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Phase II - Period 2010-2020: e-Skills for the 21st Century



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Research papers – Major Topics

The papers describing advances in the theory and practice of Virtual Environments for Education and Training (VEL&T), Virtual Reality (VR), Virtual Laboratory (VirtLab), Information and Knowledge Processing (I&KP), as well as practical results and original applications. The education category includes both the use of Web Technologies, Computer Graphics (CG) and Virtual Reality Applications, New tools, methods, pedagogy and psychology, Case studies of Web Technologies and Streaming Multimedia Applications in Education, experience in preparation of courseware.

Thematic Areas / Sections

- **MODELS & METHODOLOGIES (M&M)**
- **TECHNOLOGIES & VIRTUAL LABORATORY (TECH)**
- **SOFTWARE SOLUTIONS (SOFT)**
- **"Intel® Education" – Innovation in Education and Research (IntelEdu)**

Objectives

2010 – Towards a Learning and Knowledge Society – 2030

Phase II - **Period 2010-2020**: e-Skills for the 21st Century

Phase III - **Period 2020-2030**: Intelligence Learning –
Knowledge Society and Learning Culture

Relevant topics include but are not restricted to:

- National Policies and Strategies on Virtual Learning
- National Projects on Virtual Universities
- International Projects and International Collaboration on Web-based Education
- Dot-com Educational Institutions and their Impact on Traditional Universities
- Educational Portals for education and training
- Reusable Learning Objects for e-Learning and e-Training
- Testing and Assessment Issues of Web-based Education
- Academia/Industry Collaboration on Web-based Training
- Faculty Development on Web-based Education
- Funding Opportunities for Projects in Web-based Education

Color as One of the Supporting Elements of Training in Minimalism

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Abstract

Minimalism is a style that suggests a method of reduction, where all design elements are reduced to their necessary size and shape. In addition to the mentioned feature, it is important to understand how effective color is in minimalist spaces and what kind of a role color plays in those interior spaces. The study also explored minimalist interiors, and performed a statistical analysis of minimalist interiors in the Republic of Northern Macedonia. This specific study, at first explains minimalism, beginning with its relation to design, interior design, art and color. Color is an important element of design and has a special role in interior design. Therefore, literature has been reviewed, in order to analyze these minimalist interiors, color, design and interior design.

Keywords: Minimalism, Design, Simplicity, Interior, Color

1 Introduction

The word minimalism means least in quantity, and if we scale, minimalism would be the lowest level. What minimalism seeks to achieve is the simplification of aspects of modernism, and it is often identified as a reaction against abstract expressionism and its connection with post-modern art. The term minimalism, when it comes to architecture and design, is used to describe a style of design that is characterized by simplicity and functionality (Bueno, 2003; Indrie et al., 2017). Color plays a specific role in the design, and is one of the primary features of design elements. It is used in various design disciplines and creates the uniqueness of the design itself. The study discusses about the application, role and meaning of color in different design disciplines and the use of color in interior design, with particular reference to the minimalism in the interior (Rosel, 2005). The goal is to find similarities and differences in the use of different colors in minimalist interior spaces, because each color has a different effect and function in the interior. In other words, the final goal is to find out what is the use of color in interior minimalist spaces, in different regions of the world.

2 The history of the appearance of style

Minimalism has emerged as a design reaction to the abundance of contemporary trends. The basics of minimalism are taken from Japanese culture. Japanese minimalism in the interior is more of a void, there is not so much furniture and decorations. European minimalism is less radical. The simplicity in Europe is combined with functionality.

3 Minimalism and design

Design minimalism can be defined by the artist's non-dramatic expression and the simplicity of the form and shape of the elements. Minimalism is a movement that first rises through the arts, music, paintings, theater and the movie industry, where the artists send their message through a small number of simple and essential creations. This movement begins with the sudden development of art, after World War II and trace their roots in western arts and visual arts within the United States, between 1960 and 1970.

4 Minimalism in interior design

The minimalist approach can be used in various design disciplines. Many modern architects have implemented purity and rigor in their designs, so we can call these designs minimalist. Bruno Munari, a professional graphic designer, once quoted: "To complicate is easy, to simplify is difficult" (Leonart, 2019). He says that to complicate something, you only need to add things to it. On the other hand, in order to get something done, you need to recognize the essential features of the element, so that its basic function can be preserved. Simplification is a reflection of intelligence. As noted in an old Chinese proverb: "What cannot be said in a few words cannot be said, even in a lot of words." What everyone has been trying to say is that it is easy to design a complicated space, for example through a combination of five cubes, but it is difficult to use just one cube, which will perform the same function as all five. Famous Italian designer, AG Fronzoni, claims that a cube is a cube. Fronzoni wanted to say that materials and forms cannot and shouldn't be considered secondary elements in the domination of the human figure. Also, the shapes and colors of nature should not be considered as subordinate elements. This Italian designer is known for emphasizing the possibility of incorporating abstraction into everyday life. This philosophy is supported by other renowned minimalist architects, such as Louis Borgan, Claudio Silverstein, Peter Zumtor and Tadao Ando. Borgan is known for his geometric purity and sharp colors, which he uses in his paintings, sculptures and architecture (Grimley, 2018).

5 Minimalism and color in interior design

Color is the basis of everything related to art. It helps define the elements and plays a dominant role in the basic aesthetics of artistic creations. Color is often the only characteristic of design and design elements, and is also present in minimalist style because it is a symbol of purity and simplicity. Herbert Ipma points out, in his book, "London Minimum", that color plays a different role in shaping visual culture, it represents one of the oldest forms of communication and attracting people. The color is simple and clean. Color is a feature of minimalism and helps in defining the space (Zlatev et al., 2017; Layne, 2019). Leonart points out in his book, *Minimalism and Color*, that minimalism is not style, but it is absolute simplicity. Because the whiteness itself, in the minimalist space, reminds us that white light is the basis of the whole spectrum of colors. Another color accent is needed to capture the power of white. The decorations in minimalism are actually the colors themselves, because their combination adorns the space and makes it harmonious. As we know, color perception comes from different types of retinal cells that we have in our eyes and goes to different parts of the spectrum, colors can be defined and measured to the degree that they stimulate these cells. These physical or psychological quantifications of color, however, do not fully explain the psychophysical perception of color. Light from certain rays, is energy that comes from a source of light, such as the sun, moon, etc. The globe is illuminated by this energy. Although light is invisible, when a particle illuminates the atmosphere, some wavelengths are absorbed and others are reflected. The sky is blue because the moisture or dust that exists in the atmosphere absorbs short, blue wavelengths, and red wavelengths that pass through it. For example, people can sometimes see a rainbow because the light is refracted and reflected by stains of moisture or dust in the air. In addition, ambient light is the one that illuminates the day and makes surfaces and objects visible to the human eye (Fiell et al., 2012; Secan et al., 2012; Taschen, 2015). Without light, the world would be the same as the black moonless sky, and all surfaces that are visible to us and receive direct light, would be burned with the frozen shadow. To sum up, the color in our environment is characterized by light and shade. Color is a general term that encompasses both light and shade, though we often use shade as a synonym for color. Lighting is determined by the amount of light emitted by a light source and reflected on the surface. The hue is determined by the type of light-specific wavelengths in the light emitted by the source and reflected on the surface. (Minimalist, 2019).

6 The role of color in interior design

Color plays a strong role in changing the perception and feeling we get when perceiving it. For example, it can make a room without sunlight look cooler than it is, or a room illuminated by the sun, even brighter. As Mandelberg said: "If we use cold blue in a room that is not touched by sunlight, we will get a feeling of extreme coldness in the perception of the room. Conversely, if we use warm-white color in a room that is illuminated by the sun, it will awaken a feeling of unnecessary heat." Miller said that the color in the interiors can enhance a sense of belonging in that space, or it may be the reason for creating some kind of illusion. The color would be stronger and more striking if:

- ✓ Its value has decreased;
- ✓ Its saturation has increased;
- ✓ And it's warmer in terms of hue.

The color can also contain both advanced and retractable features. It depends on the features that are present in its interior, some are dominant and others subordinate. The darkness or lightness of the color, its saturation, the grayness it contains, sometimes can be more important features of the color, than its hue. When we are already talking about colors and their characteristics, we will say a word about the contrast that appears in them.



a) Warm space



b) Cold space

Figure 1. Example of warm and cold interior spaces

The contrast can be achieved by using a light color along with dark, where the light color makes the dark look even darker and conversely. Also, complementary colors increase their intensity if they are used together. The use of strong, eye-catching colors, along with the gray shades, will make the gray look even lighter than they are (Cumberbatch, 2016; Gordon et al., 2019). Effective, vibrant colors, along with textures and eye-catching designs, can be used to add vibrancy to the space. However, when using them, care should be taken not to overfill the space (Ilieva et al., 2019). There is one way to avoid this problem, and that is to use contrasts of the complementary color scheme. For example, orange tones contrasted with blue tones, resulting in achieving a soft pale blue. State of harmony, is a general principle of design and is known as the law of the arrangement of things, where elements and structures have a visual connection and appear to form a whole together. The whole of art means that everything we see in a work of art belongs right

there. Whole as such, it is achieved through balance, repetition and harmony in design. If we use two complementary colors for the floor, or the same color, we will achieve the unification of two rooms, for example a living room and a dining room. Whole helps piece of furniture look as if they belong together. Similar objects, with similar components or attributes, can be more easily combined with one another and look as if they complement each other. Repeating colors, shapes, textures or lines to create a visual connection between the elements makes exactly the whole space, because it creates a consistency and wholeness. By repeating colors, volume, layout, texture, shape, we can design elements that will be similar to each other. Suppose all the elements in the room are blue and highlighted. The elements send a clear message to the observer that they are connected and harmonized as a whole. To create dominance in their work, designers create attention by setting triumphant elements. Every design should have its primary purpose, which serves as a guide for the designers themselves. Once the primary, dominant element is created, the designers continue to create less dominant elements. The best way to achieve dominance is to use contrasts, because without contrasts, it would probably be the same. Imagine two cubes, one of which is larger than the other, which one would dominate? Of course, the bigger cube, it doesn't matter how big it is, it will dominate.

Conclusion

In minimalist interior design simple elements are always used, the most necessary elements, the color plays a big role in achieving the width and openness of the space and so on. But there are similarities and differences between the rooms themselves. The similarities are the use of cold colors for the main elements such as ceiling, floor, wall, basic pieces of furniture etc. The rooms differ due to the use of warm colors to achieve a focal point. No matter how many traditions, cultures, periods exist in the world, the minimalist interior design was the same everywhere. This research is analyzed in the study and is devoted to only a few cases of interior design, which are characterized by a minimalist style. Research can be further developed, with a more detailed approach, to a wider field of study.

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