

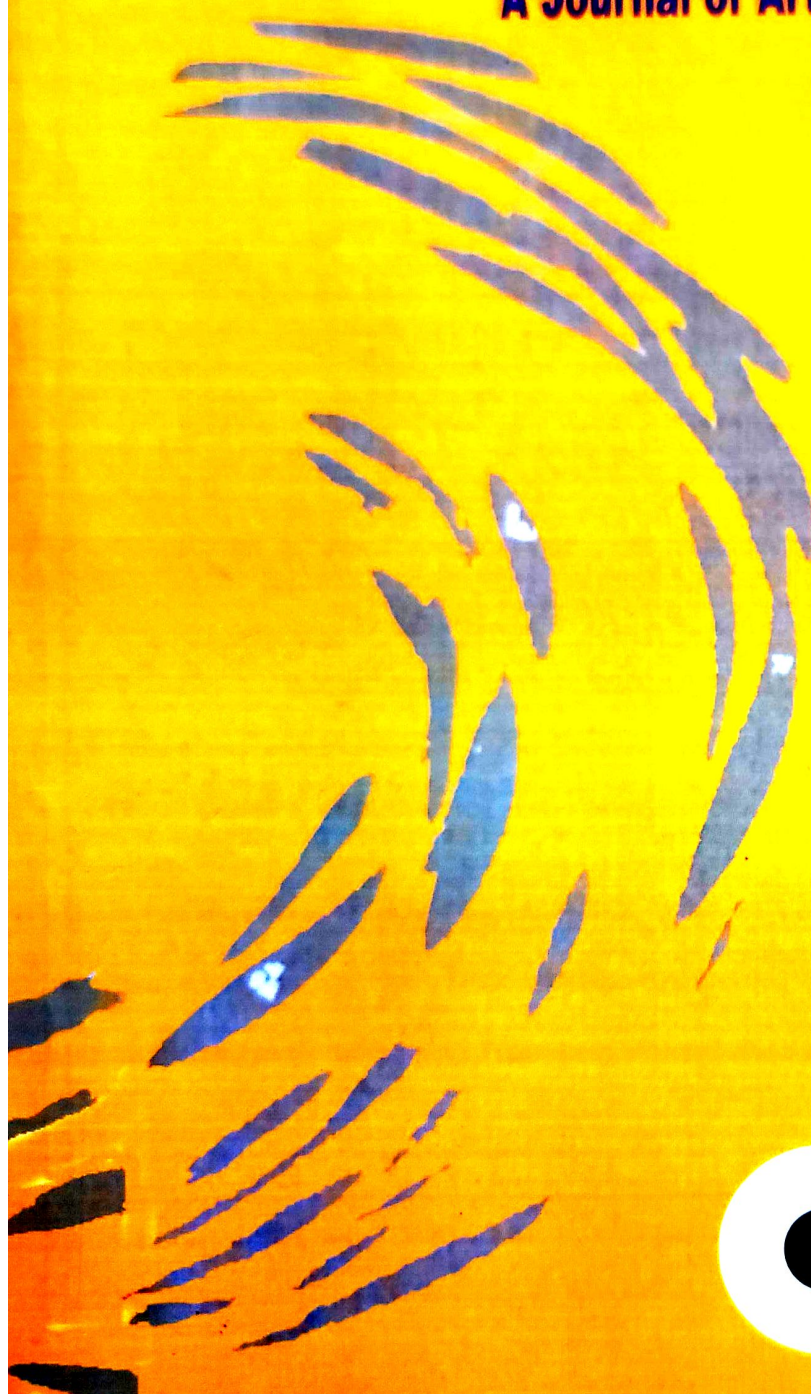


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THE SIGNIFICANCE OF DRAWING AND ART ELEMENTS IN DESIGN ACTIVITIES OF ARCHITECTURE

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Abstract

Drawing is an essential tool of creativity for architects in the process of documenting imagination, information or ideas on paper, for further development. Art elements such as line, shapes, and forms are channels for developing concepts which culminate, into an effective presentation of architectural design. It is obvious that the importance of art in design cannot be over emphasized, but the application of these elements of art to achieve a desirable result in design is not well understood by many students of Architecture; most times it is misapplied. The paper is based on literature review as well as 26 years of auto ethnographic+ transactions with students of architecture. It has been observed that students are unable to translate ideas through drawing into concrete design. As such this paper looks into the process of using elements of art as a panacea for solving design problems in architecture. It further goes on to explain how these elements of art can be manipulated by architecture students to produce a pragmatic design.

Key Words: Elements of Art, Design Activities, Creativity and Architecture.

Introduction

Architecture has to do with the planning, designing and constructing form, space and ambience that reflect functional, technical, social, environmental and aesthetic considerations (Parsae, Parva, & Karimi, 2014). It requires the creative manipulation and coordination of material technology, light and shadow. Architecture also encompasses the pragmatic aspects of realising buildings and structures, including scheduling, cost estimating and construction administration. Architecture defines the structure and behaviour of a building or any other kind of system that is to be or has been constructed. Architecture is defined as the art or science of building or that branch of Fine-Arts which has for its objective the production of edifices and ideas (Illies & Ray, 2009). Similarly, Architecture also involves activities required for creation and construction of buildings including consultation, analysis and the preparation of graphics that clearly show the intent of the design. This is perhaps why the great masters of design were mostly Artist. The period from 1400 to 1800 BC witnessed the emergence of the Renaissance art and architecture and a new type of designer, the artist architect. The artist such as Leonardo Davinci, Rafael and Michael Angelo had distinguished careers as architects. However, in the period of renaissance, attention was focused on facade treatment through ornamentation and decorative elements, while modernism and post modernism emphasized on forms and symbolism to create magnificent buildings. As such architecture is not an art only but also a science which requires a diversity of knowledge especially the elements of arts. This is because Architects who emphasize only one of these capabilities are not completely equipped and they render imperfect services as architects. Architecture must be a composite work, involving all talents that will aid creative possibilities in design, especially in the knowledge of elements of art and their application. However, architecture students do not seem to be creative enough these days, they prefer to copy existing drawings, instead of being creative by developing their own individual approach, style and technique of planning and design. This is due to lack of understanding of how to apply the rudiment of art (elements of art), especially in translating ideas into functional design. Moreover, it is observed that most of the Architecture students do not

understand the tool of expression at the early stage of learning, they only approach design by trial and error technique, and as such considerable time is wasted.

Relating Architecture to Art

In the realm of design, by contrast, the stage of planning and inventing may take place entirely on the plane of symbol systems, but the actualisation of the works involves a dramatic and amazing transformation from the cognitive world to the material world (Krengel, 2015). In the cognitive realm there is no categorical split between the thinking stage and the conversion of ideas into a system of written or pictorial symbols, (Mukerjee & Dabbeeru, 2012). The motive for innovation and creation in art and design is identical (Lindauer, 2011; Spuzic et al., 2016). They are all complementary pairs of ostensibly independent alternatives each of which have no meaning without the other. They are merely two ends of the same thing two tendencies of the same (Mitrache, 2012). Design is art and art is a representation of figures or forms in order to give an impression or expression. Similarly, Architecture is the art and science of designing and also bringing an idea into reality. However, art elements are important in architecture because they involve the capturing of imaginary ideas with varying concepts in design using the graphical elements such as line, shape, form, volume, space, tone, texture, structure, depth, hue, shade, orientation, size, visual inertia, position, perspective and rendering. As such Architecture is viewed as art because it is also involved in aesthetic, nature, symbolism, form and function (Carlson, 2002). Furthermore, architecture also provides opportunity for self-expression, which involves the bringing of the inner world into the outer world of concrete reality. Similarly art is a means through which sensuous and concrete expression is given to our ideas and inner feelings, with the focus in creating reality from imagination. It is asserted that the way we perceive or see the world around us, is also how we blend to be part of the whole (Andrews & Gatersleben, 2010; Gibson, 1950). It therefore, means that the understanding of the basic elements of art are important as means of representing information, data, ideas or feeling externally on paper, by giving a vivid description of an object or idea on two dimensional space with three dimensional effect. Art is everything we see, because it is monumental it records every event in history, so it is used to record information, and at the same time exhibit it for its aesthetic or functional purpose. Sketching, which involves the use of elements of art serves as a means for quick recording of information, which also serve as an extended memory of visual images in the mind of the architect (Lindauer, 2011; Pérez-Fabello & Campos, 2011). Elements of art give varieties of ways for flexible manipulation of ideas and information to be represented in different forms at different level of development. Drawing produces beautiful objects to look at for visual appeal, appreciation and satisfaction (Augustin, Wagemans, & Carbon, 2012; Dudek, 2011). By extension, architecture is known as visual art (Forty, 2000), simply because it satisfies human needs, physical, personal and group need. The main needs that visual art satisfies are personal expression and communication (Barnbaum, 2010). Thus, it is obvious that without a proficient skill in drawing, which is the main tool of communication in architecture, there can be no architecture. Architecture is the art and science of designing and constructing buildings from macro level of building (Illies & Ray, 2009). Architecture cannot be separated from art; this is because without the skills of art in architecture, it will be difficult to design a building that is aesthetical in appearance and functional in nature. Art as a word and field of study of its own has many parts. For example, drawing elements such as line, shape, form, space, colour and texture, are elements of art which are used in the teaching and practice of architecture. These elements help to create a graphical understanding of design being made

by an architect. Without these elements being correctly applied, there will be a poor expression of a design since they constitute the medium of design communication. Moreover, an Architect who has no good background of art will have a poor sense of imagination and will exhibit a high level of rigidity without flexibility. Successful architects need certain characteristics, which involve creativity and understanding of elements of art.

The Importance of Drawing in Architectural Design

Drawing is the preferred method of external data representation, in the mind, externally on paper, a computer screen or other media. It is obvious that picture is more vivid in sending message than written description of an object (Berg & Pooley, 2013). Similarly, drawings can group all information together, thereby, avoiding the wastage of time. Drawings explicitly preserve information about geometry and topology whereas; text is only serial in nature. Furthermore drawings are used because they provide an extended memory for visual images in the mind of the architect. Drawing allow for more facile manipulation of ideas. Similarly drawings allow the information to be represented in various forms such as differing views or levels concept. Thus, drawings are metaphors for both the real object and the draft object under development. They are also a principal medium of external thinking. They are therefore necessary extension of a designer's cognitive capability for all, but the most trivial data representation, constrain propagation, and mental stimulation (Vanwindekens, Stilmant, & Baret, 2013). Drawing serves as an extension of the architect's limited ability to visualize object in their medium. Drawing both utilize and deterring the cognitive units (design features) used in mental image formulation. Thus the architect's cognitive information organization is interdependent with drawing's characteristics during the design process; the design is refined from an abstract concept to a final detailed functional design. The component is refined from drawings that contain primarily functional information to a refined scaled drawing of the final form. Drawing is used to achieve the geometric form of the design. To communicate ideas between architects, builder, civil engineer and the quantity surveyor, drawing acts as an extension of the architect's short time memory. Architect often unconsciously make sketches to help them remember ideas that they might otherwise forget (Barlow, Jolley, & Hallam, 2011).

Understanding Design Process

Design is the main part of the work of an architect; it involves the process of gathering data or material information, which is known as design brief. The brief determines the content and pattern of the design. It is like a guide that helps to control the plan flow, the design goal, the technique implored and the level of creativity achieved at the end of the design. The architect has to carry out research and take case studies, which include site analysis and feasibility or viability study. It also involves taking notes of merits and demerits of the case studies. This amongst other things informs the concept that determines the resolutions of problems identified, such that they are not replicated in the new design. The developed brief and the design concept or philosophy are based or determined by the availability of information and the understanding of the Architects (intuition) mind, which should serve as a guide from the beginning of design to it completion. It is important to note that, individual thinking affects architectural designs, in their varied creative formations and as such, design process is exhibited in different forms, for different clients. In view of this, it is believed that design is a personal and creative endeavour, which exhibits individual character and approach that helps in the modification of different ideas, to solving diverse problems with varied conceptions. These varied conceptions are captured by the architect based on the way it is phenomenological experienced (Seamon, 2000). It therefore, means that, design process is

informed by individual experiences, that are personal, looking at solving design problems, from different perspectives that eventually leads to different approaches, styles, techniques and at last produce varied outcomes. This is what gives room to variety of design plan styles and techniques, which can only be effectively expressed through the use of art elements.

Communication Through Art in Design

The architect's ideas (design) are usually communicated through the use of presentations. It is used as form of records keeping, so that ideas conceived in the mind are not forgotten. It is believed that architects conceive the finished product in the mind eye, and visualise the building through the use of working drawings, in which every minute detail is reproduced in reality and specification. This process is known as thinking on paper, because drawing is not just illustration of visual concepts. It is much more than that, it serves as the primary means of discovering and clarifying ideas. Design passes through stages of transitional development and modifications, directed by the set goal. It is a procedure of exploring concepts, techniques and imagination that answers the question posed by the design problem through the use of drawing. Drawings in the form of sketches thus, become a handy procedure to use. Sketches go beyond realism, it is active and fluid, with sense of direction and an intrinsic logic that grows from within, which opens ways for abundant sources of ideas that connote a lot of meaning. Similarly, it coordinate the mind, eyes and hand to roam beyond the sub conscious mind, as can be seen in abstract or representational images and symbols discovered or generated. This helps in solidifying the concept of the design, after passing through many stages of development guided by the brief of design. Sketches are therefore, the compositional drawing that explores the artist's initial creative impulse, which is the ingredient for developing new styles, techniques and approaches to design and planning. Spontaneity and originality are the characteristics of a good sketch, and the first step after been given the design brief, is to develop the concept which is achieved by using sketching techniques that can vividly communicate information. Since the main goal of using a sketch is to produce a concept to get the germ of the ideas down on paper, concentrating upon the feelings of the images produce and guided by the information given, helps in the creation of a good concept. The concept generated must be able to guide the design from the beginning to the end product, bearing in mind the aesthetic and functionality of the design. This involves the use of line to draw out the form and the shape of the concept and also use of space, which explains the proportion and balance in abstract form, help in development of the design.

As a requirement of concept development, students communicate with themselves to test design ideas and understand space. Abu-Ghazze (1997) states that, teaching design students the means by which space can best be represented and how the general public might respond to, this representation is a crucial era of an applied design education and builders, as they need to visualize how a space might be realized. For example, before adding new lighting and sound controls, projection systems and other "smart" technologies in a classroom, college administrators need to visualize the aesthetics and functionality of that classroom through drawing completed by a designer. For both the design student and practicing professional, design concepts must be developed as an integral part of the work, beginning on graphic representations of space, to be presented to the client. Linking design concept development with visual communication has implications for the process by which the designer communicates with self. According to Yee (2012), if drawing and drafting techniques are taught in the context of concept development, then the means of visual communication (drawing tools, techniques and media) addressed in the classroom are effected by their support of the design process. A design student might be taught to begin exploring design concept, preliminary sketches using simple drawing tools, and then to utilize more complex manual drafting and computer-aided design techniques, as the design process evolves, based

on the selected concept. In the past, students of interior design typically became involve with the generation of advanced three-dimension drawings in classroom, before developing design concepts. This practice brings to light, the critical reinforcement of design concept development and visual communication.

As stated by Brown and Wyatt (2015), design is best understood as an outcome of thinking processes. Eggink and Laseau (1982) described the importance of what they referred to as extra-personal communication in conjunction with a freehand sketching approach. This form of communication might also be termed self-conferencing, suggesting that in initial stages, it is not necessary to have others involved. Experiences in eye-hand interaction that occur in freehand sketching, provide support for the interaction, thought and visual representation, allowing the student to formulate and test design ideas before presenting them to appropriate recipients. The design student must recognize that self-conferencing is an integral component of design concept development, proceeding from freehand sketching to more specific manual drafting or computer-generated graphic representations as illustrated in Figure 1.

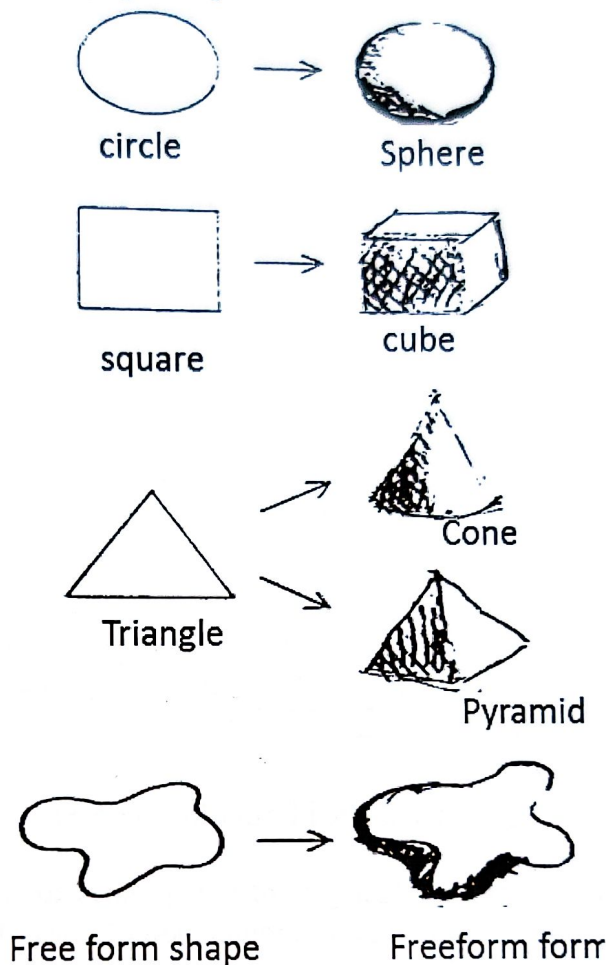


Figure 1: Transformation from basic shapes to 3 dimensional form

The Use of Lines in Design Process

Line is used to give an idea of the site intended for the design proper; it is rendered in a map form by way of drawing out the shape of the supposed site in its entire outlook and out line. When we lose the ability to draw, we lose a part of our ability to think (Spuzic et al., 2016). One of the most important objectives of an architect is to develop his own characteristic design process or approach to design, and the main tool for this assignment is use of line. Ragans and Pub (1988) states that, lines are everywhere, because words, numbers and symbols are written with the help of line. Similarly, the lines on a map help people to find the

best route from one place to another". For example, to represent a site plan on paper, line is used to convey the message on site, in a kind of map that explains the component and characteristics of the site. However, different types of lines are used with different meaning to convey messages. This is because lines have different qualities such as thick, thin, delicate or bold, continuous or broken, wavy, curved or straight (see Figure 2). As such, they are employed differently, to suggest information such as movement, direction or location. Similarly, line is used symbolically to express movement of the wind, the direction of the sun, the form and content of the building.

Figure 2: using different types of line to achieve 3 dimensional effects on 2 dimensional



planes, Adopted from Ching (1943)

It is also the same process, when producing floor a plan; lines are also the main tool used to render it. For rendering elevations however, combination of lines of different thickness with graphical shading are used to bring out the interplay of light and shade, which gives the design a three dimensional effect or outlook, by defining the shape and if possible the texture more vividly, because it also helps in bringing out the tone value of the work produced.

Manipulation of Shapes and Forms in Design

Shape, form, and space are closely related and connected, in identifying objects or buildings in a design process, which in working together, helps to bring out or speaks out the message by expressing one's ideas and feelings. A shape is a two-dimensional area that may have out line or boundary around it or it may be recognized by the area it covered. Shapes are found in most designs, although they are two-dimensional, flat in nature. Shapes are classified as either geometric or free form. In design, geometric shapes are precise and mathematical formulas that can be put together, to create buildings (Özdural, 2000). The basic geometric shapes that are essential in design are, circle, square, and triangle (Clark & Pause, 2012). All other geometric shapes are either variations or combinations of these basic shapes, which make it possible for architect to manipulate drawings in design. These shapes are used for decoration, uniformity, and organization in design. Moreover with the combination of free-form shapes, which are irregular and uneven in nature, these help in creation of concept, rendering and in the formulation of irregular area of a design, like contours, bend, curves and others. They are used throughout the design process.

Forms are objects having three dimensions, like shapes, they both have length and width, but forms also have depth, which differentiates form from shape. Form is a developed shape after shading has been added; implying tonal value, showing gradation of light effect on a shape makes it a solid form. For example, a circle is a shape but a sphere is a solid form, a triangle is a shape, while a cone or pyramid is a solid form derived from a triangle. This is because, a shape is flat; it is two dimensional, while a solid form is three dimensional. These forms are used and manipulated to create different types of buildings in variations of style and techniques, to achieve aesthetic and functional design. Shapes and forms exist in space, which is the emptiness or void between, around, above, below, or within objects. Every object occupies space and it is the space that determines the size and proportion of the object or building in space, either two dimensional or three dimensional spaces. Shapes and forms are defined by the space around and within them. Without space, there can be no shape or forms, whatsoever, because they depend on space for their existence. It is a spatial flow or arrangement that appeals to the eyes for appreciation. Since we have positive and negative spaces, it is imperative for one to understand the way it works. Architects shape space by designing structures that enclose a variety of shapes and forms for different people with different meaning, seeing from different perspectives. The eyes and the brain work together in unison to enable one perceive and see three dimensions, length, width and depth as illustrated in Figure 3

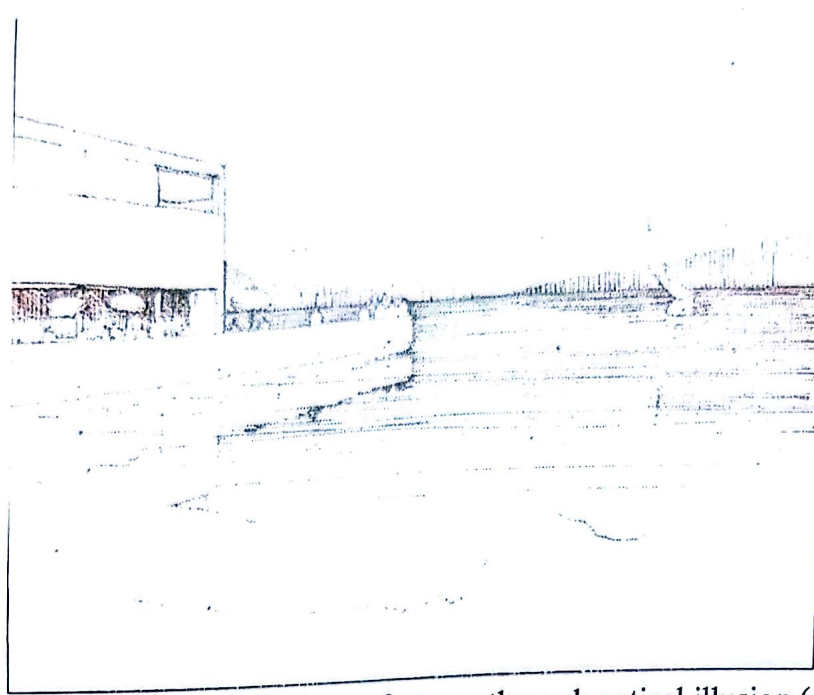


Figure 3: The use of lines to depict different features through optical illusion (adopted from ching 1943)

We see objects from different angles. It is applying these, together that tricks the brain into thinking it sees depth, it is called optical illusion, because if one touches the drawing with hand, it is flat, but looking at it, one feels the sense of distance on a two dimensional space. The shapes and forms that one sees depends on ones point of view, as the object reflects from the eyes to the brain, it exhibits changes in value that can be used, to create illusion of three dimensional shapes and forms on a two dimensional surface. Impression of depth and solidity are then impressed on the viewer. Also, the arrangement of light and shadow called chiaroscuro in Italian, which simply means light and shade, is a vital tool, used effectively to mould an object or building to a solid state. This is always handy when projecting elevations in design as can be seen in Figure 4.

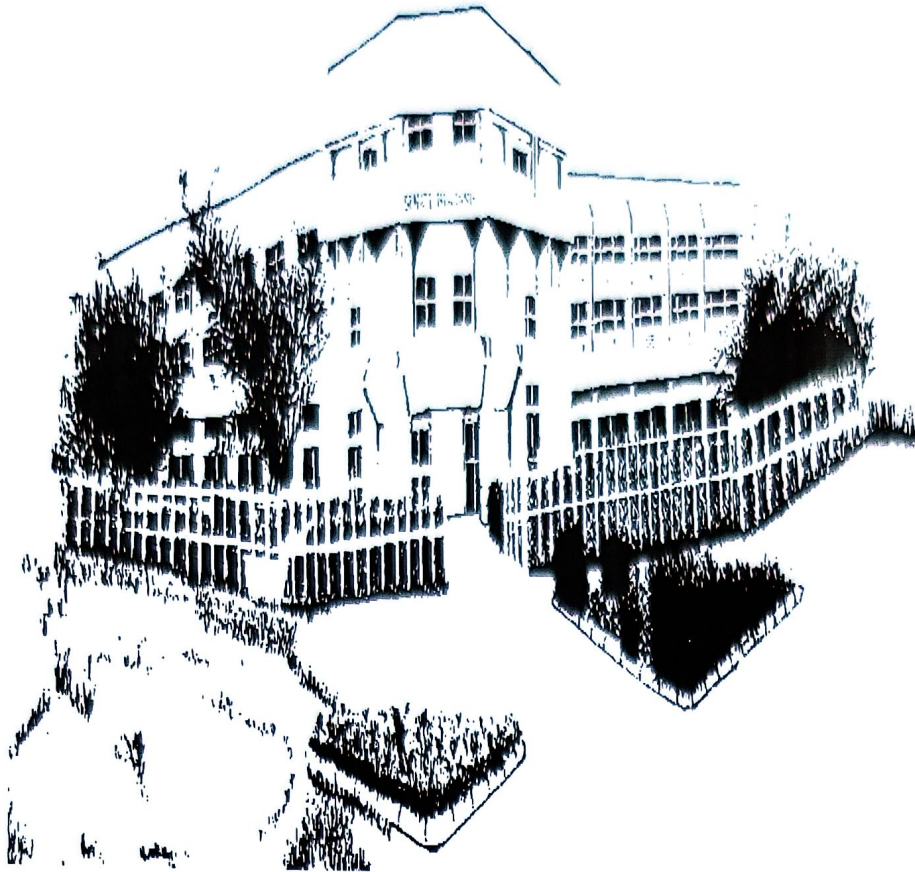


Figure 4: The use of shading to illustrate light and dark spots in a building (source; Author's sketch 2015)

This technique is called shading in rendering. The shape of an object or building determines the type of rendering or shading to be applied, but mostly the intensity of light determines the level of solidity. The dark point of a building is usually the part far away from the light, while the lightest point is the direct part facing the light.

Solidifying Building Forms in Design

Combining lines, shading, spatial arrangement, rendering, interplay of shapes and manipulation of forms definitely bring out the three dimensional effect of a planned design, but to drive the point home and achieve a design that is close to reality, the use of Colour and Texture could be exhibited in the exploration of three dimensional rendering (model). Without Colour representation, the work will be only in black and white (monochrome), but to represent reality, Colour and texture speak louder and appeal to our sense of appreciation vividly. Colour is exciting, people react and are sensitive to colour because it appeals directly to our emotions. It is the most expressive element of art. Colours are symbolical; it stands for ideas and feelings. Different buildings, carries different colours according to their purpose and meaning in relation to the message intended. For example green and its different hues can be used for buildings that stand for Agriculture and serenity. Meanwhile we have warm colours like Red, Yellow and Orange, they are loud, they demand to be noticed at once and as such they are used on a building that stands for vigorous activity like market building and sport complex, in order to catch the viewer's attention. Colours are also used to create movement and depth.

Colours have different symbolical meaning in different cultures throughout history. It is important that architects should investigate and use the appropriate colour for a particular purpose, in line with the lay down belief of a particular culture and custom. Texture is another element of Art that refers to how things feel, or how they look, as they might feel on the surface. We perceive Texture in two ways, sense of touch and vision. We are still using our sense of touch when we look at surfaces. Our sense of seeing transmit something we see and would feel as if touched. Rendering inscribed patterns on the surface, creates an illusion of light and shade that reminds us of how those things really feel. This is called visual texture, an illusion of three dimensional surfaces. These textures are two dimensional patterns created by repetition of lines or shapes. These invented Textures are two dimensional patters created by repetition and interplay of light and shade that stimulate our memories of real textures to achieve realism and pragmatic design.

Conclusion

The paper did not only set out to showcase the importance of elements of art in the training of architecture students, But it also pointed out that students of Architecture should have a background of Fine-Art or at least take the freehand-sketching class seriously, by trying to understand the application of the elements of Arts because drawing is the main tool of communication and creativity in Architecture. Without a proficient knowledge and skill in drawing, it would be difficult to put down ideas accurately and as such the message of the design will be lost. The conditions for the success in achieving a pragmatic design are the revival of the importance of drawing and manipulation of the skill through elements of Art. The study makes it clear that it is possible for the students of architecture to develop individual styles and techniques by applying the Elements of art in diverse ways, which in turn helps in the improvement of creativity. Most importantly the understanding of the elements of art by architecture students can lead to a better comprehension and presentation of architectural works.

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