Chapter I

Introduction

1.1 Design Education

Design is a process. It is a process where by a designer, equipped with a technical knowledge of all processes and materials available at the time, and a true understanding of the problems to be solved, and of the constraints that may be imposed upon the solution, together with a sensitive and humanitarian respect for the same, combines these different elements in to a cohesive practical whole.

Design is the successful relationship between aesthetics and technology. Designing therefore is a procedure that combines the creative skills of an artist, the technological skills of a craft person and the knowledge of technology. A designer always works to a pre determined brief. They aim to produce innovative solutions to a particular human need that can be produced at competitive price. Design synthesizes purpose and process. Design education aims to provide knowledge and experience of the process of design as well as an understanding of the purpose of design and how they affect people and society.

The capacity to think creatively and systematically search for solutions are skills which have to be learned. They are as significant in science as they

are in art. Creative thinking and expression of ideas are the main aspects of design education.

Design education is essentially an exercise in problem solving. Creative problem solving is characterized by the capacity of students to: research information, think imaginatively, define problems in their own terms, seeks their own solutions, experiment with materials, build and refine prototypes and evaluate and results against original intentions.

Design education is about making students think that is, recognize and solve problems in the context of materials and tools. Design education is seen as an extension of handicraft in that the technical and manipulative competence which was the aim of handicraft course is used as the medium for developing design thinking skills. Design is all about problem solving, and the purpose of design education is to prepare them to meet problems in design, and solve them.

In art, the artist gives more importance to the message which is to be conveyed, and the skill is taken a back seat; art demands only minimum skill which is required to convey the message that is very person specific. No generalization happens here.

Historically craft preceded both art and design. In earlier time art and design had not been considered as separate specialization. But they were subsumed within the broad range of workshop skills. In modern period

one of the key differences between the craft and design is that in the former, the making process from conception to execution is undertaken by the same person or a small team of people. The division of labor between designers and makers does not exist as it does in the industry.

1.1.1 Craft and design

Craft has three historical stages. First there is the time when everything is craft. All processes of making products are hand processes, every thing, made, whether utilitarian, ritual or merely decorative is essentially a craft object. Later, at least in Europe, from the Renaissance onwards, it is possible to distinguish two further stages of development. There was an intellectual separation between the idea of craft and that of fine art, which eventually came to be regarded as superior. This development is one of the distinguishing marks of the European Renaissance. Later still, with the industrial revolution, a separation between a craft object and an industrial produces- the thing made by the machine –arrived.

Crafts and designs are two different concepts that are closely linked. Crafts persons generally engage in design and the mass production of designed goods frequently relies upon craft process. The word craft means skill, particularly the manual kind. Hence we call it handy craft. Traditional craft includes pottery, furniture making, leather work, metal work, stone masonry, jewellery, glass blowing , stain glass , embroideries , knitting, weaving , tapestry, book binding , basketry, toy making etc.

In the case of a craft it always deals with the importance of skill and the intellectual activity becomes less important. It is all about production rather than visualization. But in design there is an amalgamation of art and craft. Equal roles are given to visualization and production. And it demands a generalization to a certain extent because it always has a target audience. In design logical thinking is necessary not just intuitive creativity. So a lot of parameters have to be taken into consideration in designing. So design needs a lot of inputs from skill development as well as visualization.

Teaching a course in design is inevitably more demanding than teaching a handicraft course, for the teacher has to continuously balance apparently conflicting requirements. Clearly the teacher must impart skills, technical competence but at the same time the teacher must foster the student's imaginative potential and help him/her to acquire the questioning and exploratory attitudes that are fundamental to any success in designing.

1.1.2 Design

Design describes the activity of people who create products and systems that satisfy human needs and improve people's life. It is concerned with the research, planning, design, design development and production of a wide range of products.

Historically, design education programs were introduced in art and fine art schools where they were treated in a master apprentice fashion. As

the procession has developed and the knowledge required has been identified, educational programs have developed and separated from art programs at undergraduate and postgraduates levels.

The complexity of planning and operating the course should not however confirm the simplicity of its aim. It is intended to establish the skills, attitudes sensitivities and procedures which, at however rudimentary a level, will facilitate the activity of designing and making.

1.1.3 Training of the designer

In design education, traditionally there are many approaches; different approaches were adopted in different time periods. Some are as follows

1.1.3.1 Artists' Guilds

This was more popular in the middle ages. In a guild system when the education begins the person at twelve years joins an artist's shop as an apprentice. In two to six years he would have learned his craft. After serving his apprenticeship one would go out as a journeyman and after several years of practice he would become a master. Eventually he would establish as an independent artist. The programs of this kind still exist in the craft area.

1.1.3.2 The academies

The academies are also developed in the middle of sixteenth century. This underwent many changes before it reached its peak in 1930s. The

program of instruction in academies essentially was lecture and a lot of drawing exercises. This program has lead to the formation of a definite set of rules for art students. These rules fell in to the following categories.

1. Proportion
2. color
3. expression
4. composition

Under this instruction the students were kept under study supervision and influence of one master instead of studying under many instructors. The goal of the student was to imitate the master. Those who have imitated most accurately were considered the exceptional students.

1.1.3.3 The Bauhaus approach

Bauhaus education has become synonymous with a series of fundamental exercises introduced as preparation for the applied visual art courses to follow.

This is known as workshop approach. In this approach the first course in which the sole purpose was to develop the creative aspects of the student. It excluded the usual emphasis on teaching the retainable knowledge and specific vocational skills. The students were not required or even encouraged to produce practical results instead they were offered the opportunity to experiment freely with various ideas, material and tools within structured problems.

In theory, the attitudes, knowledge and skills acquired in the course would be carried over to an applied visual art activity. The system of teaching learning method, developed by Bauhaus has been adopted by many design schools all over the world. Bauhaus's major contribution to visual art education was that it undertook the definitive educational step of forbidding the student to imitate the work of the teacher. The Bauhaus intellectualized design education and developed a program that permitted the student to combine creative invention with aesthetics of technology.

Bauhaus

The historical origins of Bauhaus can be traced back to the 19th century. It began with the devastating consequences of the industrial revolution to the artisans first in England and later in Germany. Increase of industrialization lead to social restructuring and the proletarization of broad sections of population. At the same time, it meant rationalistic opportunity to show off its latest technical and cultural achievements. England remained as the leader till 1890. Since 1850 the English had also been reforming the traditional path of training both as followed by crafts men and enshrined by art academies. The following few years saw the founding of numerous artisans and guilds, many seeking to combine their economic purpose with a community life style.

Countries in Europe had been attempting since 1870 to copy England's success in the field of industrial production. The key to revitalization of

the art industry was seen to lie in the revision of educational and training policies. Following the English example, small private workshops were opened up all over Germany making household furniture and metal utensils. In the course of eighteen nineties, Germany overtook England as the leading industrial nation and maintained the new position until the outbreak of 1st world war in 1914. During this time the search began for a stylistic language which would complement Germany's world wide industrial reputation. The combination of economic- national and cultural considerations lead in 1907 to the founding in Munich of the German Werkbund, an association which represented the most successful and significant marriage of art and industry before the first world war. After the war broke out Werkbund had became less active. This was the time people were talking about the necessity of an intellectual change of front. Walter Gropious, an architect had been involved with the Weimar school of arts and crafts founded by Henry Van de Valde.

Gropious was in touch with the academy of fine arts too. In 1919, the government appointed Gropious as the head of both the schools under the single title of "sttatliches Bauhaus in Weimar ", the school was new in both name and nature. Its foundation took place in the period of revolutionary unrest following the war.

Bauhaus came to be known as center of modern designs and progressive talented students from all over the world came to take a decisive part in the construction of the program and the work. Many of these later

became recognized artists and designers, and their achievements contributed towards the general outlook of Bauhaus.

Bauhaus was a center of activity for the problems of creation in art. Art, Architecture, Design, Technique and Sociology. But these were common problem for many progressive artists and technicians all over the world. At Bauhaus artistic and technical media was taught systematically and thoroughly for the first time.

Bauhaus became an influence to all modern design institutes through its methods of education and subjects covered in the curriculum. One of the most important aspects of learning at Bauhaus was its basic course. Basic course was a general introduction to composition, color, materials and three dimensional forms that familiarized students with techniques, concepts and formal relationships considered fundamental to all visual expression.

The basic courses were developed in order to give a theoretical and practical basis for any artistic and design endeavor.

1.1.3.4 Elements and principles approach:

The elements and principle approach is a two dimensional orientation. Each element and principle are isolated, the student experiences each and in turn theoretically combines them to create beauty. A very similar approach is nature approach. In this the instructor makes reference to

the elements and principles as they are found in nature. Each assignment is solved with nature as the source.

1.1.3.5 Institute of design approach.

This is a modified Bauhaus approach. In an effort to return to the pure approach this became too modified. A graduate design education program was established in the early 1950s at the institute of design Chicago, the recognized successor to the Bauhaus. The purpose was to spread the basic educational philosophy of the institute of design.

1.1.3.6 The unstructured approach.

The design education program seemed to stabilize during the 1950s through the mid 1960s, but by late 1960s the "anything goes" attitude in the art world has made its way to campus. This unstructured approach became a major method in teaching design. This lacked the continuity and different for teacher to teacher. The progress was all the time low and very little progress was made towards refining the discipline.

1.1.3.7 Today's approach.

Recently, however there has been a trend towards accountability and a return to basics in general education. This trend has carried over to the design students too and the demand for structure is increasing each year and will be still grater in the future.

It does not mean that design education should return to the educational methods of the guild, the academy or the Bauhaus or that it should continue with the unstructured approach. They worked some better than others in their time period. But those methods will not be successful in present day world.

The latest catchword in educational circles is "constructivism," applied both to learning theory and to epistemology---both to how people learn, and to the nature of knowledge. So we need to ask: what is constructivism, what does it have to tell us that are new and relevant, and how do we apply it to design education? There is nothing dramatically new in constructivism: the core ideas expressed by it have been clearly enunciated by John Dewey among others, but there is a new, widespread acceptance of this old set of ideas and new research in cognitive psychology to support it.

1.1.3.8 Constructivism

The term refers to the idea that learners construct knowledge for themselves---each learner individually (and socially) constructs meaning--- as he or she learns. Constructing meaning is learning; there is no other kind. The dramatic consequences of this view are twofold;

1. We have to focus on the learner in thinking about learning (not on the subject/lesson to be taught):

2. There is no knowledge independent of the meaning attributed to constructed experience by the learner, or community of learners.

Although the second point appears radical on an everyday level, it is a position which has been frequently adopted ever since people began to ponder on epistemology. If we accept constructivist theory (which means we are willing to follow in the path of Dewey, Piaget and Vigotsky among others), then we have to give up Platonic and all subsequent realistic views of epistemology. We have to recognize that there is no such thing as knowledge "out there" independent of the knower, but only knowledge we construct for ourselves as we learn. Learning is not understanding the "true" nature of things, nor is it (as Plato suggested) remembering dimly perceived perfect ideas, but rather a personal and social construction of meaning out of the bewildering array of sensations which have no order or structure besides the explanations which the teachers fabricate for them.

If the teachers believe that knowledge consists of learning about the real world out there, then the teachers try first and foremost to understand that world, organize it in the most rational way possible, and, as teachers, present it to the learner. This view may still engage us in providing the learner with activities, with hands-on learning, with opportunities to experiment and manipulate the objects of the world, but the intention is always to make clear to the learner the structure of the world independent of the learner. The teacher helps the learner understand the world. But they don't ask him to construct his or her own world.

The great triumph of Western intellectual history from the Enlightenment until the beginning of the 20th century rested on its ability to organize the knowledge of the world in a rational way independent of the learner, determined by some structure of the subject. Disciplines were developed, taxonomic schemes established, and all these categories were viewed as components of a vast mechanical machine in which the parts could be explained in terms of their relationship to each other, and each part contributed to making the whole function smoothly. Nowhere in this description does the learner appear. The task of the teacher was to make clear to the learner the working of this machine and any accommodation to the learner was only to account for different appropriate entry points for different learners.

1.1.3.9 Principles of learning

Some guiding principles of constructivist thinking are out lined below, all predicated on the belief that learning consists of individuals' constructed meanings and then indicate how they influence design education.

1. Learning is an active process in which the learner uses sensory input and constructs meaning out of it. The more traditional formulation of this idea involves the terminology of the active learner (Dewey's term) stressing that the learner needs to do something; that learning is not the passive acceptance of knowledge which exists "out there" but that learning involves the learner s engaging with the world.

2. People learn to learn as they learn: learning consists both of constructing meaning and constructing systems of meaning. Each meaning we construct makes us better able to give meaning to other sensations which can fit a similar pattern.

3. The crucial action of constructing meaning is mental: it happens in the mind. Physical actions, hands-on experience may be necessary for learning, especially for design students, but it is not sufficient; we need to provide activities which engage the mind as well as the hands (Dewey called this reflective activity.)

4. Learning is a social activity: our learning is intimately associated with our connection with other human beings, our teachers, our peers, our family as well as casual acquaintances. We are more likely to be successful in our efforts to educate if we recognize this principle rather than try to avoid it. Much of traditional education, as Dewey pointed out, is directed towards isolating the learner from all social interaction, and towards seeing education as a one-on-one relationship between the learner and the objective material to be learned. In contrast, progressive education (to continue to use Dewey's formulation) recognizes the social aspect of learning and uses conversation, interaction with others, and the application of knowledge as an integral aspect of learning.

5. Learning is contextual: we do not learn isolated facts and theories in some abstract ethereal land of the mind separate from the rest of our lives: we learn in relationship to what else we know, what we believe, our prejudices and our fears. On reflection, it becomes

clear that this point is actually a corollary of the idea that learning is active and social. We cannot divorce our learning from our lives.

6. One needs knowledge to learn: it is not possible to assimilate new knowledge without having some structure developed from previous knowledge to build on. The more we know, the more we can learn. Therefore any effort to teach must be connected to the state of the learner must provide a path into the subject for the learner based on that learner's previous knowledge.

7. Motivation is a key component in learning. Not only is it the case that motivation helps learning, it is essential for learning. This idea of motivation as described here is broadly conceived to include an understanding of ways in which the knowledge can be used. Unless we know "the reasons why", we may not be very involved in using the knowledge that may be instilled in us. Even by the most severe and direct teaching.

A major theme in the theoretical framework of Bruner (1966) is that learning is an active process in which learners construct new ideas or concepts based upon their current/past knowledge. The learner selects and transforms information, constructs hypotheses, and makes decisions, relying on a cognitive structure to do so. Cognitive structure (i.e., schema, mental models) provides meaning and organization to experiences and allows the individual to "go beyond the information given".

As far as instruction is concerned, the instructor should try and encourage students to discover principles by themselves. The instructor and student should engage in an active dialog (i.e., Socratic learning). The task of the instructor is to translate information to be learned into a format appropriate to the learner's current state of understanding. Curriculum should be organized in a spiral manner so that the student continually builds upon what they have already learned.

Design education today needs, to take from the best elements of all the above approaches and to put them into one course of study relevant to the present.

1.2 Design education in India.

The Government of India asked for recommendations on a program of training in design that would serve as an aid to the small industries; and that would resist the present rapid deterioration in design and quality of consumer goods

Charles Eames, American industrial designer and his wife and colleague Ray Eames, visited India for three months at the invitation of the Government, with the sponsorship from the Ford Foundation, to explore the problems of design and to make recommendations for a training program. The Eameses toured throughout India, making a careful study of the many centers of design, handicrafts and general manufacture. They talked with many persons, official and non-official, in the field of small

and large industry, in design and architecture, and in education. As a result of their study and discussions, they submitted a report known as Eames report (1958). As per the recommendation of Eameses the government has set up National Institute of Design.

NID (National Institute of Design) is one of India's premiere institutes for design education. It was established in 1962 with the objective to train people to cater to various Design needs. To fulfill the various needs in different areas of design. It offers courses in two broad categories, Industrial Design and Communication Design.

Industrial Design offers the following specialized courses

Product Design, Furniture & Interior Design, Toy Design, Textile Design, Apparel Design, Life style accessory Design.

And in Communication Design the specializations are Graphics, Animation, Film and Video, New Media and Exhibition Design.

For a designer it is very important to have a good understanding of the technologies relevant to that particular field; but this alone will not make a successful and productive designer. For the many of the kinds of design we are considering it is important not just to be technically competent but also to have a well developed aesthetic appreciation. In environmental, product, graphic design space form, line color and texture are the very tools of the trade.

1.3 Need for color and form studies in Design Education

Color is one of the most powerful tools of an artist and a designer. It affects the emotions and it can convey any mood. Color is used by all artists and designers. From painters and potters to product designers and graphic designers. In art color is a vehicle for expressing emotions and concepts as well as information and it is very power full element in design. Its possibilities are limitless. The art of using color is thus open ended, complex discipline which incorporates many different points of view and poses many questions.

Scientists have tried for centuries to understand what creates color in our world and how we see them. Theories put forth by those studying the physics of light and the anatomy and physiology of vision still lie in the realm of hypothesis. Color theorists have tried to condense the infinite number of visible color variations into a few basic colors to form theories about their relationship. But no one color theory has been generally adopted as satisfactory explaining all color phenomena. Psychologists are studying the impact of various colors on our emotions and health, but they find that individuals tend to differ in their responses. Art historians analyze the different ways in which color has been used in different times and places.

Those interested in design tried to discuss how colors affect compositional factors such as unity, emphasis, balance, contrast and spatial awareness. Other specialists offer suggestions and attempts at standardization in the

realms of mixing colors with lights and pigments, for there is a special science of color creation for each discipline.

To tap the tremendous potential of color, designers must explore all these intellectual approaches. But beyond this it is very important to have a direct experience with color.

Actually working with color, exploring its characteristics and potentials, carefully observing how colors work together will give a better understanding about color.

The theories are useful ways of narrowing the field of exploration. Intellectual information provides a general map so that one does not have to wander randomly through the myriad halls of color. Along with the intellect one works intuitively, experimentally and with all senses alert this is the way to use the color for complete communication in a design problem.

When we look at the time allotted to Color and Form study in undergraduate program in Design it is three week units in the third semester and given three week units in the fourth semester. This is after they have done a six week units in the foundation program. (Foundation program is a one year common course for all design students before they enter their specialization. During foundation program they undergo all basic courses and develops a good understanding and skill which will

work as the base for any discipline they choose after the foundation program.) The color and form study occurs at three levels .One is of six weeks in foundation which focuses on basic skill, application and theories. Second and third courses happens in the third and fourth semester, that is after they enter their specialized discipline in their respective discipline in design, which focuses more on color interaction ,psychological aspects of color and color application. This is an indication of the importance of color and form studies in Design education. But at post graduate level students are coming from different backgrounds, many of them did not have undergone a course in color .So a course which contains all aspects of color like color theories, color interaction, color mixing, contextual meaning and cultural and geographical preferences on color is required at post graduate level.

1.4 Color and Form: How we see objects

Visual communication relies both on eyes that function and a brain that makes sense of all sensory information received. An active, curious mind remembers and uses visual messages in thoughtful and innovative ways. Knowing about the world and the images that it conveys will help you analyze picture. And if you can examine pictures critically, you have a good chance of producing high quality images that others will remember. General knowledge of the physics of light, how the eye focuses light, how the retinas collect light and how the brain processes, sorts and stores light is important because camera and computer construction is based on some of the same principles. Knowledge of the physics of light and physiology

of the eye will enhance your use of the technologies of the future and the ability to decipher innovative visual messages.

1.5 Color Theory:

Color theory encompasses a multitude of definitions, concepts and design applications. All the information would fill several encyclopedias. As an introduction, here are a few basic concepts.

1.5.1 The Color Wheel

A color circle, based on red, yellow and blue, is traditional in the field of art. Sir Isaac Newton developed the first circular diagram of colors in 1666. Since then scientists and artists have studied and designed numerous variations of this concept. Differences of opinion about the validity of one format over another continue to provoke debate. In reality, any color circle or color wheel which presents a logically arranged sequence of pure hues has merit.

1.5.2 Primary colors

Red, yellow and blue

In traditional color theory, these are the 3 pigment colors that can not be mixed or formed by any combination of other colors. All other colors are derived from these 3 hues

1.5.3 Secondary colors

Green, orange and purple

These are the colors formed by mixing the primary colors.

1.5.4 Tertiary colors

Yellow-orange, red-orange, red-purple, blue-purple, blue-green and yellow-green.

These are the colors formed by mixing the secondary colors.

1.5.5 Color Harmony

Harmony can be defined as a pleasing arrangement of parts, whether it be music, poetry or color. In visual experiences, harmony is something that is pleasing to the eye. It engages the viewer and it creates an inner sense of order, a balance in the visual experience. When something is not harmonious, it's either boring or chaotic. At one extreme is a visual experience that is so bland that the viewer is not engaged. The human brain will reject under-stimulating information. At the other extreme is a visual experience that is so overdone, so chaotic that the viewer can't stand to look at it. The human brain rejects what it can not organize, what it can not understand. The visual task requires that we present a logical structure. Color harmony delivers visual interest and a sense of order.

In summary, extreme unity leads to under-stimulation, extreme complexity leads to over-stimulation. Harmony is a dynamic equilibrium.

Some Formulas for Color Harmony

There are many theories for harmony. The following descriptions present some basic formulas.

A color scheme based on analogous colors

Analogous colors are any three colors which are side by side on a 12 part color wheel, such as yellow-green, yellow, and yellow-orange. Usually one of the three colors predominates.

A color scheme based on complementary colors

Complementary colors are any two colors which are directly opposite each other, such as red and green and red-purple and yellow-green. There are several variations of yellow-green in the leaves and several variations of red-purple in the orchid. These opposing colors create maximum contrast and maximum stability.

A color scheme based on nature

Nature provides a perfect departure point for color harmony. Red yellow and green create a harmonious design, regardless of whether this combination fits into a technical formula for color harmony.

1.5.6 Color Context

How color behaves in relation to other colors and shapes is a complex area of color theory. Red appears more brilliant against a black background and somewhat duller against the white background. In

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contrast with orange, the red appears lifeless; in contrast with blue-green, it exhibits brilliance Different readings of the same color

Observing the effects colors have on each other is the starting point for understanding the relativity of color. The relationship of values, saturations and the warmth or coolness of respective hues can cause noticeable differences in our perception of color. In order to mix pigments into clean saturated colors it is necessary to include a warm and cool of each of the primaries in your palette. There is no such thing as a pure primary pigment, so when mixing green for example, choosing a cool blue such as phthalo and a cool yellow such as lemon ensures there is no trace of red in the green. Using a warm yellow like cadmium or a warm blue such as ultramarine would introduce a slight trace of red into the green resulting in a compound color.

Imagine a color wheel filled in with all the compound mixtures between all the complementary colors. If this color wheel is placed in the middle of a cylinder with progressively darker shades of all those colors below and progressively lighter tints above, the cylinder would contain every possible color.

1.5.7 Successive contrast

In successive contrast

- Complementary colors appear as afterimages.

- The human visual system is adapted to perceive temporal and spatial variations of stimuli rather than uniformed, prolonged stimuli.

- The complement of a color appears as an after-image.

- The after-image will blend with the next color looked at.

- The duration of the after-image depends upon intensity and time of stimulation (less important for design because our eye roves around rather than remaining in one spot)

1.5.8 Simultaneous contrast

In simultaneous contrast,

- The complementary of a color appears in adjacent zones.

- A light area next to a dark area will appear lighter than it is in fact, and the dark one will appear darker.

- The same is true for complimentary colors.

- Alternating bands of color equalize.

1.6 Importance of color and form; what brain sees.

It is the brain – not the eyes that understands visual messages. Therefore to consider how the mind processes the visual information it receives from the eyes is vital. The brain processes images as four basic visual perception cues. (Color, form, depth and movement). Knowing how the brain divides and sorts visual messages will help you create images that take advantage of that knowledge.

1.7 Perception of color

In nature Form itself is defined by color. Color cannot be seen in isolation, the perception of color is always related to many factors like culture, psychology, geographical region, context and associated meanings.

1.7.1 Color and culture

Different cultures have different meaning for the same color. For example, white would be an inappropriate color for a wedding in China. It is the color of mourning. If a bride chooses a white wedding gown, her parents would probably not allow her to get married. In India, even in Christian weddings, while most brides wear white, it is usually relieved by at least a touch of some other color. If a married woman wears unrelieved white in India, she is inviting widowhood and unhappiness.

Let us take the evolution of the symbolism of green in Western culture: In Celtic myths the Green man was the God of fertility. Later in the millennium, early Christians banned green because it had been used in pagan ceremonies. Nevertheless, as evidenced by the 15th Century wedding portrait, by Jan VanEyck the color green was the best choice for the bride's gown because of its earliest symbolism. Of note is the continued symbolism attached to the color in the latter part of this century. Anyone who chooses a green m & m (an American candy which contains an assortment of different colored chocolate sweets) is sending a somewhat similar message. Green has been reinterpreted by late 20th

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century American culture to signify a state of heightened sexuality in this specific situation.

Green was a sacred color to the Egyptians representing the hope and joy of spring. Green is a sacred color to Moslems because when we look at the land which Islam was originated; green is the color of oasis, which is the hope and life in a desert land. Japanese Emperor Hirohito's birthday is celebrated as "Green Day" because he loved to garden .In this case Japan is a country where land is very scarce. So a garden is one of the biggest luxuries. This explains the culture specific meanings to a color.

Universal symbolism: But apart from this there are certain meanings which are not region or culture specific .These symbolic meanings are universally accepted for example green is associated to Nature and freshness in any part of the world irrespective of the region.

Contemporary symbolism: Now in the contemporary context we have another symbolism which is derived from issues and other concerns .For example the same color green is associated to ecologically beneficial aspects of the world. When we say "green" it means it is eco friendly," green design "refers to environment friendly design.

1.7.2 Color, Gender and psychology

What we see and interact with is in color, includes both natural and built environments. About 80% of the information which we assimilate

through the sense is visual. However, color does more than just give us objective information about our world-it affects how we feel. The presences of color become more important in interior environment, since most people spend more time inside than outside. Is there a gender difference in response to color? Although findings are ambiguous, many investigations have indicated that there are differences between genders in preferences for colors. Early investigations done by Guilford (1934) on the harmony of color combinations found that a person is likely to see balance in colors that are closely related or the opposite. Guilford also found some evidence that more pleasing results were obtained from either very small or very large differences in hue rather than medium differences, with this tendency more frequent in women than men. A review of color studies done by Eysenck in early 1940's notes the following results to the relationship between gender and color. Dorcus (1926) found yellow had a higher affective value for the men than women and St. George (1938) maintained that blue for men stands out far more than for women. An even earlier study by Jastrow (1897) found men preferred blue to red and women red to blue. Eysenck's study, however, found only one gender difference with yellow being preferred to orange by women and orange to yellow by men. This finding was reinforced later by Birren (1952) who found men preferred orange to yellow; while women placed orange at the bottom of the list. Guilford and Smith (1959) found men were generally more tolerant toward achromatic colors than women. Thus, Guilford and Smith proposed that women might be more color-conscious and their color tastes more flexible

and diverse. Likewise, McInnis and Shearer (1964) found that blue green was more favored among women than men, and women preferred tints more than shades. They also found 56% of men and 76% of women preferred cool colors, and 51% men and 45% women chose bright colors. In a similar study, Plater (1967) found men had a tendency to prefer stronger chromas (color) than women.

More recently, Radeloff (1990) has found that women were more likely than men to have a favorite color. In expressing the preferences for light versus dark colors, there were no significant differences between men and women; however, in expressing the preference for bright and soft colors, there was a difference, with women preferring soft colors and men preferring bright ones.

Color choice is very specific to one's personality. Color has been used for the study of one's personality. Once the color choice is made, the personality can be studied .Luscher has made an in depth study in this area.

1.7.3 Color Context

Color appears different in different backgrounds .Red appears more brilliant against a black background and somewhat duller against the white background. In contrast with orange, the red appears lifeless; in contrast with blue-green, it exhibits brilliance. The red square appears larger on black than on other background colors.

Observing the effects colors have on each other is the starting point for understanding the relativity of color. The relationship of values, saturations and the warmth or coolness of respective hues can cause noticeable differences in our perception of color.

1.7.4 Color and Geographical region

The living environment affects the liking and disliking for color .For example people from Arabian countries mostly uses green as their flag color because the color green contrasts with the general back ground of the landscape which is yellow ochre of the deserts. In the case of Kerala where the land is full of greenery and the people are dark in complexion, the most preferred color for the traditional dress is off white, which contrasts with both the nature and body color. Another example is Rajasthan where the landscape color is dry ochre and the dress color is bright reds, blacks and yellows. These examples show the general preference of color and geographical conditions of the place

In the same way that language, music and food differ from one culture to the next; so does the significance and meaning attached to color. Everybody reacts to many color-coded messages daily. From childhood onwards color and its meaning is learned from childhood onwards through many incidents and situations. For example we learn which color is for go and which color is for stop. And color has dozens of other associated meanings, from the monumental to the mundane; that we take it for granted and accept as fact.

A single color can have very different meanings in different cultures. In Asia Orange is positive, spiritually enlightened, and life affirming color; while in the US it is a sign of road hazards, traffic delays and fast food restaurants. Even the colors of nature are subject to regional context. The sky is blue everywhere, but depending upon where you live, a clear sky might be predictable daily occurrence or a note worthy break in the typical cloud cover. A spot of green might be an oasis in the desert or a patch of moss in a rain forest. Red while universally equated with blood can signify the courage of heroes or the slaughter of martyrs.

Some Color associations for different parts of the world

United States.

Red is meant as a warning color it always draws attention to itself. Red is considered as a loud color, red promises excitement; it is a powerful symbol of vibrancy and life, but also of danger and death. For women high healed red shoes, red lipstick and red dress and symbols of sexiness and passion. Red is also considered as a color of safety (fire engines, emergency equipment).

Color Yellow

Yellow is the most visible color from a distance. Yellow seems cheap. In the U.S yellow is a cautionary signal; it is designated for quarantine and yellow tape is used to cordon off areas under police investigation. Alternating black and yellow diagonal stripes indicate a hazardous area. In most cities of America taxies are yellow. In most of the part it is

considered as a happy color denoting the sun welcome, warmth and ripe grains. According to Luscher's color test, yellow represent 'spontaneity' in "expansive, aspiring, active and investigatory" and signifies "originality, expectancy, variability and exhilaration on the down side, yellow is the English language has a host of negative connotation the word yellow is synonymous with coward while yellow journalism means biased partisan and inflammatory news reporting.

Blue is a popular hue, a favorite color for companies and organizations who wish to convey their reliability and trust worthiness, they are true blue. Blue indicates quality, value, durability, strength and authority. Dark blue is the symbol of officialdom uniforms, mail boxes and symbols of the U.S government are navy to midnight blue. Dark blue suits are the daily uniform of office works nation wide, blue design is everyday wear for people of all ages and sexes.

Green is the color of money and nature. Recently it is a symbol of environmentalism. Dark green is considered to be masculine. In food green indicates health and freshness.

Americans claim a strong dislike for orange; it is associated with plastic furniture and fast food restaurants used for signs for highway construction and maintenance. In much of the US jailed prisoners are made to wear orange.

Black is associated not only to death but also to despair, the void, evil and negation. Black is meant be taken seriously. Black is sophisticated dignified, dramatic, very adult and extremely formal.

Similar to black, white also has symbolic connotations for Americans. It means clean, sanitary, pure, elegant and perfect. It also means cold antiseptic, empty ghostly, boring and un-finished.
White also means new, fresh and ready to go.

Mexico

Compared to USA, Mexico has a very rich background of ancient culture. It has the influence of Olmec, Mayan and Aztec civilization combined with those Spain, the Caribbean and a bit of France and Philippines. Mexico was the centerpiece of Spanish colonialism. The geography, climate, local materials and their beliefs has a major role in their color associations.

Aztec compass were color coded. East was gold, west was turquoise and jade green. South was white and north was red.

Color association and meaning for different colors.

Red was a favorite in religions and secular décor. In most of Indian mythology, red is the color of the sun although gold is often used to portray it.

The Aztec god who held up the sky was named Kan which also is the word for color yellow. In Mexican folk, yellow is a popular background color.

Dark blue and black were worn for morning; one Aztec god was born carrying a blue spear and shield and has his arms and legs painted blue.

In Mexico, the meanings of green are linked with vegetation. Mayan tombs were painted jade green. It could be a symbol of earth reclaiming the death.

Black is the color of death, mourning priestly robes. In any other western society black clothing demands respect. White is the traditional color for peasant daily wear. White also signifies purity and cleanliness.

Europe

The countries of Europe – East, West, North and South – share a cohesive set of color conventions. In a general approach, the darker the color the more serious, dignified formal and sometimes negative implications, lighter colors take on less formal, more positive meanings.

However, complex and contradictory is meanings, black is always takes seriously. This is the color of death and mourning. Widows throughout the European society have traditionally worn black for a long period of mourning. Black is also a symbol of elegance sophistication and nobility. A black tie is a part of a formal wear. A black automobile sending the

message that its owner is serious, powerful and may be from the upper class.

White means purity, cleanliness and goodness. It also stands for emptiness and blankness, it means neutrality. It is a common packaging color for diary products conveying hygiene and freshness. White can also mean antiseptic too clean, germ free, sterile, and lifeless. A white flag signals true or surrender.

Red conveys full and strong vigor. It is associated with optimism, extraversion, impulsiveness and vigor. On international signage red indicates a prohibition of movement, the possibility of danger and a warning towards extreme caution.

Yellow is a popular background for banners and signs because of its high visibility. Many countries use it as mailboxes, telephone booth and some of reference (yellow pages etc.). Yellow may also indicate a potential hazard. Yellow packaging can signify a precautious product particularly in food packaging.

Blue is the color of the sky. As Christian heaven is represented as being in sky this gives the color a spiritual significance and the implications of serenity and truth. Blue indicates trustworthiness, liability, and peace of mind. Blue implications carry along with shade: lighter blue tend towards positive and happy meanings, medium blue get more serious, trust

worthy, reliable etc. and darker blue has similar meanings of black, dark blue represents the sea.

Green symbolizes nature and fertility. In Pagan ceremonies the King and Queen wears green to symbolize spirit and re-birth.

Colors and Asian region

China, Hong-Kong and Taiwan

Most of the customs of these regions traces back to Chinese origins. The color associations of Chinese traditions traces back to bronze age and over the ages color has developed into a complex and formal color and symbol system. These color meanings also tie into the ancient practice of Feng -Shui.

In Asia, harmony and balance are important in daily life. Contrasting colors are placed side by side as a display of balance between opposing elements. This sort of effect is seen in Yin-yan symbol and many Buddhist temples in Thailand.

When looking at individual colors and its associated meanings:

Red is associated with communist China. The color symbolizes fire, red means summer, the south, good luck, joy good fortune and fertility. It is a traditional color for wedding dress.

Yellow symbolizes the color earth. For several centuries, yellow was emblematic and reserved for use of exclusively by the imperial family. So it still has the power and royalty associated to the color. Yellow is the color of wisdom.

Blue signifies sky and water, has positive associations. Blue is considered as a feminine aspect of nature. There are no significant mystical connotations associated with the color. Manual laborers traditionally wear pale blue clothing.

Green is a color of wood and jade. Green represents positive connotations of plants, crops and spring. Green is the color of birth and youth.

Orange is the color of love and happiness. It has generally positive meaning. Buddhist monks wear orange. Once it was a color for criminals in India. Buddha adopted it as a symbol of humility.

Black is the color symbol for water, so it symbolizes depth, truth, life stability. Black does not have much religious significances. It represents darkness and unknown.

White is the symbol of metal, white is also the color of death and mourning. After cremation the ashes of deceased are placed in a white urn and the family wears white linen for several weeks after the funeral.

India

India is a kaleidoscope of vivid colors. Some of the color symbolisms of India are given below.

Red: Indian brides wear red wedding dress as a symbol of the birth of a new phase of their life and for fertility. Red is associated with royalty and power and the warrior class is signified by red.

Yellow: represents the sun and its power. During many spring festivals, people wear yellow clothing, eat yellow food and sprinkle turmeric powder on statutes of Gods. Yellow is associated with merchant class.

Blue has a positive meaning in the Indian sub-continent. Krishna has blue skin symbolizing the heavens, love, truth and mere of as well as mysterious nature of truth.

Green is the color of plants and crops and generally having positive feelings.

Black assumes negative to neutral connotations. The untouchables have black as its associated color. Laziness, anger and a host of bad character traits as ascribed to the Guna Tamas.

White has predominantly positive associations in India. It is the color of all things Brahmas, the god, and the high court. White is also associated

with milk. Hindu holy men cover themselves in ash symbolizing renunciation.

So as we look at the geographical context, color has different associated meaning in different parts of the world. It is very important to have an understanding of cultural contexts for a better understanding of color and its associated meaning. Understanding of color and its contextual meaning is helpful in designing for an international market.

1.8 Associated meanings

There are many associated meanings to most of the colors .For example, Red is associated with danger almost universally because the color of blood. Blood coming out of the body is the sign of some danger happened to the body, so a bleeding body is associated to some danger happened to them. Since this is a universal phenomenon, the color red is associated with danger.

So a clear understanding of all the aspects of color is necessary for a designer to create a design which communicates to the maximum with a specific population.

1.9 Importance of preparing an instructional strategy for learning about color

Understanding of psychological, sociological, geographical, contextual and cultural meanings of color will head to the appropriate use of color

and form in a design for maximum communication. So the preparation of an effective teaching learning material for color and form is important for Design education.

1.10 Rationale of the study

Color is one of the most important elements in communication. Color defines the form, and so a study on color implies a study of form also. We learn the implications of usage of color from nature primarily. For example: sky which is far away is blue and so distance is associated with vast patches of blue. Similarly Red is associated with danger universally because of the color of blood. Also meaning of color is related to the cultural context and geographical regions.

Psychology of the viewer, relative size of the Color and foreground and background are some of the other factors which affect the perception of color. In Visual Communication the right usage of color and form helps in effective communication. So a study of color and color interaction is one of the most important subjects for studying design.

The appropriate use of color and form can be taught- The teachers can provide their principles with adequate knowledge, opportunities and materials for practice and teach them the use of tools and methods of work. By having a clear understanding of how sociological and cultural implications affect the meaning of color; a designer can put it in right use to achieve effective communication with target audience. Another

important aspect is the knowledge of the science of color; which is important in learning the interaction of colors and how color behaves on different backgrounds.

Looking at the prevailing situation of teaching color and form and from the studies reviewed the investigator has not been able to find any structured course in color and form studies. And the following questions have aroused in the mind of the investigator. Are the teachers teaching color and form really conscious of the purpose for which this course is taught? Are they teaching all the aspects like sociological, psychological, cultural, geographical and scientific aspects while teaching this course? Are they using appropriate methods and techniques for teaching? Do the teachers use proper techniques and methods which will give proper exposure to the students whereby they can get adequate opportunities to the acquisition of clear understanding of practical application of color theory? Can anything be done to improve the situation?

With a view to find out the methods to improve the learning, the investigator has taken up the study. The investigator has tried to find out the methods to improve the sensitivity of design students towards the application of color and form in their designs. The research will not only help and guide the work of the researcher but also will guide all the design teachers who wish to teach Color and Form in any design institute.

1.11 Problem statement

"A STUDYOF THE DEVELOPMENT AND EFFECTIVENESS OF AN INSTRUCTIONAL STRATEGY ON TEACHING THE COURSE IN COLOUR AND FORM FOR DESIGN EDUCATION."

1.12 Research Questions

What should be the structure of the course for teaching Color and Form course for communication design?

What problems the students could face while using color and form?

Will there be any considerable change in the use of color and form for communication by the students who are taught through the modular approach?

What are the parameters for judging the effectiveness of the learning by the students who are taught by the modular approach for Color and Form?

1.13 Objectives of the Study

1. To identify the difficulties faced by the students while using color.

2. To prepare a instructional strategy for teaching the course in Color and Form for design education

3. To study the effectiveness of the prepared instructional strategy

1.14 Operational definitions of terms used

Effectiveness

The extent to which goals are achieved for which the instructional strategy is designed. In the present study the effectiveness will be measured in terms of appropriate, contextual and more communicative use of color in a given problem and project.

Strategy

Strategy is a number of teaching or instructional methodology brought together in order to achieve the pre set objectives

Color

The most technically accurate definition of color is "the visual effect that is caused by the spectral composition of the light emitted, transmitted or reflected by objects."

Design

Design describes the activity of people who create products and systems that satisfy human needs and improve people's life. It is concerned with the research, planning, design, design development and production of a wide range of products. Design is problem solving with aesthetics

Design Education

A professional education program where design is taught.

1.15 Limitations of the study

1. This study is limited to design students and to one batch of post graduate students at National Institute of Design.