CHAPTER THREE

Colour Studies: Theory and Practice

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Introduction

The study of colour is interesting. The value of human life would be meaningless without colour. This is because colour helps to enhance the beauty of both man-made and natural phenomena. Colour is not easy to define, it simply explains what the eyes see or interpret in the presence of light. According to Ngumah, Ayoola, Dalhatu, and Samkay (2013), colour is the interplay of the eyes with the light. In other words the word colour cannot exist without the presence of light, it depends on light. Ogumor (2007) sees colour as the waves of light separated by different things before reaching our eyes. Colour is perception. The eyes see something (the sky, for example), and data sent from the eyes to the brains tells one it is a certain colour (blue). Objects reflect light in different combinations of wavelengths. The brains pick up on those wavelength combinations and translate them into the phenomenon called colour (Decker, 2017).

In basic design, colour is seen as a pigment applied on a design surface. Therefore colour is the application of pigment to a surface, shape, or design. There are varieties of colours and for easy understanding, colours can be

discussed under the following terms; as, the visual response to different wavelengths of sunlight identified as red, green, blue and so on, having the physical properties of hue, intensity and value. In the field of arts and basic design, colour is seen as a pigment or substance used in organizing or arranging the other elements of art on a design or an object to satisfy our sense of beauty.

Features of Colours

Light

This is an agent of illumination that stimulates the sense of sight. It is the source of colour which begins and is derived from electromagnetic wavelengths from ambient light (sun) or artificial sources such as spot lamps. Where there is light, there is colour. Where there is little light there is little colour, and here there is strong light, the colour is likely to be intense. Whenever the light is weak, such as at dusk or dawn, it is difficult to distinguish one colour from another. Under bright strong, sunlight, as in tropical climates, colours seem to take an additional intensity; Ocvirk (2006). Every ray of light coming from the sun is composed of waves that vibrate at different speeds. Humans see colours in light waves. Mixing light—or the additive colour mixing model—allows one to create colours by mixing red, green and blue light sources of various intensities. The more light someone adds, the brighter the colour mix becomes. If one mixes all three colours of light, the result is pure, white light (Decker, 2017). Again, there is the pigment colour

mixing model. Among the colours to be mixed as such are red-yellow-blue and cyan-magenta-yellow ones.

Tints, Shades and Tones

Tint: If white is added to any hue or colour, it is made lighter and the result is called a tint.

Shade: Are relative darkness, dimness and the absence of light Ocvirk (2006). Shade is also the dark part of anything. It is the shadow. It can also be seen as a shield or screen protecting from bright light. Shade is a place sheltered from the sun. If black is added to any colour, the darker version of it is called a shade.

Tones: This is when grey (black + white) is added, and the result is a different colour level of the same colour.

Hue: Hue or colour is characteristic to which a name such as blue, red, or yellow is given to distinguish it from others. Ocvirk (2006) explains hue as the name which differentiates one colour from another; there are red hue, yellow hue, and blue hues. Hue is therefore another name for colour. In a colour chart, there are primary hues, secondary hues, and intermediate hues as the case may be. The hues of colour are divided into warm and cool hues. Warm hues are very bright and appear to advance towards the viewer when they are in the company of other colours. Warm hues are red, orange, and yellow. Cool hues are those colours that do not appear very bright and they tend

to move backwards in the group of other colours. The cool hues are green, blue, and purple. Therefore warm hues advance (i.e. coming forward) while cool hues recede (i.e. going backwards).

Intensity: Intensity is the degree of brightness of a hue, rather than value (Ocvirk 2006). Intensity depends on the amount of greyness in a colour. The intensity of a colour is its relative purity or brilliance. Chroma is another name for intensity, that is; the brightness or dullness of a hue. The word 'Chroma' is used to differentiate a bright colour from a dull colour of the same hue, for example, bright blue and dull blue, bright red and dull red. Similarly, (Mckinley, 2016) observes that Intensity is also the dimension of colour that tells the brightness or dullness, its strength or its weakness. Intensity describes the distance of the colour from grey on the colour wheel

Classification of Colours

Ngumah, Et Al (2013) classified colour as follows;

Primary Colour

The primary colour is a basic colour which cannot be derived from a mixture of other colours. Primary colour is the three colours that cannot be got through mixing other colours. Primary colour is used to obtain other colours depending on their mixture; they are red, blue and yellow. However, there are two categories of primary colours; additive primary colours (pigment) and

subtractive ones (light). Decker (2017) adds that TVs, screens and projectors use red, green and blue (RGB) as their primary colours, and then mix them to create other colours.

Fig 1: three primary colours (additive); Red, blue, and yellow (Vector Art: Emodi, 2021)

Fig 2: Another set of primary colours (additive, pigments); Cyan, magenta and yellow. (Vector Art: Emodi, 2021)

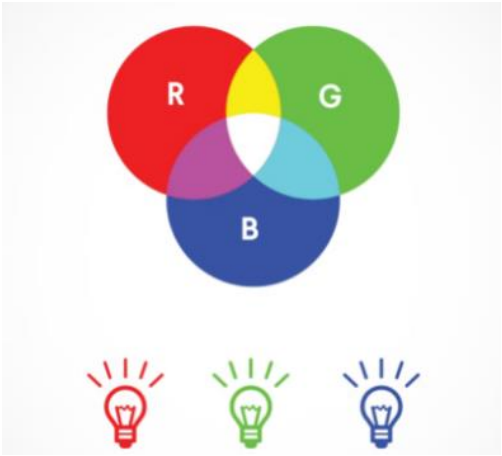

Fig 3: An illustration of the additive colour mixing, red light, blur light and green light. Source: https://99designs.com/blog tips/the-7-step-guide-to-understanding-color-theory/

Secondary Colour

Secondary colours are those colours which are derived from a mixture of two primary colours in equal proportion. The secondary colours are orange purple and green.

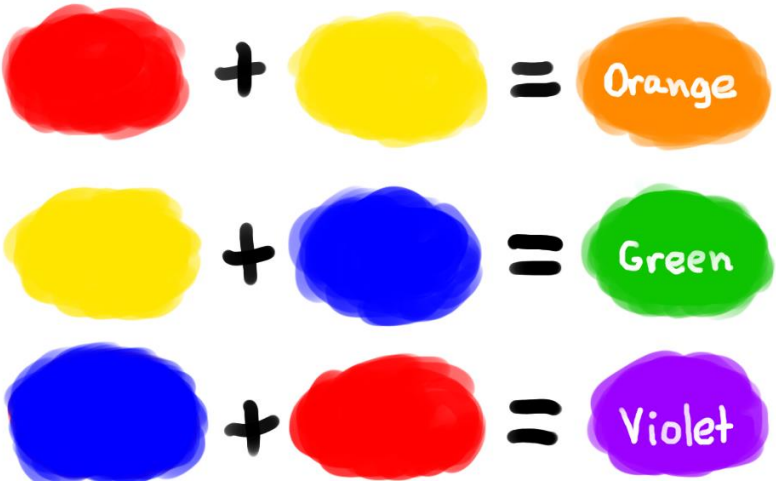

Fig 4: The secondary colour chart. Source: Color mixing clipart 20 free Cliparts | Download images on Clipground 2023

Tertiary Colour

Tertiary colour is the mixture of two secondary colours (Ocvirk, et Al 2006). For example, Tertiary Yellow appears like Smoky Yellow, Tertiary Blue is known as Slate Blue, and Tertiary Red is known as Old Red Brick. According to (Ocvirk, et Al 2006), Tertiary colours are partly neutralized colours that can be obtained by a

mixture of two secondary colours or they can be called neutralized primary colours. For example, blue dominates tertiary blue while yellow dominates tertiary yellow and red dominate tertiary red. The tertiary colours are identified by colours common to the two secondary colours, for example, purple and green have blue in common, while green and orange have yellow in common, and orange and purple have red in common.

Harmonious Colour

Harmonious colours are colours that have a relationship with each other, Ogumor (2007). They seem to belong to one family group and can be grouped into three Monochromatic, Analogous, and Opposites (Ocvirk, et al, 2006). Monochromatic is a variation of a single hue, Analogous is a family group of three or more closely allied colours, while Opposites are complementary colours, they are pairs of diametrically opposite hues with regards to dominance in the colour wheel.

Complimentary colours are colours opposite each other in the colour wheel. They are colours that show marked differences when placed near each other, therefore red is said to be complementary to green, yellow is complementary to purple and orange is complementary to blue.

Intermediate or tertiary Colour

These are derived by mixing one primary colour and one secondary colour. The intermediate colour is a

result of a colour got from the mixture of a secondary colour and a primary colour. In a colour wheel, the intermediate colour lies mid-way between one primary and one secondary colour, Ngumah, Et Al (2013) state the intermediate colour as;

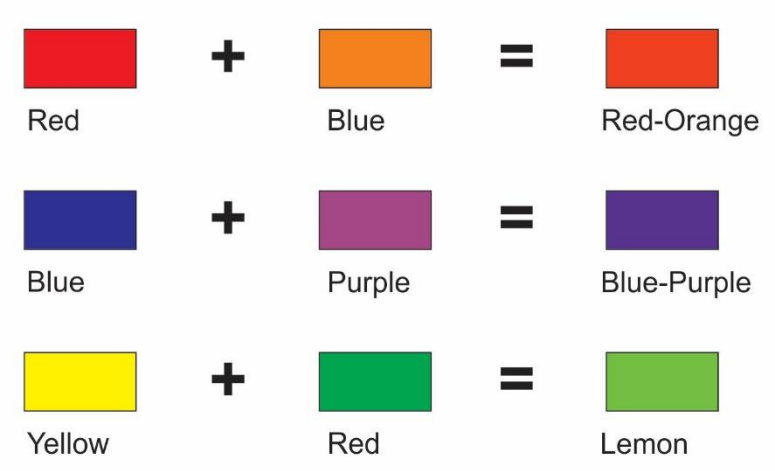

Fig 5: The tertiary colour chart (Vector Art: Emodi, 2021)

Neutral Colour

Neutral colours are black, white and grey, (Ocvirk, et Al 2006),. They do not belong to any of the colour classes mentioned above. The neutral colour can go well with any other colour. According to (Ocvirk, et Al 2006), in colouring, tint is white, while shade is black. Neutral colours, are colours of very low saturation, approaching greys.

Warm and Cool Colours

Warm colours are colours which in their nature appear to be hot and appear to advance towards the viewers. Warm colours are orange, red, and yellow. Cool colours appear calm, dull, and seem to recede from the viewers. The cool colours are green, blue, and purple, Ocvirk (2006).

Colour Wheel

Colour wheel is a diagram that shows the placement of colours in relationship to each other, Hornby (2012).

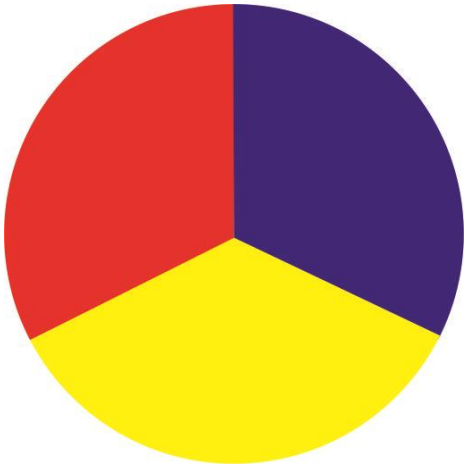

Fig 6: Primary Colour Wheel (Vector Art: Emodi, 2021)

The colour wheel theory

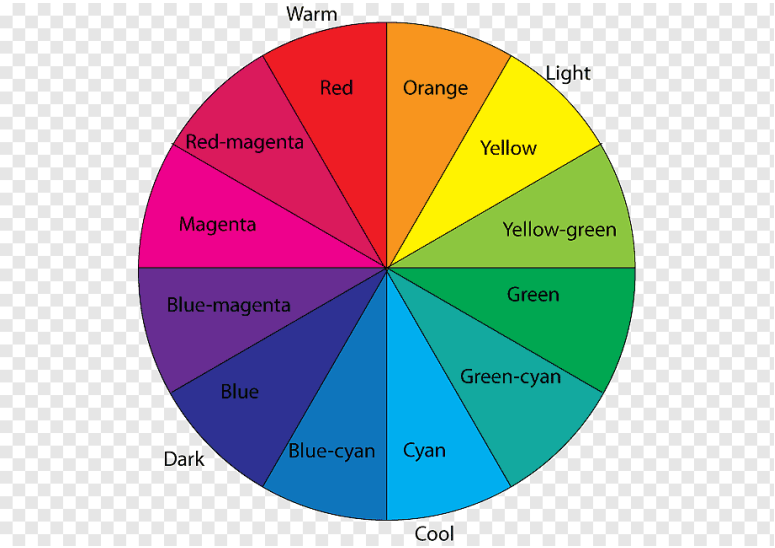

Fig. 7: colour wheel consisting of primary, secondary and tertiary colours. pngwing.com/en/search?q= color+Wheel

Colour theory is the collection of rules and guidelines which designers use to communicate with users through appealing colour schemes in visual interfaces. Having introduced the primary, secondary and tertiary colours, it is obvious that some people still find it difficult to choose colour combinations while designing or painting. To pick the best colours every time, designers use a colour wheel and refer to extensive collected knowledge about human optical ability, psychology, culture and more(Interaction design foundation).

Understanding how colours interact and their relationships on the colour wheel is important for successful colour combinations. In the colour wheel, there are several colour schemes which help a beginner while embarking on a work of design. According to Schippers (2019), remembering all the gradation of the colour wheel can be tricky, but there are a few major things one can easily recall when crafting your art and design.

Of recent, artists and designers use rules of colour combinations to find colour harmonies on the colour wheel which results in pleasing and harmonious colour combinations. In colour theory, colour harmony refers to aesthetically pleasing and harmonious colour combinations based on geometric relationships on the colour wheel (colours explained –an internet blog). It also suggests that in a work of art or design, one can use any or a combination of the colour harmonies below. Still, regardless of which harmony one chooses, it is essential to pay attention to the use of warm and cool colours so that the design will not look gaudy.

Last but not least, consider shade, tint, and tone when working on the colour harmony or scheme of a design, as they allow one to create rich, layered colour combinations. The seven major colour harmony or schemes are monochromatic, analogous, complementary, split complementary, triadic, square, and rectangle (or tetradic).

Fig. 8: colour harmony. Source: google.com

Complementary colour harmony

Complementary pairs are colours placed on opposite ends of the colour wheel (or colour circle), and they can be primary, secondary, or tertiary colours. These harmonious colour combinations create vibrant colour palettes with high contrast. It can be inappropriate if not properly managed.

Split-complimentary colour harmony

Split complementary combinations are slightly more complex than complementary colours because they have three hues. It has one key colour and two colours adjacent to that key colour's complement. Because of that, this colour harmony has a vibrant contrast that is generally easy to use.

Beginner artists and designers often move towards these types of combinations as they start to branch out into more complex colour schemes since they're approachable and intuitive.

Analogous colour harmony

The analogous colour harmony consists of three hues all placed next to each other on the colour wheel quite unlike complementary colour harmony which consists of complementary pairs. They usually consist of one dominant colour, and then a supporting colour. The third colour can be the first two colours blended or an accent colour that pops. Analogous colour schemes are widespread in decorating and interior design. These colour harmonies tend to be eye-soothing and have a sense of visual cohesion without being too flat, overwhelming, or monochromatic.

Triadic colour harmony

Triadic colour combinations consist of three colours evenly spaced on the colour wheel. They are very versatile, and more often than not, they create a vibrant, bold colour palette. When choosing colours in harmony for a design, let one hue dominate and use the others for accents only. This way, a child-like effect could be avoided that can ruin a design.

Tetradic colour harmony

Tetradic colour harmony has four individual colours: a key colour and three more colours, all equidistant from the key colour on the colour wheel. This colour harmony can also be referred to as a "double-complementary colour scheme" because it consists of two complementary colour pairs. Let one colour dominate and balance the use of warm colours and cool colours wisely, and use neutrals so that the colours are noticeable where they are supposed to be.

Square colour harmony

This consists of four colours spaced evenly around the colour wheel. To create a square colour palette, pick the key colour to start with. Then identify the other colours that are equidistant from that colour. One will end up with two complementary pairs. This colour harmony is very similar to the tetradic above, however, instead of a rectangular colour scheme; it is a square colour scheme. Beyond that, square colour schemes are less common than some of the other colour combination options, which can provide an opportunity to utilize one and set the design, one can always let one colour dominate and balance the colour temperature to make a square colour scheme work for a project without it looking childish.

Monochromatic colour harmony

Monochromatic colour schemes use a single colour with varying shades and tints to produce a consistent look

and feel. Although it lacks colour contrast, it often ends up looking very clean and polished. It also allows one to easily change the darkness and lightness of the colours. It uses a single base hue and extends the colour scheme by using different shades, tones, and tints of that colour family. The result is a complex and rich design very different from the common misconception that monochromatic colour harmonies are dull and lifeless. When choosing the colour schemes, make sure to add enough contrast in the shades to create visual interest.

With colours in harmony, one can set a mood, draw attention, or make a statement in a design. By picking a harmonious colour scheme, one can energize or cool down the project, create an ambience of elegance, warmth, and tranquillity, or convey an image of playful youthfulness.

Whatever is chosen, use the concept of colour harmony to make a design stand out from other art and design works. Colours in harmony have the power to convey messages effectively and evoke the right feelings. In other words, it is the most powerful design element.

Importance of Colour in Basic Design

Colour generally plays a vital role in Art, especially in designing and painting. Ngumah, Et Al (2013) states the importance of colour in design and painting as follows;

- Colour increases the visual effect of any art form, it makes the work beautiful.

- Colour helps to make an artwork look real and interesting.
- The application of colour in design and painting helps to evoke or arouse feelings in the viewers about the artwork.
- Colour aids in attracting attention.
- Colour aids in defining and interpreting forms.
- Colour helps to suggest mood.
- Colour has cultural significance.
- Colour helps to speed up visual search.
- Use colour to improve object recognition.
- Use colour to enhance the meaning of a piece of artwork or design.
- Use colour to convey structure in some book designs.
- Colour projects symbolism in a design.
- Colour communicates mood in a design piece or artwork.
- Colour improves usability, especially in road signs and other signs placed in the environment.

Questions

1. Explain colour
2. Prepare the colour wheel of primary colours and a colour wheel of secondary colour
3. Describe how secondary colours may be achieved.
4. Create a design using the primary colours only.

5. Explain colour harmony in a design.
6. Explain the Analogous colour harmony

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