reproduction, exploration of visual artworks, acquaintance of visual arts, interpretation of paintings, preparation of questions related to the image, discussion and critical judgment and evaluation.

Such learning by concrete examples of the paintings, i.e. by establishing a communication between children and artworks, pupils learn better and more about art. It stimulates the visual experience and develops perception among pupils. The children learn the names of painters, basic information about the authors paintings, places and periods in which they are painted, painting techniques, art motives, characteristic style of the painter, ways of composing color, action and symbolism of color and other issues. [3] In the handbook for visual art teachers is written: “Into the language of art, communication with artworks and visual exploration and the creation of art techniques, it is necessary to enter gradually, as one gradually enters into writing and creation of music”. [4]

The main instrument of this learning mode is research and analysis of the painting. Through the painting pupils build their own world and their visual experience helps them in the processing of this information. By analysis of these paintings, the visual speech and the development of all degrees of divergent thinking in the field of visual art education is enhanced. [6].

Twelve mandatory and elective color themes are defined in the Curriculum or Teaching Plan and Program. These are:
1) Pure colors, contrast warm-cold
2) Complementary contrast
3) Light values of pure colors
4) Local color, tone gradation
5) Optical color mixing
6) Symbolic and associative role of color
7) Tone modeling
8) Color modulation
9) Color perspective
10) Expression of color
11) Spatial effect of color
12) Shape and color.

Each lesson contains key concepts, educational achievements and examples of artworks.

The key concepts defined by the Curriculum are the following: spectral color scheme, warm and cold colors, chromatic intensity, color dynamics, daltonism, complementary contrast, artistic elements, chromatic scale, color brightness, pure color, local color, harmony (color harmony), tone gradation, mechanical and optical color mixing, mimicry, camouflage colors, symbolism, association, light, tone, tonic modeling, appearance of roundness, color modulation, expressiveness (expression), figurative art composition, coloristic perspectives, color dynamics and space plans. [6]

Below, artworks will be presented as examples for these color explanations, stored in a special computer program, that was also used as a database, (PaintArt 2.0) developed by the authors in previous years and presented at the Conventions of Mipro 2013 (PaintArt) and 2014 (PaintArt 2.0).
It is interesting to explain how it came to the development of these computer programs, because despite a lot of improvements and innovations in education systems worldwide, the use of computers and software in learning and teaching Visual Arts on the primary school level, was not common and widespread, not only in Croatia but also in Europe.

Taking into account that only a minority of teachers in Croatian primary schools implement modern teaching methods and activities to motivate their pupils learning and even a smaller part of them is using computers as an aid in learning and teaching Visual Arts, especially from 5th to 8th classes, the authors explored in earlier research recommended software that would be most appropriate for learning and teaching Visual Arts in Croatia and abroad. According to this research authors have come to the conclusion, that beside already existing software, it would be useful to develop a simple and portable computer program in graphic mode together with an art database to be suitable for teaching Visual Arts in school and appropriate for interactive learning at home. [8]

They also have taken into consideration the fact that in a significant number of schools only older and less powerful computers are available to teachers and pupils and even at home pupils do not always have the newest and fastest computers. Because of that, simpler software, not so demanding in terms of hardware requirements, but also running in graphic mode, would be an appropriate solution in both cases. [1]

There are of course a lot of excellent free paint programs existing in the market like Microsoft Paint being part of MS Windows, Paint.Net or GIMP even for Linux operating systems, but these computer programs are so sophisticated that they very often distract pupils, meaning that they are not enough focused on the main issue, i.e. learning about Visual Arts or like in the case of this article Color, but would rather explore the numerous possibilities of the paint programs by “playing” with them.

For this reason the authors developed a simple computer program called PaintArt with an art database included, programmed in MS Visual Basic for Windows. With this computer software which includes a paint program (in graphic format) and forms in bitmap format, it is possible not only to write text but also to draw lines, boxes, circles etc., interactive learning gets a new dimension. From now on it is possible not only to ask questions in the form of yes/no, multiple choice or demand answers in so called full-text but really to apply the solutions. [8]

In the second version of this computer program called PaintArt 2.0 enhancements are provided on two levels. On the first or technical level the program has now full freehand drawing possibilities, the delete function is enhanced and the windows can be resized in a more flexible way. Secondly, this computer program now includes four different forms in bitmap format, where it is not only possible to ask questions in the form yes/no, multiple choice, ordinary questions demanding answers in full-text but also where real applications are required such as drawing of the solution. If the lesson is about Color, the teacher could show a painting of a well known artist and ask to which movement of painting it belongs and what color concept it implies. By presenting this software in class and by sharing it, pupils can take it home and by comparing own answers with the provided solutions in the software they can verify their knowledge of the topics discussed at school. [9]

More about these articles, as well as computer programs in general, can be found in the following literature. [8] [9] [1]

II. COLOR ANALYSIS OF ARTWORKS

The analysis of artworks (stored in the computer program PaintArt 2.0) is presented below for the color concept from the 5th to the 8th grade of primary school by different sources of literature. [5] [7] [2] [10]

Paul Gauguin, Woman with Flowers, oil on canvas, 1891
- a powerful and free choice of colors
- expressing feelings and thoughts
- the color is clean and applied in wide areas
- expressive simplicity and power of the composition
- the role of the color is decorative
- chromatic intensity of color
- large areas of blue, red and yellow colors with orange, green and purple
- with a warm and cold contrast, an unusual and expressive color was achieved
- dynamics is achieved by pure spectral colors (from the chromatic circle of colors)
- separation from naturalism

Henri Matisse, Portrait of Madame Matisse, oil on canvas, 1905
- strong color, vibrant colors
- no descriptiveness, the color is already in the function of modulation
- colors work by complementing one another (they support themselves when standing next to each other)
- contoured and simplified contours
- the color is harmonious but unnatural lively
- the description of reality is missing reality

Figure 1. Painting titled Woman with Flowers in PaintArt 2.0
- flatness - a two-dimensional composition
- color separation
- the power of the tones does not diminish with the fictitious green line that runs from the forehead to the chin

Jan Vermeer, The Milkmaid, oil on canvas, 1660
- clean colors have their light value
- chromatic scale
- light has the power and accurate representation of the new scene of apparent immobility with the help of light
- the yellow and blue colors create the dynamics and clarity of the composition

Victor Vasarely, LA-MI, serigraph, 1973
- optical art - Op-Art art
- application of geometric canons
- harmony (harmony of colors)
- tone gradation
- a proper mesh of colored surfaces in the form of squares
- a motion experience in several opposing streams
- opposing two perspectives
- achieving the architectural meaning of the work
- pure abstraction

Georges Seurat, Circus, oil on canvas, 1890
- elaborated technique of pointillism
- the purity of the shape, the rigidity of the unity with the sublety
- light shimmering without the color of the paint on the palette
- placement of colors in isolated, separated and correct spots of pure color (replacement for pigment mixing)
- optical color mixing (merging complementary colors) in the observer's eye at a certain distance from the image
- strict geometry and stylization
- clarity of the image construction
- color separation technique

Joan Miro, People and Dog in the Sun, tempera on canvas, 1949
- an unusual combination of shapes
- surrealism (beyond dimension of reality)
- abstract consonance (harmony) of pure colors
- association - hidden color richness
- undetermined figures (indicated by the unusual similarity of different creatures)
- the color is caused by the sensation of stimulating and overwhelming
- the color is multidimensional and can be interpreted in different ways
- distortion of realistic (irrational, unconventional)
- color symbolism
Josip Račić, Mother with Child, oil on canvas, 1920
- tonic painting
- a simple palette enriched with gray tones
- the presence of different tonal values
- application of valence, i.e. tonal gradation (grading)
- achievement of the perception of the roundabout
- dominions of black and gray
- clarity of volume
- a realistic display of the portrait
- narrow color range
- solid modeling

Maurice de Vlaminck, Bougival, oil on canvas, 1905
- coloristic perspective - warm and cold colors
- the paint is painted with wide brush strokes
- the surface of the paint is framed with painted drawings
- color dynamics
- the volume is expressed in color contrast
- the composition is made of strong, pure and mixed colors
- the colors act aggressively and wildly
- impulsive painter (flameproof)
- the painting acts aggressively, fiercely, wildly

Marino Tartaglia, Self Portrait, oil on canvas, 1917
- color modulation achieved volume illusion
- expression and color expressiveness
- flat layout of the chromatographic surfaces
- rich but suppressed color
- warm colors appear closer and cold appear visually
- warm colors prevail
- the painter's handwritten notes
- the expressive subjective state of the artist
- the distance from the real view (close to abstraction)
- unconventional form of expression

Vincent van Gogh, The Night Cafe, oil on canvas, 1888
- color has an expressive function
- color is flattered in expression and passion (excitement, anxiety, ...)
- strong and saturated tones
- brush action can be monitored (focused and emphasized)
- color is not a function of describing reality but of the environment experience
- color is expressive and the idea is represented by chromatic values (yellow, orange, ...)
- a personal vision of the world
- thick color plaques (visible script - impasto)
- the color contains symbolic value

Piet Mondrian, Composition, oil on canvas, 1925
- abstract image
- color reflects liveliness, mobility and strength
- the color dynamics were realized in a psychological way
- subjective experience - general impression
- pure colors are rotated by a raster of vertical and horizontal lines
- artistic purity, strong action of basic colors
- color balance and spatial proportions
- ultimate simplicity and purity based on geometric shapes and pure colors
Gerrit Rietveld, Red and Blue Chair, wood, 1917  
- the color and shape are in function of the design of the chair  
- pure, dynamic colors  
- flat, smooth surfaces  
- red, blue, yellow and black support the construction

To sum up, as it can be clearly seen from 12 Figures containing screenshots of various paintings and one chair stored in PaintArt 2.0, it is evident that it really makes the analysis of these (and all desired) artworks, by teachers and for pupils, easy and effective since questions in different forms can be added and correct answers provided.

III. CONCLUSION

To explore color and its actions through artworks (paintings), the selected and presented examples, should be accessible and interesting for the children. By preparing and defining tasks, the teacher creates a process that should be motivating for pupils and focused on learning about color. The curriculum for four years teaching the subject of Visual Arts offers a list of artistic artworks and the teacher can choose and use them in the teaching process. By well prepared presentation and creating a situation in which children explore art concepts and solve artistic tasks related to the topic color and communicate with the image as a visual stimulus, the teacher can achieve the goals of teaching visual arts such as artistic literacy, visual perception, and artistic creativity and children’s learning. For this purpose special computer programs both in graphic mode, called PainArt and PaintArt 2.0, with a well prepared database were developed and presented.

REFERENCES