

UNIVERSAL DESIGN FOR CONTEMPORARY CONCEPTS

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Abstract

The accessibility and usability of a particular product, service, or space characterize the Universal Design. The universal design is used by the people with some sensory or physical limitations.

When designing a single space for visually impaired people, the light plays the major role. Proper lighting can make the space functional and easy to use.

Also, the graphic design has an important role for people with visual impairments. With good presentation of the information and knowledge of the characteristics of the good graphic design, the communication with this group of people is facilitated.

Key words: *Universal Design, lighting, graphic design, visually impaired people*

УНИВЕРСАЛЕН ДИЗАЙН ЗА СЪВРЕМЕННИ КОНЦЕПЦИИ

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Резюме

Достъпността и използваемостта на определен продукт, услуга или пространство характеризират универсалния дизайн. Универсалният дизайн се използва от хората с някои сензорни или физически ограничения.

При проектирането на единно пространство за хора със зрителни увреждания светлината играе главната роля. Правилното осветление може да направи пространството функционално и лесно за използване.

Също така графичният дизайн има важна роля за хора със зрителни увреждания. С добро представяне на информацията и познаването на характеристиките на добрия графичен дизайн се улеснява комуникацията с тази група хора.

Ключови думи: *Универсален дизайн, осветление, графичен дизайн, хора с увредено зрение*

Introduction

Light is a natural agent that stimulates vision and makes objects visible. It is electromagnetic radiation; whose wavelength is visible to the human eye. It defines three sizes:

1. Intensity (amplitude), which is associated with human perception of light intensity.
2. Purity (frequency), which a person sees as the color of light

3. Polarization (flicker angle), which is not noticeable under normal circumstances

The light can be natural or artificial and is an important element in interior or exterior design. Applying proper light to a certain space defines good lighting. Light is one of the most important elements for creating the desired atmosphere in the interior or exterior, making this space functional and easy to use.

The Universal Design maximizes the accessibility and usability of products and services for individuals with various physical or sensory impairments. The Universal Design is a product that can be used by all users without the need for adaptation or specialized design.

Principles of Universal Design:

The Universal Design consists of seven principles:

PRINCIPLE 1: Equivalent use. The design is functional, easy to operate, intelligible and designed for everyone. When this is impossible, an equivalent design is designed for people with special needs. This type of design should always be accessible, safe and appealing to users. However, it is necessary to avoid segregation or stigmatization of a particular group of users.

PRINCIPLE 2: Flexibility in use. The Universal Design has a wide range of individual preferences and capabilities, and provides a choice in the methods of use. For example, the design is adaptable for use by people using left or right hand.

PRINCIPLE 3: simple and intuitive use. Using the design is always easy to understand, regardless of the user's experience, language skills, knowledge, or current level of concentration. In the process of designing, the unnecessary complexity of the product or service is eliminated. The design should be in line with the expectations of the users and their intuition. In order to be understandable, the method of use should be written in several languages, or everything be vividly depicted with the help of graphic design- appropriate and understandable symbols.

PRINCIPLE 4: Perceptible information. The design communicates with the users, by giving the necessary information, regardless of the ambient conditions or sensory capabilities of the user. There are many ways to achieve this goal (vivid, vernal, tactile) Care should be taken to ensure an appropriate contrast between essential information and the environment itself. This is achieved by maximizing the legibility and comprehensibility of the essential information. It is also necessary to ensure compatibility with various techniques or devices that will be used by people with a sensory limitation.

PRINCIPLE 5: Error Tolerance. The design minimizes the dangers and the negative consequences of random or deliberate action. This is achieved by eliminating, protecting and isolating dangerous elements. There is always a warning about danger or possible occurrence of errors,

PRINCIPLE 6: Low physical effort. The design is efficient, easy to use, with minimal fatigue and convenient. It minimizes repetitive actions and constant physical effort. When using this design, the user maintains a neutral position on the body.

PRINCIPLE 7: Prediction of size and space for access and use. Appropriate size and space provide access manipulation and reach, regardless of the size of the body, the position or mobility of the user. Such design provides adequate space for use by immobile people.

The principles of Universal Design relate only to the universal usable design, while the practice of design involves more than looking at usability. These principles

offer guidance to designers to better integrate opportunities that meet the needs of a growing number of users.

Universal Design for visually impaired people - Lighting

During life, the human eye loses sensitivity. As a result, the eye of a seventy-year-old person may require up to three times more light, unlike the eye of a twenty-year-old person. In addition, the eye loses flexibility, so the adaptation of changes in the level of illumination lasts longer.

Damaged vision can cause problems in the performance of normal everyday activities, such as driving, reading, hanging out, walking.

There are many studies that have shown that successful planning and design facilitate the use of spaces and items used by this group of people. Good and proper lighting is one of the key elements for achieving this goal.

The seven features of good lighting:

Lighting should be included in routine assessments for the needs of people with visual impairments. It should also be part of the regular audits of maintenance, renovation or adaptation of the home. Improvements do not always involve a lot of work. It can be done with small changes at low cost.

The goal is to create a visual environment that maximizes the beneficial view and offers a uniform level of light without gloss.

The lighting should always be:

1. Appropriate for the individual- it is necessary to consider the needs of the person and to find appropriate answers that meet individual needs, such as the management of the glare.
2. Suitable for carrying out tasks- and help with orientation in the space.
3. To have minimal glare- avoid deep shadows or sharp changes in the light levels when moving from one room to another. To minimize glare, light sources should not be directly visible from normal viewing angles.
4. Adjustable flexible and secure- they can be moved, direct the light, or control their intensity. For greater security, it is important to avoid heating lamps, using LED bulbs instead.
5. Energy efficient and suitable- it is necessary to choose appropriate lamps to meet the required amount of lighting without high power consumption.
6. Easy to install- that can be installed on already existing installations
7. Adjustable for the future- can be changed to respond to changing needs.

In addition there are several examples of good interior design and lighting intended for people with visual impairment:



Image 1. COLOR BLINDNESS - 1) Deuteranomaly, 2) Protanopia, 3) Tritanopia

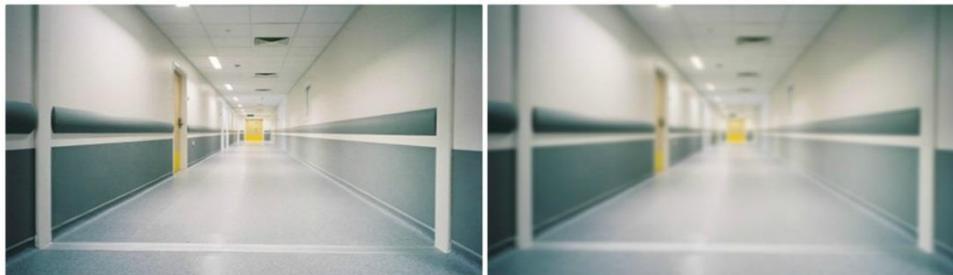


Image 2. LOW ACUITY

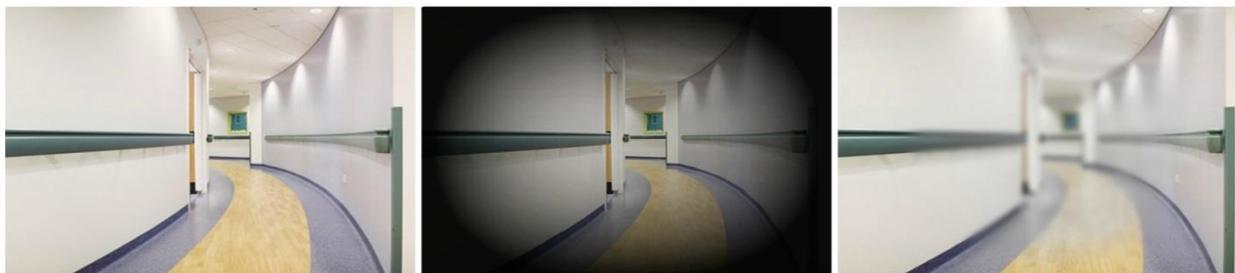


Image 3. CLOUDED/OBSTRUCTED- 1) Glaucoma, 2) Macular Degeneration

The Impact of Graphic Design for people with visual impairment

The graphic design affects people with a certain disability. The way a website, a brochure or an infographic is designed, and the information it conveys, affects the availability and user experience different for each individual.

The importance of good informative graphic design

Many times the information that needs to be shared through graphic design is not clear and understandable, meaning it does not make sense and only has a bad or opposite effect.

It only consumes the time of everyone involved in the communication process, by disregarding the rules for informative graphic design. The time of the people communicating through that design is not respected.

The quality communication means with the utmost effort to achieve the maximum effect in communication. The essence of communication is not in the transmission, but in meaningful information that increases the user's knowledge.

However, there is no proper way of working for this type of communication. It all depends on various analysis and understanding of viewers, to which the message or information is sent in the same way. The design is not a universal language-interpretation depends on the environment, education and culture.

Visual literacy

The visual literacy is the ability to interpret, assemble and shape the meaning of the information presented in the form or image. It is based on the idea- images can be "read", meaning that they can communicate through a reading process.

A visual image can overwhelm a word, concept, relationship, process, or fact. Visual images are much more specific than abstract words.

The design of infographic for people with visual impairment is relevant and available to a larger number of users. The good presentation of information through graphic design, which is available for people with visual impairment, also strengthens the user experience. The clarity, contrast elements, the use of color, the strong

symbolism, and the alternatives for text or sound, characterize the good graphic design intended for this group of people.

Conclusion

Each design by definition promotes accessibility. Designers are trying to create a Universal Design that is clearer, simpler and more accessible. The purpose of this design is to be accessible, understood and used by all users, regardless of their age, size, capability or disability. By applying appropriate lighting, as well as fitting the lamps in the space, it can be a functional space for people with visual impairment.

With a good knowledge and careful combination of art elements and principles-color, texture, size, contrast, is achieved a successful graphic design, useful for this population.

Literature

1. "Universal Design: Planning and Design for All" Norwegian State Council on Disability. (1997)
2. "Factfile no.8 The Society of Light and Lighting" - Part of the Chartered Institution of Building Services Engineers (July 2012)
3. "Advances in Usability, User Experience and Assistive Technology" - Tareq Z. Ahram, Christianne Falcao (AHFE International Conferences July 2018)
4. "Barrier- Free Design" - James Holmes-Siedle (1996)
5. "Basics Barrier-Free Planning"- Isabella Skiba, Rahel Zuger
6. "Lighting in and around the home: A guide to better lighting for people with sight loss" – Endorised by the Institution of Lighting Professionals, Published by Thomas Pocklington Trust
7. "AccessAbility: A practical Handbook on Accessible Graphic Design" – The Association of Registered Graphic Designers of Ontario (2010)